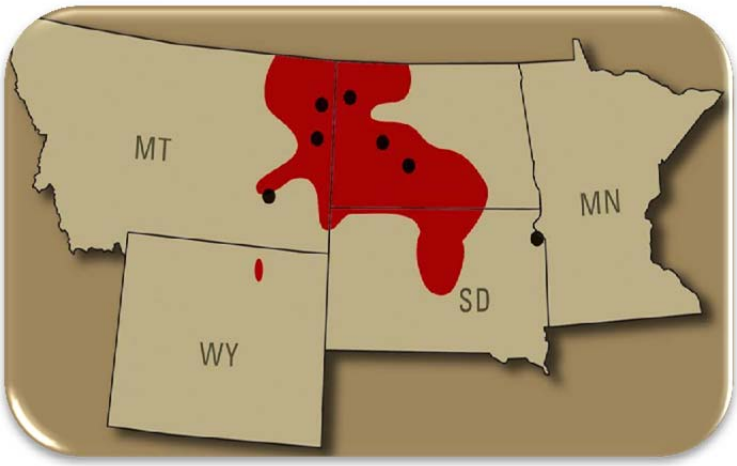
Integrated Resource Plan

2013



Submitted to the
North Dakota Public Service Commission
July 1, 2013

Volume III: Attachment B

Montana-Dakota Utilities Co.
2013 Integrated Resource Plan

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Attachment B

MONTANA-DAKOTA UTILITIES CO.
A Division of MDU Resources Group, Inc.

Attachment B

DEMAND-SIDE ANALYSIS DOCUMENTATION

Electric Energy Efficiency Potential Study

Submitted to Montana-Dakota Utilities Co.

Submitted By Nexant

December 7, 2012

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Nexant

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1 EXECUTIVE SUMMARY

1.1 OVERVIEW

Montana-Dakota Utilities Co. (MDU) has retained Nexant, Inc. (Nexant) to identify and characterize remaining cost-effective electric energy efficiency potential in MDU's Montana electric supply territory and to quantify the amount of electric energy savings achievable through energy efficiency programs.

The objectives of this study are:

- Establish attainable ten-year energy savings goals through comparing the costs and savings of energy efficiency measures relative to standard equipment and practices.
- Develop understanding of implementation barriers specific to MDU's Montana service territory.
- Identify potential energy efficiency savings opportunities to support development or expansion of new programs appropriate to MDU's Montana service territory.
- Quantify the potential energy efficiency resource for systems planning.

The values and figures presented in this report are intended to provide target ranges of achievable energy efficiency savings for MDU's Montana electric supply territory. This report does not provide precise goals for energy efficiency savings, nor does it provide a specific road map on how to acquire these energy efficiency targets. The results of this study are intended to provide MDU with an understanding of energy efficiency as a resource, add clarity to MDU's demand-side management (DSM) program development process, and add context to any goals set by MDU for future DSM programs.it

1.2 CALCULATION METHODOLOGY

Demand Side Management (DSM) resources for electric energy efficiency programs can be characterized by technical, economic, and achievable potential. Technical potential is a theoretical "snapshot" of savings if all technologically feasible efficiency measures were implemented immediately at the highest possible efficiency, without regard for cost. Economic potential is a subset of technical potential that considers only cost-effective measures as compared to supply-side resources. Achievable potential accounts for real-world efficiency implementation barriers by considering market adoption rates developed from market research and evaluation data gathered through the implementation of representative DSM programs. Achievable potential represents the savings that MDU could expect to achieve through energy efficiency programs. Figure 1-1 shows the relationship of these different types of energy efficiency potential with one another. Nexant did not assess program potential savings as part of this study.

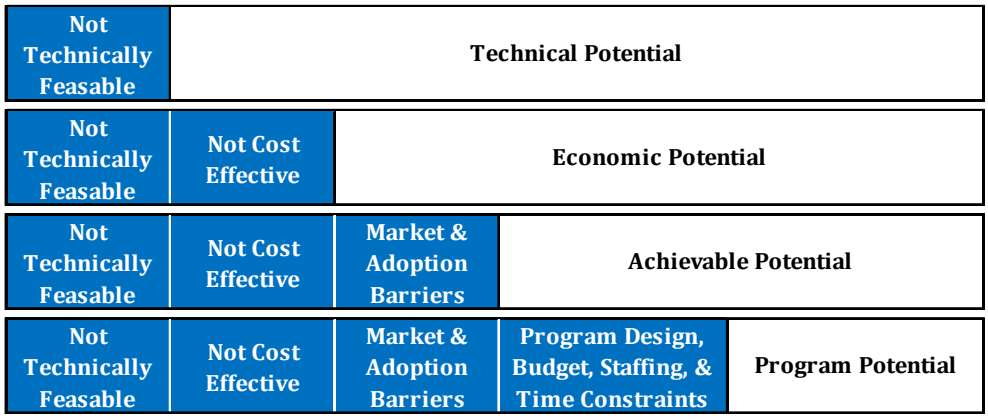


Figure 1-1: Types of Energy Efficiency Potential[1]

Nexant conducted the evaluation of electric energy efficiency potential in MDU's Montana service territory using a top-down modeling approach and following a three-step process. The core steps in the top-down potential estimation are described below. A more detailed description of calculation methodology is included in Section 2.

- **Step 1: Determine Baseline Energy Use and End-use Saturation.** Nexant first created a baseline energy consumption forecast for each sector: residential, commercial and industrial. An MDU-provided database of 2011 electricity sales by customer account enabled Nexant to classify base year consumption according to housing, business, or building type. Residential and commercial base year consumption was further disaggregated into end-uses before individual end-use growth rates were applied, resulting in a fully disaggregated end-use-level baseline forecast for commercial and industrial sectors, and a slightly less granular business-type-level disaggregated forecast for the industrial sector.

- **Step 2: Identify Energy Efficiency Measures and other Program Opportunities.** Nexant developed measure libraries by consolidating and refining base-case and efficient-case energy impacts and costs specific to MDU's unique market classes and other characteristics (such as load profile, discount rate, and avoided costs). Measure economic inputs were developed using MDU-specific avoided energy and capacity costs, and refined using Montana-specific models of typical homes and businesses.

- **Step 3: Estimate Technical, Economic, and Achievable Potential.** Nexant employed a top-down approach to estimate energy and demand savings potential in Technical, Economic, and various Achievable scenarios. Section 2.4 includes an explanation of the methods used to generate results by sector, segment, and end-use.

[1] Reproduced from "Guide to Resource Planning with Energy Efficiency" November 2007. US EPA. Figure 2-1.

The technical and economic potential of Demand Response (DR) programs was estimated by evaluating two popular types of DR programs known as Direct Load Control (DLC). DLC programs enable the local utility to remotely turn off or cycle certain residential equipment such as air conditioners and water heaters. Section 7 includes a detailed description of the methods used to summarize potential demand reductions and the associated costs.

1.3 MDU BASELINE

In 2011, MDU provided approximately 748 GWh of electricity to nearly 24,900 residential, commercial, and industrial premises in Montana.

Approximately 41% of 2011 MDU electricity sales in Montana were to accounts that are considered ineligible for utility-sponsored energy efficiency programs, primarily due to these accounts self-funding their own DSM efforts. Self-funded accounts include all Large Universal Systems Benefit Charge (USBC) customers who accounted for 39% of total electricity sales in 2011. About two percent of electricity sales were to unallocated/non-premise accounts such as radio towers and other communication, transportation, or utility-related uses.

Figure 1-2 summarizes 2011 electricity sales attributable to DSM-eligible customers in MDU's Montana service territory. A detailed analysis of MDU's disaggregated electricity sales forecast is contained in Section 3.

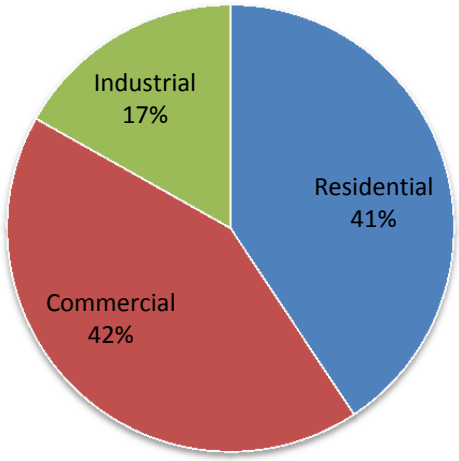


Figure 1-2: 2011 Montana Electricity Sales to DSM-Eligible Customers

Figure 1-3 shows MDU's forecasted electricity sales to DSM-eligible customers through 2022. Annual overall DSM-eligible electricity sales are expected to increase more than 40% between 2011 and 2022, from around 444 GWh to more than 628 GWh. As the figure below illustrates, electricity sales to commercial premises are expected to grow as a portion of DSM-eligible sales, from 42% in 2011 to 52% in 2022.

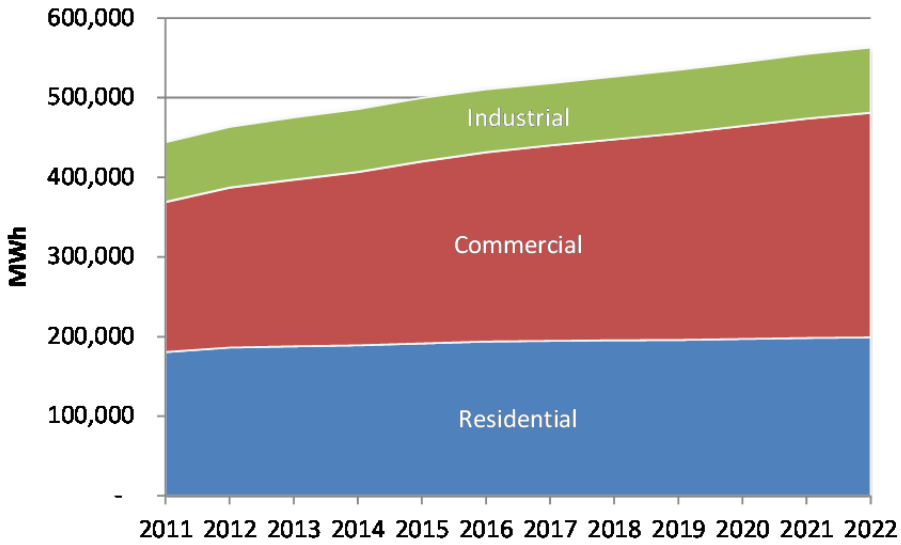


Figure 1-3: DSM-Eligible Electricity Sales Forecast

1.4 RESULTS

The following section contains Nexant's findings of technical, economic, and achievable savings potential along with the associated economic costs and benefits.

1.4.1 Savings Potential

This section summarizes the savings potential for the 10 year horizon of the study (2013-2022) first across the entire MDU system, then for each sector: residential, commercial & industrial.

1.4.1.1 System Wide Savings Potential

The technical potential savings for the entire MDU territory in 2013 is 5.6 GWh, or 3.3 percent of MDU forecasted sales. Cumulative technical energy savings in 2022 reach just under 68 GWh, representing 30.4 percent of forecasted sales. Economic potential in 2013 is 3.9 GWh, while cumulative economic potential in 2022 is 40.5 GWh, representing just under 23 percent of forecasted sales. Cumulative economic potential demand savings are estimated at just over 5 MW in 2022, or 3.4 percent of forecasted demand.

System-wide achievable potential savings at a moderate 50% incentive level are estimated to be 0.1 GWh in 2013, increasing to a cumulative savings value of 9.9 GWh in 2022, representing 5.5 percent of forecasted sales. A 50% incentive level is defined as an incentive that covers 50% of the customer's incremental cost above the cost to adopt a standard efficiency alternative. Table 1-1 provides a summary of the savings potential for each scenario across the different time horizons assessed in this study. The table includes four achievable potential scenarios, each representing an incentive level as a percentage of incremental cost.

Table 1-1: MDU System-Wide Potential Savings Summary

Forecast Period	Technical		Economic		Ach. 100%		Ach. 75%		Ach. 50%		Ach. 25%	
Energy Savings (GWh) and Percentage of Forecasted Montana Sales												
2013	5.6	3.3%	3.9	2.5%	0.3	0.2%	0.2	0.1%	0.1	0.1%	0.1	0.1%
2017	5.8	3.2%	4.0	2.4%	1.8	1.1%	1.5	0.9%	1.0	0.6%	0.6	0.4%
2022	6.0	3.1%	4.2	2.4%	3.2	1.8%	2.5	1.4%	1.7	0.9%	1.1	0.6%
Cum. 2017	28.4	16.0%	19.8	12.0%	5.0	3.0%	4.0	2.4%	2.7	1.6%	1.7	1.0%
Cum. 2022	57.9	30.4%	40.5	22.9%	18.7	10.4%	15.0	8.3%	9.9	5.5%	6.4	3.5%
Demand Savings (kW) and Percentage of Forecasted Montana Sales												
2013	678	0.5%	476	0.4%	34	0.0%	27	0.0%	18	0.0%	11	0.0%
2017	716	0.5%	501	0.4%	210	0.2%	168	0.1%	111	0.1%	71	0.1%
2022	761	0.5%	533	0.4%	310	0.2%	248	0.2%	165	0.1%	106	0.1%
Cum.2017	3,489	2.5%	2,449	1.8%	564	0.5%	452	0.4%	299	0.2%	192	0.2%
Cum.2022	7,195	4.8%	5,044	3.4%	1,979	1.6%	1,583	1.2%	1,053	0.8%	676	0.5%

Figure 1-4 shows the expected MDU system-wide forecast with DSM energy savings removed for each scenario assessed in the study.

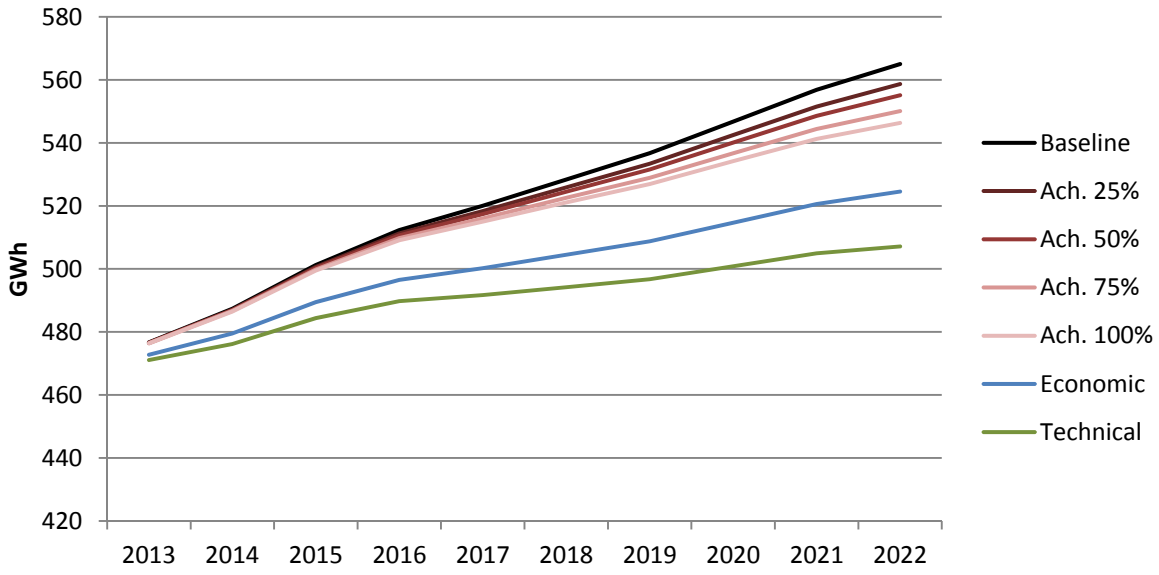


Figure 1-4: MDU System-Wide Sales Forecast with DSM Potential Removed

1.4.1.2 Savings Potential in the Residential Sector

Total technical potential in the residential sector in 2013 is 2.6 GWh, representing 1.4 percent of residential forecasted sales. Cumulative technical energy savings in 2022 reach 25.3 GWh and account for 12.7 percent of residential forecasted sales. Economic potential is 1.8 GWh in 2013, representing

nearly 1 percent of residential forecasted sales. Cumulative economic energy savings potential reaches 16.7 GWh in 2022, accounting for 8.4 percent of residential forecasted sales. 10-year cumulative achievable potential savings at an incentive level of 50% are estimated at 4.1 GWh, or 2 percent of forecasted residential sales. 10-year cumulative demand savings are estimated at 0.4 MW, representing 0.3% of forecasted residential demand. Table 1-2 summarizes these findings.

Table 1-2: Summary of Potential Savings in the Residential Sector

Forecast Period	Technical		Economic		Ach. 100%		Ach. 75%		Ach. 50%		Ach. 25%	
Energy Savings (GWh) & Percentage of Residential Forecasted Sales												
2013	2.6	1.4%	1.8	0.9%	0.1	<0.1%	0.1	<0.1%	0.1	<0.1%	<0.0	<0.1%
2017	2.5	1.3%	1.7	0.9%	0.7	0.4%	0.6	0.3%	0.4	0.2%	0.3	0.1%
2022	2.4	1.2%	1.6	0.8%	1.2	0.6%	1.0	0.5%	0.7	0.3%	0.5	0.2%
Cum. 2017	13.0	6.6%	8.6	4.4%	1.9	1.0%	1.5	0.8%	1.1	0.6%	0.7	0.4%
Cum. 2022	25.3	12.7%	16.7	8.4%	7.2	3.6%	5.8	2.9%	4.1	2.0%	2.7	1.4%
Demand Savings (MW) and Percentage of MT System Peak												
2013	0.3	0.2%	0.2	0.1%	<0.1	<0.1%	<0.1	<0.1%	<0.1	<0.1%	<0.1	<0.1%
2017	0.3	0.2%	0.2	0.1%	0.1	0.1%	0.1	<0.1%	<0.1	<0.1%	<0.1	<0.1%
2022	0.3	0.2%	0.2	0.1%	0.1	0.1%	0.1	0.1%	0.1	<0.1%	<0.1	<0.1%
Cum. 2017	1.3	1.0%	0.9	0.6%	0.2	0.1%	0.2	0.1%	0.1	0.1%	0.1	0.1%
Cum. 2022	2.6	1.8%	1.7	1.2%	0.8	0.5%	0.6	0.4%	0.4	0.3%	0.3	0.2%

1.4.1.3 Saving Potential in the Commercial Sector

Total technical potential in the commercial sector in 2013 is 2.2 GWh, representing 1.1 percent of commercial forecasted sales. Cumulative technical energy savings in 2022 reach 25.5 GWh and account for 9 percent of commercial forecasted sales. Economic potential is 1.5 GWh in 2013, representing 0.7 percent of commercial forecasted sales. Cumulative economic energy savings potential reaches 16.7 GWh in 2022, accounting for 5.9 percent of commercial forecasted sales. 10-year cumulative achievable potential savings at an incentive level of 50% are estimated at 4.4 GWh, or 1.6 percent of forecasted commercial sales. 10-year cumulative demand savings are estimated at 0.6 MW, representing 0.4% of forecasted commercial demand. Table 1-3 summarizes these findings.

Table 1-3: Summary of Potential Savings in the Commercial Sector

Forecast Period	Technical		Economic		Ach. 100%		Ach. 75%		Ach. 50%		Ach. 25%	
Energy Savings (GWh) & Percentage of Commercial Forecasted Sales												
2013	2.2	1.1%	1.5	0.7%	0.1	0.1%	0.1	<0.1%	0.1	<0.1%	<0.1	<0.1%
2017	2.5	1.0%	1.7	0.7%	0.8	0.4%	0.7	0.3%	0.4	0.2%	0.3	0.1%
2022	2.9	1.0%	1.9	0.7%	1.4	0.5%	1.2	0.4%	0.7	0.3%	0.5	0.2%
Cum. 2017	11.9	4.8%	7.8	3.2%	2.3	1.0%	1.9	0.8%	1.2	0.5%	0.7	0.3%
Cum. 2022	25.5	9.0%	16.7	5.9%	8.6	3.2%	6.9	2.5%	4.4	1.6%	2.7	1.0%
Demand Savings (MW) and Percentage of Forecasted MT System Peak												
2013	0.3	0.2%	0.2	0.2%	<0.1	0.0%	<0.1	0.0%	<0.1	<0.1%	<0.1	<0.1%
2017	0.4	0.3%	0.2	0.2%	0.1	0.1%	0.1	0.1%	0.1	<0.1%	<0.1	<0.1%
2022	0.4	0.3%	0.3	0.2%	0.2	0.1%	0.1	0.1%	0.1	0.1%	0.1	<0.1%
Cum. 2017	1.7	1.2%	1.1	0.8%	0.3	0.2%	0.3	0.2%	0.2	0.1%	0.1	0.1%
Cum. 2022	3.6	2.4%	2.4	1.6%	1.2	0.8%	0.9	0.6%	0.6	0.4%	0.4	0.3%

1.4.1.4 Savings Potential in the Industrial Sector

Total technical potential in the industrial sector in 2013 is 0.7 GWh, representing just less than 1% of industrial forecasted sales. Cumulative technical energy savings in 2022 reach 7.2 GWh and account for 8.8 percent of industrial forecasted sales. Economic potential is 0.7 GWh in 2013, representing just less than 1% of industrial forecasted sales. Cumulative economic energy savings potential reaches 7.1 GWh in 2022, accounting for 8.6%of industrial forecasted sales. Economic savings potential is typically about the same as technical savings potential in the industrial sector as measures that are technically feasible tend to also be economically feasible. 10-year cumulative achievable potential savings at an incentive level of 50% are estimated at 1.5 GWh, or 1.8 percent of forecasted industrial sales. 10-year cumulative demand savings are estimated at 0.3 MW, representing 0.2% of forecasted industrial demand. Table 1-4summarizes these findings.

Table 1-4: Summary of Potential Savings in the Industrial Sector

Forecast Period	Technical		Economic		Ach. 100%		Ach. 75%		Ach. 50%		Ach. 25%	
Energy Savings (GWh) & Percentage of Industrial Forecasted Sales												
2013	0.7	0.9%	0.7	0.9%	0.1	0.1%	<0.1	0.1%	<0.1	<0.1%	<0.1	<0.1%
2017	0.7	0.9%	0.7	0.9%	0.3	0.4%	0.2	0.3%	0.1	0.2%	0.1	0.1%
2022	0.7	0.9%	0.7	0.9%	0.5	0.6%	0.4	0.5%	0.3	0.3%	0.2	0.2%
Cum. 2017	3.5	4.5%	3.5	4.5%	0.8	1.1%	0.7	0.8%	0.4	0.5%	0.3	0.3%
Cum. 2022	7.2	8.8%	7.1	8.6%	2.9	3.6%	2.3	2.9%	1.5	1.8%	0.9	1.1%
Demand Savings (MW) & Percentage of Industrial Forecasted Demand												
2013	0.1	0.1%	0.1	0.1%	<0.1	<0.1%	<0.1	<0.1%	<0.1	<0.1%	<0.1	<0.1%
2017	0.1	0.1%	0.1	0.1%	<0.1	<0.1%	<0.1	<0.1%	<0.1	<0.1%	<0.1	<0.1%
2022	0.1	0.1%	0.1	0.1%	0.1	<0.1%	0.1	<0.1%	<0.1	<0.1%	<0.1	<0.1%
Cum. 2017	0.5	0.3%	0.5	0.3%	0.1	0.1%	0.1	0.1%	0.1	<0.1%	<0.1	<0.1%
Cum. 2022	0.9	0.6%	0.9	0.6%	0.4	0.3%	0.3	0.2%	0.2	0.1%	0.1	0.1%

1.4.2 Savings Potential by Premise Type and by End-use

This section provides achievable savings potential by premise type for the residential, commercial and industrial sector. The achievable savings potential findings presented are for the 50% incentive level. Achievable potential savings are also presented by end use for the residential and commercial sectors.

1.4.2.1 Residential Savings Potential by Premise Type, and by End Use

Figure 1-5 shows the distribution of residential 2017 achievable potential energy savings by residence type for a moderate (50%) incentive scenario. In line with consumption, single family homes represent the largest share for potential savings at 87% of all potential savings. Figure 1-6 shows the distribution of residential 2017 achievable potential energy savings by end use for a moderate (50%) incentive scenario. Lighting and appliances comprise the largest share of savings by end use at 35% and 30% respectively.

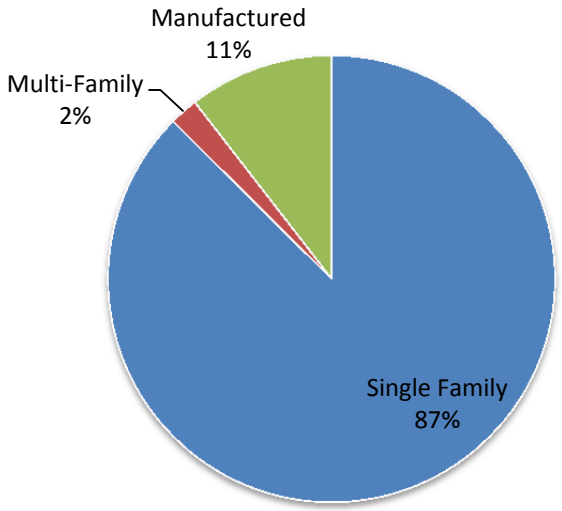


Figure 1-5: Residential Achievable Savings Potential by Residence Type, 2017

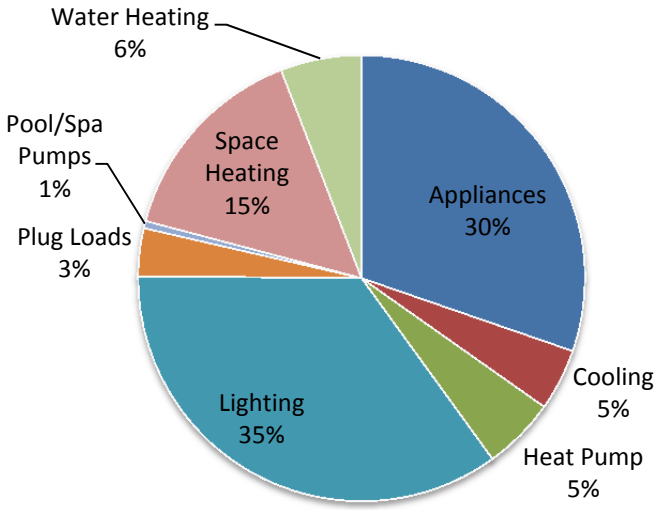


Figure 1-6: Residential Achievable Savings Potential by End Use, 2017

1.4.2.2 Commercial Savings Potential by Building Type, and by End Use

Figure 1-7 shows the distribution of commercial 2017 achievable potential energy savings by business type for a moderate (50%) incentive scenario. Savings are fairly evenly distributed across the buildings types with grocery and lodging representing the largest shares at 20% and 19% respectively. Figure 1-8 shows the distribution of commercial 2017 achievable potential energy savings by end use for a moderate (50%) incentive scenario. Similar to the residential sector,

lighting again represents the largest opportunity for savings potential at 37%, followed by measures in the refrigeration end use (23% of savings).

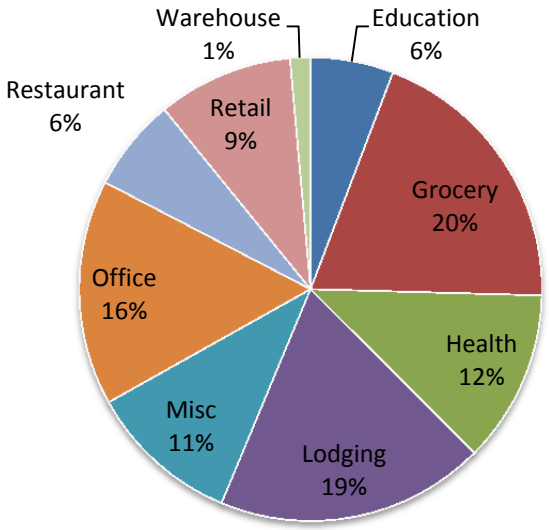


Figure 1-7: Commercial Achievable Savings Potential by Building Type, 2017

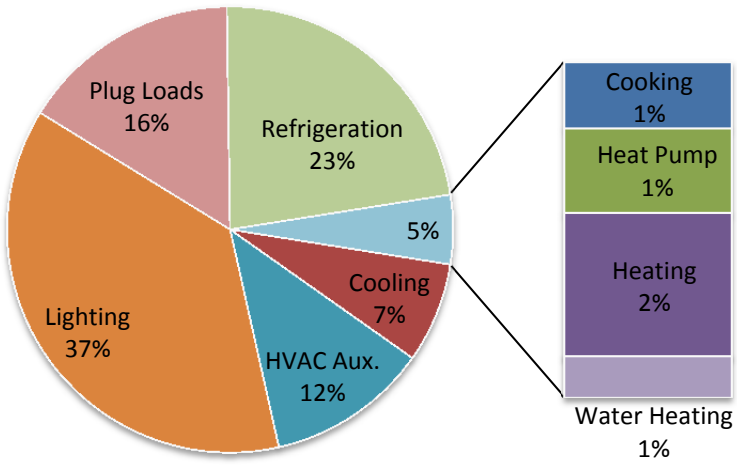


Figure 1-8: Commercial Achievable Savings Potential by End Use, 2017

1.4.2.3 Industrial Savings Potential by Business-Type

Figure 1-9 shows the distribution of industrial 2017 potential energy savings by industry type for a moderate (50%) incentive scenario. In line with consumption, the petroleum coal products industry represents the largest share of savings potential with 67.5% of all estimated savings.

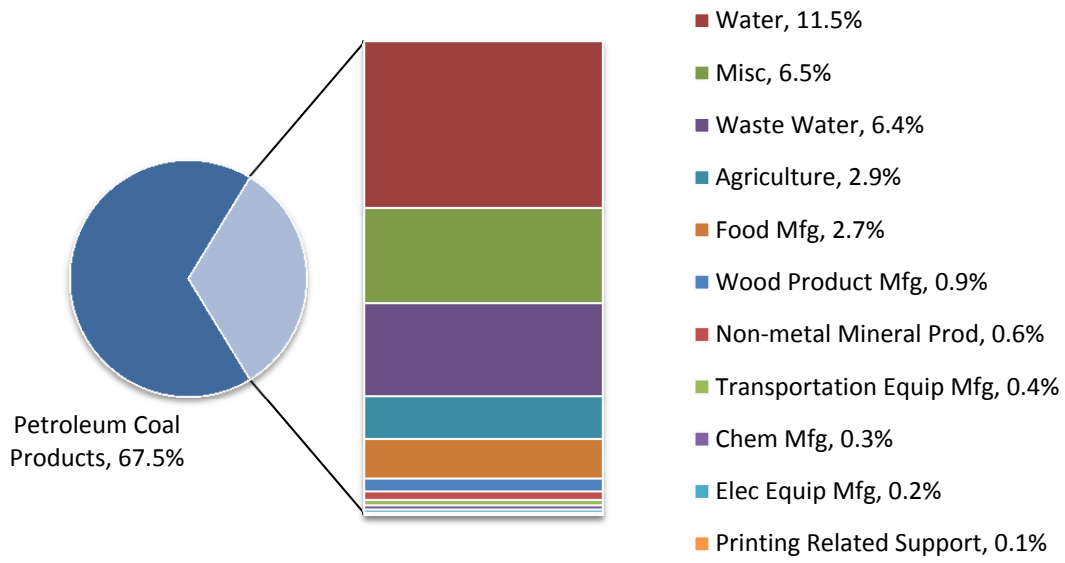


Figure 1-9: Industrial Achievable Savings Potential by Business Type, 2017

1.4.3 Key Findings

Nexant's findings show that MDU's Montana service territory has ample opportunity to achieve considerable savings through energy efficiency programs. The following depicts several of the key findings:

- Single-family homes provide a solid resource as they account for 87% of achievable energy savings in the residential sector.
- Lighting, appliance, and space heating end uses make up approximately 80% of the residential sector's achievable potential.
- Commercial segments with the largest achievable savings include grocery, office, and lodging, which when combined account for over half of the potential in the sector.
- Higher incentive levels will likely cause proportionally greater market adoption in all sectors. Low incentive levels likely have less of an effect in MDU's Montana service territory as compared to the average utility service territory.

- Commercial end-uses such as lighting, plug loads, and refrigeration should be given priority since together they account for over 75% of the sector's savings potential.
- Over two-thirds of the achievable potential in the industrial sector comes from the petroleum and coal products industry.
- Water and wastewater industries provide nearly an additional 20% of the Industrial sector's achievable savings.

2

Nexant employed a top-down approach to estimate technical, economic, and achievable energy and demand savings potential among MDU's residential, commercial, and industrial customer sectors.

2.1 OVERVIEW

The general methodology used by Nexant in the calculations of Energy Efficiency Potential is illustrated in Figure 2-1 and described in detail in this section.

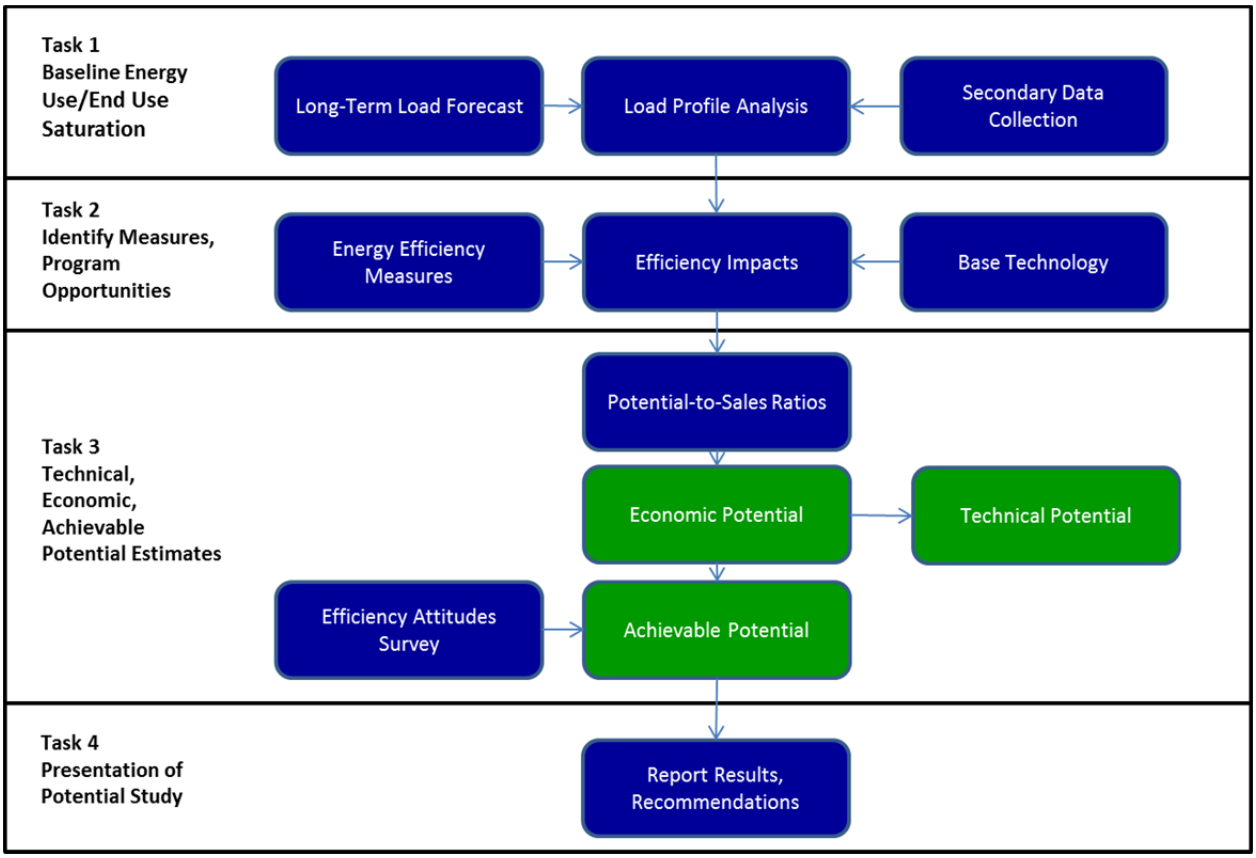


Figure 2-1: Methodology

2.2 TASK 1: DETERMINE BASELINE ENERGY USE AND END-USE SATURATION

An accurate assessment of achievable electric energy savings requires a thorough characterization of the energy usage and equipment saturation of the regional customer base within MDU's Montana service territory. Our approach included compiling a large amount of information on utility loads and sales forecasts, market data (fuel shares, energy system saturations), end-uses (energy use intensities, growth rates and load shapes), and measure characteristics (technologies, costs, life, savings).

Nexant utilized a collection of secondary research to compile data and calibrate our findings to historical Montana service territory electricity consumption. Data points included the results of a 2006 Residential End-use Survey of MDU's Montana residential electric customers, and the results of desk review of available secondary sources including:

- iTRON Statistically-Adjusted End-use trends
- Energy Information Administration (EIA) Commercial Building Energy Consumption Survey (CBECS)
- EIA Manufacturing Energy Consumption Survey (MECS)
- 2009 End-use and Load Profile Study completed for NorthWestern Energy (NWE)
- 2010 Assessment of Energy Efficiency Potentials (2010-2029), also completed for NWE
- 2011 State of Pennsylvania Market Potential Study

NWE is another major electricity supplier that services central and western Montana. An overview of the tasks involved in Task 1 follows.

2.2.1 Disaggregation of Load and Forecast

2.2.1.1 Base Year Load Disaggregation

Nexant disaggregated MDU's 2011 Montana electricity sales into sectors, segments, and end-uses appropriate for analysis of savings potential. Residential consumption was segmented into single-family, multi-family, and manufactured homes. Commercial segmentation was based on widely-used Commercial Buildings Energy Consumption Survey[1] (CBECS) business types. Industrial segmentation was based on the major industrial segments in the North American Industry Classification System (NAICS). Each segment was further divided into end-use consumption based on existing regional load profile data. The complete segmentation scheme is shown in Table 2.1.

[1] http://www.eia.gov/consumption/commercial/

Table 2-1: Electric Load Segmentation Scheme

Sector	Segments	End-uses	
Residential	Single Family	Appliances	Plug Loads
	Multi-Family	Cooling	Pool/Spa Pumps
	Manufactured	Heat Pump	Space Heating
Commercial	Education	Cooking Cooling Heat Pump Heating HVAC Aux.	Lighting Plug Loads Refrigeration Water Heating
	Grocery		
	Health		
	Lodging		
	Miscellaneous		
	Office		
	Restaurant		
	Retail		
	Warehouse		
Industrial	Agriculture	Not Used	
	Chemical Mfg.		
	Electrical Equip. Mfg.		
	Food Mfg.		
	Miscellaneous		
	Nonmetallic Mineral Products		
	Petroleum Coal Products		
	Printing Related Support		
	Transportation Equip. Mfg.		
	Water		
	Waste Water		
	Wood Product Mfg.		

2.2.1.2 Forecast Disaggregation

After classifying the base year consumption, the next step was to apply unique growth rates to the end-use level consumption over the study period, resulting in a disaggregated electricity forecast at the end-use level for residential and commercial sales, and at the segment level for industrial sales. Growth rates were determined using statistically-adjusted end-use efficiency projections. Lighting consumption was adjusted to account for the impacts of the 2007 Energy Independence and Security Act (EISA). An explanation of EISA impact adjustments is included in Section 3. The results of the forecast disaggregation were calibrated to MDU's aggregate system load forecast as provided to Nexant.

2.3 TASK 2: IDENTIFY ENERGY EFFICIENCY MEASURES AND OTHER PROGRAM OPPORTUNITIES

2.3.1 Measure Development

To complement the top-down energy efficiency potential assessment, Nexant developed three distinct electric energy efficiency measure libraries. Since a comprehensive "bottom-up" analysis of all measure inputs was not within the scope of this study, Nexant utilized contemporary measure lists from prior studies (including the 2009 Northwestern Energy Market Potential Study and the 2011 State of Pennsylvania Market Potential Study) and adjusted savings parameters to align with the unique characteristics of MDU's Montana service territory. Some of the inputs adjusted include technology saturation levels, residential unit energy consumption (UEC), building type average square footage, and load profiles. All measures appropriate for the service territory were considered along with reliable data on costs, savings, and measure life. This effort had two main components as described in the following sections.

2.3.1.1 Energy Efficiency Measure List

An initial list of measures was compiled based on the Nexant Team's experience and a review of MDU's current energy efficiency programs. Consideration was also given to measures that show promise for future viability but have not yet gained a foothold in the market. As a top-down potential study, it should be noted that Nexant did not use the measure lists to directly determine savings potential. Rather, the lists were developed to provide MDU with an illustrative list of the universe and cost-effective DSM measures given MDU's unique characteristics (such as load profile, discount rate, line losses, avoided costs, etc.)

2.3.1.2 Energy Efficient Measure Costs and Savings

Upon finalization of the energy efficiency measure list, Nexant updated key inputs for the savings and cost estimations. These inputs include variables such as residential end-use unit energy consumption (UEC), lighting operating hours, building type average square footage, end-use saturations, load shape, discount rates, avoided costs, line losses, among others. Measure lifetimes and measure incremental customer costs were held constant from the previous studies as these values are based on national averages and are not region-specific. This work was performed through a three-step process.

Step 1: Define market classes

The first step in determining energy efficiency measure impacts involved defining appropriate sectors, market segments, vintages, and end uses as illustrated in Table 2.1.

Table 2-1.

Step 2: Develop base case impacts and costs

For each of the energy efficiency measures on the final list, base case equipment and practices were determined. All residential base case assumptions and data were informed by local and federal codes and standards, when deemed appropriate. For new construction and turnover installations, measure baselines were defined primarily by ASHRAE 90.1 – 2007 / IECC 2009 if an efficiency or minimum requirement was specified. For weather-dependent measures, IECC 2009 provided baseline specifications primarily for heating, cooling, and envelope (insulation) measures. In some cases, recent changes to federal code (such as the new lighting standards associated with the 2007 Energy Independence & Security Act) were adopted over the IECC code because the code would take precedence in all regions. Motor baseline efficiencies were taken primarily from the Energy Policy Act of 1992. Measure baselines for early retirement scenarios were adjusted from these new construction levels based on Nexant's knowledge of old code specifications, equipment performance degradation, and regional code compliance.

Step 3: Develop energy efficiency measure impacts and costs

For each measure, energy savings were estimated both as a percentage of base energy usage and in absolute (kWh) savings. Energy efficient measure costs were also based on recent research.

2.3.2 Measure Economic Inputs

To accurately determine the cost effectiveness of each measure and evaluate the overall economics of the DSM resource, Nexant input a number of economic variables into the residential, commercial and industrial measure lists. First, Nexant was provided with MDU's avoided energy cost forecast on an hourly level as well as annual avoided capital costs to reflect reductions in system peak demand. The hourly avoided energy costs were averaged for three usage periods (on-peak summer, off-peak summer, and winter). Load shapes for each end-use were then applied to these periods to find an average annual avoided cost value. Nexant further refined the load shapes by end-use for the commercial and residential sectors by using data from an eQuest[1] modeling analysis exercise conducted for typical homes and businesses in Montana.

To accurately quantify avoided energy savings for MDU, Nexant applied the appropriate values to account for line losses from the customers' meters to MDU's generation. In addition to line losses, Nexant applied a discount rate of 8.58% to value future avoided costs.

Finally, Nexant assigned an expected program administration cost to the model. This value includes costs to MDU for running DSM programs, excluding customer incentives. This cost includes general

[1] eQuest is an acronym for the QUick Energy Simulation Tool; http://www.doe2.com/equest/

activities such as rebate processing, trade-ally organization, and technical assistance. For calculation of the TRC (Total Resource Cost) test, Nexant assumed a value of $0.05 per first year kWh saved which reflects the typical costs of a utility in the ramping stages of DSM programs. This rate reflects the cost of processing applications and issuing rebate checks, the minimum costs needed to assess measure cost effectiveness.

2.4 TASK 3: ESTIMATE TECHNICAL, ECONOMIC, AND ACHIEVABLE POTENTIAL

Nexant employed a top-down approach to modeling electric energy efficiency potential for MDU's Montana service territory. This approach involves applying savings and demand reduction factors to the disaggregated consumption at the segment and end-use level to generate results for economic potential. Applying a sector-level factor to the economic potential values results in sector-level technical potential. Finally, applying market adoption rates to economic potential results in achievable potential.

The accuracy of this type of top-down approach is greatly increased due to the availability of significant data from the two NorthWestern Energy (NWE) reports from 2009/2010. Step 1 and Step 2 provide details on how metrics from these reports were used to arrive at Economic and Technical Potential for MDU.

2.4.1 Step 1: Estimate Economic Potential

For each sector, the economic potential was estimated at the end-use level within each of the sector's segments. The 2009/2010 End-use and Load Profile Study and Assessment of Energy Efficiency Potential for NorthWestern Energy played key roles in this step. Estimating economic potential followed this approach for each sector:

1. Using the End-use and Load Profile Study data, attribute a consumption value to each end-use within each segment.
2. Using the Assessment of Energy Efficiency Potential Report, determine the sector's total economic potential.
3. Using the Assessment of Energy Efficiency Potential Report, determine the breakdown of that sector's economic potential across its segments.
4. Using the Assessment of Energy Efficiency Potential Report, attribute to each end-use within each segment a percentage of that segment's economic potential. An example of this is shown for two commercial segments in Table 2-2.

Table 2-2: Breakdown of Segment Economic Potential by End-Use

End-Use	Office	Restaurant
Cooking	0.0%	2.0%
Cooling	3.0%	0.8%
Heat Pump	4.0%	3.0%

Heating	5.0%	0.5%
HVAC Aux.	10.0%	5.0%
Lighting	44.0%	30.0%
Other	0.0%	0.0%
Plug Loads	34.0%	4.0%
Refrigeration	0.0%	54.0%
Water Heating	0.0%	0.8%
Total	**100.0%**	**100.0%**

5. Use each segment's potential energy savings and the breakdown across each segment's end-uses to attribute an economic potential energy savings value for each end-use within each segment.
6. At that same resolution, generate a factor representing economic potential as a percentage of consumption for each segment/end-use combination. An example of this is shown for two commercial segments in Table 2-3.

Table 2-3: End-Use Economic Potential as a Percentage of End-Use Consumption

End-Use	Office	Restaurant
Cooking	0.00%	0.04%
Cooling	0.29%	0.09%
Heat Pump	0.49%	0.63%
Heating	0.81%	2.66%
HVAC Aux.	0.59%	0.55%
Lighting	0.96%	0.76%
Other	0.00%	0.00%
Plug Loads	1.04%	1.61%
Refrigeration	0.00%	1.05%
Water Heating	0.00%	0.44%

2.4.2 Step 2: Estimate Technical Potential

Sector-level technical potential was also derived from the NWE Assessment of Energy Efficiency Potential report. In this case, the resolution supplied in the NWE report was only at the sector level. Therefore, only sector-level technical potential results were possible. The factors in Table 2-4 represent the relationship between technical potential and economic potential. These factors were applied to the aggregated sector-level economic potential resulting from Step 1.

Table 2-4: Ratio of Technical Potential to Economic Potential by Sector

Residential	Commercial	Industrial
1.51	1.53	1.02

2.4.3 Step 3: Develop Market Adoption Rates

An important step in assessing achievable potential is to evaluate the expected market adoption rates for energy efficiency measures. These rates represent the fraction of economic potential in a given year that can be considered achievable.

Market adoption rates were evaluated for each end-use and each potential scenario (technical, economic, achievable). However, for the technical and economic potential estimations, market adoption rates were assumed to be 100% by definition – that is all efficiency measures are assumed to be implemented immediately.

The achievable potential scenario used market adoption curves at the end-use level with varying ramp rates and asymptotes to capture the impacts of several market adoption factors. These ramp rates are aggressive for certain end-uses for which energy efficiency upgrades are easier to market, install, and understand by the customer. Examples of these end-uses include lighting, appliances, and plug loads. On the other hand, for example, commercial HVAC, refrigeration, and cooking measures had more moderate adoption rates due to their complexity and relatively difficult installation. Another factor that affects market adoption curves is the incentive level offered by the utility for a set of DSM efficiency measures. For this study, four different adoption curves were developed based in-part on different incentive level scenarios – 25%, 50%, 75%, and 100% of incremental cost of a measure. The higher the incentive level, the more aggressive the adoption curve in converting economic into achievable potential. The Nexant team calibrated the adoption curves to account for key findings from the Energy Efficiency Attitudes Surveys. An example of a moderate market adoption curve (for moderately easy measures to install and 50% incentive level) is shown in Figure 2-2.

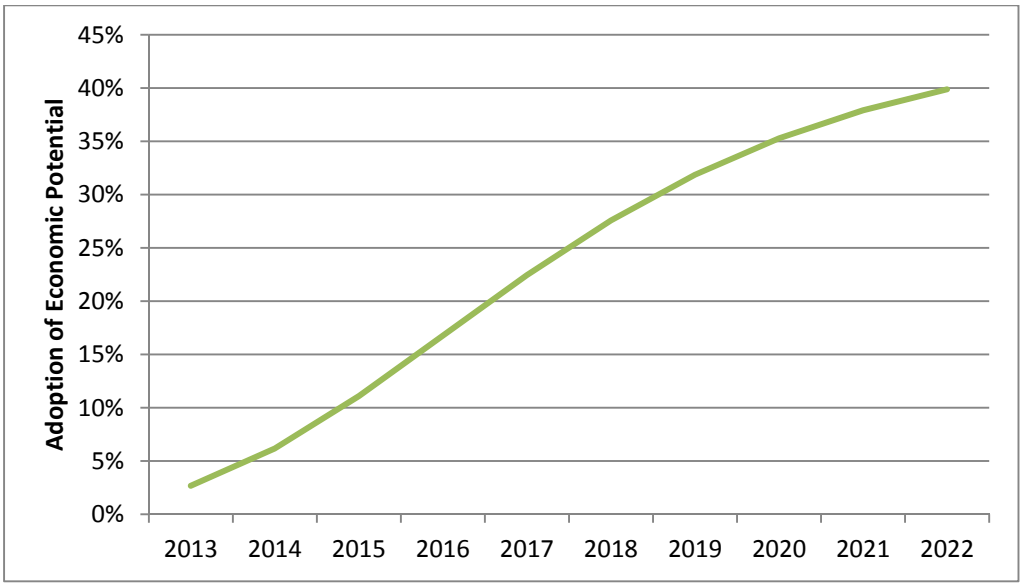


Figure 2-2: Market Adoption Curve with Moderate Ramp Rate

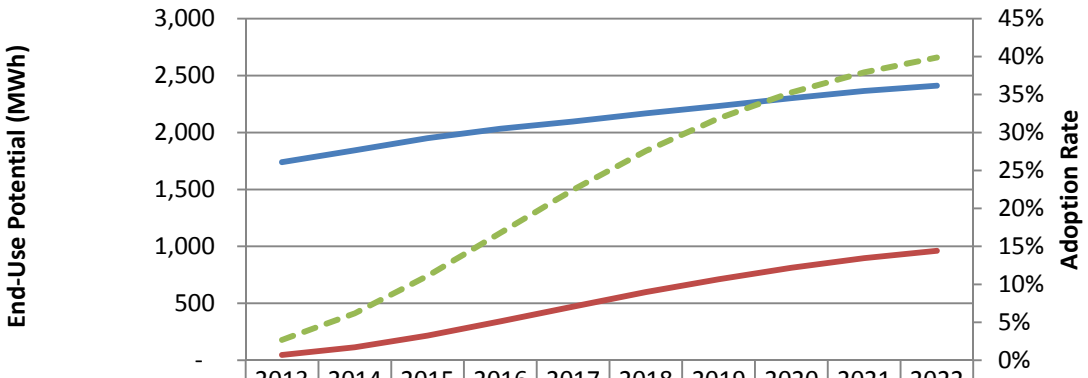
Market adoption is of great concern in MDU's Montana service territory. Previous DSM programs in the region have seen lower than average participation as compared to other programs across the nation. In order to represent the unique character of MDU's Montana service territory with respect to market adoption, Nexant created an Energy Efficiency Attitudes survey that was distributed to a set of randomly selected customers within MDU's Montana service territory. Two versions of this survey were created: one for residential customers and one for commercial and industrial customers. The results of these surveys served to inform a calibration of the market adoption curves used in this analysis. The surveys themselves, as well as the aggregate results and interpretation, are presented in Appendix C.

2.4.4 Step 4: Estimate Achievable Potential

Achievable potential can be thought of as the fraction of economic potential in a given year that the market will allow to be captured. Typically, the first year of a new program will, depending on numerous factors, achieve between 1% and 10% of the economic potential associated with the program's targeted end-use. That fraction will increase over time as the program matures; reaching an asymptote that is always less than 100%. The industry standard assumption is that 85% is the maximum market adoption a utility can expect to achieve. The market adoption curves mentioned in 2.4.3 define that asymptote and how quickly it is reached.

For MDU, achievable potential was determined by applying the appropriate market adoption curves to the economic potential in each year at the segment/end-use level. Figure 2-3 depicts an example of the relationship between an adoption curve and economic and achievable potential. The green dashed line represents a specific adoption curve that, when applied to the economic potential for this particular end-use, generates an achievable potential curve (the red line). In this example, the

moderate adoption curve does not reach its asymptote (approximately 45%) in the 10-year study period.



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Economic Potential	1,740	1,843	1,951	2,034	2,096	2,169	2,233	2,301	2,365	2,411
Achievable Potential	47	114	217	341	471	598	712	812	897	961
Adoption Curve	3%	6%	11%	17%	22%	28%	32%	35%	38%	40%

Economic Potential Achievable Potential Adoption Curve

Figure 2-3: Relationship between Economic and Achievable Potential

2.5 DEMAND RESPONSE METHODOLOGY

As part of this study, two popular types of demand response (DR) programs were evaluated to determine their technical and achievable potential. Both programs investigated are known as direct load control (DLC) programs and apply to residential customers only. One program works by controlling the operation of a customer's central air conditioner during peak periods. The other works by controlling residential water heaters during peak periods.

The methods used to analyze DR programs are detailed in Section 7.

3 -

3.1 OVERVIEW

Analysis of savings potential requires an accurate characterization of baseline energy usage and customer profiles. Nexant analyzed an MDU-provided database of monthly account-level consumption in order to segment electricity sales into sector (Commercial/Industrial/Residential), segment (residence /business type), and end-use.

MDU's 2011 electricity sales in the Montana service territory totaled nearly 748 GWh. Figure 3-1 summarizes MDU's 2011 Montana electricity sales.

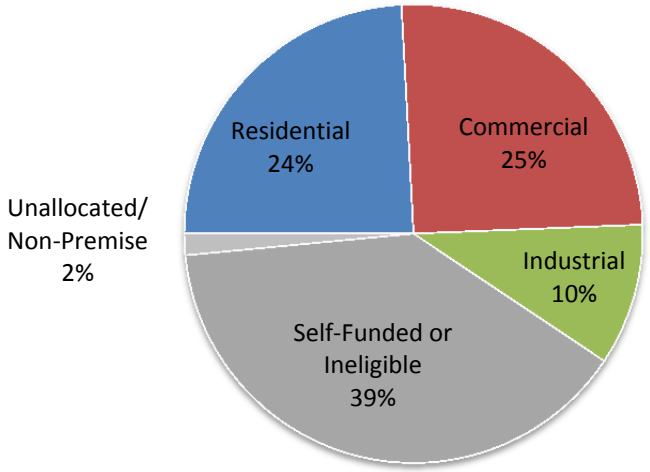


Figure 3-1: 2011 Montana Electricity Sales (MWh)

3.1.1 Self-Funded/Ineligible Customers and Sales

Analysis of customer billing rates and premise types determined that approximately 41% of 2011 electricity sales in Montana were to accounts that are considered ineligible for MDU-sponsored energy efficiency programs, primarily due to self-funding of DSM. These customers and sales are not included in the analysis of savings potential. Self-funded accounts include all Large Universal Systems Benefit Charge (USBC) customers, who accounted for 39% of electricity sales in 2011. Roughly two percent of electricity sales were to unallocated/non-premise accounts such as radio towers and other communication, transportation, or utility-related uses.

3.1.2 Eligible Customers and Sales

Figure 3-2 shows only the 2011 electricity sales attributable to DSM-eligible customers. In 2011, the Residential and Commercial sectors each accounted for slightly more than 40% of sales, while the Industrial sector accounted for 17% of sales. The remainder of this report considers only the electricity sales to DSM-eligible customers.

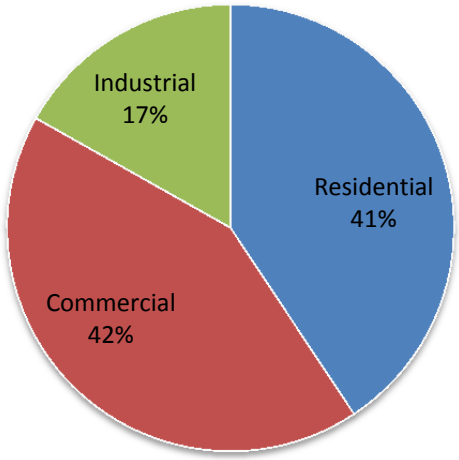


Figure 3-2: 2011 Montana Electricity Sales to DSM-Eligible Customers (MWh)

3.1.3 DSM-Eligible Baseline Electricity Sales Forecast

Figure 3-3 shows MDU's forecasted electricity sales to DSM-eligible customers through 2022. The baseline forecast assumes a business-as-usual scenario where energy efficiency levels remain fixed over time, with the exception of anticipated reductions due to codes and standards such as the 2007 Energy Independence and Security Act (EISA).

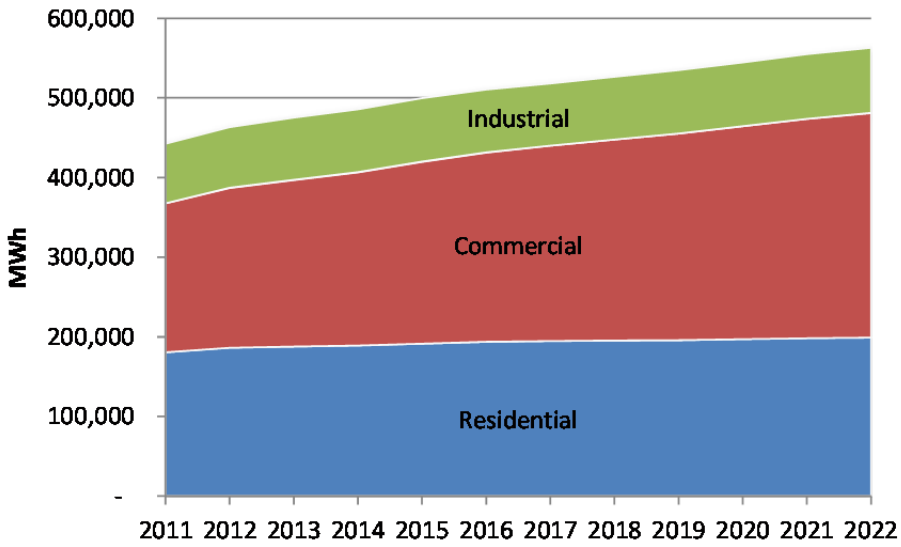


Figure 3-3: DSM-Eligible Electricity Sales Forecast

3.1.3.1 EISA Forecast Adjustments

EISA established minimum lighting efficiency and lifetime standards, mandating that certain lighting technologies be phased out by 2014. Because the MDU-provided forecast of electricity sales did not incorporate EISA impacts, Nexant estimated the reductions in lighting consumption as a result of EISA and adjusted the forecast accordingly. The estimated cumulative reduction in sales due to EISA over the entire forecast period is 501 GWh, or about 7.6% of projected electricity consumption. While the net impacts of EISA on lighting consumption are uncertain, the relative magnitude of this adjustment is in line with industry practice. Figure 3-4 shows the estimated impacts of EISA on MDU's DSM-eligible electricity sales forecast during 2013 – 2022.

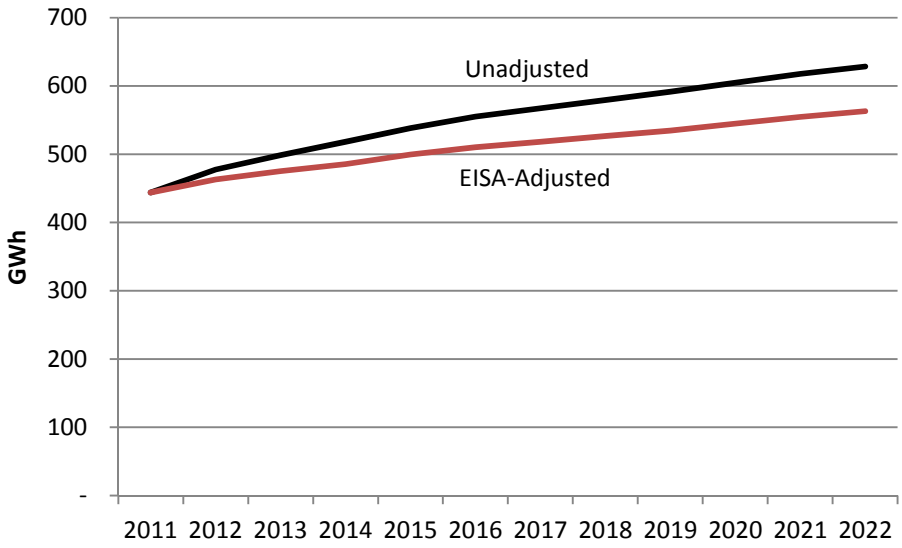


Figure 3-4: EISA Forecast Impacts

Inclusive of EISA lighting impacts, MDU's annual DSM-eligible electricity sales are expected to increase by around 27% between 2011 and 2022, from fewer than 444 GWh to more than 562 GWh. Electricity sales to commercial premises are responsible for most of the growth in this forecast, as commercial sales grow from 42% of DSM-eligible sales in 2011 to 52% by 2022.

3.2 RESIDENTIAL END-USE AND LOAD CHARACTERISTICS

3.2.1 Residential Base Year Sales

MDU provided electricity to 18,087 residential premises in Montana during 2011, representing nearly 181 GWh of consumption. Single-family residences account for 86 percent of residential consumption during 2011. Figure 3-5 summarizes MDU's base year residential sales by housing type.

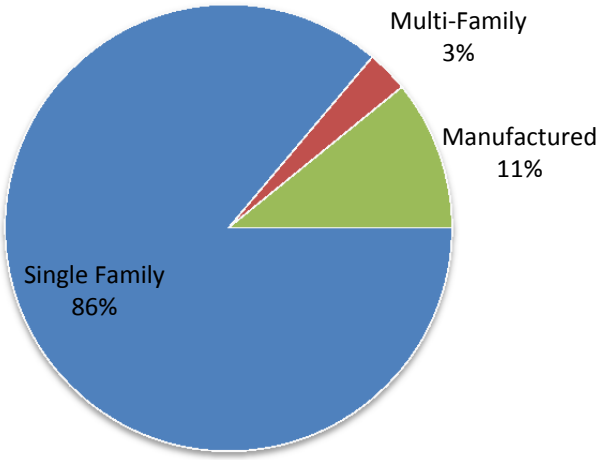


Figure 3-5: Residential Sales by Housing Type (MWh)

Nexant made use of MDU's 2006 Residential End Use Survey results to establish residential end-use fuel shares and saturations, and the resulting market share for each end-use. Market share represents the portion of premises in each segment that have a particular electrically-operated end-use. Appendix A includes market shares by end-use within each residential segment.

Figure 3-6 shows estimated 2011 residential sales by end-use. Household appliances are responsible for the greatest share of residential electricity consumption, representing 33% of total residential sales. Plug loads and lighting each consume around 17% of residential electricity, and all other end-use categories combined are responsible for the remaining 34% of residential sales.

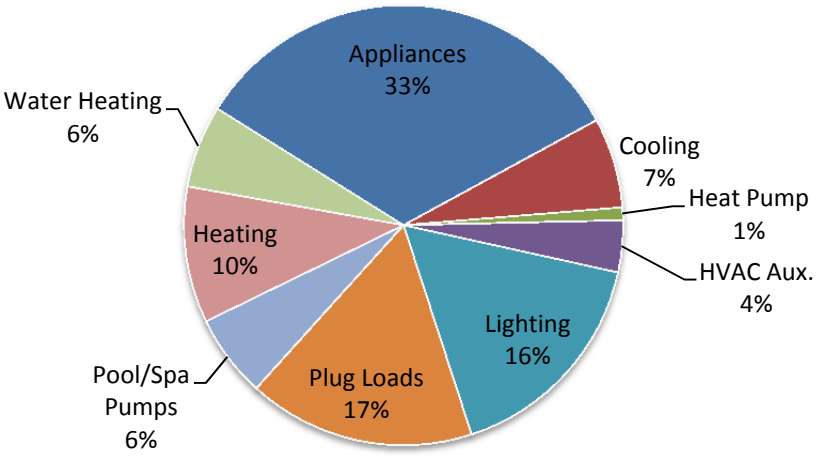


Figure 3-6: 2011 Residential Sales by End-Use (MWh)

Figure 3-7 shows end-use distribution within each housing type. End-use profiles are relatively similar among housing types, with slight variations. Appliances represent a greater portion of residential electricity consumption in the multi-family housing segment, whereas multi-family heating and cooling end-uses are responsible for a slightly smaller portion of consumption.

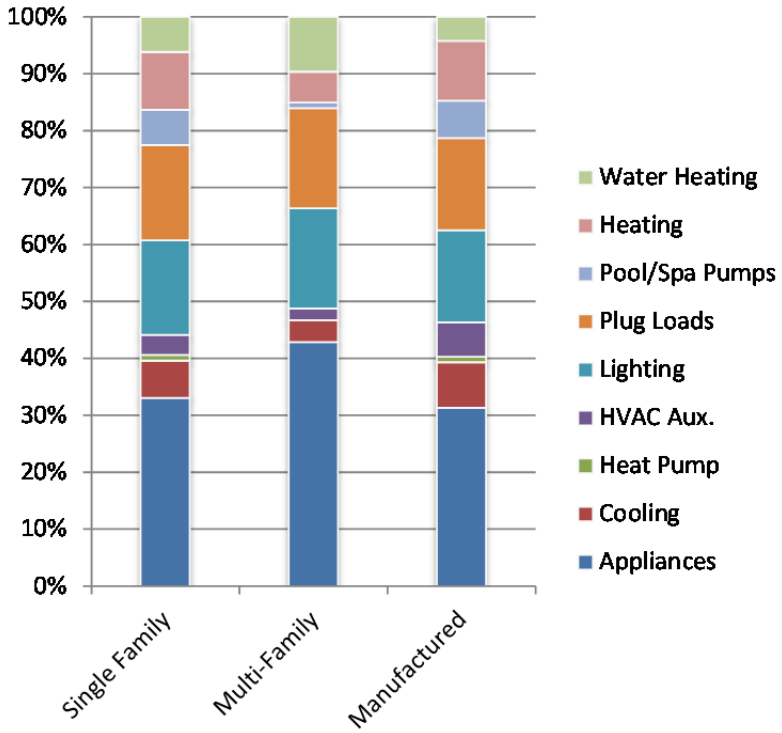


Figure 3-7: End-use Distribution by Residential Housing Type

3.2.2 Residential Baseline Forecast

Figure 3-8 depicts forecasted residential consumption by end-use through 2022. Unique end-use-level growth rates influence proportional sales by end-use over the forecast period. For instance, the aforementioned EISA lighting codes and standards result in a lighting decrease as a percentage of residential sales, from 16% in 2012 to 9% in 2022, while plug loads experience a relative increase from 17% to 22% over the same period. Lighting is the only residential end-use expected to undergo a net reduction in sales during the forecast period.

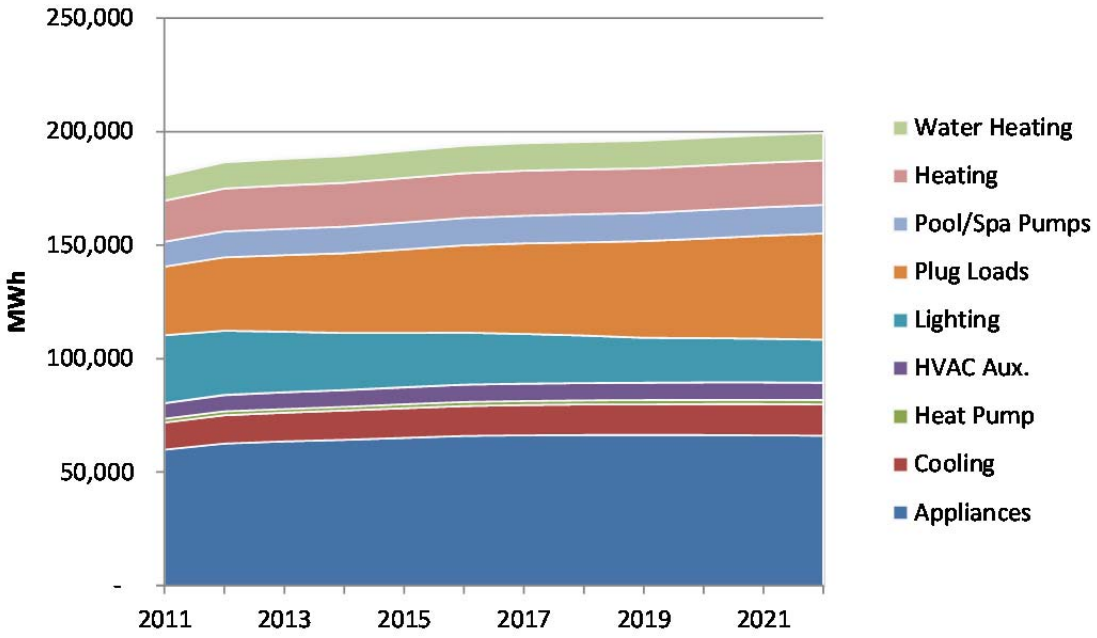


Figure 3-8: Forecasted Residential Sales by End-Use

3.3 COMMERCIAL END-USE AND LOAD CHARACTERISTICS

3.3.1 Commercial Base Year Sales

MDU provided electricity to 3,262 commercial premises in Montana during 2011, representing more than 188 GWh of consumption. Figure 3-9 breaks down 2011 commercial sales by business type. Sales are divided somewhat evenly among the major commercial business types. The top-tier segments are health, office, and retail premises, each consuming around 17% of total commercial electricity. Education, grocery, lodging, miscellaneous, and restaurant premises were each responsible for between eight and ten percent of commercial sales, and the warehouse segment consumed the least, at around four percent of commercial sales.

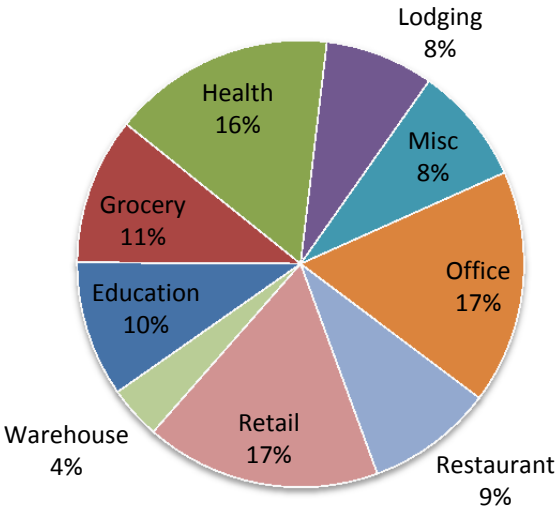


Figure 3-9: 2011 Commercial Sales by Business Type

Nexant established energy use intensities (EUI) by end-use for each of the nine commercial segments. An EUI represents the average annual consumption per square foot of building floor area for electrically operated equipment in a given end-use. See Appendix A for EUIs by end-use within each commercial segment.

Figure 3-10 shows 2011 estimated commercial sales by end-use. Lighting is by far the primary electrical end-use in the commercial sector, accounting for 34% of total commercial electricity consumption. No other segment is responsible for more than 14% of commercial consumption.

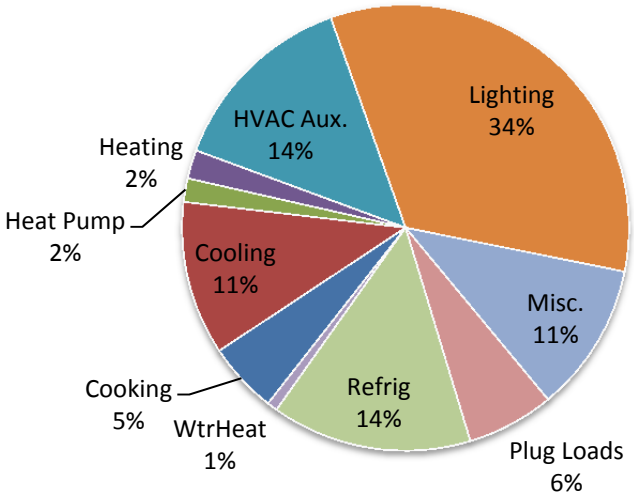


Figure 3-10: 2011 Commercial Sales by End-use

Figure 3-11 shows 2011 end-use distribution within each business type. Relatively high refrigeration loads in the grocery and warehouse segments are immediately apparent. Plug loads are naturally higher in the office segment given the use of computers and other office equipment. Lighting represents a large portion of consumption across the board, while the portion attributable to heating and heat pump end-uses is relatively small. Restaurant premises are the only large consumers of electricity used for cooking.

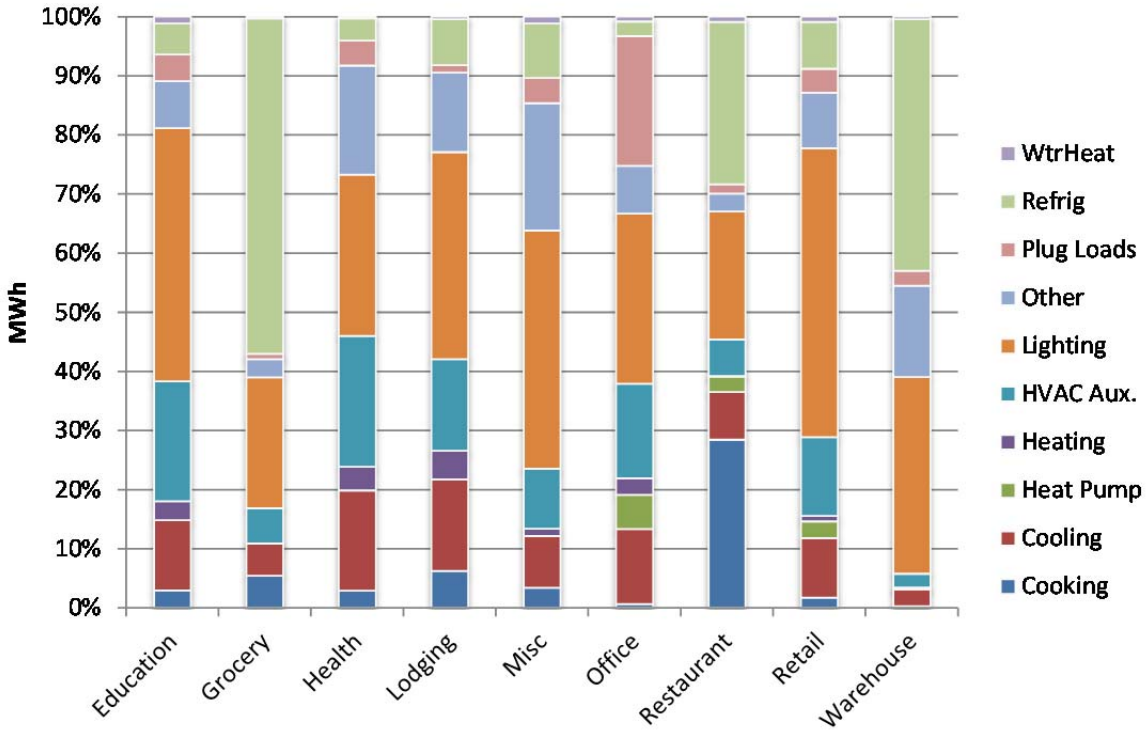


Figure 3-11: 2011 End-use Distribution within Commercial Business Types

3.3.2 Commercial Baseline Forecast

Figure 3-12 shows a forecast of commercial sales by end-use. The growth of individual end-uses is adjusted over the forecast period using the same methodology for the residential forecast laid out in Section 3.2.2.

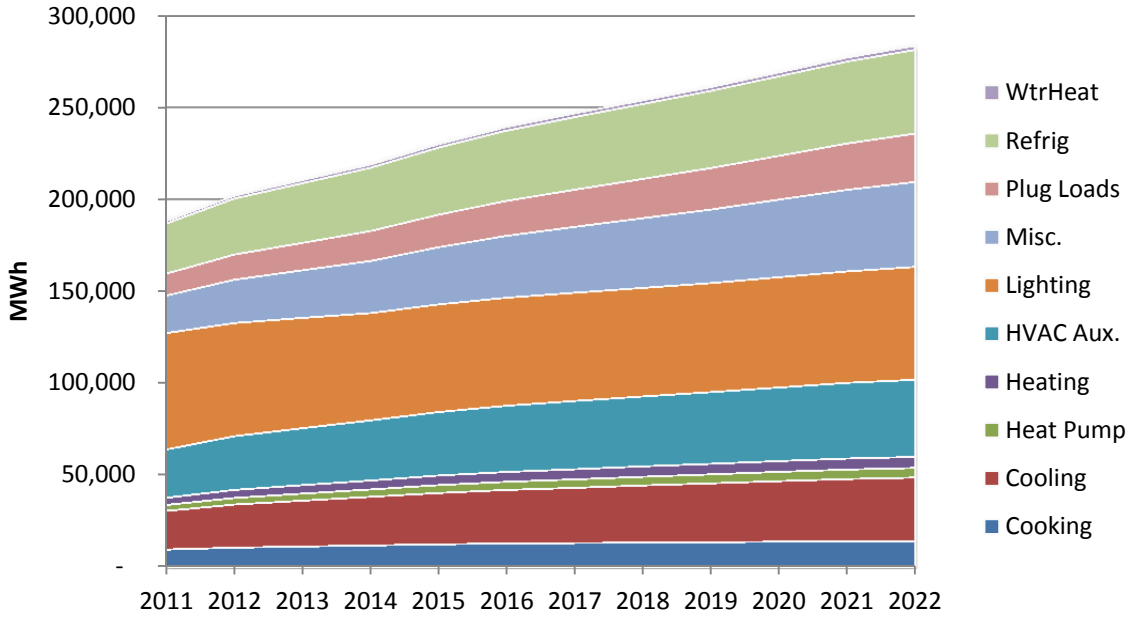


Figure 3-12: Forecasted Commercial Sales by End-use

3.4 INDUSTRIAL END-USE AND LOAD CHARACTERISTICS

3.4.1 Industrial Base Year Sales

Figure 3-13 shows 2011 industrial sales by business type. Notably, 58% of industrial sales are attributable to the Petroleum Coal Products industry. Thirteen percent of industrial sales are to miscellaneous industrial premises; this is often the case with industrial load disaggregation, and the wide-ranging nature of industrial premises and business types can complicate the design and planning of industrial DSM programs.

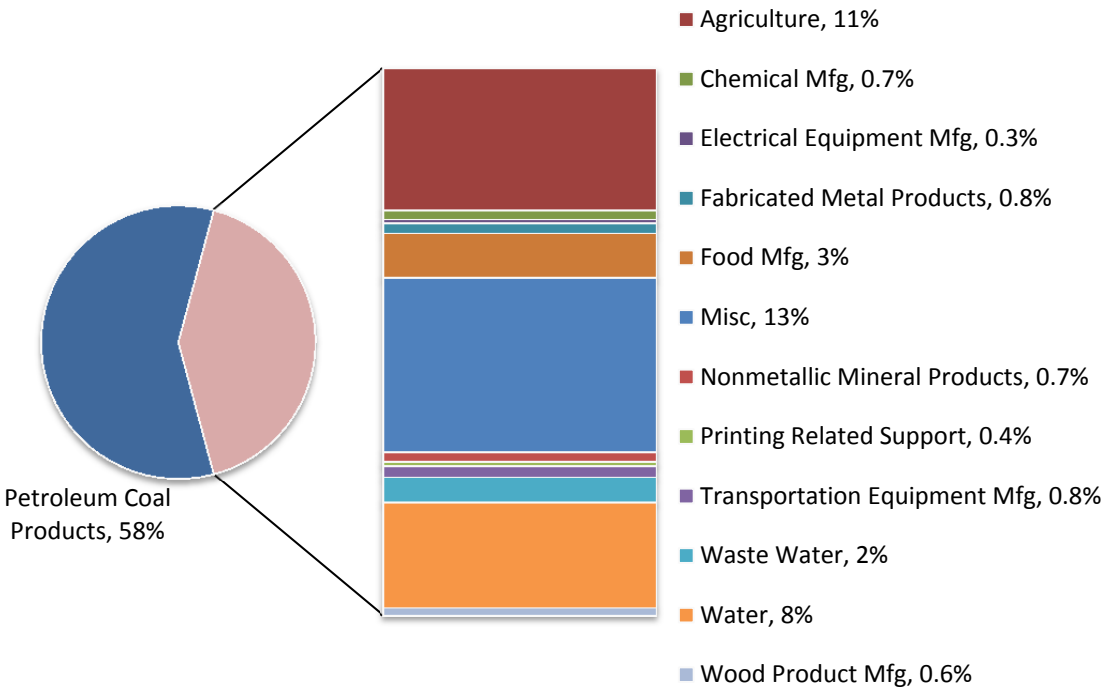


Figure 3-13: 2011 Industrial Sales by Premise Type

3.4.2 Industrial Baseline Forecast

Figure 3-14 shows a forecast of industrial electricity sales by premise type.

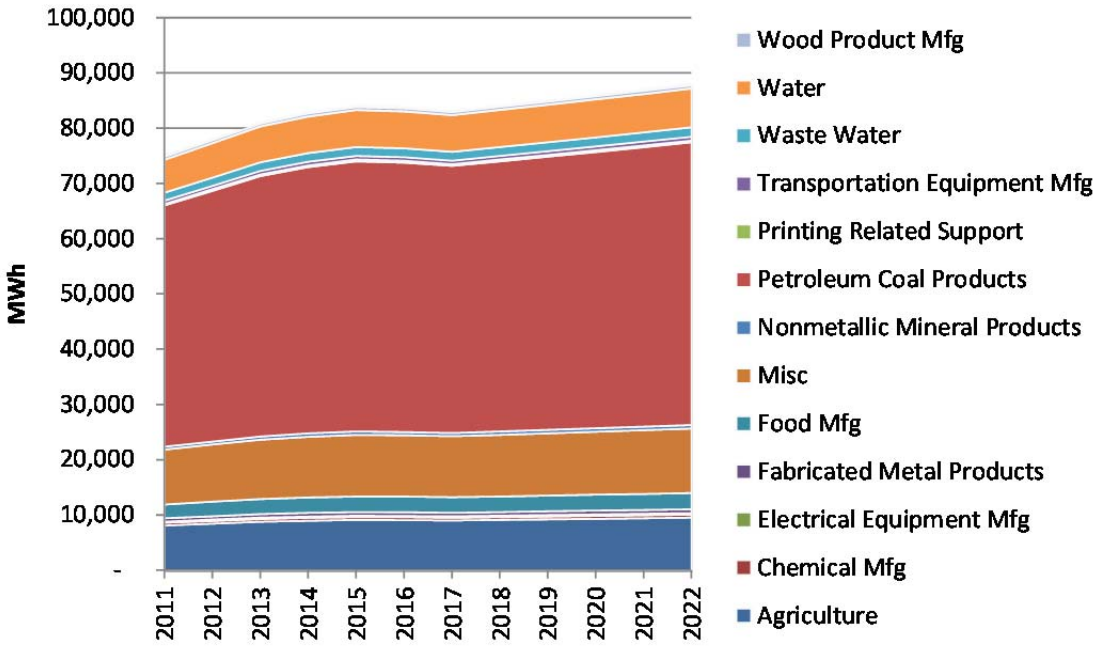


Figure 3-14: Forecasted Industrial Sales by Premise Type

4 RESIDENTIAL POTENTIAL

4.1 OVERVIEW

The residential sector is responsible for nearly 181 GWh of electricity consumption in MDU's Montana service territory. This accounted for 41% of DSM-eligible sales in 2011.

4.2 RESIDENTIAL MEASURE REVIEW

4.2.1 Measure Overview

For the residential sector Nexant evaluated approximately 111 unique energy efficiency measures. These measures were selected with consideration of DSM program design and implementation, with a comprehensive suite of measures available for each residential end-use. Sources for the measure database included current MDU programs, other utility DSM programs, past DSM potential studies, and studies of emerging technologies.

Upon selection of appropriate efficiency measures, Nexant assembled a database of measure information including energy savings, peak demand savings, customer costs, and expected lifetimes. This information was determined for new installation, equipment turnover, and early retirement situations.

4.2.2 Market Inputs

In addition to gathering measure level data, Nexant assembled the pertinent regional data and economic inputs necessary to complete the residential measure analysis.

4.2.2.1 Regional Inputs

The primary regional inputs needed were the total premise count, end-use Unit Energy Consumption (UEC) and saturation. Nexant started with the UEC values derived from the Northwestern Energy study and made adjustments as necessary for MDU's territory based on data from MDU customer billing records, MDU's 2006 Residential End-use Survey, and engineering judgment. Additionally, expected improvements, code changes, and other general trends were built into the UECs based on the trends found in the U.S. Energy Information Administration's forecasts. In general these trends showed a decrease in all end-use UECs with the exception of plug loads, which showed an increasing trend.

4.2.2.2 Economic Inputs

As discussed in 2.3.2, Nexant utilized the avoided energy and capacity cost data, line losses rate and the discount rates provided by MDU along with end-use load shape data to develop appropriate levelized avoided cost benefits for each measure. The 20-year levelized avoided cost used for this

study equaled $46.04/MWh[1]. These benefits were weighed against each measure's costs to develop measure-level cost-effectiveness estimates as discussed below.

4.2.3 Measure Screening Results

With the appropriate input variables in place, Nexant was able to apply the Total Resource Cost (TRC) test to each measure. Approximately 19.8 % of the residential measures passed the TRC test performed for this study[2]. It is important to note that the TRC test is very sensitive to changes in the input values. Changing the measure cost or energy savings even a small amount can in some cases mean the difference between a passing measure and a failing one. For this reason, Nexant recommends the continuing review of these measures as the program matures. There was a hand full of measures in this study that fall on the border of passing and failing the TRC test. These measures include:

- Wall Insulation (over R-13 & R-20)
- Outlet Gasket
- Door Weatherization
- Cool Roofs
- Energy Star Office Computers
- Rim & Band Joist Insulation
- Ceiling & Attic Insulation
- Efficient Doors
- Energy Star Dehumidifiers

Many of the above measures did pass the TRC test with a narrow margin. Others that did not pass the TRC test for one end-use, climate zone, or change case did pass for a different scenario. This is due to the differing characteristics of the baseline condition that the measures are compared to, and the differences in measure cost and load shape from one climate zone or change case to the next.

Nexant also performed two additional cost-effectiveness screens, including the Ratepayer Impact (RIM) and Program Administrator Cost (PAC) tests.

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[1] The 20-year levelized avoided cost was calculated by summing the annual summer on-peak marginal energy cost ($/kWh) and annualized cost of avoided capacity ($/MW-year) provided by MDU to estimate a "total avoided cost" for each year. Avoided capacity price was converted to $/MWh by dividing each year's annualized cost of avoided capacity by 8760. The total avoided cost stream for the 20-years was then discounted back to its net present value using MDU's discount rate of 8.58%. Finally, the net present value number was annualized into a single 20-year levelized avoided cost number using MS Excel's "PMT" function, again using the MDU discount rate of 8.58%.

[2] This is a slightly lower pass-rate for Montana-Dakota when compared with NorthWestern Energy. This is largely due to the lower 20-year levelized avoided cost for MDU ($46.04) compared to NorthWestern Energy ($70.12), which in turn provides fewer benefits to each kWh saved for MDU.

4.3 RESIDENTIAL POTENTIAL RESULTS

The potential for residential electricity savings from all cost-effective measures was evaluated using the methodology presented in Section 2. Residential sector savings potential is described in detail below, along with a discussion of the results and recommendations. Nexant's complete findings are included in Appendix B.

4.3.1 Sector-Level Savings Potential

The following sections present Nexant's findings of technical, economic, and achievable savings potential in the residential sector during the ten-year study period from 2013-2022. Table 4-1 provides a summary of the residential savings potential for each scenario.

Total technical potential in the residential sector in 2013 is 2.6 GWh, representing 1.4 percent of residential forecasted sales. Cumulative technical energy savings in 2022 reach 25.3 GWh and account for 12.7 percent of residential forecasted sales. Technical demand reduction potential is just under 0.3 MW per year, culminating in a total demand reduction from residential DSM of 2.6 MW, or 1.8 percent of MDU's Montana system peak forecast.

Economic potential is 1.8 GWh in 2013, representing nearly 1 percent of residential forecasted sales. Cumulative economic energy savings potential reaches 16.7 GWh in 2022, accounting for 8.4 percent of residential forecasted sales. There is also the potential to reduce demand by just under 0.2 MW per year, or a total of 1.7 MW over the ten-year horizon. This is a reduction of 1.2 percent of MDU's Montana system peak forecast.

Finally, theoretically achievable potential was calculated using four different levels of marketing and incentive aggressiveness (25 to 100 percent of measure incremental costs). The results of the Energy Efficiency Attitudes Survey, which are detailed in Appendix C.3, informed the development of specific market adoption curves for MDU's Montana service territory. Figure 4-1 show these adoption rates for the residential sector. Table 4-1 summarizes the savings potential for each scenario.

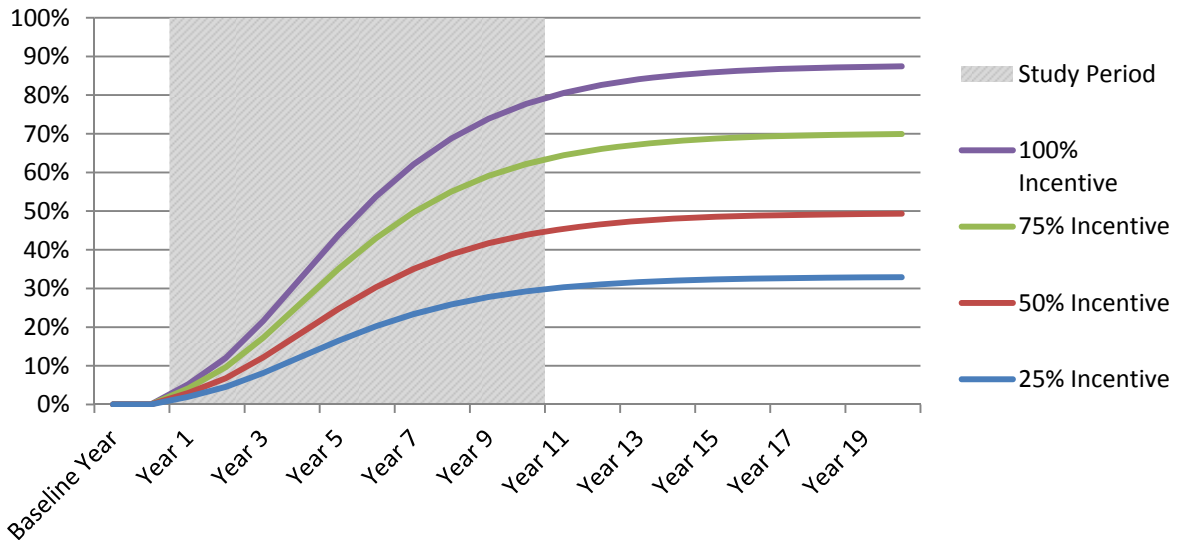

Figure 4-1: Residential Market Adoption Curves

Table 4-1: Summary of Potential Savings in the Residential Sector

Forecast Period	Technical		Economic		Ach. 100%		Ach. 75%		Ach. 50%		Ach. 25%	
Energy Savings (GWh) & Percentage of Residential Forecasted Sales												
2013	2.6	1.4%	1.8	0.9%	0.1	<0.1%	0.1	<0.1%	0.1	<0.1%	<0.1	<0.1%
2017	2.5	1.3%	1.7	0.9%	0.7	0.4%	0.6	0.3%	0.4	0.2%	0.3	0.1%
2022	2.4	1.2%	1.6	0.8%	1.2	0.6%	1.0	0.5%	0.7	0.3%	0.5	0.2%
Cum. 2017	13.0	6.6%	8.6	4.4%	1.9	1.0%	1.5	0.8%	1.1	0.6%	0.7	0.4%
Cum. 2022	25.3	12.7%	16.7	8.4%	7.2	3.6%	5.8	2.9%	4.1	2.0%	2.7	1.4%
Demand Savings (MW) and Percentage of MT System Peak												
2013	0.3	0.2%	0.2	0.1%	<0.1	<0.1%	<0.1	<0.1%	<0.1	<0.1%	<0.1	<0.1%
2017	0.3	0.2%	0.2	0.1%	0.1	0.1%	0.1	<0.1%	<0.1	<0.1%	<0.1	<0.1%
2022	0.3	0.2%	0.2	0.1%	0.1	0.1%	0.1	0.1%	0.1	<0.1%	<0.1	<0.1%
Cum. 2017	1.3	1.0%	0.9	0.6%	0.2	0.1%	0.2	0.1%	0.1	0.1%	0.1	0.1%
Cum. 2022	2.6	1.8%	1.7	1.2%	0.8	0.5%	0.6	0.4%	0.4	0.3%	0.3	0.2%

Annual energy savings for each potential scenario are shown in Figure 4-2.

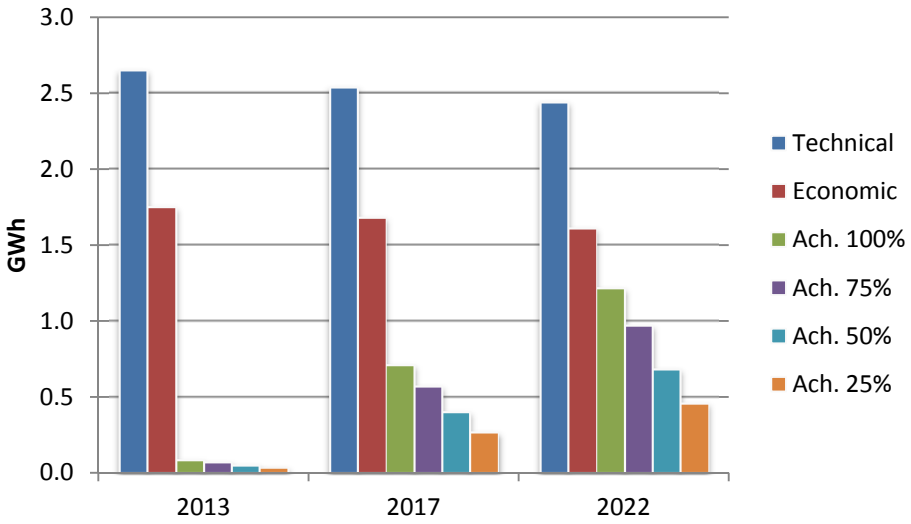

Figure 4-2: Annual Residential Energy Savings Potential

Figure 4-3 shows the expected residential energy forecast with DSM energy savings removed.

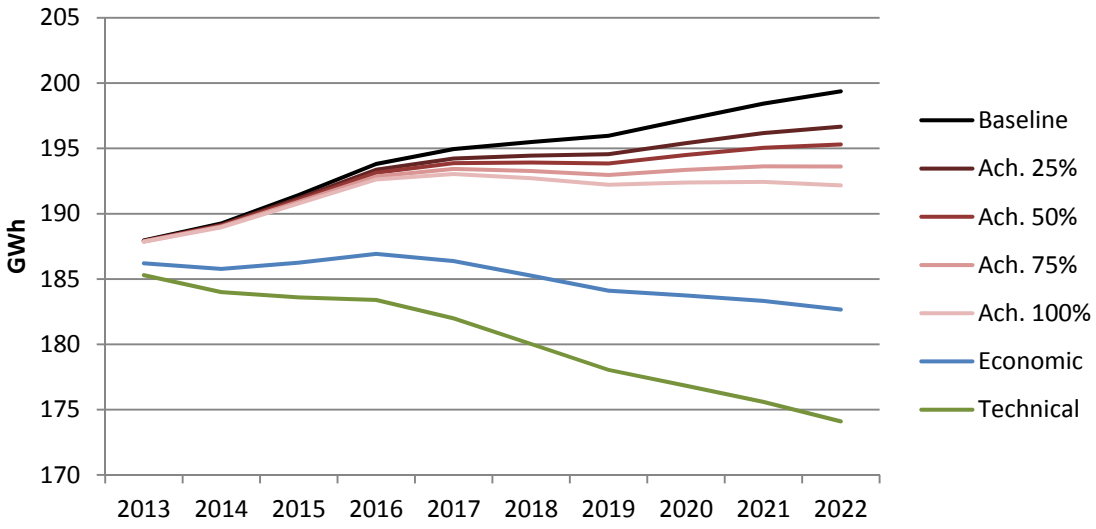

Figure 4-3: Residential Sales Forecast with DSM Potential Removed

4.3.2 Savings Potential by Premise Type and End-use

Nexant estimated savings potential on a premise type and end-use level. The figures in this section provide examples of achievable potential savings at this increased resolution.

Figure 4-4 shows the distribution of residential 2017 achievable potential energy savings by residence type for a moderate (50%) incentive scenario. The share of potential savings by residence type does not vary significantly for the different years or achievable scenarios.

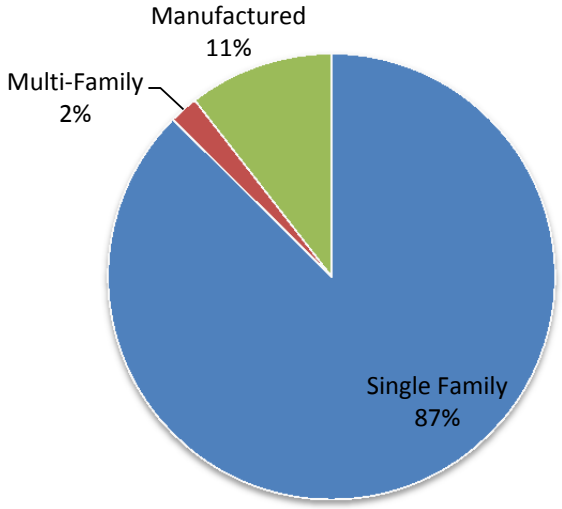

Figure 4-4: Residential Savings Potential by Residence Type, 2017

Figure 4-5 shows the distribution of residential 2017 achievable potential energy savings by end use for a moderate (50%) incentive scenario. The share of potential savings by end use does not vary significantly for the different years or achievable scenarios.

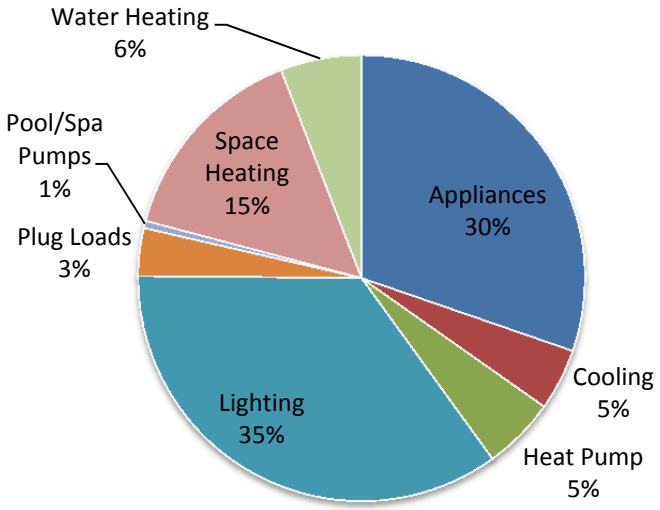

Figure 4-5: Residential Savings Potential by End Use, 2017

4.4 RECOMMENDATIONS

Based on Nexant's findings, MDU's next steps in program planning and design for residential energy efficiency programs should give priority to a particular set of segments and end-uses. Specifically, single-family homes are a great resource as they account for 87% of achievable energy savings in the sector. Additionally, end-uses such as lighting, appliances, and space heating should be given priority since, together, they account for roughly 80% of the sector's savings potential. Finally, Nexant's findings suggest that higher incentive levels will have a proportionally greater impact on market adoption. MDU should be aware that there are numerous drivers of market adoption, but Nexant's finding suggest it may be useful to investigate program designs and delivery mechanisms that allow for substantial incentive levels.

5 COMMERCIAL POTENTIAL

5.1 OVERVIEW

The commercial sector is responsible for 189 GWh of electric consumption, which accounts for 25% of MDU's total Montana electricity sales and 42% of the consumption by customers deemed eligible for MDU-sponsored DSM. In general, the commercial sector covers a large spectrum of customers and is characterized by a high degree of variation in electricity consumption, resulting in many potential energy efficiency measures.

Nexant evaluated a large number of commercial technologies applicable to all of the commercial end-uses. These measures were both well established in the market place and undergoing recent emergence.

5.2 COMMERCIAL MEASURE REVIEW

5.2.1 Measure Overview

In the commercial sector roughly 167 unique energy efficiency measures were selected for evaluation. These measures were selected with consideration for DSM program design and implementation and provide a comprehensive suite of measures for each end-use. Nexant started with a contemporary measure list and made adjustments to all the appropriate savings inputs to reflect the unique characteristics of MDU's service territory.

Upon selection of appropriate efficiency measures, Nexant assembled a database of measure information including energy savings, peak demand savings, customer costs, and expected lifetimes. This information was determined for new installation, equipment turnover, and early retirement situations.

The end-use and load disaggregation portion of the study characterized MDU's sales using a total of 14 end-uses. To illustrate savings potential the measures were bundled together based on their applicable end-use. To provide deeper resolution into the savings potential, and account for technology differences within the end-uses, the lighting and HVAC categories were subdivided further. The allocation of energy usage to each subdivision was based on historical data and reconciled against the known characteristics of MDU's commercial customers. The final measure categories evaluated for the commercial sector included: Chiller, Cooking, Florescent lighting, Heat Pump, Heating, HID lighting, Incandescent lighting, Appliances, Motors, Office Equipment, Other, Package DX, Refrigeration, Signage lighting, Water Heating.

5.2.2 Market Inputs

In addition to gathering measure level data, Nexant assembled the pertinent regional data and economic inputs necessary to complete the commercial modeling.

5.2.2.1 Regional Inputs

As noted above, Nexant utilized a contemporary list of measures and, where appropriate, measure savings assumptions were adjusted to reflect the unique characteristics of MDU's service territory. This included adjustments to inputs such as lighting operating hours, energy use intensity (EUI) by commercial segment, lighting power density, equipment saturations, and facility square footage by building type. Taken together, these adjustments calibrated the measures to the MDU territory to provide reasonable cost-effectiveness estimates discussed below.

5.2.2.2 Economic Inputs

As discussed in 2.3.2, Nexant utilized the avoided energy & capacity cost data, line losses rate and the discount rates provided by MDU along with end-use load shape data to develop appropriate levelized avoided cost benefits for each measure. The 20-year levelized avoided cost used for this study equaled $46.04/MWh. These benefits were weighed against each measure's costs to develop measure-level cost-effectiveness estimates as discussed below.

5.2.3 Measure Screening Results

With the appropriate input variables in place, Nexant was able to apply the Total Resource Cost (TRC) test to each measure. Approximately 39.2% of the commercial measures passed the TRC test performed for this study[1]. It is important to note that the TRC test is very sensitive to changes in the input values. Changing the measure cost or energy savings even a small amount can in some cases mean the difference between a passing measure and a failing one. For this reason, Nexant recommends the continuing review of these measures as the program matures. There was a hand full of measures in this study that fall on the border of passing and failing the TRC test. These measures include:

- Reach-in Cooler: PSC to ECM
- Reach-in Cooler: Evap Fan Motor
- Chiller – Premium Efficiency
- Insulation – Wall
- Hotel Key Card
- T8 High Bay Fixture
- Photocell Dimming Control
- Motor – CEE Premium Efficiency
- Insulation – Duct
- Motor Rewind – 500+ HP
- Ceramic Metal Halide
- Motor Rewind NEMA Premium

Many of the above measures did pass the TRC test with a narrow margin. Others that did not pass the TRC test for one end-use did pass for a different scenario. This is due to the differing characteristics of the baseline condition that the measures are compared to.

[1] This is a slightly lower pass-rate for Montana-Dakota when compared with Northwestern Energy. This is largely due to the lower 20-year levelized avoided cost for MDU ($46.04) compared to Northwestern Energy ($70.12), which in turn provides fewer benefits to each kWh saved for MDU.

Nexant also performed two additional cost-effectiveness screens, including the Ratepayer Impact (RIM) and Program Administrator Cost (PAC) tests. A complete listing of all measures and the results of their respective TRC, RIM & PAC tests are included in Appendix C.

5.3 COMMERCIAL POTENTIAL RESULTS

The potential DSM resource was evaluated using the methodologies presented in Section 2. The savings potential is presented in the following sections, along with a discussion of the results and recommendations for moving forward. Nexant's complete findings may be found in Appendix A.

5.3.1 Sector-Level Savings Potential

The following sections present Nexant's findings of technical, economic, and achievable savings potential in the commercial sector during the ten-year study period from 2013-2022.

Total technical potential in the commercial sector in 2013 is 2.2 GWh, representing 1.1 percent of commercial forecasted sales. Cumulative technical energy savings in 2022 reach 25.5 GWh and account for 9 percent of commercial forecasted sales. Technical demand reduction potential in 2013 is 0.3 MW and increases to 0.4 MW in 2022. Cumulative technical demand reduction potential in 2022 is 3.6 MW or 2.4 percent of MDU's Montana system peak demand.

Economic potential is 1.5 GWh in 2013, representing 0.7 percent of commercial forecasted sales. Cumulative economic energy savings potential reaches 16.7 GWh in 2022, accounting for 5.9 percent of commercial forecasted sales. Economic demand reduction potential in 2013 is 0.2 MW and increases to 0.3 MW in 2022. Cumulative economic demand reduction potential in 2022 is 2.4 MW or 1.6 percent of MDU's Montana system peak forecast.

Finally, theoretically achievable potential was calculated using four different levels of marketing and incentive aggressiveness (25 to 100 percent of measure incremental costs). The results of the Energy Efficiency Attitudes Survey, which are detailed in Appendix C.3, informed the development of specific market adoption curves for MDU's Montana service territory. Figure 5-1 show these adoption rates for the commercial sector. Table 5-1 summarizes the savings potential for each scenario.

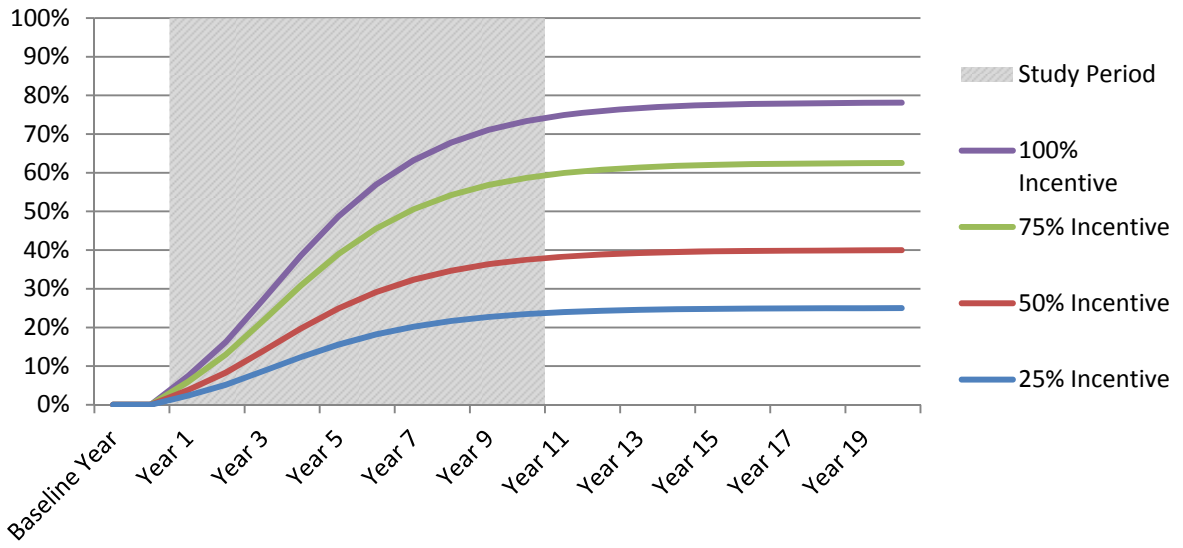

Figure 5-1: Commercial Market Adoption

Table 5-1: Summary of Potential Savings in the Commercial Sector

Forecast Period	Technical		Economic		Ach. 100%		Ach. 75%		Ach. 50%		Ach. 25%	
Energy Savings (GWh) & Percentage of Commercial Forecasted Sales												
2013	2.2	1.1%	1.5	0.7%	0.1	0.1%	0.1	<0.1%	0.1	<0.1%	<0.1	<0.1%
2017	2.5	1.0%	1.7	0.7%	0.8	0.4%	0.7	0.3%	0.4	0.2%	0.3	0.1%
2022	2.9	1.0%	1.9	0.7%	1.4	0.5%	1.2	0.4%	0.7	0.3%	0.5	0.2%
Cum. 2017	11.9	4.8%	7.8	3.2%	2.3	1.0%	1.9	0.8%	1.2	0.5%	0.7	0.3%
Cum. 2022	25.5	9.0%	16.7	5.9%	8.6	3.2%	6.9	2.5%	4.4	1.6%	2.7	1.0%
Demand Savings (MW) and Percentage of Forecasted MT System Peak												
2013	0.3	0.2%	0.2	0.2%	<0.1	<0.1%	<0.1	<0.1%	<0.1	<0.1%	<0.1	<0.1%
2017	0.4	0.3%	0.2	0.2%	0.1	0.1%	0.1	0.1%	0.1	<0.1%	<0.1	<0.1%
2022	0.4	0.3%	0.3	0.2%	0.2	0.1%	0.1	0.1%	0.1	0.1%	0.1	<0.1%
Cum. 2017	1.7	1.2%	1.1	0.8%	0.3	0.2%	0.3	0.2%	0.2	0.1%	0.1	0.1%
Cum. 2022	3.6	2.4%	2.4	1.6%	1.2	0.8%	0.9	0.6%	0.6	0.4%	0.4	0.3%

Annual energy savings for each potential scenario are shown in Figure 5-2.

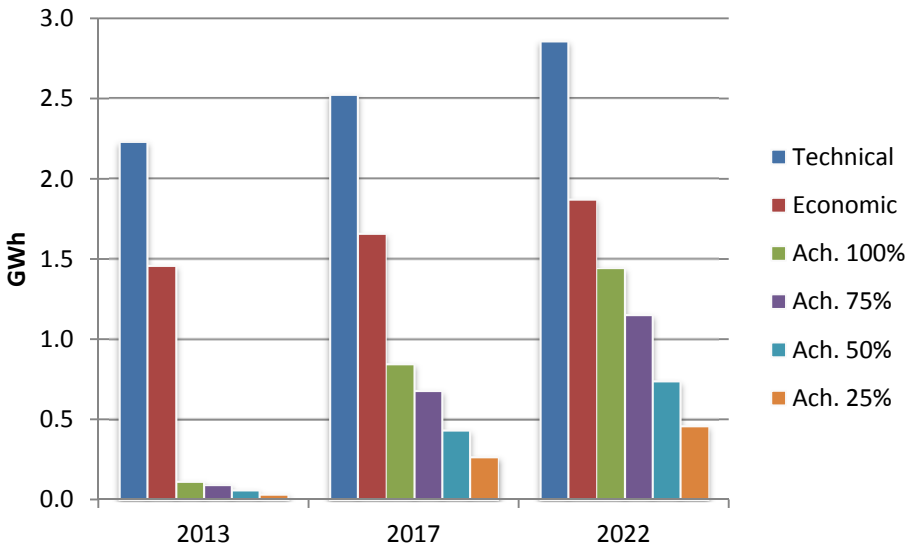

Figure 5-2: Annual Commercial Energy Savings Potential

Figure 5-3 shows the expected commercial energy forecast with DSM energy savings removed.

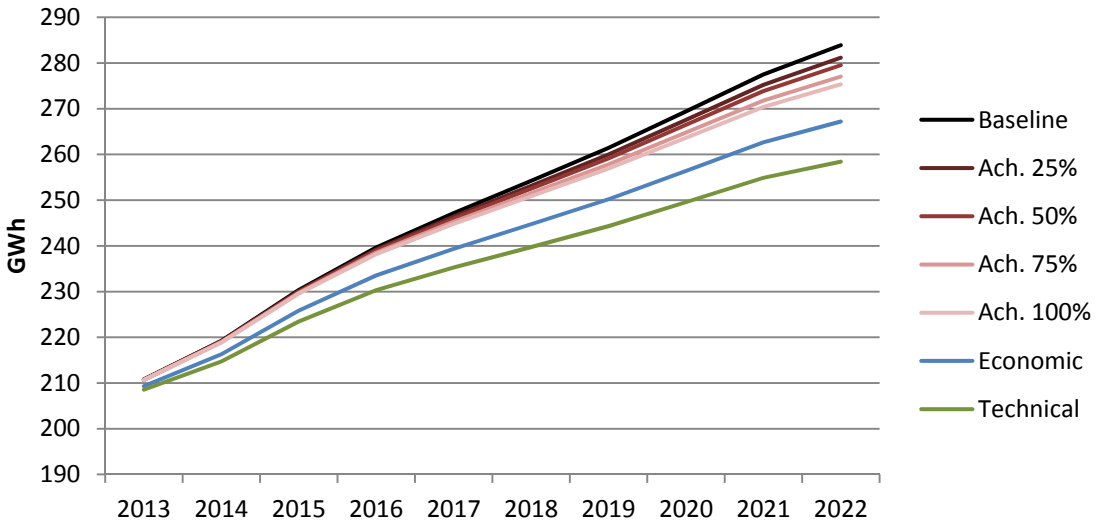

Figure 5-3: Commercial Sales Forecast with DSM Potential Removed

5.3.2 Savings Potential by Premise Type and End-use

Nexant estimated savings potential on a premise type and end-use level. The figures in this section provide examples of achievable potential savings at this increased resolution.

Figure 5-4 shows the distribution of commercial 2017 achievable potential energy savings by business type for a moderate (50%) incentive scenario. The share of potential savings by business type does not vary significantly for the different years or different achievable scenarios.

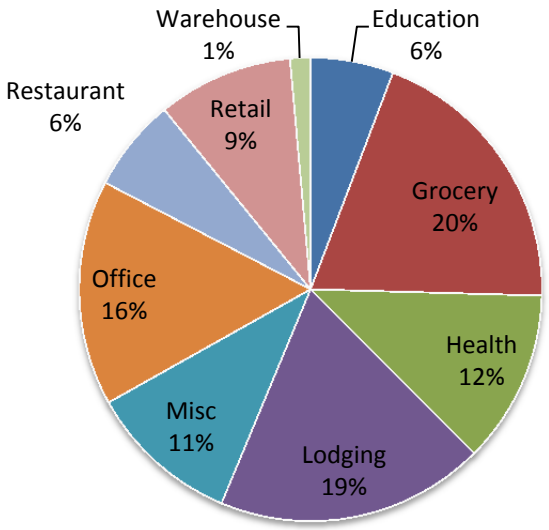

Figure 5-4: Commercial Savings Potential by Business Type, 2017

Figure 5-5 shows the distribution of commercial 2017 achievable potential energy savings by end use for a moderate (50%) incentive scenario. The share of potential savings by end use does not vary significantly for the different years or different achievable scenarios.

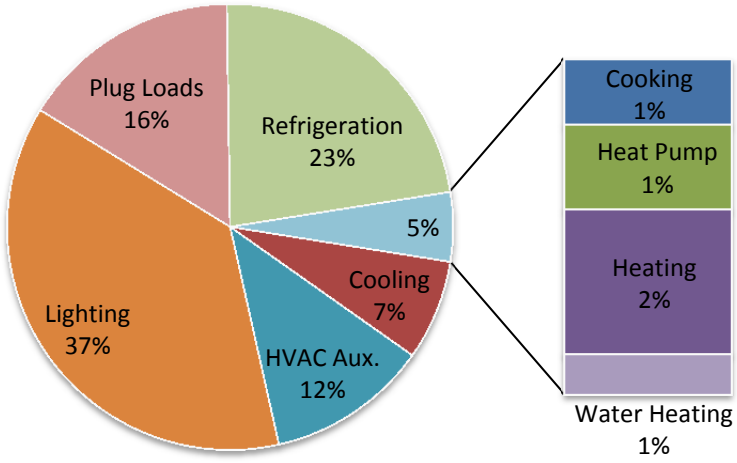

Figure 5-5: Commercial Savings Potential by End Use, 2017

5.4 RECOMMENDATIONS

Based on Nexant's findings, MDU's next steps in program planning and design for commercial energy efficiency programs should give priority to a particular set of segments and end-uses. Commercial segments with the largest achievable savings include grocery, office, and lodging, which when combined account for over half of the potential in the sector. Additionally, end-uses such as lighting, plug loads, and refrigeration should be given priority since together they account for over 75% of the sector's savings potential. Finally, Nexant's findings suggest that higher incentive levels will have a proportionally greater impact on market adoption. MDU should be aware that there are numerous drivers of market adoption, but Nexant's finding suggest it may be useful to investigate program designs and delivery mechanisms that allow for substantial incentive levels. In the commercial sector, direct install programs tend to be a successful and cost-effective option for offering high incentives.

6 INDUSTRIAL POTENTIAL

6.1 OVERVIEW

The industrial sector is responsible for 75 GWh of electric consumption, which accounts for 17% of DSM-eligible Montana sales. The vast majority of the industrial load corresponds to processes specific to a given industry type. This results in a variety of potential energy efficiency measures.

Nexant evaluated a large number of industrial technologies applicable to all of the industry types. These measures were both well established in the marketplace and undergoing recent emergence.

6.2 INDUSTRIAL MEASURE REVIEW

6.2.1 Measure Overview

In the industrial sector roughly 85 unique energy efficiency measures were selected for evaluation. These measures were selected with consideration for DSM program design and implementation and provide a comprehensive suite of measures for each end-use. Nexant started with a contemporary measure list and made adjustments to all the appropriate savings inputs to reflect the unique characteristics of MDU's service territory.

Upon selection of appropriate efficiency measures, Nexant assembled a database of measure information including energy savings, peak demand savings, customer costs, and expected lifetimes. This information was determined for new installation, equipment turnover, and early retirement situations.

The end-use and load disaggregation portion of the study characterized MDU's sales using a total of 12 end-uses. To illustrate savings potential the measures were bundled together based on their applicable end-use. The final measure categories evaluated for the commercial sector included: fans, HVAC, irrigation, lighting, motors, other, process – air compressor, process – cooling, process – heating, process – other, process – refrigeration, pumps.

6.2.2 Market Inputs

In addition to gathering savings data, Nexant assembled the pertinent regional data and economic inputs necessary to complete the industrial modeling.

6.2.2.1 Regional Inputs

The primary regional input needed for calculation of savings potential was simply the total industrial energy usage by end-use. This data was assembled from the end-use and load disaggregation study, and uniquely calibrated to the energy sales of MDU. The top-down methodology of the industrial sector minimized the number of inputs needed for the potential model.

6.2.2.2 Economic Inputs

As discussed in 2.3.2, Nexant utilized the avoided energy & capacity cost data, line losses rate and the discount rates provided by MDU along with end-use load shape data to develop appropriate levelized avoided cost benefits for each measure. The 20-year levelized avoided cost used for this study equaled $46.04/MWh. These benefits were weighed against each measure's costs to develop measure-level cost-effectiveness estimates as discussed below.

6.2.3 Measure Screening Results

With the appropriate input variables in place, Nexant was able to apply the Total Resource Cost (TRC) test to each measure. Approximately 79.2% of the industrial measures passed the TRC test performed for this study. It is important to note that the TRC test is very sensitive to changes in the input values. Changing the measure cost or energy savings even a small amount can in some cases mean the difference between a passing measure and a failing one. For this reason, Nexant recommends the continuing review of these measures as the program matures. There was a hand full of measures in this study that fall on the border of passing and failing the TRC test. These measures include:

- Milk Precoolers
- Automatic Milker Takeoffs
- Motor Rewinds: 51-100 HP
- High Efficiency Livestock Waterers
- Motor Rewinds: 20-50 HP
- VFD Controlled Compressor

Many of the above measures passed the TRC test with a narrow margin. Others that did not pass the TRC test for one end-use, climate zone or change case did pass for a different scenario. This is due to the differing characteristics of the baseline condition that the measures are compared to, and the differences in measure cost and load shape from one climate zone or change case to the next.

Nexant also performed two additional cost-effectiveness screens, including the Ratepayer Impact (RIM) and Program Administrator Cost (PAC) tests. A complete listing of all measures and the results of their respective TRC, RIM & PAC tests is included in Appendix E.

6.3 INDUSTRIAL POTENTIAL RESULTS

6.3.1 Sector-Level Savings Potential

The following sections present Nexant's findings of technical, economic, and achievable savings potential in the industrial sector during the ten-year study period from 2013-2022.

Total technical potential in the industrial sector in 2013 is 0.7 GWh, representing just less than 1% of industrial forecasted sales. Cumulative technical energy savings in 2022 reach 7.2 GWh and account for 8.8 percent of industrial forecasted sales. DSM in the industrial sector attains technical demand reduction potential of 0.1 MW per year, culminating in a 0.9 MW demand reduction over the time-horizon (2013 – 2022). This represents 0.6% of the forecasted peak demand in 2022.

Economic potential is 0.7 GWh in 2013, representing just less than 1% of industrial forecasted sales. Cumulative economic energy savings potential reaches 7.1 GWh in 2022, accounting for 8.6% of industrial forecasted sales. DSM in the industrial sector attains economic demand reduction potential of 0.1 MW per year, culminating in a 0.9 MW demand reduction over the time-horizon (2013 – 2022). This represents 0.6% of the forecasted peak demand in 2022. Economic savings potential is typically about the same as technical savings potential in the industrial sector as measures that are technically feasible tend to also be economically feasible.

Finally, theoretically achievable potential was calculated using four different levels of marketing and incentive aggressiveness (25 to 100 percent of measure incremental costs). The results of the Energy Efficiency Attitudes Survey, which are detailed in Appendix C.3, informed the development of specific market adoption curves for MDU's Montana service territory. Figure 6-1 show these adoption rates for the industrial sector. Table 6-1 summarizes the industrial sector savings potential for each scenario.

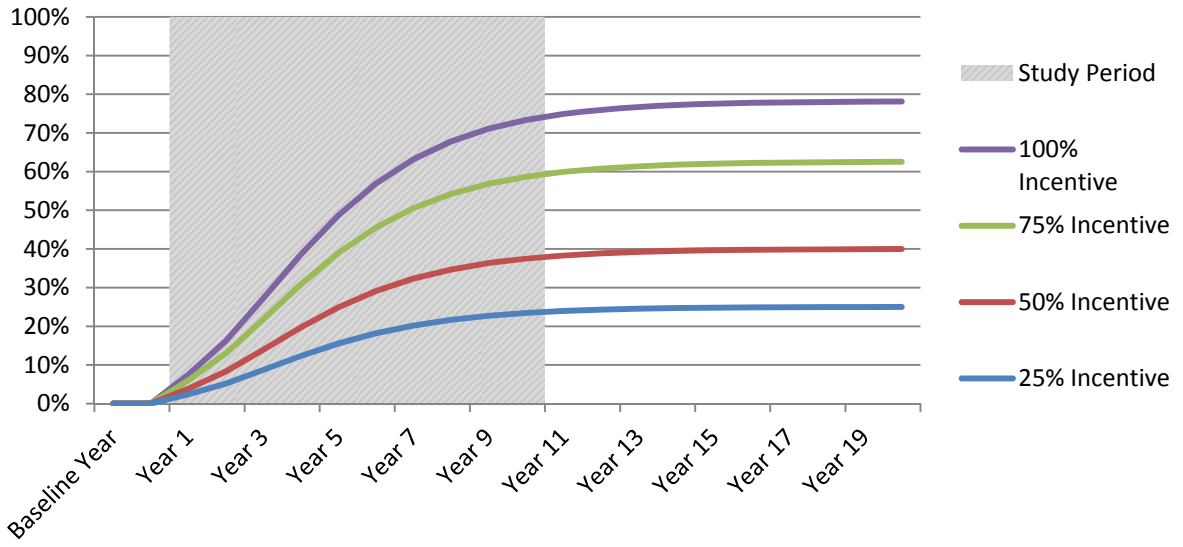

Figure 6-1: Industrial Market Adoption

Table 6-1: Summary of Potential Savings in the Industrial Sector

Forecast Period	Technical		Economic		Ach. 100%		Ach. 75%		Ach. 50%		Ach. 25%	
Energy Savings (GWh) & Percentage of Industrial Forecasted Sales												
2013	0.7	0.9%	0.7	0.9%	0.1	0.1%	<0.1	0.1%	<0.1	<0.1%	<0.1	<0.1%
2017	0.7	0.9%	0.7	0.9%	0.3	0.4%	0.2	0.3%	0.1	0.2%	0.1	0.1%
2022	0.7	0.9%	0.7	0.9%	0.5	0.6%	0.4	0.5%	0.3	0.3%	0.2	0.2%
Cum. 2017	3.5	4.5%	3.5	4.5%	0.8	1.1%	0.7	0.8%	0.4	0.5%	0.3	0.3%
Cum. 2022	7.2	8.8%	7.1	8.6%	2.9	3.6%	2.3	2.9%	1.5	1.8%	0.9	1.1%
Demand Savings (MW) & Percentage of Industrial Forecasted Demand												
2013	0.1	0.1%	0.1	0.1%	<0.1	0.0%	<0.1	<0.1%	<0.1	<0.1%	<0.1	<0.1%
2017	0.1	0.1%	0.1	0.1%	<0.1	0.0%	<0.1	<0.1%	<0.1	<0.1%	<0.1	<0.1%
2022	0.1	0.1%	0.1	0.1%	0.1	0.0%	0.1	<0.1%	<0.1	<0.1%	<0.1	<0.1%
Cum. 2017	0.5	0.3%	0.5	0.3%	0.1	0.1%	0.1	0.1%	0.1	<0.1%	<0.1	<0.1%
Cum. 2022	0.9	0.6%	0.9	0.6%	0.4	0.3%	0.3	0.2%	0.2	0.1%	0.1	0.1%

Annual energy savings for each potential scenario are shown in Figure 6-2.

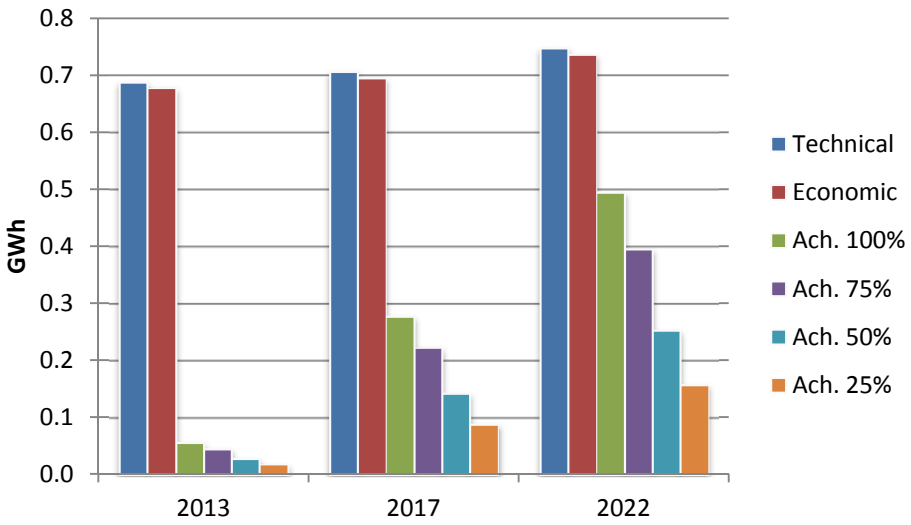

Figure 6-2: Annual Industrial Energy Savings Potential

Figure 6-3 shows the expected industrial energy forecast with DSM energy savings removed.

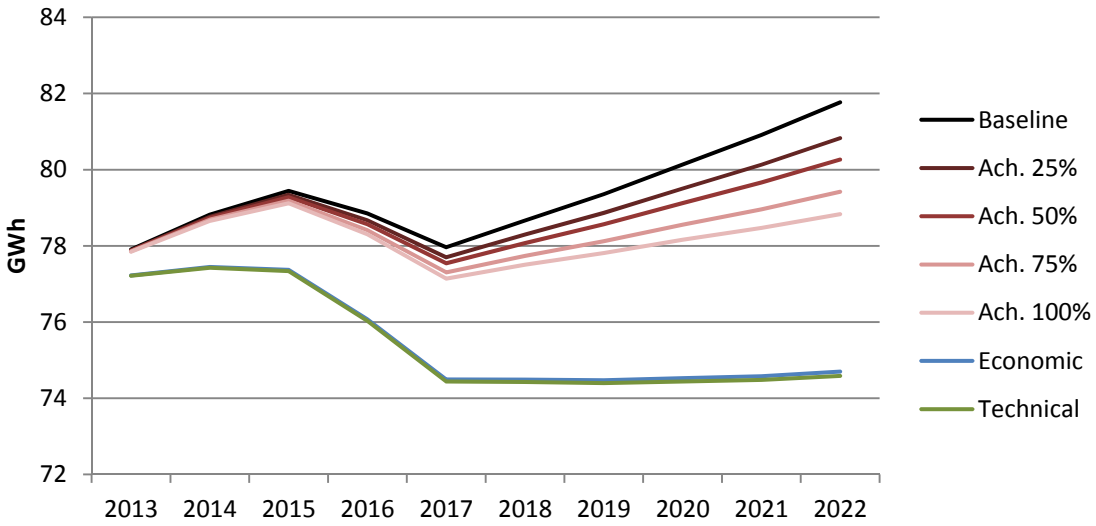

Figure 6-3: Industrial Sales Forecast with DSM Potential Removed

6.3.2 Savings Potential by Premise Type and End-use

Nexant estimated achievable savings potential for the industrial sector on the industry type level. The following summarizes potential savings at this increased resolution.

Figure 6-4 shows the distribution of industrial 2017 potential energy savings by industry type for a moderate (50%) incentive scenario. The breakdown of potential savings by industry type does not vary significantly for the different years or different achievable scenarios.

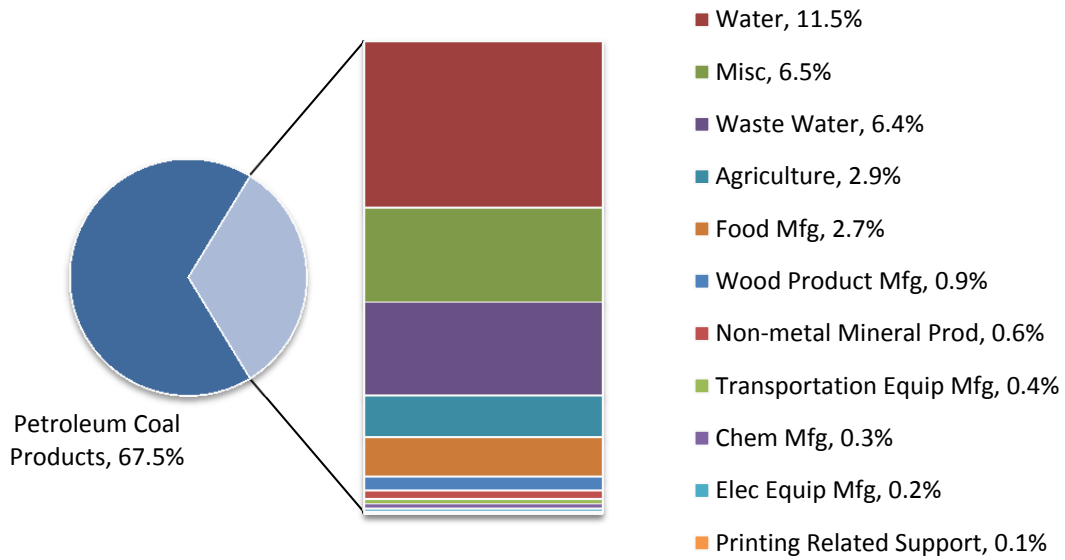

Figure 6-4: Industrial Achievable Savings Potential by Business Type, 2017

6.4 RECOMMENDATIONS

Based on Nexant's findings, MDU's next steps in program planning and design for industrial energy efficiency programs should give priority to a specific set of segments. Over two-thirds of the achievable potential in the industrial sector comes from the petroleum and coal products industry. Attention should be given to designing industrial energy efficiency programs geared towards process efficiency improvements in that segment. Secondarily, the water and wastewater industries provide nearly an additional 20% of the sector's achievable savings. Consideration should be given to designing programs with measures highly applicable to these segments.

7 DEMAND RESPONSE

7.1 SUMMARY OF DEMAND RESPONSE POTENTIAL

Demand response, sometimes referred to as load management, is a demand-side resource that focuses on reducing capacity needs. These programs are designed to help reduce peak demand during system emergencies or at times of extreme market prices, promote improved system reliability, and, in some cases, may lead to the deferment of investments in delivery and generation infrastructure. The programs discussed in this section offer incentives to customers to reduce loads during utility-specified events. The demand response programs evaluated in this study include two Residential Direct Load Control (DLC) programs. DLC programs allow the local utility to remotely turn off or cycle certain residential end-uses. This section analyzes the potential of central air conditioning and electric water heating DLC programs.

7.2 DEMAND RESPONSE POTENTIAL MODEL

There are a few important differences between the assessment of demand response programs and other demand-side management options, such as energy efficiency. First, demand response programs require active, ongoing participation by customers. Second, unlike energy efficiency programs, demand response often shifts load from peak periods of energy use to non-peak periods, which can affect the availability of service to the customer. Finally, demand response depends on a customer's willingness to participate in individual events. This willingness to participate is a function of program design, which includes the number of events, incentive levels, the stipulation of mandatory or voluntary participation, and the existence of penalties for non-compliance. Hence, estimating demand response potential evolves in a number of steps. The final potential number is a product of the base peak demand, eligibility rates, technical load impact rates, program participation rates, and event participation rates.

In this section, assumptions for rates and cost data were gathered from demand response studies that Nexant has performed for other entities as well as from publicly available studies published on utility websites.

7.2.1 Peak Demand

System peak demand data was available for MDU's Montana service territory. To estimate the base peak demand for both residential DLC programs, the peak for the residential sector was estimated based on that sector's energy use during the peak month relative to the system energy use during the same time period. The peak was further subdivided to isolate the contribution by residential central air conditioning loads and water heating loads.

7.2.2 Eligibility Rates

Eligibility rates are applied to the base peak demand to determine the peak load eligible to participate in each of the programs. For the residential DLC programs, only those customers with central air conditioners or electric water heaters are eligible to participate.

7.2.3 Technical Potential

In theory, it is possible to shed all loads during an event. However, it is neither practically feasible nor reasonable for a customer to do so. Therefore, after adjusting the base peak demand to include only eligible customers and loads, estimates must be developed that describe the load that is practically available to be curtailed. For the residential air conditioning and water heater DLC programs analyzed here, this rate approaches 100 percent, as all central air conditioners and electric water heaters can practically be shed.

7.2.4 Program and Event Participation: Market Potential

Program participation rates are applied to technical potential to determine the amount of load that will sign-up to participate in demand response programs. This participation rate is expressed as a percentage of eligible customers. As it takes some time for a utility to fully implement a demand response program, program participation rates are assumed to increase on a straight line to a mature participation rate over ten years. Finally, event participation rates are applied to determine the actual amount of load that will be reduced during any one event. Event participation rates in the case of DLC programs are adjusted to account for customers who opt out and equipment failures.

Combining technical potential with program and event participation rates provides what this section will call "market potential," or the load that can reasonably be reduced during any one event for a certain program.

7.3 RESOURCE POTENTIAL

7.3.1 Summary

Table 7-1 shows the technical and market potential for the two residential direct load control programs. The majority of the potential from these two programs comes from central air conditioning load control with 1.53 MW, or 1.02 percent of the Montana service territory peak in 2022.

Table 7-1: Technical and Market Potential (MW in 2022)

Program	Technical Potential	Market Potential	Market Potential as % of 2022 System Peak
Residential A/C DLC	21.75	1.53	1.02%
Residential Water Heater DLC	1.44	0.39	0.26%
Total	**23.18**	**1.92**	**1.28%**

Resource acquisition costs fall into one of two categories. Fixed costs include program start-up, infrastructure, maintenance, administration, and data acquisition. Variable costs include hardware costs, which vary by the number of customers, and incentive costs, which can vary by number of customers or kW reduced.

Where possible, based on Nexant's previous research for demand response studies, fixed and variable costs were estimated for each program type according to comparable programs implemented by other utilities. In some cases, this was hard to accomplish because cost information is generally not reported or recorded. This analysis assumes a cost of $100,000 to start a demand response program in MDU's Montana service territory. Marketing costs were estimated at $25 per residential DLC participant. Average hardware, communication, and incentive levels were estimated based on published values from other utilities or studies. Table 7-2 summarizes the cost assumptions for each program.

Table 7-2: Program Cost Assumptions

Variable	Unit	Residential A/C DLC	Residential Water Heater DLC
Start-Up	$, Fixed Cost	$100,000	$100,000
Hardware	$ per new customer	$175	$175
Marketing	$ per new customer	$25	$25
Incentive	$ per customer-year	$25	$25
Communication	$ per customer-year	$7	$7
Administration	% of total annual costs	15%	15%
Attrition	n/a	5%	5%
Equipment Life	Years	10	10

In determining levelized costs for each program, annual costs were calculated over the life of the program (10 years). These costs were discounted by the cost of capital for MDU (6.53%) and summed to come up with a total program cost. Annual costs include a rate of annual attrition to account for electric customer turnover and customers leaving the program. Thus, attrition requires the reinvestment of new customer program costs. Annual costs also include a general 15% cost increase (over total costs) for administration expenses.

Table 7-3 shows the expected levelized costs and potential peak reduction in 2022 for each program. Both residential DLC programs have relatively high levelized costs because of the large number of customers and the low impact per customer. Analysis of MDU's annualized cost of avoided capacity over the same time horizon, 2013 – 2022, resulted in a levelized cost of avoided capacity of $135.50/kW-year[1]. The levelized cost of both residential DLC programs exceeds that cost of avoided capacity by an appreciable margin.

Table 7-3: Levelized Costs and Market Potential (MW in 2022)

Program	Levelized Cost ($/kW-year)	Market Potential
Residential A/C DLC	$89	1.53
Residential Water Heater DLC	$183	0.39

7.3.2 Residential DLC

Direct load control programs allow the utility to remotely control certain end-uses. Typically, receiver systems are installed on customer equipment (the air conditioner compressor, for example) that enable the utility to communicate with the equipment. Customers do not have to pay for the receiver or the installation costs, and are compensated for the possibility of interruption of service via monthly bill credits, whether or not an interruption occurs in any one month. When the utility foresees system reliability issues, or witnesses extremely high market prices, they may interrupt electrical service for a limited duration, a limited total number of hours, and on a limited number of occasions. Thirty-five to 40 total hours of service interruption is typical for these programs.

7.3.2.1 Central Air Conditioning

Residential central air conditioning direct load control is by far the most popular DLC program in the nation. A 2006 report by the FERC found that 234 service providers offered a DLC program, most of which offered air conditioning control. When calling an event, many programs employ a cycling strategy where only half of the air conditioners in a region are turned off at any one time. To account for this, and the rate of opt-outs and hardware breakdown, event participation is assumed to be 46% (combination of 50% cycling and 92% event participation). Program participation varies widely between the many service providers, ranging from 1% to over 40%. The national average participation rate is approximately 20% to 30% of eligible customers – Rocky Mountain Power, for example, has 30% participation in its Utah Cool Keeper program. This analysis adopts a conservative 18% long-run participation rate.

[1] Levelized cost was determined using the Annualized Cost of Avoided Capacity supplied by MDU over the time horizon of the study, 2013 – 2022, as well as the Discount Rate defined at 6.73%. Levelized cost was determined by calculating the net present value (NPV) in 2013 dollars of the 10-year annualized avoided cost of capacity, and subsequently taking the annual payment value of that NPV.

Technology costs can also vary widely between programs. Load reduction can be accomplished through the installation of a two-way thermostat or switches. Switches are less expensive, costing around $150 after installation, while thermostats may cost $450. This analysis assumes a switch similar to the Utah Cool Keeper program at a cost of $175.

By implementing this program, MDU could see 1.53 MW of peak reduction by 2022, or 1.02% of the system peak, at a levelized cost of approximately $89/kW-year.

7.3.2.2 Electric Water Heating

There are not many investor-owned utilities that employ water heater only DLC programs, with Hawaii Electric Company being one of the main exceptions. This is most likely due to the low saturations of electric water heaters in densely populated areas. However, some Midwestern co-ops with high electric water heater saturations have used water heater DLC programs as an effective way to reduce peak loads.

Due to the similarity between this program and the air conditioning program, cost and participation assumptions are nearly identical. The one exception is the event participation rate – electric water heaters do not need to be cycled during an event because water will retain its heat for long periods of time. Thus, we use 92% as an event participation rate. Peak reduction of 0.39 MW, or 0.26% of peak, is forecasted for 2022 at levelized costs of $183/kW-year.

Many service providers consider combining both the central air conditioning and electric water heating programs, providing utilities the ability to control both end-uses for a single customer. This will save on labor and installation costs per kW reduced because both switches can be installed at the same time. The program will have a greater market potential than the stand-alone air conditioner program, but the average levelized costs will increase because the per-unit demand reduction for water heaters is smaller than that of air conditioners.

8 APPENDICES

Appendix A END-USE & LOAD DISAGGREGATION FINDINGS

A.1 END-USE MARKET SHARE

Table 8-1: End-Use Market Share by Residential Segment

End-Use	Single Family	Multi-Family	Manufactured
Central A/C	59.0%	20.4%	61.6%
Central Heat	5.8%	0.9%	5.0%
Cooking: Oven	86.0%	94.0%	45.6%
Cooking: Range	86.0%	94.0%	45.6%
Dryer	91.3%	62.0%	89.4%
Freezer	70.0%	30.0%	60.0%
HVAC Auxiliary	75.0%	58.0%	90.0%
Heat Pump	1.1%	<0.1%	0.8%
Lighting	100.0%	100.0%	100.0%
Other	100.0%	100.0%	100.0%
Plug Load	100.0%	100.0%	100.0%
Refrigerator	141.5%	110.0%	126.0%
Room A/C	45.8%	34.0%	50.0%
Room Heat	17.2%	20.0%	21.6%
Water Heat	27.0%	34.2%	19.0%

A.2 END-USE INTENSITY

Table 8-2: Electric Energy Use Intensity (EUI) by Commercial Segment and End-use (kWh/ft^2/yr)

Building Type	Space Heat-ing	Cool-ing	Venti-lation	Water Heat-ing	Light-ing	Cook-ing	Refrig-eration	Plug Loads	Other
Education	0.31	1.16	1.98	0.11	4.17	0.29	0.51	0.44	0.78
Grocery	0.04	2.74	3.03	0.18	11.26	2.77	28.87	0.45	1.57
Health	0.80	3.39	4.43	0.06	5.46	0.58	0.76	0.84	3.70
Lodging	0.30	0.98	0.98	0.03	2.20	0.39	0.49	0.08	0.85
Miscellaneous	0.06	0.41	0.47	0.06	1.87	0.16	0.43	0.20	1.00
Office	0.20	1.34	1.16	0.06	2.09	0.05	0.18	1.59	0.59
Restaurant	0.02	2.92	1.70	0.25	5.92	7.79	7.52	0.44	0.83
Retail	0.07	1.00	1.04	0.07	3.80	0.13	0.62	0.31	0.73
Warehouse	0.01	0.09	0.07	0.01	0.99	0.01	1.27	0.08	0.46

Appendix B SAVINGS POTENTIAL RESULTS

B.1 RESIDENTIAL POTENTIAL

Table 8-3: Annual Residential Energy Savings Potential & Percentage of Forecasted Sales (GWh)

Year	Technical		Economic		Ach. 100%		Ach. 75%		Ach. 50%		Ach. 25%	
2013	2.6	1.4%	1.8	0.9%	0.1	<0.1%	0.1	<0.1%	0.1	<0.1%	0.1	<0.1%
2014	2.6	1.4%	1.7	0.9%	0.2	0.1%	0.2	0.1%	0.1	0.1%	0.2	<0.1%
2015	2.6	1.4%	1.7	0.9%	0.4	0.2%	0.3	0.2%	0.2	0.1%	0.3	0.1%
2016	2.6	1.3%	1.7	0.9%	0.5	0.3%	0.4	0.2%	0.3	0.2%	0.3	0.1%
2017	2.5	1.3%	1.7	0.9%	0.7	0.4%	0.6	0.3%	0.4	0.2%	0.4	0.1%
2018	2.5	1.3%	1.7	0.8%	0.9	0.4%	0.7	0.4%	0.5	0.2%	0.5	0.2%
2019	2.5	1.3%	1.6	0.8%	1.0	0.5%	0.8	0.4%	0.6	0.3%	0.6	0.2%
2020	2.5	1.2%	1.6	0.8%	1.1	0.5%	0.9	0.4%	0.6	0.3%	0.7	0.2%
2021	2.4	1.2%	1.6	0.8%	1.2	0.6%	0.9	0.5%	0.7	0.3%	0.7	0.2%
2022	2.4	1.2%	1.6	0.8%	1.2	0.6%	1.0	0.5%	0.7	0.3%	0.8	0.2%

Table 8-4: Cumulative Residential Energy Savings Potential & Percentage of Forecasted Sales (GWh)

Year	Technical		Economic		Ach. 100%		Ach. 75%		Ach. 50%		Ach. 25%	
2013	2.6	1.4%	1.8	0.9%	0.1	<0.1%	0.1	<0.1%	0.1	<0.1%	0.0	<0.1%
2014	5.3	2.8%	3.5	1.8%	0.3	0.2%	0.2	0.1%	0.2	0.1%	0.1	0.1%
2015	7.8	4.1%	5.2	2.7%	0.7	0.3%	0.5	0.3%	0.4	0.2%	0.2	0.1%
2016	10.4	5.4%	6.9	3.6%	1.2	0.6%	1.0	0.5%	0.7	0.3%	0.4	0.2%
2017	13.0	6.6%	8.6	4.4%	1.9	1.0%	1.5	0.8%	1.1	0.6%	0.7	0.4%
2018	15.5	7.9%	10.2	5.2%	2.8	1.4%	2.2	1.1%	1.6	0.8%	1.0	0.5%
2019	17.9	9.1%	11.9	6.0%	3.7	1.9%	3.0	1.5%	2.1	1.1%	1.4	0.7%
2020	20.4	10.3%	13.5	6.8%	4.8	2.4%	3.9	2.0%	2.7	1.4%	1.8	0.9%
2021	22.8	11.5%	15.1	7.6%	6.0	3.0%	4.8	2.4%	3.4	1.7%	2.3	1.1%
2022	25.3	12.7%	16.7	8.4%	7.2	3.6%	5.8	2.9%	4.1	2.0%	2.7	1.4%

Table 8-5: Annual Residential Demand Savings Potential & Percentage of MT System Peak (MW)

Year	Technical		Economic		Ach. 100%		Ach. 75%		Ach. 50%		Ach. 25%	
2013	0.27	0.2%	0.18	0.1%	0.01	<0.1%	0.01	<0.1%	0.01	<0.1%	0.00	<0.1%
2014	0.27	0.2%	0.18	0.1%	0.02	<0.1%	0.02	<0.1%	0.01	<0.1%	0.01	<0.1%
2015	0.27	0.2%	0.18	0.1%	0.04	<0.1%	0.03	<0.1%	0.02	<0.1%	0.01	<0.1%
2016	0.27	0.2%	0.18	0.1%	0.06	<0.1%	0.05	<0.1%	0.03	<0.1%	0.02	<0.1%
2017	0.27	0.2%	0.18	0.1%	0.08	0.1%	0.06	<0.1%	0.04	<0.1%	0.03	<0.1%
2018	0.26	0.2%	0.17	0.1%	0.09	0.1%	0.07	0.1%	0.05	<0.1%	0.03	<0.1%
2019	0.26	0.2%	0.17	0.1%	0.10	0.1%	0.08	0.1%	0.06	<0.1%	0.04	<0.1%
2020	0.26	0.2%	0.17	0.1%	0.12	0.1%	0.09	0.1%	0.06	<0.1%	0.04	<0.1%
2021	0.26	0.2%	0.17	0.1%	0.12	0.1%	0.10	0.1%	0.07	<0.1%	0.05	<0.1%
2022	0.26	0.2%	0.17	0.1%	0.13	0.1%	0.10	0.1%	0.07	<0.1%	0.05	<0.1%

Table 8-6: Cumulative Residential Demand Savings Potential & Percentage of MT System Peak (MW)

Year	Technical		Economic		Ach. 100%		Ach. 75%		Ach. 50%		Ach. 25%	
2013	0.27	0.2%	0.18	0.1%	0.01	<0.1%	0.01	<0.1%	0.01	<0.1%	<0.01	<0.1%
2014	0.55	0.4%	0.36	0.3%	0.03	<0.1%	0.02	<0.1%	0.02	<0.1%	0.01	<0.1%
2015	0.82	0.6%	0.54	0.4%	0.07	0.1%	0.05	<0.1%	0.04	<0.1%	0.03	<0.1%
2016	1.08	0.8%	0.72	0.5%	0.13	0.1%	0.10	0.1%	0.07	0.1%	0.05	0.03%
2017	1.35	1.0%	0.89	0.6%	0.20	0.1%	0.16	0.1%	0.11	0.1%	0.08	0.05%
2018	1.61	1.1%	1.07	0.8%	0.29	0.2%	0.23	0.2%	0.16	0.1%	0.11	0.08%
2019	1.87	1.3%	1.24	0.9%	0.40	0.3%	0.32	0.2%	0.22	0.2%	0.15	0.10%
2020	2.13	1.5%	1.41	1.0%	0.51	0.4%	0.41	0.3%	0.29	0.2%	0.19	0.13%
2021	2.39	1.6%	1.58	1.1%	0.63	0.4%	0.51	0.3%	0.36	0.2%	0.24	0.16%
2022	2.64	1.8%	1.75	1.2%	0.76	0.5%	0.61	0.4%	0.43	0.3%	0.29	0.19%

Table 8-7: Technical Energy Savings Potential by Residential End Use (GWh)

Year	Appliances	Cooling	Heat Pumps	Lighting	Plug Loads	Pool/Spa Pumps	Space Heat	Water Heat	TOTAL
2013	0.72	0.12	0.14	1.05	0.07	0.01	0.39	0.15	**2.65**
2014	0.72	0.12	0.14	0.99	0.08	0.01	0.40	0.15	**2.61**
2015	0.73	0.12	0.14	0.95	0.08	0.01	0.40	0.16	**2.59**
2016	0.74	0.12	0.14	0.91	0.08	0.01	0.41	0.16	**2.57**
2017	0.75	0.12	0.14	0.86	0.09	0.01	0.41	0.16	**2.54**
2018	0.75	0.12	0.14	0.82	0.09	0.01	0.40	0.16	**2.50**
2019	0.75	0.12	0.15	0.78	0.09	0.01	0.40	0.16	**2.47**
2020	0.75	0.12	0.15	0.77	0.09	0.01	0.40	0.16	**2.46**
2021	0.75	0.13	0.15	0.76	0.10	0.01	0.40	0.16	**2.45**
2022	0.74	0.13	0.15	0.75	0.10	0.01	0.40	0.16	**2.44**

Table 8-8: Technical Demand Savings Potential by Residential End Use (kW)

Year	Appliances	Cooling	Heat Pumps	Lighting	Plug Loads	Pool/Spa Pumps	Space Heat	Water Heat	TOTAL
2013	111	31	6	102	7	2	2	14	**275**
2014	112	31	6	96	7	2	2	15	**271**
2015	113	32	6	92	8	2	2	15	**270**
2016	115	32	6	88	8	2	2	15	**268**
2017	115	33	6	84	8	2	2	15	**265**
2018	116	33	6	80	9	2	2	15	**262**
2019	116	33	6	76	9	2	2	15	**259**
2020	116	33	6	75	9	2	2	15	**258**
2021	115	34	6	74	9	2	2	15	**257**
2022	115	34	7	72	10	2	2	15	**256**

Table 8-9: Technical Energy Savings Potential by Residential Segment (GWh)

Year	Single Family	Multi-Family	Manu-factured	TOTAL
2013	2.32	0.06	0.27	**2.65**
2014	2.28	0.05	0.27	**2.61**
2015	2.26	0.05	0.27	**2.59**
2016	2.25	0.05	0.27	**2.57**
2017	2.22	0.05	0.27	**2.54**
2018	2.18	0.05	0.27	**2.50**
2019	2.15	0.05	0.27	**2.47**
2020	2.14	0.05	0.27	**2.46**
2021	2.13	0.05	0.27	**2.45**
2022	2.12	0.05	0.26	**2.44**

Table 8-10: Technical Demand Savings Potential by Residential Segment (kW)

Year	Single Family	Multi-Family	Manu-factured	TOTAL
2013	244	7	25	**275**
2014	240	7	24	**271**
2015	239	6	24	**270**
2016	238	6	24	**268**
2017	235	6	24	**265**
2018	232	6	24	**262**
2019	229	6	24	**259**
2020	228	6	24	**258**
2021	228	6	23	**257**
2022	227	6	23	**256**

Table 8-11: Economic Energy Savings Potential by End Use (GWh)

Year	Appliances	Cooling	Heat Pumps	Lighting	Plug Loads	Pool/Spa Pumps	Space Heat	Water Heat	TOTAL
2013	0.47	0.08	0.09	0.70	0.05	0.01	0.26	0.10	**1.75**
2014	0.48	0.08	0.09	0.65	0.05	0.01	0.26	0.10	**1.72**
2015	0.49	0.08	0.09	0.63	0.05	0.01	0.26	0.10	**1.71**
2016	0.49	0.08	0.09	0.60	0.05	0.01	0.27	0.10	**1.70**
2017	0.49	0.08	0.09	0.57	0.06	0.01	0.27	0.11	**1.68**
2018	0.49	0.08	0.10	0.54	0.06	0.01	0.27	0.11	**1.66**
2019	0.49	0.08	0.10	0.52	0.06	0.01	0.27	0.11	**1.63**
2020	0.49	0.08	0.10	0.51	0.06	0.01	0.27	0.11	**1.63**
2021	0.49	0.08	0.10	0.50	0.06	0.01	0.27	0.11	**1.62**
2022	0.49	0.08	0.10	0.49	0.07	0.01	0.27	0.10	**1.61**

Table 8-12: Economic Demand Savings Potential by End Use (kW)

Year	Appliances	Cooling	Heat Pumps	Lighting	Plug Loads	Pool/Spa Pumps	Space Heat	Water Heat	TOTAL
2013	73	20	4	68	5	1	1	10	**182**
2014	74	21	4	63	5	1	1	10	**179**
2015	75	21	4	61	5	1	1	10	**178**
2016	76	21	4	58	5	1	1	10	**177**
2017	76	22	4	55	5	1	1	10	**176**
2018	76	22	4	53	6	1	1	10	**173**
2019	76	22	4	50	6	1	1	10	**171**
2020	76	22	4	49	6	1	1	10	**171**
2021	76	22	4	49	6	1	1	10	**170**
2022	76	22	4	48	6	1	1	10	**170**

Table 8-13: Economic Energy Savings Potential by Residential Segment (GWh)

Year	Single Family	Multi-Family	Manu-factured	TOTAL
2013	1.53	0.04	0.18	**1.75**
2014	1.51	0.04	0.18	**1.72**
2015	1.50	0.04	0.18	**1.71**
2016	1.49	0.03	0.18	**1.70**
2017	1.47	0.03	0.18	**1.68**
2018	1.44	0.03	0.18	**1.66**
2019	1.42	0.03	0.18	**1.63**
2020	1.42	0.03	0.18	**1.63**
2021	1.41	0.03	0.18	**1.62**
2022	1.41	0.03	0.17	**1.61**

Table 8-14: Economic Demand Savings Potential by Residential Segment (kW)

Year	Single Family	Multi-Family	Manu-factured	TOTAL
2013	161	4	16	**182**
2014	159	4	16	**179**
2015	158	4	16	**178**
2016	157	4	16	**177**
2017	155	4	16	**176**
2018	154	4	16	**173**
2019	151	4	16	**171**
2020	151	4	16	**171**
2021	151	4	16	**170**
2022	150	4	15	**170**

Table 8-15: Ach. 100% Energy Savings Potential by Residential End Use (GWh)

Year	Appliances	Cooling	Heat Pumps	Lighting	Plug Loads	Pool/Spa Pumps	Space Heat	Water Heat	TOTAL
2013	0.02	0.00	0.004	0.04	0.003	0.00	0.01	<0.01	**0.09**
2014	0.06	0.01	0.01	0.08	0.006	0.00	0.03	0.01	**0.20**
2015	0.10	0.02	0.02	0.14	0.01	0.00	0.05	0.02	**0.36**
2016	0.16	0.02	0.03	0.20	0.02	0.00	0.08	0.03	**0.54**
2017	0.22	0.03	0.04	0.25	0.02	0.00	0.11	0.04	**0.71**
2018	0.27	0.04	0.05	0.29	0.03	0.00	0.13	0.05	**0.86**
2019	0.31	0.05	0.05	0.32	0.04	0.01	0.15	0.06	**0.98**
2020	0.34	0.05	0.06	0.35	0.04	0.01	0.17	0.07	**1.08**
2021	0.36	0.06	0.07	0.37	0.05	0.01	0.18	0.07	**1.16**
2022	0.38	0.06	0.07	0.38	0.05	0.01	0.19	0.07	**1.21**

Table 8-16: Ach. 100% Energy Savings Potential by Residential Segment (GWh)

Year	Single Family	Multi-Family	Manu-factured	TOTAL
2013	0.08	<0.01	0.01	**0.09**
2014	0.18	<0.01	0.02	**0.20**
2015	0.31	0.01	0.04	**0.36**
2016	0.47	0.01	0.06	**0.54**
2017	0.62	0.01	0.07	**0.71**
2018	0.75	0.02	0.09	**0.86**
2019	0.86	0.02	0.10	**0.98**
2020	0.95	0.02	0.12	**1.08**
2021	1.01	0.02	0.12	**1.16**
2022	1.06	0.02	0.13	**1.21**

Table 8-17: Ach. 100% Demand Savings Potential by Residential Segment (kW)

Year	Single Family	Multi-Family	Manu-factured	TOTAL
2013	8	<1	1	**9**
2014	19	1	2	**21**
2015	34	1	3	**38**
2016	50	1	5	**57**
2017	67	2	7	**75**
2018	81	2	8	**91**
2019	92	2	9	**104**
2020	102	3	10	**115**
2021	109	3	11	**123**
2022	114	3	12	**129**

Table 8-18: Ach. 75% Energy Savings Potential by Residential End Use (GWh)

Year	Appliances	Cooling	Heat Pumps	Lighting	Plug Loads	Pool/Spa Pumps	Space Heat	Water Heat	TOTAL
2013	0.02	<0.01	<0.01	0.03	<0.01	<0.01	0.01	<0.01	**0.07**
2014	0.05	0.01	0.01	0.06	<0.01	<0.01	0.02	0.01	**0.16**
2015	0.08	0.01	0.01	0.11	0.01	<0.01	0.04	0.02	**0.29**
2016	0.13	0.02	0.02	0.16	0.01	<0.01	0.06	0.02	**0.43**
2017	0.17	0.03	0.03	0.20	0.02	<0.01	0.09	0.03	**0.57**
2018	0.21	0.03	0.04	0.23	0.03	<0.01	0.10	0.04	**0.69**
2019	0.25	0.04	0.04	0.26	0.03	<0.01	0.12	0.05	**0.79**
2020	0.27	0.04	0.05	0.28	0.03	<0.01	0.13	0.05	**0.87**
2021	0.29	0.04	0.05	0.30	0.04	0.01	0.14	0.06	**0.93**
2022	0.31	0.05	0.06	0.31	0.04	0.01	0.15	0.06	**0.97**

Table 8-19: Ach. 75% Energy Savings Potential by Residential Segment (GWh)

Year	Single Family	Multi-Family	Manu-factured	TOTAL
2013	0.06	<0.01	0.01	**0.07**
2014	0.14	<0.01	0.02	**0.16**
2015	0.25	0.01	0.03	**0.29**
2016	0.38	0.01	0.05	**0.43**
2017	0.50	0.01	0.06	**0.57**
2018	0.60	0.01	0.07	**0.69**
2019	0.69	0.02	0.08	**0.79**
2020	0.76	0.02	0.09	**0.87**
2021	0.81	0.02	0.10	**0.93**
2022	0.85	0.02	0.10	**0.97**

Table 8-20: Table 8 16: Ach. 75% Demand Savings Potential by Residential Segment (kW)

Year	Single Family	Multi-Family	Manu-factured	TOTAL
2013	7	<1	1	**7**
2014	15	<1	2	**17**
2015	27	1	3	**30**
2016	40	1	4	**46**
2017	53	1	5	**60**
2018	65	2	7	**73**
2019	74	2	8	**83**
2020	81	2	8	**92**
2021	87	2	9	**99**
2022	91	2	9	**103**

Table 8-21: Ach. 50% Energy Savings Potential by Residential End Use (GWh)

Year	Appliances	Cooling	Heat Pumps	Lighting	Plug Loads	Pool/Spa Pumps	Space Heat	Water Heat	TOTAL
2013	0.01	<0.01	<0.01	0.02	<0.01	0.000	0.01	<0.01	**0.05**
2014	0.03	<0.01	0.01	0.04	<0.01	0.001	0.02	0.01	**0.11**
2015	0.06	0.01	0.01	0.08	0.01	0.001	0.03	0.01	**0.20**
2016	0.09	0.01	0.02	0.11	0.01	0.002	0.04	0.02	**0.30**
2017	0.12	0.02	0.02	0.14	0.01	0.002	0.06	0.02	**0.40**
2018	0.15	0.02	0.03	0.17	0.02	0.00	0.07	0.03	**0.49**
2019	0.17	0.03	0.03	0.18	0.02	0.00	0.09	0.03	**0.55**
2020	0.19	0.03	0.03	0.20	0.02	0.00	0.09	0.04	**0.61**
2021	0.21	0.03	0.04	0.21	0.03	0.00	0.10	0.04	**0.65**
2022	0.22	0.03	0.04	0.22	0.03	0.00	0.11	0.04	**0.69**

Table 8-22: Ach. 50% Energy Savings Potential by Residential Segment (GWh)

Year	Single Family	Multi-Family	Manu-factured	TOTAL
2013	0.04	<0.01	0.01	**0.05**
2014	0.10	<0.01	0.01	**0.11**
2015	0.18	<0.01	0.02	**0.20**
2016	0.27	0.01	0.03	**0.30**
2017	0.35	0.01	0.04	**0.40**
2018	0.43	0.01	0.05	**0.49**
2019	0.48	0.01	0.06	**0.55**
2020	0.53	0.01	0.07	**0.61**
2021	0.57	0.01	0.07	**0.65**
2022	0.60	0.01	0.07	**0.69**

Table 8-23: Ach. 50% Demand Savings Potential by Residential Segment (kW)

Year	Single Family	Multi-Family	Manu-factured	TOTAL
2013	4.68	0.13	0.47	**5**
2014	10.59	0.29	1.07	**12**
2015	18.93	0.52	1.91	**21**
2016	28.45	0.78	2.88	**32**
2017	37.65	1.02	3.82	**43**
2018	45.64	1.24	4.65	**52**
2019	52.02	1.41	5.32	**59**
2020	57.46	1.55	5.88	**65**
2021	61.55	1.66	6.31	**70**
2022	64.46	1.74	6.61	**73**

Table 8-24: Ach. 25% Energy Savings Potential by Residential End Use (GWh)

Year	Appliances	Cooling	Heat Pumps	Lighting	Plug Loads	Pool/Spa Pumps	Space Heat	Water Heat	TOTAL
2013	0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	**0.03**
2014	0.02	<0.01	<0.01	0.03	<0.01	<0.01	0.01	<0.01	**0.08**
2015	0.04	0.01	0.01	0.05	<0.01	<0.01	0.02	0.01	**0.14**
2016	0.06	0.01	0.01	0.07	0.01	<0.01	0.03	0.01	**0.20**
2017	0.08	0.01	0.01	0.09	0.01	<0.01	0.04	0.02	**0.27**
2018	0.10	0.02	0.02	0.11	0.01	<0.01	0.05	0.02	**0.32**
2019	0.12	0.02	0.02	0.12	0.01	<0.01	0.06	0.02	**0.37**
2020	0.13	0.02	0.02	0.13	0.02	<0.01	0.06	0.02	**0.41**
2021	0.14	0.02	0.02	0.14	0.02	<0.01	0.07	0.03	**0.44**
2022	0.14	0.02	0.03	0.14	0.02	<0.01	0.07	0.03	**0.46**

Table 8-25: Ach. 25% Energy Savings Potential by Residential Segment (GWh)

Year	Single Family	Multi-Family	Manu-factured	TOTAL
2013	0.03	<0.01	<0.01	**0.03**
2014	0.07	<0.01	0.01	**0.08**
2015	0.12	<0.01	0.01	**0.14**
2016	0.18	<0.01	0.02	**0.20**
2017	0.23	0.01	0.03	**0.27**
2018	0.28	0.01	0.03	**0.32**
2019	0.32	0.01	0.04	**0.37**
2020	0.36	0.01	0.04	**0.41**
2021	0.38	0.01	0.05	**0.44**
2022	0.40	0.01	0.05	**0.46**

Table 8-26: Ach. 25% Demand Savings Potential by Residential Segment (kW)

Year	Single Family	Multi-Family	Manu-factured	TOTAL
2013	3	<1	<1	**4**
2014	7	<1	1	**8**
2015	13	<1	1	**14**
2016	19	1	2	**21**
2017	25	1	3	**28**
2018	30	1	3	**34**
2019	35	1	4	**39**
2020	38	1	4	**43**
2021	41	1	4	**46**
2022	43	1	4	**49**

B.2 COMMERCIAL POTENTIAL

Table 8-27: Annual Commercial Energy Savings Potential & Percentage of Forecasted Sales (GWh)

Year	Technical		Economic		Ach. 100%		Ach. 75%		Ach. 50%		Ach. 25%	
2013	2.2	1.1%	1.5	0.7%	0.1	0.1%	0.1	<0.1%	0.1	<0.1%	0.0	<0.1%
2014	2.3	1.0%	1.5	0.7%	0.3	0.1%	0.2	0.1%	0.1	0.1%	0.1	<0.1%
2015	2.4	1.0%	1.6	0.7%	0.4	0.2%	0.4	0.2%	0.2	0.1%	0.1	0.1%
2016	2.5	1.0%	1.6	0.7%	0.7	0.3%	0.5	0.2%	0.3	0.2%	0.2	0.1%
2017	2.5	1.0%	1.7	0.7%	0.8	0.4%	0.7	0.3%	0.4	0.2%	0.3	0.1%
2018	2.6	1.0%	1.7	0.7%	1.0	0.4%	0.8	0.3%	0.5	0.2%	0.3	0.1%
2019	2.6	1.0%	1.7	0.7%	1.2	0.5%	0.9	0.4%	0.6	0.2%	0.4	0.1%
2020	2.7	1.0%	1.8	0.7%	1.3	0.5%	1.0	0.4%	0.6	0.3%	0.4	0.2%
2021	2.8	1.0%	1.8	0.7%	1.4	0.5%	1.1	0.4%	0.7	0.3%	0.4	0.2%
2022	2.9	1.0%	1.9	0.7%	1.4	0.5%	1.2	0.4%	0.7	0.3%	0.5	0.2%

Table 8-28: Cumulative Commercial Energy Savings Potential & Percentage of Forecasted Sales (GWh)

Year	Technical		Economic		Ach. 100%		Ach. 75%		Ach. 50%		Ach. 25%	
2013	2.2	1.1%	1.5	0.7%	0.1	0.1%	0.1	<0.1%	0.1	<0.1%	0.04	<0.1%
2014	4.5	2.1%	3.0	1.4%	0.4	0.2%	0.3	0.1%	0.2	0.1%	0.1	0.1%
2015	6.9	3.0%	4.5	2.0%	0.8	0.4%	0.7	0.3%	0.4	0.2%	0.3	0.1%
2016	9.4	3.9%	6.1	2.6%	1.5	0.7%	1.2	0.5%	0.8	0.3%	0.5	0.2%
2017	11.9	4.8%	7.8	3.2%	2.3	1.0%	1.9	0.8%	1.2	0.5%	0.7	0.3%
2018	14.5	5.7%	9.5	3.7%	3.3	1.4%	2.7	1.1%	1.7	0.7%	1.1	0.4%
2019	17.1	6.5%	11.2	4.3%	4.5	1.8%	3.6	1.5%	2.3	0.9%	1.4	0.6%
2020	19.8	7.4%	13.0	4.8%	5.8	2.3%	4.6	1.8%	2.9	1.2%	1.8	0.7%
2021	22.6	8.2%	14.8	5.3%	7.1	2.7%	5.7	2.2%	3.6	1.4%	2.3	0.9%
2022	25.5	9.0%	16.7	5.9%	8.6	3.2%	6.9	2.5%	4.4	1.6%	2.7	1.0%

Table 8-29: Annual Commercial Demand Savings Potential & Percentage of MT System Peak (MW)

Year	Technical		Economic		Ach. 100%		Ach. 75%		Ach. 50%		Ach. 25%	
2013	0.31	0.2%	0.21	0.2%	0.02	<0.1%	0.01	<0.1%	0.01	<0.1%	0.01	<0.1%
2014	0.32	0.2%	0.21	0.2%	0.04	<0.1%	0.03	<0.1%	0.02	<0.1%	0.01	<0.1%
2015	0.34	0.2%	0.22	0.2%	0.06	<0.1%	0.05	<0.1%	0.03	<0.1%	0.02	<0.1%
2016	0.35	0.3%	0.23	0.2%	0.09	0.1%	0.08	0.1%	0.05	<0.1%	0.03	<0.1%
2017	0.36	0.3%	0.23	0.2%	0.12	0.1%	0.10	0.1%	0.06	<0.1%	0.04	<0.1%
2018	0.37	0.3%	0.24	0.2%	0.14	0.1%	0.12	0.1%	0.07	0.1%	0.05	<0.1%
2019	0.38	0.3%	0.25	0.2%	0.16	0.1%	0.13	0.1%	0.08	0.1%	0.05	<0.1%
2020	0.39	0.3%	0.25	0.2%	0.18	0.1%	0.14	0.1%	0.09	0.1%	0.06	<0.1%
2021	0.40	0.3%	0.26	0.2%	0.19	0.1%	0.16	0.1%	0.10	0.1%	0.06	<0.1%
2022	0.41	0.3%	0.27	0.2%	0.16	0.1%	0.13	0.1%	0.08	0.1%	0.05	<0.1%

Table 8-30: Cumulative Commercial Demand Savings Potential & Percentage of MT System Peak (MW)

Year	Technical		Economic		Ach. 100%		Ach. 75%		Ach. 50%		Ach. 25%	
2013	0.31	0.2%	0.21	0.2%	0.02	<0.1%	0.01	<0.1%	0.01	<0.1%	0.01	<0.1%
2014	0.63	0.5%	0.42	0.3%	0.05	<0.1%	0.04	<0.1%	0.03	<0.1%	0.02	0.01%
2015	0.97	0.7%	0.64	0.5%	0.12	0.1%	0.10	0.1%	0.06	0.0%	0.04	0.03%
2016	1.32	1.0%	0.86	0.6%	0.21	0.2%	0.17	0.1%	0.11	0.1%	0.07	0.05%
2017	1.68	1.2%	1.10	0.8%	0.33	0.2%	0.27	0.2%	0.17	0.1%	0.11	0.08%
2018	2.04	1.4%	1.34	0.9%	0.48	0.3%	0.38	0.3%	0.25	0.2%	0.15	0.11%
2019	2.42	1.7%	1.58	1.1%	0.64	0.4%	0.51	0.4%	0.33	0.2%	0.21	0.14%
2020	2.80	1.9%	1.84	1.3%	0.82	0.6%	0.66	0.5%	0.42	0.3%	0.26	0.18%
2021	3.20	2.2%	2.10	1.4%	1.02	0.7%	0.82	0.6%	0.52	0.4%	0.33	0.22%
2022	3.61	2.4%	2.36	1.6%	1.18	0.8%	0.94	0.6%	0.60	0.4%	0.38	0.25%

Table 8-31: Technical Energy Savings Potential by Commercial End Use (GWh)

Year	Cooking	Cooling	Heat Pump	Heating	HVAC Aux.	Lighting	Plug Load	Refrig.	Water Heat	TOTAL
2013	0.02	0.16	0.03	0.05	0.26	0.92	0.29	0.50	0.01	**2.23**
2014	0.02	0.17	0.03	0.05	0.27	0.89	0.31	0.52	0.01	**2.29**
2015	0.02	0.18	0.03	0.05	0.29	0.89	0.34	0.56	0.02	**2.38**
2016	0.03	0.19	0.03	0.06	0.30	0.90	0.36	0.58	0.02	**2.46**
2017	0.03	0.19	0.03	0.06	0.31	0.90	0.39	0.60	0.02	**2.52**
2018	0.03	0.20	0.03	0.06	0.32	0.90	0.41	0.62	0.02	**2.58**
2019	0.03	0.21	0.04	0.06	0.33	0.91	0.43	0.64	0.02	**2.65**
2020	0.03	0.21	0.04	0.06	0.34	0.92	0.45	0.66	0.02	**2.72**
2021	0.03	0.22	0.04	0.06	0.34	0.93	0.48	0.68	0.02	**2.79**
2022	0.03	0.22	0.04	0.06	0.35	0.94	0.50	0.69	0.02	**2.85**

Table 8-32: Technical Demand Savings Potential by Commercial End Use (kW)

Year	Cooking	Cooling	Heat Pump	Heating	HVAC Aux.	Lighting	Plug Load	Refrig.	Water Heat	TOTAL
2013	4	41	7	1	34	121	45	59	1	**313**
2014	4	44	8	1	36	117	49	62	1	**322**
2015	4	46	8	1	38	118	54	66	1	**336**
2016	4	48	8	1	40	118	58	69	1	**348**
2017	4	50	9	1	41	119	61	71	1	**357**
2018	4	52	9	1	42	119	65	74	1	**366**
2019	4	53	9	1	43	119	68	76	1	**375**
2020	4	55	10	1	44	121	72	78	1	**386**
2021	4	56	10	1	45	122	76	80	1	**397**
2022	4	57	10	1	46	124	80	82	1	**406**

Table 8-33: Technical Energy Savings Potential by Commercial Segment (GWh)

Year	Education	Grocery	Health	Lodging	Misc	Office	Restaurant	Retail	Warehouse	TOTAL
2013	0.13	0.43	0.26	0.43	0.24	0.33	0.14	0.22	0.03	**2.23**
2014	0.13	0.45	0.27	0.44	0.24	0.34	0.15	0.22	0.03	**2.29**
2015	0.14	0.48	0.29	0.46	0.25	0.36	0.16	0.22	0.03	**2.38**
2016	0.14	0.50	0.30	0.47	0.25	0.38	0.16	0.23	0.03	**2.46**
2017	0.14	0.52	0.31	0.48	0.26	0.39	0.17	0.23	0.03	**2.52**
2018	0.14	0.53	0.32	0.49	0.26	0.40	0.17	0.23	0.03	**2.58**
2019	0.15	0.54	0.32	0.50	0.27	0.42	0.18	0.24	0.04	**2.65**
2020	0.15	0.56	0.33	0.51	0.27	0.43	0.18	0.24	0.04	**2.72**
2021	0.15	0.58	0.34	0.52	0.28	0.45	0.19	0.25	0.04	**2.79**
2022	0.16	0.59	0.35	0.53	0.28	0.46	0.19	0.25	0.04	**2.85**

Table 8-34: Technical Demand Savings Potential by Commercial Segment (kW)

Year	Education	Grocery	Health	Lodging	Misc	Office	Restaurant	Retail	Warehouse	TOTAL
2013	18	52	41	63	34	50	19	31	4	**313**
2014	18	55	43	65	34	52	20	31	4	**322**
2015	19	58	45	68	34	55	21	32	5	**336**
2016	19	61	47	70	35	57	21	32	5	**348**
2017	19	62	49	71	36	59	22	33	5	**357**
2018	20	64	50	73	36	61	23	33	5	**366**
2019	20	66	52	75	37	64	23	34	5	**375**
2020	21	68	54	76	38	66	24	35	5	**386**
2021	21	70	55	78	39	69	25	35	5	**397**
2022	21	72	57	80	40	71	25	36	5	**406**

Table 8-35: Economic Energy Savings Potential by Commercial End Use (GWh)

Year	Cooking	Cooling	Heat Pump	Heating	HVAC Aux.	Lighting	Plug Load	Refrig.	Water Heat	TOTAL
2013	0.01	0.10	0.02	0.03	0.17	0.60	0.19	0.32	0.01	**1.46**
2014	0.02	0.11	0.02	0.03	0.18	0.58	0.20	0.34	0.01	**1.50**
2015	0.02	0.12	0.02	0.04	0.19	0.59	0.22	0.37	0.01	**1.56**
2016	0.02	0.12	0.02	0.04	0.20	0.59	0.24	0.38	0.01	**1.61**
2017	0.02	0.13	0.02	0.04	0.20	0.59	0.25	0.40	0.01	**1.66**
2018	0.02	0.13	0.02	0.04	0.21	0.59	0.27	0.41	0.01	**1.69**
2019	0.02	0.13	0.02	0.04	0.21	0.59	0.28	0.42	0.01	**1.74**
2020	0.02	0.14	0.02	0.04	0.22	0.60	0.30	0.43	0.01	**1.78**
2021	0.02	0.14	0.02	0.04	0.23	0.61	0.31	0.45	0.01	**1.83**
2022	0.02	0.15	0.03	0.04	0.23	0.61	0.33	0.46	0.01	**1.87**

Table 8-36: Economic Demand Savings Potential by Commercial End Use (kW)

Year	Cooking	Cooling	Heat Pump	Heating	HVAC Aux.	Lighting	Plug Load	Refrig.	Water Heat	TOTAL
2013	2	27	5	0.4	22	79	30	38	1	**205**
2014	2	29	5	0.4	24	77	32	41	1	**211**
2015	3	30	5	0.4	25	77	35	43	1	**220**
2016	3	32	6	0.4	26	78	38	45	1	**228**
2017	3	33	6	0.4	27	78	40	47	1	**234**
2018	3	34	6	0.4	28	78	42	48	1	**240**
2019	3	35	6	0.5	28	78	45	50	1	**246**
2020	3	36	6	0.5	29	79	47	51	1	**253**
2021	3	37	6	0.5	30	80	50	53	1	**260**
2022	3	38	7	0.5	30	81	52	54	1	**266**

Table 8-37: Economic Energy Savings Potential by Commercial Segment (GWh)

Year	Educa-tion	Grocery	Health	Lodging	Misc	Office	Restau-rant	Retail	Ware-house	TOTAL
2013	0.09	0.28	0.17	0.28	0.16	0.22	0.09	0.15	0.02	**1.46**
2014	0.09	0.30	0.18	0.29	0.16	0.22	0.10	0.14	0.02	**1.50**
2015	0.09	0.31	0.19	0.30	0.16	0.24	0.10	0.15	0.02	**1.56**
2016	0.09	0.33	0.19	0.31	0.17	0.25	0.11	0.15	0.02	**1.61**
2017	0.09	0.34	0.20	0.32	0.17	0.26	0.11	0.15	0.02	**1.66**
2018	0.09	0.35	0.21	0.32	0.17	0.26	0.11	0.15	0.02	**1.69**
2019	0.10	0.36	0.21	0.33	0.17	0.27	0.12	0.16	0.02	**1.74**
2020	0.10	0.37	0.22	0.34	0.18	0.28	0.12	0.16	0.02	**1.78**
2021	0.10	0.38	0.23	0.34	0.18	0.259	0.12	0.16	0.02	**1.83**
2022	0.10	0.39	0.23	0.35	0.19	0.30	0.12	0.16	0.03	**1.87**

Table 8-38: Economic Demand Savings Potential by Commercial Segment (kW)

Year	Educa-tion	Grocery	Health	Lodging	Misc	Office	Restau-rant	Retail	Ware-house	TOTAL
2013	12	34	27	42	22	33	12	20	3	**205**
2014	12	36	28	43	22	34	13	20	3	**211**
2015	12	38	30	44	23	36	14	21	3	**220**
2016	12	40	31	46	23	38	14	21	3	**228**
2017	13	41	32	47	23	39	14	22	3	**234**
2018	13	42	33	48	24	40	15	22	3	**240**
2019	13	43	34	49	24	42	15	22	3	**246**
2020	13	45	35	50	25	43	16	23	3	**253**
2021	14	46	36	51	25	45	16	23	3	**260**
2022	14	47	37	52	26	46	16	24	4	**266**

Table 8-39: Ach. 100% Energy Savings Potential by Commercial End Use (MWh)

Year	Cooking	Cooling	Heat Pump	Heating	HVAC Aux.	Lighting	Plug Load	Refrig.	Water Heat	TOTAL
2013	1	8	1	2	13	49	15	24	1	**115**
2014	3	18	3	5	29	104	36	56	2	**256**
2015	4	32	6	10	52	176	66	100	3	**448**
2016	6	47	8	14	76	249	101	147	4	**654**
2017	8	62	11	18	99	316	135	193	5	**847**
2018	10	74	13	22	119	371	167	232	6	**1014**
2019	11	85	15	25	135	413	196	265	7	**1152**
2020	12	94	16	27	149	448	222	293	8	**1270**
2021	13	101	18	29	161	475	246	317	8	**1368**
2022	14	107	19	30	169	496	266	334	9	**1442**

Table 8-40: Ach. 100% Energy Savings Potential by Commercial Segment (MWh)

Year	Educa-tion	Grocery	Health	Lodging	Misc	Office	Restau-rant	Retail	Ware-house	TOTAL
2013	7	21	13	22	13	17	7	12	2	**115**
2014	15	49	30	49	28	39	16	26	4	**256**
2015	26	87	53	85	48	69	29	44	6	**448**
2016	38	128	78	124	70	102	42	63	9	**654**
2017	49	166	102	159	90	133	55	80	12	**847**
2018	58	200	123	190	107	161	66	95	14	**1014**
2019	66	228	140	215	120	185	75	107	16	**1152**
2020	72	252	155	236	132	205	83	117	18	**1270**
2021	77	272	168	252	141	223	89	125	19	**1368**
2022	82	287	177	265	149	237	94	132	20	**1442**

Table 8-41: Ach. 75% Energy Savings Potential by Commercial End Use (MWh)

Year	Cooking	Cooling	Heat Pump	Heating	HVAC Aux.	Lighting	Plug Load	Refrig.	Water Heat	TOTAL
2013	1	6	1	2	10	40	12	19	1	**92**
2014	2	14	3	4	23	83	29	45	1	**205**
2015	4	26	4	8	41	141	53	80	2	**358**
2016	5	38	7	11	61	200	81	118	3	**524**
2017	7	49	9	15	79	253	108	154	4	**678**
2018	8	60	10	17	95	296	134	185	5	**811**
2019	9	68	12	20	108	330	157	212	6	**922**
2020	10	75	13	22	119	358	178	235	6	**1016**
2021	10	81	14	23	128	380	197	253	7	**1094**
2022	11	85	15	24	135	397	213	267	7	**1154**

Table 8-42: Ach. 75% Energy Savings Potential by Commercial Segment (MWh)

Year	Educa-tion	Grocery	Health	Lodging	Misc	Office	Restau-rant	Retail	Ware-house	TOTAL
2013	6	17	11	18	10	14	6	9	1	**92**
2014	12	39	24	39	23	31	13	20	3	**205**
2015	21	69	43	68	39	55	23	35	5	**358**
2016	31	102	63	99	56	82	34	50	7	**524**
2017	39	133	82	127	72	107	44	64	10	**678**
2018	47	160	98	152	85	129	53	76	11	**811**
2019	53	183	112	172	96	148	60	86	13	**922**
2020	58	202	124	188	105	164	66	94	14	**1016**
2021	62	218	134	202	113	178	71	100	15	**1094**
2022	65	229	142	212	119	190	75	105	16	**1154**

Table 8-43: Ach. 50% Energy Savings Potential by Commercial End Use (MWh)

Year	Cooking	Cooling	Heat Pump	Heating	HVAC Aux.	Lighting	Plug Load	Refrig.	Water Heat	TOTAL
2013	1	4	1	1	7	25	8	12	<1	**59**
2014	1	9	2	3	15	53	19	29	1	**131**
2015	2	16	3	5	26	90	34	51	1	**229**
2016	3	24	4	7	39	128	52	75	2	**335**
2017	4	31	6	9	51	162	69	98	3	**433**
2018	5	38	7	11	61	189	85	119	3	**518**
2019	6	44	8	13	69	211	100	136	4	**589**
2020	6	48	8	14	76	229	114	150	4	**650**
2021	7	52	9	15	82	243	126	162	4	**699**
2022	7	55	10	15	86	254	136	171	4	**738**

Table 8-44: Ach. 50% Energy Savings Potential by Commercial Segment (MWh)

Year	Education	Grocery	Health	Lodging	Misc	Office	Restaurant	Retail	Warehouse	TOTAL
2013	4	11	7	11	7	9	4	6	1	**59**
2014	8	25	15	25	14	20	8	13	2	**131**
2015	14	44	27	43	25	35	15	22	3	**229**
2016	20	65	40	63	36	52	22	32	5	**335**
2017	25	85	52	81	46	68	28	41	6	**433**
2018	30	102	63	97	55	82	34	49	7	**518**
2019	34	117	72	110	61	94	38	55	8	**589**
2020	37	129	79	121	67	105	42	60	9	**650**
2021	40	139	86	129	72	114	46	64	10	**699**
2022	42	147	91	135	76	121	48	67	10	**738**

Table 8-45: Ach. 25% Energy Savings Potential by Commercial End Use (MWh)

Year	Cooking	Cooling	Heat Pump	Heating	HVAC Aux.	Lighting	Plug Load	Refrig.	Water Heat	TOTAL
2013	<1	3	<1	1	4	16	5	8	<1	**37**
2014	1	6	1	2	9	33	12	18	<1	**82**
2015	1	10	2	3	17	56	21	32	1	**143**
2016	2	15	3	5	24	80	32	47	1	**209**
2017	3	20	3	6	32	101	43	62	2	**271**
2018	3	24	4	7	38	118	53	74	2	**324**
2019	4	27	5	8	43	132	63	85	2	**368**
2020	4	30	5	9	48	143	71	94	2	**406**
2021	4	32	6	9	51	152	79	101	3	**437**
2022	4	34	6	10	54	159	85	107	3	**461**

Table 8-46: Ach. 25% Energy Savings Potential by Commercial Segment (MWh)

Year	Education	Grocery	Health	Lodging	Misc	Office	Restaurant	Retail	Warehouse	TOTAL
2013	2	7	4	7	4	6	2	4	1	**37**
2014	5	16	10	16	9	12	5	8	1	**82**
2015	8	28	17	27	16	22	9	14	2	**143**
2016	12	41	25	40	22	33	14	20	3	**209**
2017	16	53	33	51	29	43	18	26	4	**271**
2018	19	64	39	61	34	51	21	30	5	**324**
2019	21	73	45	69	38	59	24	34	5	**368**
2020	23	81	50	75	42	66	26	37	6	**406**
2021	25	87	54	81	45	71	28	40	6	**437**
2022	26	92	57	85	48	76	30	42	6	**461**

B.3 INDUSTRIAL POTENTIAL

Table 8-47: Annual Industrial Energy Savings Potential & Percentage of Forecasted Sales (GWh)

Year	Technical		Economic		Ach. 100%		Ach. 75%		Ach. 50%		Ach. 25%	
2013	0.69	0.9%	0.68	0.9%	0.06	0.1%	0.05	0.1%	0.03	<0.1%	0.02	<0.1%
2014	0.70	0.9%	0.69	0.9%	0.10	0.1%	0.08	0.1%	0.05	0.1%	0.03	0.0%
2015	0.71	0.9%	0.70	0.9%	0.16	0.2%	0.13	0.2%	0.08	0.1%	0.05	0.1%
2016	0.71	0.9%	0.70	0.9%	0.22	0.3%	0.18	0.2%	0.11	0.1%	0.07	0.1%
2017	0.71	0.9%	0.70	0.9%	0.28	0.4%	0.22	0.3%	0.14	0.2%	0.09	0.1%
2018	0.71	0.9%	0.70	0.9%	0.33	0.4%	0.27	0.3%	0.17	0.2%	0.11	0.1%
2019	0.72	0.9%	0.71	0.9%	0.39	0.5%	0.31	0.4%	0.20	0.2%	0.12	0.2%
2020	0.73	0.9%	0.72	0.9%	0.43	0.5%	0.34	0.4%	0.22	0.3%	0.14	0.2%
2021	0.74	0.9%	0.73	0.9%	0.47	0.6%	0.37	0.5%	0.24	0.3%	0.15	0.2%
2022	0.75	0.9%	0.74	0.9%	0.50	0.6%	0.40	0.5%	0.25	0.3%	0.16	0.2%

Table 8-48: Cumulative Industrial Energy Savings Potential & Percentage of Forecasted Sales (GWh)

Year	Technical		Economic		Ach. 100%		Ach. 75%		Ach. 50%		Ach. 25%	
2013	0.7	0.9%	0.7	0.9%	0.1	0.1%	<0.1	0.1%	<0.1	<0.1%	<0.1	<0.1%
2014	1.4	1.8%	1.4	1.7%	0.2	0.2%	0.1	0.2%	0.1	0.1%	0.1	0.1%
2015	2.1	2.7%	2.1	2.6%	0.3	0.4%	0.3	0.3%	0.2	0.2%	0.1	0.1%
2016	2.8	3.6%	2.8	3.5%	0.5	0.7%	0.4	0.6%	0.3	0.4%	0.2	0.2%
2017	3.5	4.5%	3.5	4.5%	0.8	1.1%	0.7	0.8%	0.4	0.5%	0.3	0.3%
2018	4.2	5.4%	4.2	5.3%	1.2	1.5%	0.9	1.2%	0.6	0.8%	0.4	0.5%
2019	5.0	6.3%	4.9	6.2%	1.5	1.9%	1.2	1.6%	0.8	1.0%	0.5	0.6%
2020	5.7	7.1%	5.6	7.0%	2.0	2.5%	1.6	2.0%	1.0	1.3%	0.6	0.8%
2021	6.4	7.9%	6.3	7.8%	2.4	3.0%	2.0	2.4%	1.2	1.5%	0.8	1.0%
2022	7.2	8.8%	7.1	8.6%	2.9	3.6%	2.3	2.9%	1.5	1.8%	0.9	1.1%

Table 8-49: Annual Industrial Demand Savings Potential & Percentage of MT System Peak (kW)

Year	Technical		Economic		Ach. 100%		Ach. 75%		Ach. 50%		Ach. 25%	
2013	91	0.1%	89	0.1%	8	<0.1%	6	<0.1%	4	<0.1%	2	<0.1%
2014	93	0.1%	91	0.1%	14	<0.1%	11	<0.1%	7	<0.1%	4	<0.1%
2015	94	0.1%	93	0.1%	21	<0.1%	17	<0.1%	11	<0.1%	7	<0.1%
2016	94	0.1%	92	0.1%	29	<0.1%	23	<0.1%	15	<0.1%	9	<0.1%
2017	93	0.1%	92	0.1%	37	<0.1%	29	<0.1%	19	<0.1%	12	<0.1%
2018	94	0.1%	93	0.1%	44	<0.1%	35	<0.1%	23	<0.1%	14	<0.1%
2019	95	0.1%	94	0.1%	51	<0.1%	41	<0.1%	26	<0.1%	16	<0.1%
2020	96	0.1%	95	0.1%	57	<0.1%	45	<0.1%	29	<0.1%	18	<0.1%
2021	97	0.1%	96	0.1%	61	<0.1%	49	<0.1%	31	<0.1%	20	<0.1%
2022	99	0.1%	97	0.1%	65	<0.1%	52	<0.1%	33	<0.1%	21	<0.1%

Table 8-50: Cumulative Industrial Demand Savings Potential & Percentage of MT System Peak (MW)

Year	Technical		Economic		Ach. 100%		Ach. 75%		Ach. 50%		Ach. 25%	
2013	0.09	0.1%	0.09	0.1%	0.01	<0.1%	0.01	<0.1%	<0.01	<0.1%	<0.01	<0.1%
2014	0.18	0.1%	0.18	0.1%	0.02	<0.1%	0.02	<0.1%	0.01	<0.1%	0.01	<0.1%
2015	0.28	0.2%	0.27	0.2%	0.04	<0.1%	0.03	<0.1%	0.02	<0.1%	0.01	<0.1%
2016	0.37	0.3%	0.37	0.3%	0.07	0.1%	0.06	<0.1%	0.04	<0.1%	0.02	<0.1%
2017	0.46	0.3%	0.46	0.3%	0.11	0.1%	0.09	0.1%	0.06	<0.1%	0.03	<0.1%
2018	0.56	0.4%	0.55	0.4%	0.15	0.1%	0.12	0.1%	0.08	0.1%	0.05	<0.1%
2019	0.65	0.5%	0.64	0.4%	0.20	0.1%	0.16	0.1%	0.10	0.1%	0.07	0.1%
2020	0.75	0.5%	0.74	0.5%	0.26	0.2%	0.21	0.1%	0.13	0.1%	0.08	0.1%
2021	0.85	0.6%	0.84	0.6%	0.32	0.2%	0.26	0.2%	0.16	0.1%	0.10	0.1%
2022	0.95	0.6%	0.93	0.6%	0.39	0.2%	0.31	0.2%	0.20	0.1%	0.12	0.1%

Table 8-51: Technical Energy Savings Potential by Industrial Segment (MWh)

Yr.	Agricul ture	Chem- ical Mfg.	Electr- ical Equip.	Food Mfg.	Misc.	Min- eral	Petrol- eum/ Coal	Print- ing	Trans- porta- tion	Waste Water	Water	Wood Prod- ucts	TOTAL
2013	20	2	1	19	45	4	464	1	2	44	79	6	**688**
2014	20	2	1	19	46	4	475	1	3	45	81	6	**704**
2015	21	2	1	19	46	4	482	1	3	46	82	7	**714**
2016	21	2	1	19	46	4	480	1	3	46	82	7	**712**
2017	20	2	1	19	46	4	476	1	3	45	81	7	**706**
2018	21	2	1	19	46	4	482	1	3	46	82	7	**714**
2019	21	2	1	20	47	4	487	1	3	46	83	7	**722**
2020	21	2	1	20	47	4	493	1	3	47	84	7	**731**
2021	21	2	1	20	48	4	499	1	3	47	85	7	**739**
2022	22	2	1	20	48	4	504	1	3	48	86	7	**747**

Table 8-52: Economic Energy Savings Potential by Industrial Segment (MWh)

Yr.	Agricul ture	Chem- ical Mfg.	Electr- ical Equip.	Food Mfg.	Misc.	Min- eral	Petrol- eum/ Coal	Print- ing	Trans- porta- tion	Waste Water	Water	Wood Prod- ucts	TOTAL
2013	20	2	1	18	44	4	457	1	2	44	78	6	**678**
2014	20	2	1	19	45	4	468	1	3	45	80	6	**693**
2015	20	2	1	19	46	4	474	1	3	45	81	6	**703**
2016	20	2	1	19	45	4	473	1	3	45	81	6	**701**
2017	20	2	1	19	45	4	469	1	3	45	80	6	**695**
2018	20	2	1	19	46	4	474	1	3	45	81	6	**703**
2019	21	2	1	19	46	4	480	1	3	46	82	7	**711**
2020	21	2	1	20	47	4	485	1	3	46	83	7	**719**
2021	21	2	1	20	47	4	491	1	3	47	84	7	**728**
2022	21	2	1	20	48	4	496	1	3	47	85	7	**736**

Table 8-53: Ach. 100% Energy Savings Potential by Industrial Segment (MWh)

Yr.	Agricul ture	Chem- ical Mfg.	Electr- ical Equip.	Food Mfg.	Misc.	Min- eral	Petrol- eum/ Coal	Print- ing	Trans- porta- tion	Waste Water	Water	Wood Prod- ucts	TOTAL
2013	1.7	0.2	0.1	1.6	3.7	0.3	38.7	0.1	0.2	3.7	6.6	0.5	57
2014	3.0	0.3	0.2	2.8	6.8	0.6	70.5	0.2	0.4	6.7	12.0	1.0	104
2015	4.7	0.5	0.3	4.4	10.5	0.9	109.5	0.2	0.6	10.4	18.7	1.5	162
2016	6.4	0.7	0.4	6.0	14.4	1.3	149.8	0.3	0.8	14.3	25.5	2.0	222
2017	8.1	0.9	0.6	7.6	18.1	1.6	187.8	0.4	1.0	17.9	32.0	2.6	278
2018	9.7	1.1	0.7	9.1	21.7	1.9	225.9	0.5	1.2	21.5	38.5	3.1	335
2019	11.2	1.3	0.8	10.5	25.0	2.2	259.9	0.6	1.4	24.7	44.3	3.6	385
2020	12.4	1.4	0.9	11.7	27.8	2.4	289.1	0.6	1.6	27.5	49.2	3.9	429
2021	13.5	1.5	0.9	12.7	30.2	2.6	313.8	0.7	1.7	29.9	53.4	4.3	465
2022	14.3	1.6	1.0	13.5	32.2	2.8	334.4	0.7	1.8	31.8	56.9	4.6	496

Table 8-54: Ach. 75% Energy Savings Potential by Industrial Segment (MWh)

Yr.	Agricul ture	Chem- ical Mfg.	Electr- ical Equip.	Food Mfg.	Misc.	Min- eral	Petrol- eum/ Coal	Print- ing	Trans- porta- tion	Waste Water	Water	Wood Prod- ucts	TOTAL
2013	1.3	0.1	0.1	1.3	3.0	0.3	31.0	0.1	0.2	3.0	5.3	0.4	46
2014	2.4	0.3	0.2	2.3	5.4	0.5	56.4	0.1	0.3	5.4	9.6	0.8	84
2015	3.8	0.4	0.3	3.5	8.4	0.7	87.6	0.2	0.5	8.3	14.9	1.2	130
2016	5.1	0.6	0.4	4.8	11.5	1.0	119.9	0.3	0.6	11.4	20.4	1.6	178
2017	6.4	0.7	0.4	6.1	14.5	1.3	150.3	0.3	0.8	14.3	25.6	2.1	223
2018	7.8	0.9	0.5	7.3	17.4	1.5	180.8	0.4	1.0	17.2	30.8	2.5	268
2019	8.9	1.0	0.6	8.4	20.0	1.7	207.9	0.5	1.1	19.8	35.4	2.8	308
2020	9.9	1.1	0.7	9.3	22.2	1.9	231.3	0.5	1.2	22.0	39.4	3.2	343
2021	10.8	1.2	0.7	10.1	24.1	2.1	251.0	0.5	1.3	23.9	42.7	3.4	372
2022	11.5	1.3	0.8	10.8	25.7	2.2	267.5	0.6	1.4	25.5	45.6	3.7	397

Table 8-55: Ach. 50% Energy Savings Potential by Industrial Segment (MWh)

Yr.	Agricul ture	Chem- ical Mfg.	Electr- ical Equip.	Food Mfg.	Misc.	Min- eral	Petrol- eum/ Coal	Print- ing	Trans- porta- tion	Waste Water	Water	Wood Prod- ucts	TOTAL
2013	0.9	0.1	0.1	0.8	1.9	0.2	19.8	<0.1	0.1	1.9	3.4	0.3	29
2014	1.5	0.2	0.1	1.5	3.5	0.3	36.0	0.1	0.2	3.4	6.1	0.5	53
2015	2.4	0.3	0.2	2.3	5.4	0.5	56.0	0.1	0.3	5.3	9.5	0.8	83
2016	3.3	0.4	0.2	3.1	7.4	0.6	76.6	0.2	0.4	7.3	13.0	1.0	114
2017	4.1	0.5	0.3	3.9	9.2	0.8	96.1	0.2	0.5	9.1	16.4	1.3	142
2018	5.0	0.6	0.3	4.7	11.1	1.0	115.6	0.3	0.6	11.0	19.7	1.6	171
2019	5.7	0.6	0.4	5.4	12.8	1.1	132.9	0.3	0.7	12.7	22.6	1.8	197
2020	6.3	0.7	0.4	6.0	14.2	1.2	147.8	0.3	0.8	14.1	25.2	2.0	219
2021	6.9	0.8	0.5	6.5	15.4	1.3	160.5	0.4	0.9	15.3	27.3	2.2	238
2022	7.3	0.8	0.5	6.9	16.4	1.4	171.0	0.4	0.9	16.3	29.1	2.3	254

Table 8-56: Ach. 25% Energy Savings Potential by Industrial Segment (MWh)

Yr.	Agricul ture	Chem- ical Mfg.	Electr- ical Equip.	Food Mfg.	Misc.	Min- eral	Petrol- eum/ Coal	Print- ing	Trans- porta- tion	Waste Water	Water	Wood Prod- ucts	TOTAL
2013	0.5	0.1	<0.1	0.5	1.2	0.1	12.4	<0.1	0.1	1.2	2.1	0.2	**18**
2014	1.0	0.1	0.1	0.9	2.2	0.2	22.5	<0.1	0.1	2.1	3.8	0.3	**33**
2015	1.5	0.2	0.1	1.4	3.4	0.3	35.0	0.1	0.2	3.3	6.0	0.5	**52**
2016	2.1	0.2	0.1	1.9	4.6	0.4	47.9	0.1	0.3	4.6	8.2	0.7	**71**
2017	2.6	0.3	0.2	2.4	5.8	0.5	60.0	0.1	0.3	5.7	10.2	0.8	**89**
2018	3.1	0.3	0.2	2.9	6.9	0.6	72.2	0.2	0.4	6.9	12.3	1.0	**107**
2019	3.6	0.4	0.2	3.4	8.0	0.7	83.1	0.2	0.4	7.9	14.1	1.1	**123**
2020	4.0	0.4	0.3	3.7	8.9	0.8	92.4	0.2	0.5	8.8	15.7	1.3	**137**
2021	4.3	0.5	0.3	4.0	9.6	0.8	100.3	0.2	0.5	9.6	17.1	1.4	**149**
2022	4.6	0.5	0.3	4.3	10.3	0.9	106.9	0.2	0.6	10.2	18.2	1.5	**158**

Appendix C ENERGY EFFICIENCY ATTITUDES SURVEYS

C.1 RESIDENTIAL CUSTOMER SURVEY

MONTANA DAKOTA SURVEY: ENERGY EFFICIENCY ATTITUDES RESIDENTIAL CUSTOMERS

MONTANA-DAKOTA UTILITIES CO.
A Division of MDU Resources Group, Inc.
In the Community to Serve®

This survey is designed to gain a better understanding of the opportunities and barriers towards energy efficiency adoption in the Montana service territory of MDU. Thank you for participating in this survey. We appreciate your feedback as we seek to better understand your opinions about energy efficiency. Your responses will be anonymous.

Perceptions about Energy Efficiency

1 **What do you consider the overall "best reason" to increasing energy efficiency?**
(Please check only one)

- ☐ Reduce carbon footprint
- ☐ Save energy; overall good for the environment
- ☐ Reduce demand on fossil fuels
- ☐ Decrease energy dependency on others
- ☐ Reduce your utility bill, operating costs
- ☐ Other (please specify_____)
- ☐ No reason at all

2 **Please rate the following by considering how they would impact your decision to participate in an energy efficiency program offered by Montana Dakota Utilities?**
Use a scale where 1 is Not at All Important and 5 is Extremely Important, use 0 for No Opinion.

	0	1	2	3	4	5
Environmental impact	☐	☐	☐	☐	☐	☐
Effect on the value of your home	☐	☐	☐	☐	☐	☐
Effect on your monthly bill	☐	☐	☐	☐	☐	☐
Out of pocket cost for new energy-efficient appliances or equipment	☐	☐	☐	☐	☐	☐
Payback period from new energy-efficient appliances or equipment	☐	☐	☐	☐	☐	☐
Willingness to risk a change comfort level	☐	☐	☐	☐	☐	☐
Accepting of impact on lifestyle or convenience	☐	☐	☐	☐	☐	☐
Ease of understanding the energy efficiency program	☐	☐	☐	☐	☐	☐
Other, please specify _____	☐	☐	☐	☐	☐	☐

3 **Using the checklist on the next page, please indicate energy efficiency measures or upgrades that you have** [A] performed in the **previous five (5) years**, [B] performed in the **previous twelve (12) months**, or [C] may consider performing in the **upcoming twelve (12) months**.

Measure	[A] Past 5 years	[B] Past 12 months	[C] Next 12 months
Lighting			
Turn off lights when not in use			
Install occupancy sensors			
Replace incandescent lamps with compact fluorescent (CFL) lamps			
Perform other lighting measure [specify]: _____			
Heating and Cooling			
Adjust thermostat setting at night			
Adjust thermostat setting while at work			
Install programmable thermostat			
Reduce thermostat setting in the winter			
Increase thermostat setting in the summer			
Increase level of insulation			
Reduce air infiltration or leaks (by caulking, adding storm windows, etc.)			
Retrofit A/C system with high efficiency option			
Retrofit heating system with high efficiency option			
Replace other heating and cooling equipment [specify]: _____			
Water Heating			
Install hot water pipe insulation			
Install low-flow fixtures (faucets, toilets, showerheads)			
Take shorter showers			
Retrofit water heating system with high efficiency option			
Adjust water heating thermostat setting			
Perform other water heating energy efficiency measure [specify]: _____			
Plug Loads			
Unplug adapters and charging devices when not in use			
Unplug electronic devices with "instant on" feature			
Purchase Energy Star computers			
Purchase high-efficiency refrigerator			
Purchase high-efficiency freezer			
Purchase high-efficiency TV			
Purchase high-efficiency washer/dryer			
Purchase other high-efficiency appliance or device [specify]: _____			
Perform other plug load energy efficiency measure [specify]: _____			
Renewable Energy			
Install solar photovoltaic system			
Install solar thermal system			
Install solar thermal system			
Install other renewable technology [specify]: _____			
Other			
Other [specify]:_____			
Other [specify]:_____			
Other [specify]:_____			

4 **How likely would you be to take to the following actions if discounts or rebates were offered by Montana Dakota Utilities?** Please circle No Incentive if you would consider paying the full cost of the measure, circle Full Added Cost if you would consider the measure with MDU covering the full cost, and circle 25%, 50%, or 70% if one of those rebate levels would motivate you to consider the measure.

Measure with approximate cost	No Incentive	25%	50%	75%	Full Added Cost
Have an on-site home energy audit ($600)					
Recycle an old appliance ($100)					
Upgrade central air conditioning ($600 added cost for high efficiency unit)					
Install energy efficient lighting (e.g. CFLs - $2 added cost per lamp)					
Upgrade space heating (e.g. gas furnace - $300 added cost for high eff. unit)					
Purchase energy efficient appliances (e.g. clothes dryer - $50 added cost)					
Purchase energy efficient electronics (e.g. TV - $100 added cost)					
Install weatherization components (e.g. add attic insulation - $2,000)					

5 **What are your top 3 reasons for not adopting energy efficiency measures?**
Please check three options

	1	2	3
a. Upfront cost is too high	☐	☐	☐
b. Too much time needed to understand value of investment	☐	☐	☐
c. Takes too long to recover the cost	☐	☐	☐
d. Technical information is too complicated	☐	☐	☐
e. Do not have time to schedule someone to do the work	☐	☐	☐
f. Do not believe the results	☐	☐	☐
g. Energy efficiency equipment not readily available	☐	☐	☐
h. Waiting until current equipment breaks	☐	☐	☐
i. No barriers exist	☐	☐	☐
j. Other, please specify _____	☐	☐	☐

6 **Please indicate your level of agreement with the following statements,**
where 1 is Completely Disagree and 5 is Completely Agree, and 0 indicates No Opinion.

	0	1	2	3	4	5
High efficiency measures are generally too expensive	☐	☐	☐	☐	☐	☐
I need more information about high efficiency measures	☐	☐	☐	☐	☐	☐
I am not responsible for purchasing energy efficiency items	☐	☐	☐	☐	☐	☐
I do not know enough about my current energy usage	☐	☐	☐	☐	☐	☐
Energy prices are not high enough to motivate me to take action	☐	☐	☐	☐	☐	☐
Energy efficiency takes too much time to understand in order to make good decisions	☐	☐	☐	☐	☐	☐

7 **Are you aware of the energy efficiency programs for businesses offered by Montana Dakota Utilities?**

☐ Yes
☐ No

Thank you for your feedback!

C.2 COMMERCIAL AND INDUSTRIAL CUSTOMER SURVEY

MONTANA-DAKOTA SURVEY: ENERGY EFFICIENCY ATTITUDES COMMERCIAL AND INDUSTRIAL CUSTOMERS

MONTANA-DAKOTA UTILITIES CO.
A Division of MDU Resources Group, Inc.
In the Community to Serve®

This survey is designed to gain a better understanding of the opportunities and barriers towards energy efficiency adoption in the Montana service territory of MDU. Thank you for participating in this survey. We appreciate your feedback as we seek to better understand your opinions about energy efficiency. Your responses will be anonymous.

Perceptions about Energy Efficiency

1 **What do you consider the overall "best reason" to increase energy efficiency?**
(Please check only one)

- ☐ Reduce carbon footprint
- ☐ Save energy; overall good for the environment
- ☐ Reduce demand on fossil fuels
- ☐ Decrease energy dependency on others
- ☐ Reduce your utility bill, operating costs
- ☐ Other (please specify_____)
- ☐ No reason at all

2 **Please rate the following by considering how they would impact your decision to participate in an energy efficiency program offered by Montana-Dakota Utilities?**
Use a scale where 1 is Not at All Important and 5 is Extremely Important, use 0 for No Opinion.

	0	1	2	3	4	5
Environmental impact	☐	☐	☐	☐	☐	☐
Effect on the value of your business	☐	☐	☐	☐	☐	☐
Effect on your monthly bill	☐	☐	☐	☐	☐	☐
Out of pocket cost for new energy-efficient appliances or equipment	☐	☐	☐	☐	☐	☐
Payback period from new energy-efficient appliances or equipment	☐	☐	☐	☐	☐	☐
Willingness to risk a change in comfort level	☐	☐	☐	☐	☐	☐
Impact on lifestyle or convenience	☐	☐	☐	☐	☐	☐
Ease of understanding the energy efficiency program	☐	☐	☐	☐	☐	☐
Other, please specify _____	☐	☐	☐	☐	☐	☐

3 **Using the checklist on the next page, please indicate energy efficiency measures or upgrades that you have** [A] performed in the **previous five (5) years**, [B] performed in the **previous twelve (12) months**, or [C] may consider performing in the **upcoming twelve (12) months**.

1

Measure	[A] Past 5 years	[B] Past 12 months	[C] Next 12 months
Lighting			
Turn off lights when not in use			
Install occupancy sensors			
Replace linear fluorescent lighting			
Replace high-intensity discharge lighting			
Replace screw-in lamps			
Replace other lighting [specify]: _____			
Heating and Cooling			
Adjust thermostat setting when business is closed			
Install programmable thermostat			
Reduce thermostat setting in the winter			
Increase thermostat setting in the summer			
Increase level of insulation			
Reduce air infiltration or leaks (by caulking, adding storm windows, etc.)			
Retrofit central A/C system with high efficiency option			
Retrofit central heating system with high efficiency option			
Retrofit packaged heating and/or cooling systems (rooftop units, etc.)			
Replace other heating and cooling equipment [specify]: _____			
Water Heating			
Install hot water pipe insulation			
Install low-flow fixtures (faucets, toilets, showerheads)			
Retrofit water heating system with high efficiency option			
Adjust water heating thermostat setting			
Perform other water heating energy efficiency measure [specify]: _____			
Motors			
Replace failed motor with high efficiency motor			
Replace operating motor with high efficiency motor			
Add variable frequency drives (VFD or VSD) to HVAC fan motor			
Add variable frequency drives (VFD or VSD) to HVAC pump motor			
Add variable frequency drives (VFD or VSD) to process-related motor			
Perform other motor energy efficiency measure [specify]: _____			
Plug Loads			
Unplug adapters and charging devices when not in use			
Unplug electronic devices with "instant on" feature			
Implement PC power management			
Implement server virtualization			
Purchase Energy Star computers			
Purchase high-efficiency appliances (refrigerators, dish washers)			
Purchase Energy Star office equipment (copiers, fax machines)			
Perform other plug load energy efficiency measure [specify]: _____			

2

Measure	[A] Past 5 years	[B] Past 12 months	[C] Next 12 months
Renewable Energy			
Install solar photovoltaic system			
Install solar thermal system			
Install wind turbine			
Install other renewable technology [specify]: _____			
Other			
Other [specify]:_____			
Other [specify]:_____			
Other [specify]:_____			

4 **How likely would you be to take to the following actions if discounts or rebates were offered by Montana-Dakota Utilities?** Please check No Incentive if you would consider paying the full cost of the measure, check Full Added Cost if you would consider the measure with MDU covering the full cost, and check 25%, 50%, or 75% if one of those rebate levels would motivate you to consider the measure.

Measure with approximate cost	No Incentive	25%	50%	75%	Full Added Cost
Have an on-site energy audit ($1500)					
Upgrade lighting (e.g. T12 to T8 upgrade - $15 per fixture)					
Upgrade cooling system (e.g. packaged rooftop unit - $100 added cost per ton)					
Purchase high efficiency motor (e.g. 10 HP - $800 added cost)					
Install variable frequency drive on pump or fan motor (e.g. 10 HP - $5,000)					
Install weatherization components (e.g. add attic insulation - $2,000)					

5 **What are your top 3 reasons for not adopting energy efficiency measures?**
Please rank your top 3 reasons by checking one box in each column.

	1	2	3
a. Upfront cost is too high	☐	☐	☐
b. Too much time needed to understand value of investment	☐	☐	☐
c. Takes too long to recover the cost	☐	☐	☐
d. Technical information is too complicated	☐	☐	☐
e. Do not have time to schedule someone to do the work	☐	☐	☐
f. Do not believe the results	☐	☐	☐
g. Energy efficiency equipment not readily available	☐	☐	☐
h. Waiting until current equipment breaks	☐	☐	☐
i. No barriers exist	☐	☐	☐
j. Other, please specify _____	☐	☐	☐

3

6 **Please indicate your level of agreement with the following statements,**
where 1 is Completely Disagree and 5 is Completely Agree, and 0 indicates No Opinion.

	0	1	2	3	4	5
High efficiency measures are generally too expensive	☐	☐	☐	☐	☐	☐
I need more information about high efficiency measures	☐	☐	☐	☐	☐	☐
I am not responsible for purchasing energy efficiency items	☐	☐	☐	☐	☐	☐
I do not know enough about my current energy usage	☐	☐	☐	☐	☐	☐
Energy prices are not high enough to motivate me to take action	☐	☐	☐	☐	☐	☐
Energy efficiency takes too much time to understand in order to make good decisions	☐	☐	☐	☐	☐	☐

7 **Are you aware of the current energy efficiency programs for businesses offered by Montana-Dakota Utilities?**

☐ Yes
☐ No

Thank you for your feedback!

4

C.3 SURVEY RESULTS

Key Findings of Residential Survey

The following are the key takeaways from the results of the Residential Energy Efficiency Attitudes Survey:

- Reduction of customers' energy bill is a strong market driver.
- Residential customers are generally open to energy efficiency, but cost is a barrier. Lifestyle and comfort are not key concerns.
- While customers are actively pursuing energy efficiency, the majority of actions are related to behavior change like turning off lights and adjusting thermostat settings.
- Residential customers have an interest in a wide variety of measures that includes weatherization, occupancy sensors, and upgrading or replacing appliances and HVAC equipment.
- Only the least expensive measures are likely to be considered with an incentive level of 25% of the incremental cost. In many cases, customers would be more likely to take action at the 50% or greater incentive level.
- Residential customers have two major reasons for not taking action to adopt energy efficiency: waiting until current equipment fails and that the upfront cost of the measures is too high.
- A large percentage of residential customers are looking for more information on energy efficiency measures, and many feel they know very little about their current energy usage.
- Only about 1 in 6 residential customers are currently aware of MDU's energy efficiency programs.

Key Findings of Commercial/Industrial Survey

The following are the key takeaways from the results of the Commercial and Industrial Energy Efficiency Attitudes Survey:

- Reduction of customers' energy bill/operating cost is the primary market driver for energy efficiency.
- Commercial and Industrial customers are generally open to energy efficiency, but cost is a barrier. Convenience and comfort are not primary concerns.
- While customers are actively pursuing energy efficiency, the majority of actions are related to behavior change like turning off lights and adjusting thermostat settings. There are some businesses that purchase Energy Star-rated computers and office equipment.
- Commercial and Industrial customers have an interest in a wide variety of measures that includes weatherization, occupancy sensors, and upgrading or replacing appliances and HVAC equipment.
- Commercial and Industrial customers require a minimum incentive level of 50% of incremental cost in most cases.
- Customers have two major reasons for not taking action to adopt energy efficiency: waiting until current equipment fails and that the upfront cost of the measures is too high.

- A large percentage of commercial customers are looking for more information on energy efficiency measures.
- Less than 1 in 10 commercial and industrial customers are currently aware of MDU's energy efficiency programs.

Detailed Results of Residential Survey

The figures below detail the results of the residential survey. Refer to the surveys in C.1 and C.2 for the full questions and response options.

Question 1 asked "What do you consider the overall "best reason" to increase energy efficiency?"

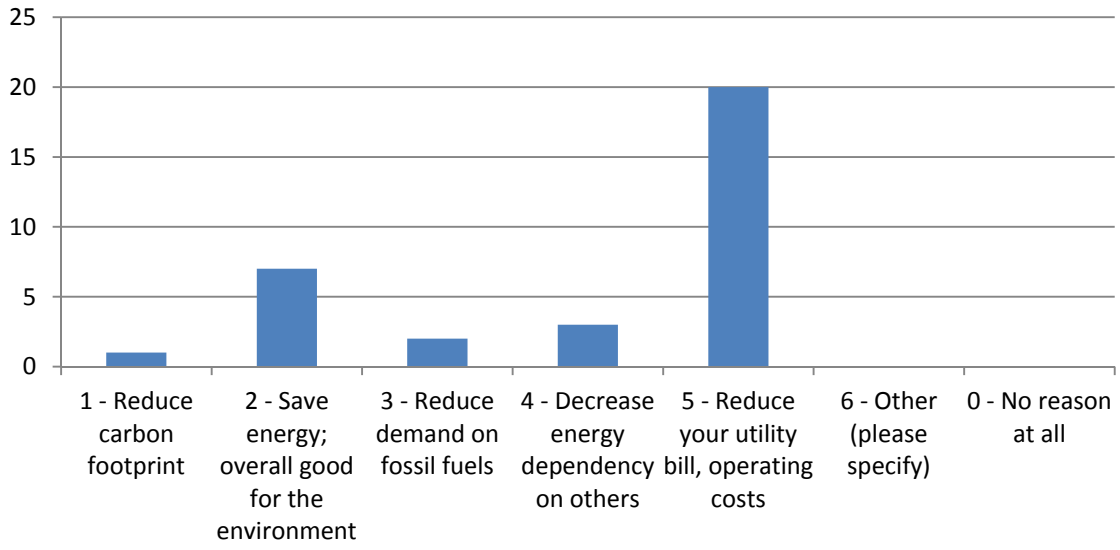

Figure 8-1: Responses to Question 1

Question 2 asked respondents to "rate the following by considering how they would impact your decision to participate in an energy efficiency program offered by Montana-Dakota Utilities? (Use a scale where 1 is Not at All Important and 5 is Extremely Important, use 0 for No Opinion.)"

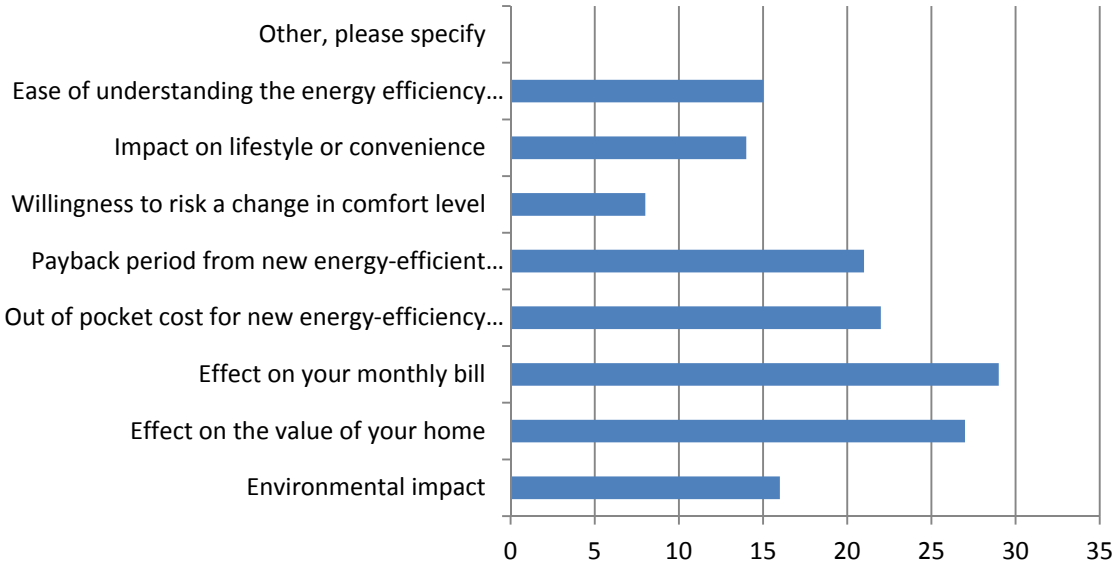

Figure 8-2: Responses of Importance Level "4" or "5" to Question 2

Question 3 asked respondents to fill out a checklist of measures that they have completed either in the previous 5 years, the previous 12 months, or plan to complete in the upcoming 12 months.

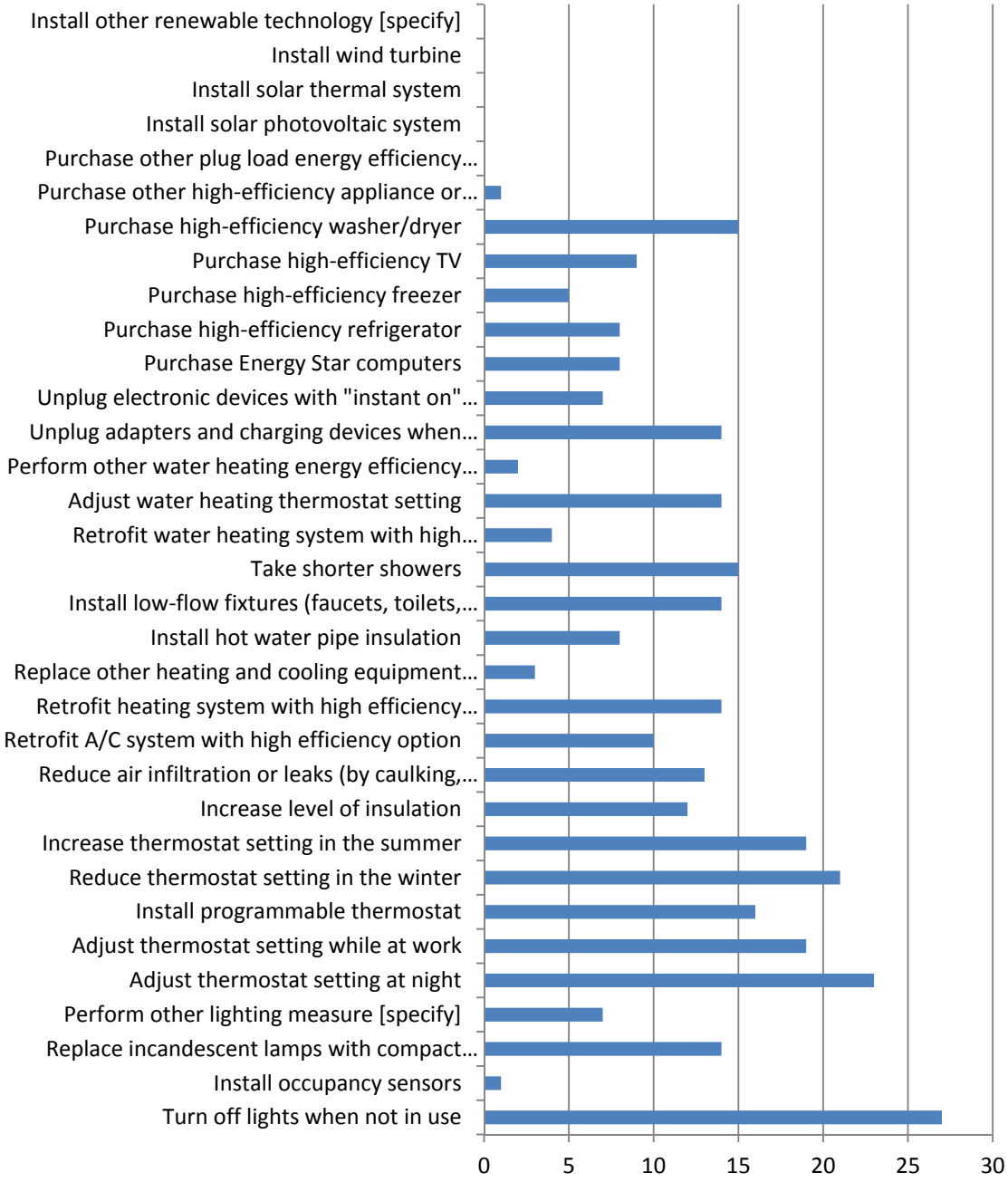

Figure 8-3: Number of Respondents Having Completed a Measure in the Previous 5 Years

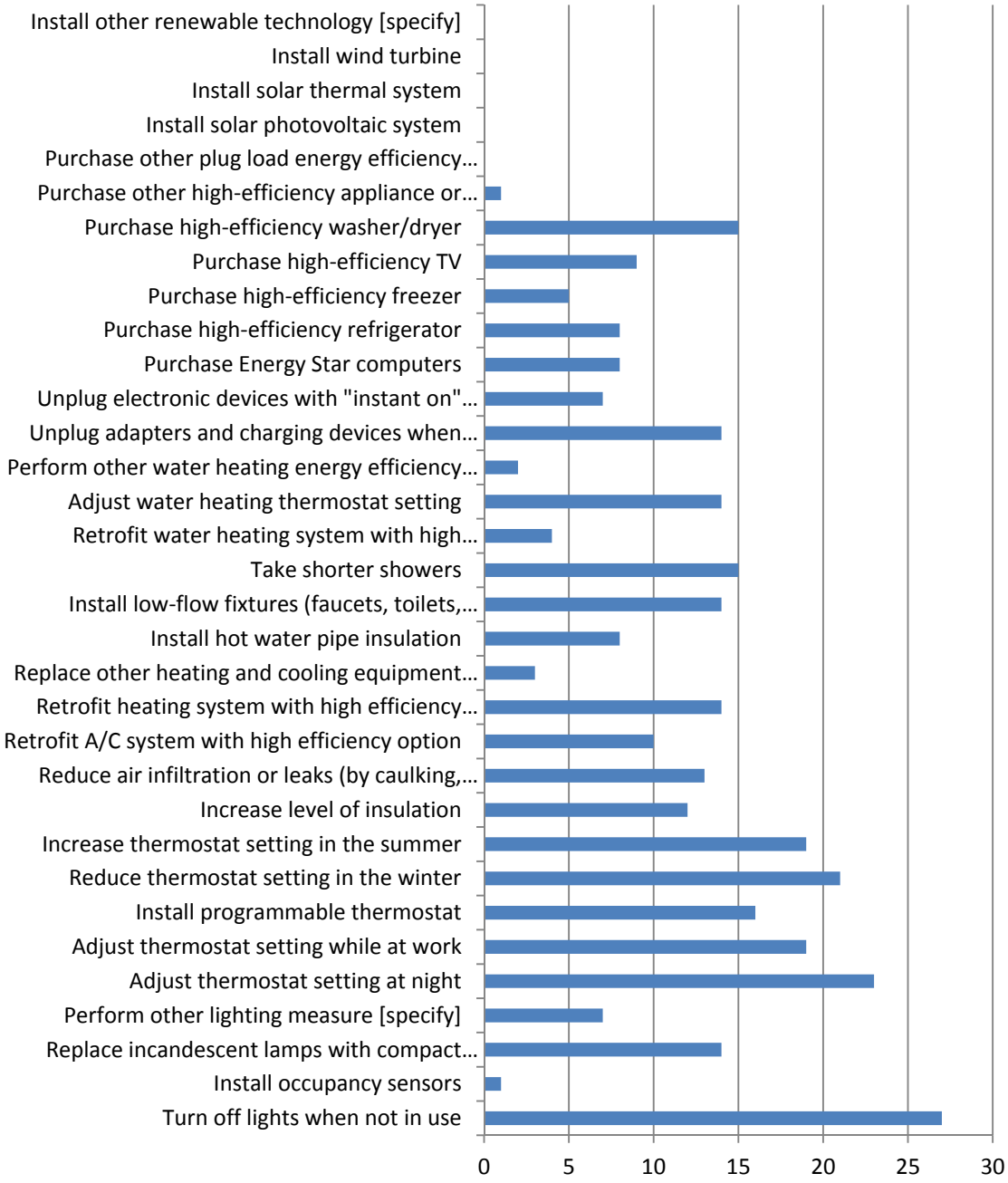

Figure 8-4: Number of Respondents Having Completed a Measure in the Previous 12 Months

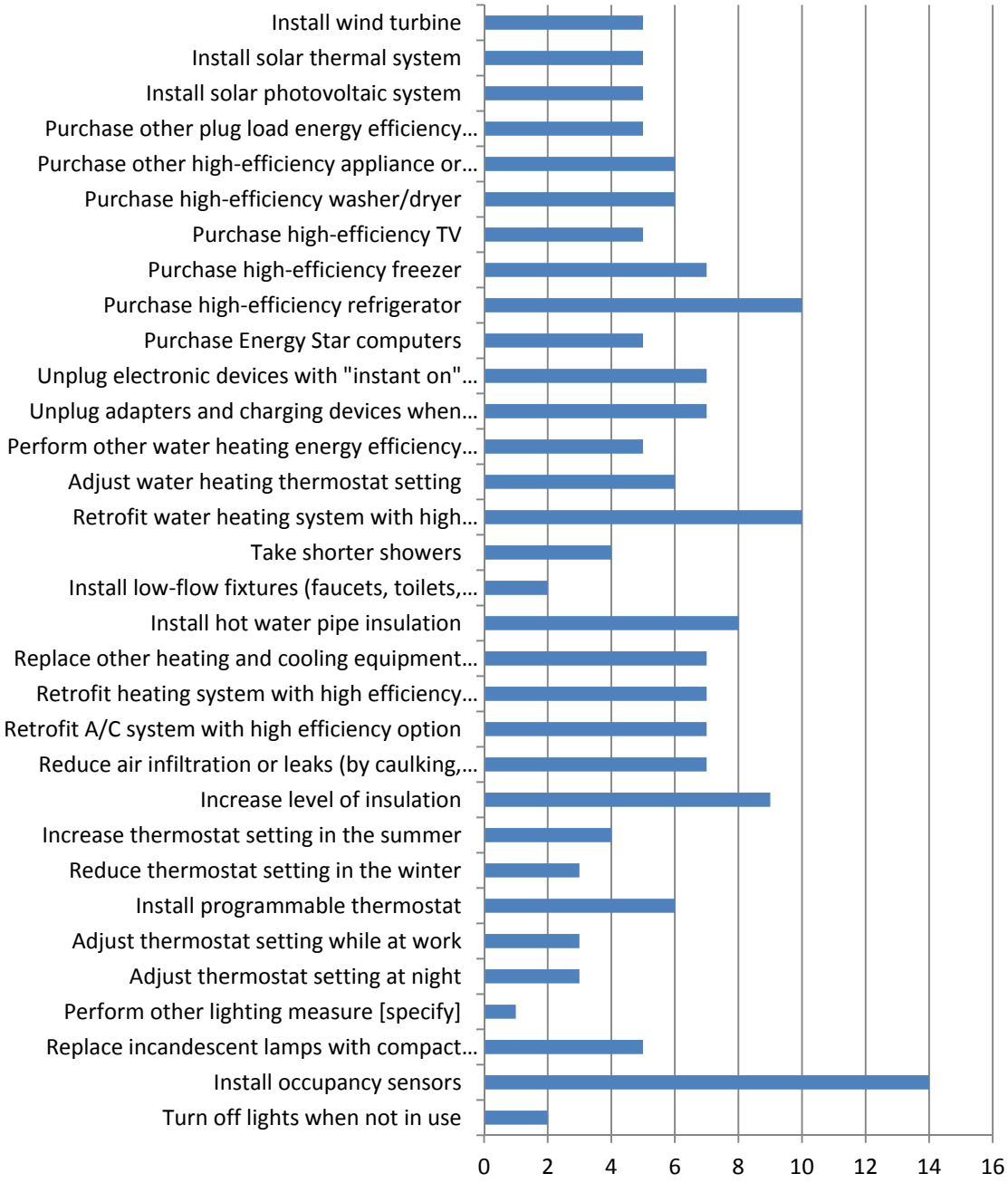

Figure 8-5: Number of Respondents Planning to Complete a Measure in the Next 12 Months

Question 4 asked respondents to note an incentive level for certain energy efficiency measures that would cause them to perform that measure.

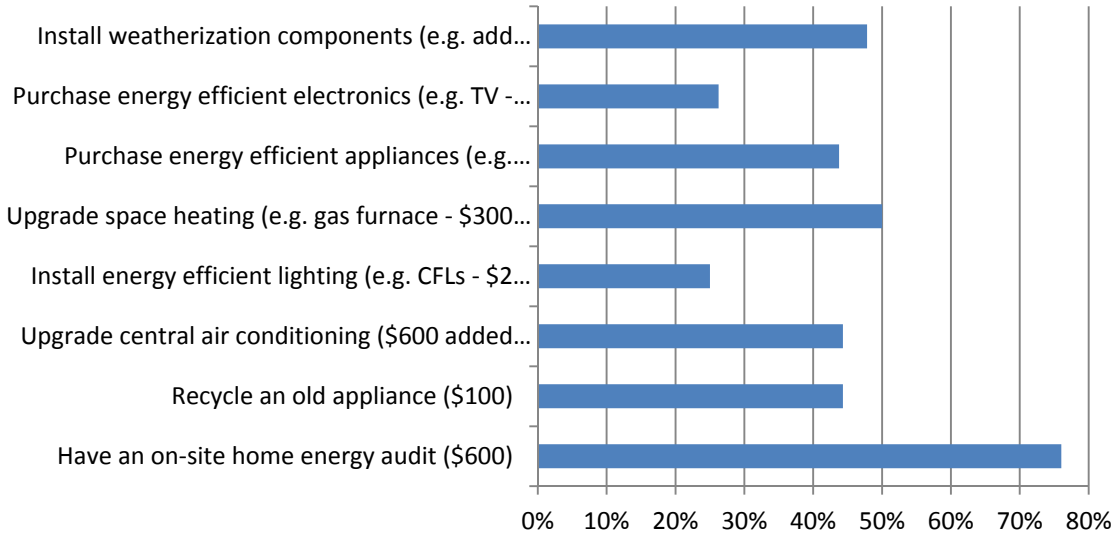

Figure 8-6: Average Incentive Threshold Required by Customers

Question 5 asked respondents to rank their top three reasons for *not* adopting energy efficiency measures.

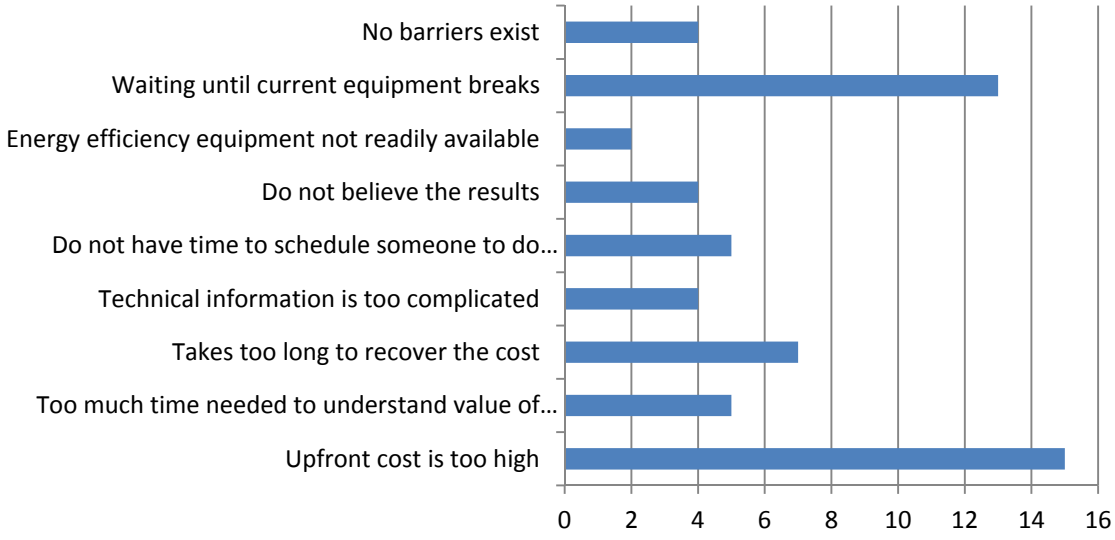

Figure 8-7: Respondents *Top Reason* for Not Adopting Energy Efficiency Measures

Question 6 asked respondents to indicate their level of agreement with several statements.

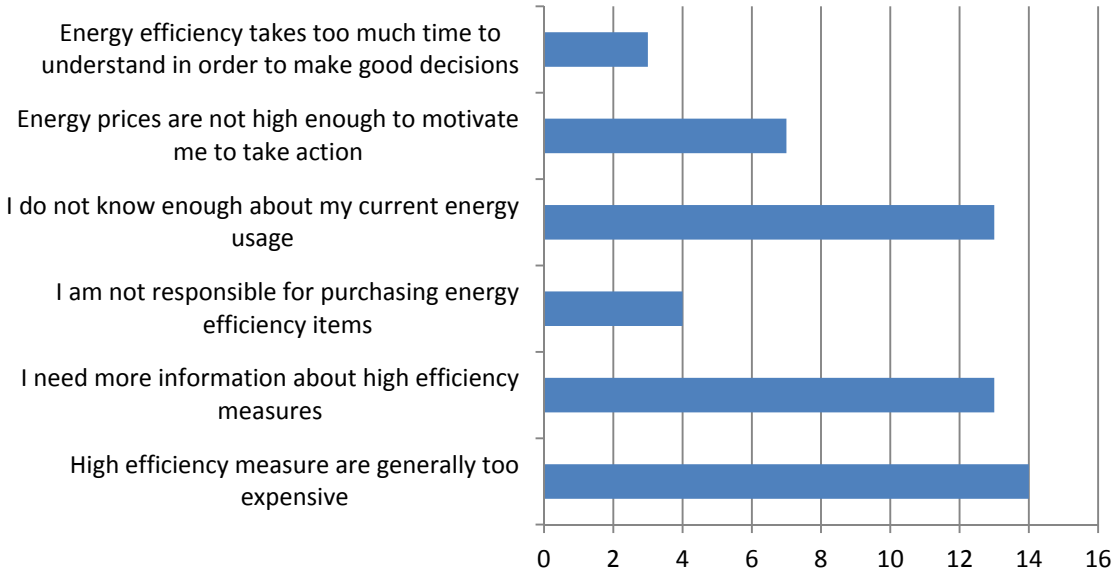

Figure 8-8: Respondents Indicating a Level of Agreement of "4" or "5"

Question 7 asked respondents whether or not they were aware of MDU's existing energy efficiency programs.

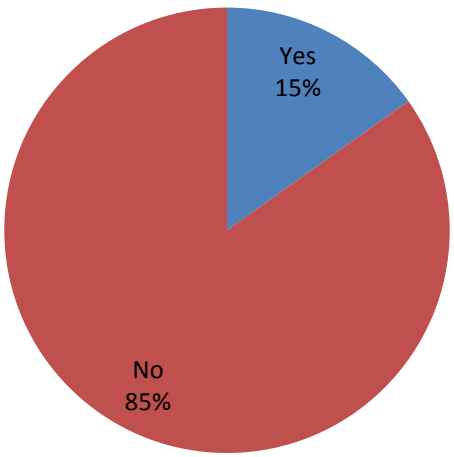

Figure 8-9: Responses to Question 7

Detailed Results of Commercial/Industrial Survey

The figures below detail the results of the residential survey. Refer to the surveys in C.1 and C.2 for the full questions and response options.

Question 1 asked "What do you consider the overall "best reason" to increase energy efficiency?"

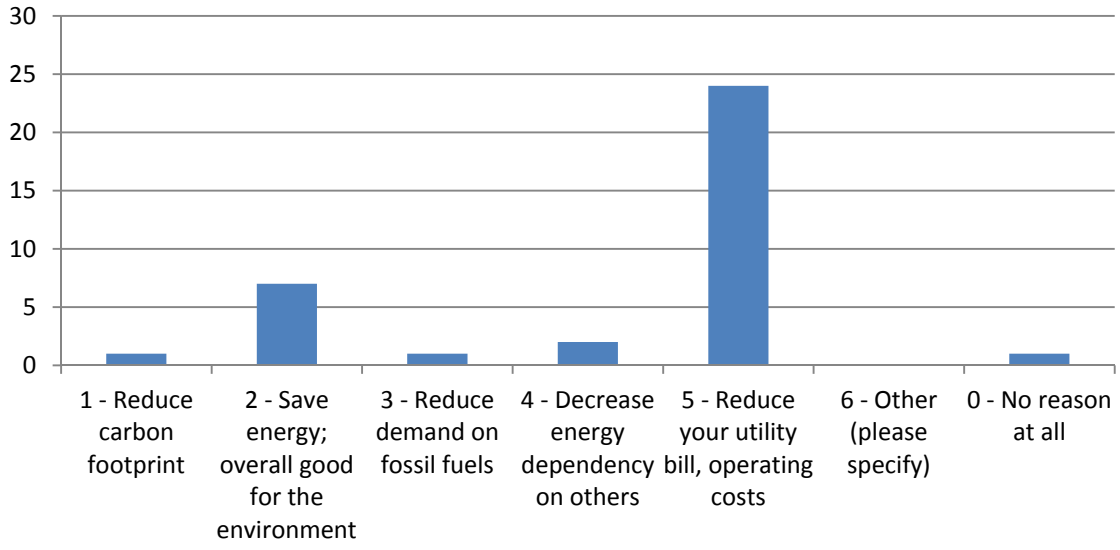

Figure 8-10: Responses to Question 1

Question 2 asked respondents to "rate the following by considering how they would impact your decision to participate in an energy efficiency program offered by Montana-Dakota Utilities? (Use a scale where 1 is Not at All Important and 5 is Extremely Important, use 0 for No Opinion.)"

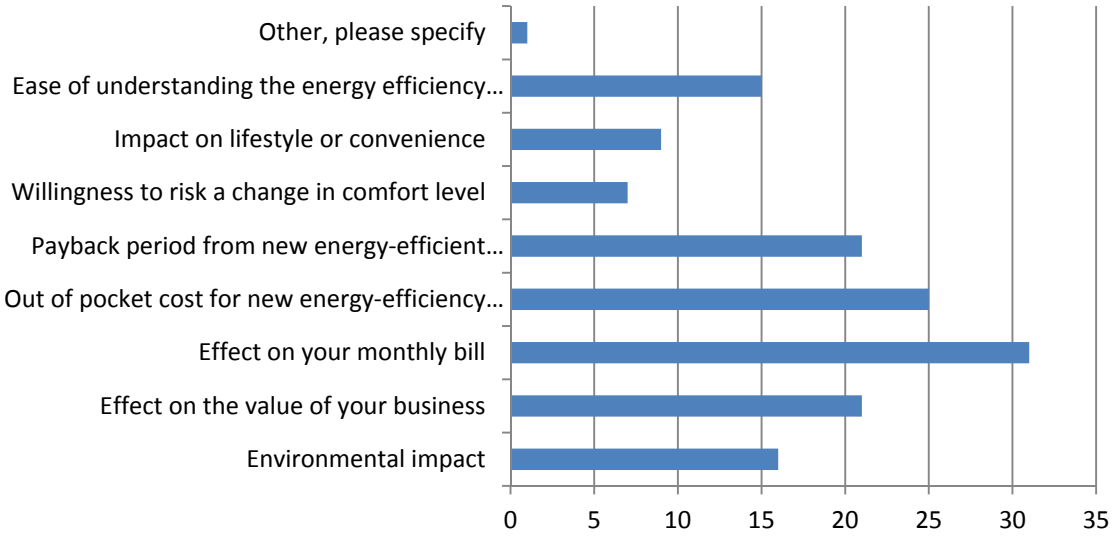

Figure 8-11: Responses of Importance Level "4" or "5" to Question 2

Question 3 asked respondents to fill out a checklist of measures that they have completed either in the previous 5 years, the previous 12 months, or plan to complete in the upcoming 12 months.

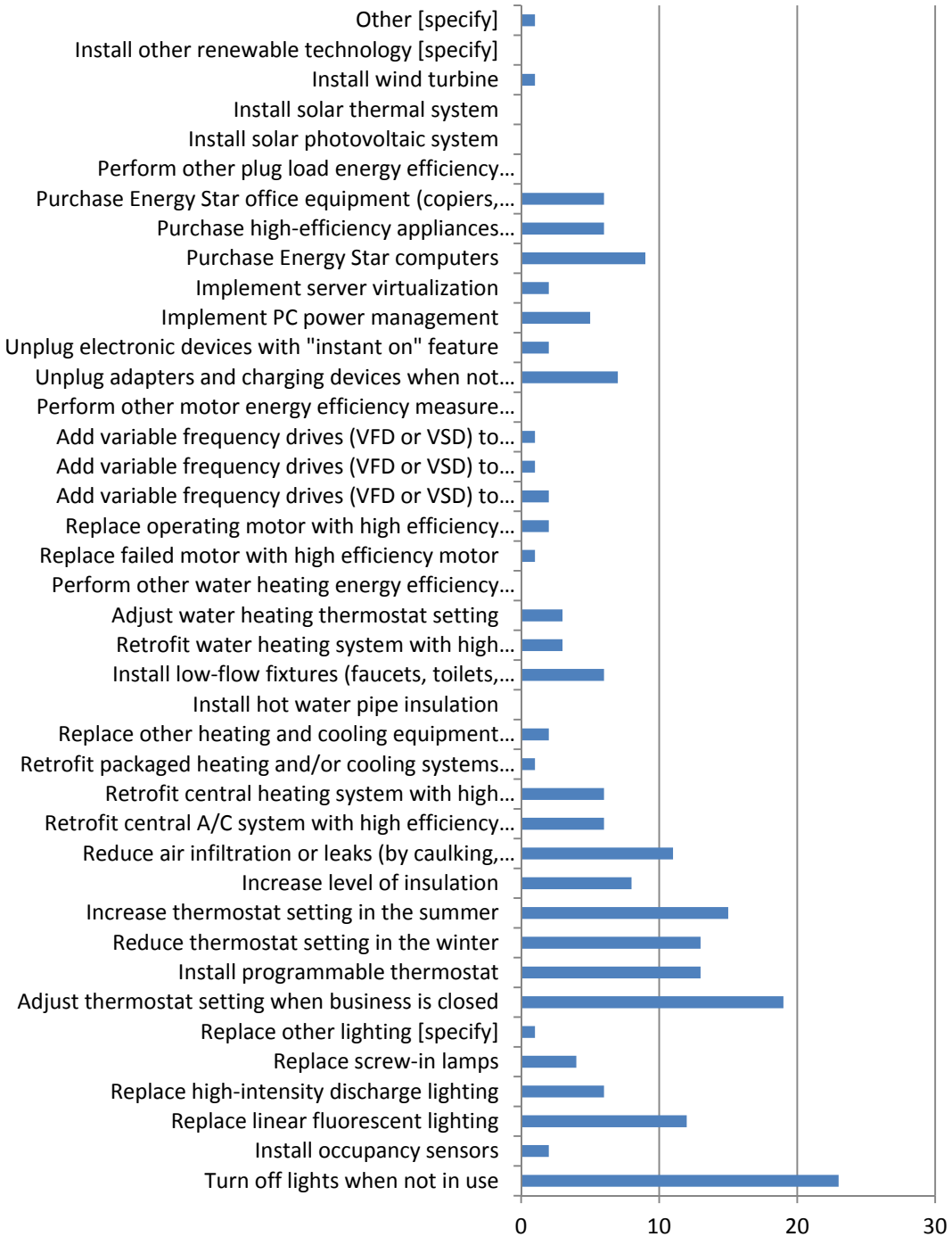

Figure 8-12: Number of Respondents Having Completed a Measure in the Previous 5 Years

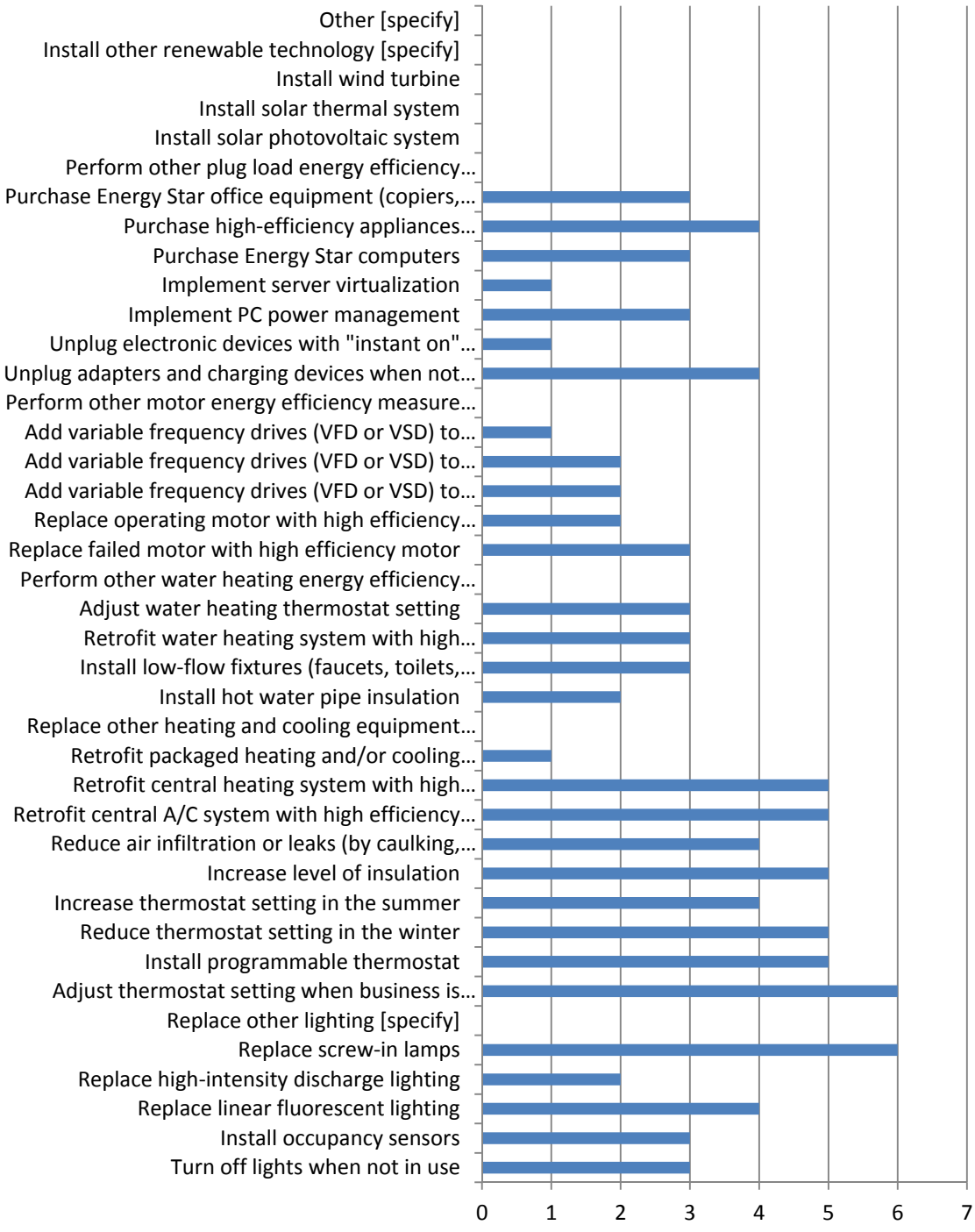

Figure 8-13: Number of Respondents Having Completed a Measure in the Previous 12 Months

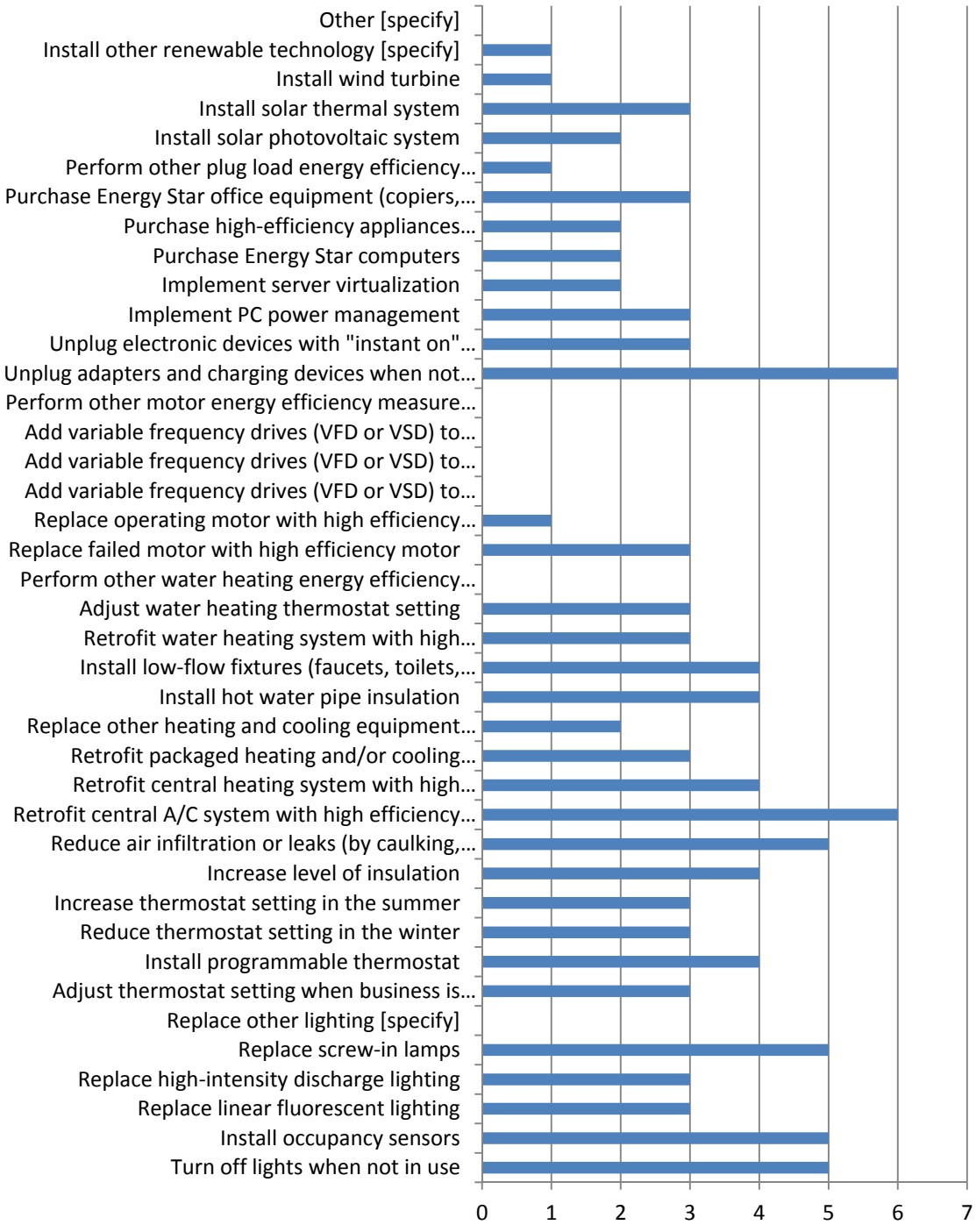

Figure 8-14: Number of Respondents Planning to Complete a Measure in the Next 12 Months

Question 4 asked respondents to note an incentive level for certain energy efficiency measures that would cause them to perform that measure.

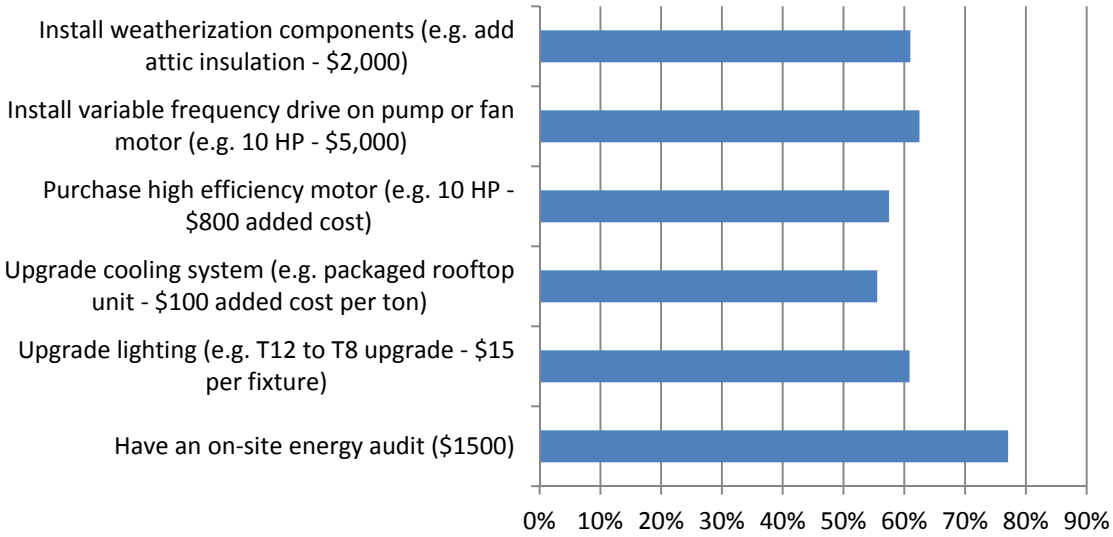

Figure 8-15: Average Incentive Threshold Required by Customers

Question 5 asked respondents to rank their top three reasons for *not* adopting energy efficiency measures.

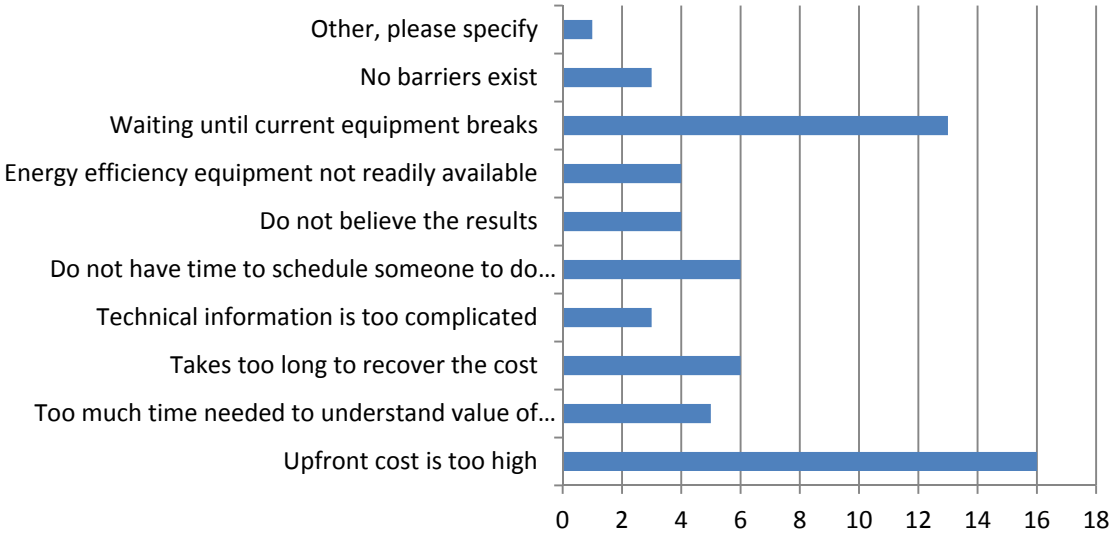

Figure 8-16: Respondents *Top Reason* for Not Adopting Energy Efficiency Measures

Question 6 asked respondents to indicate their level of agreement with several statements.

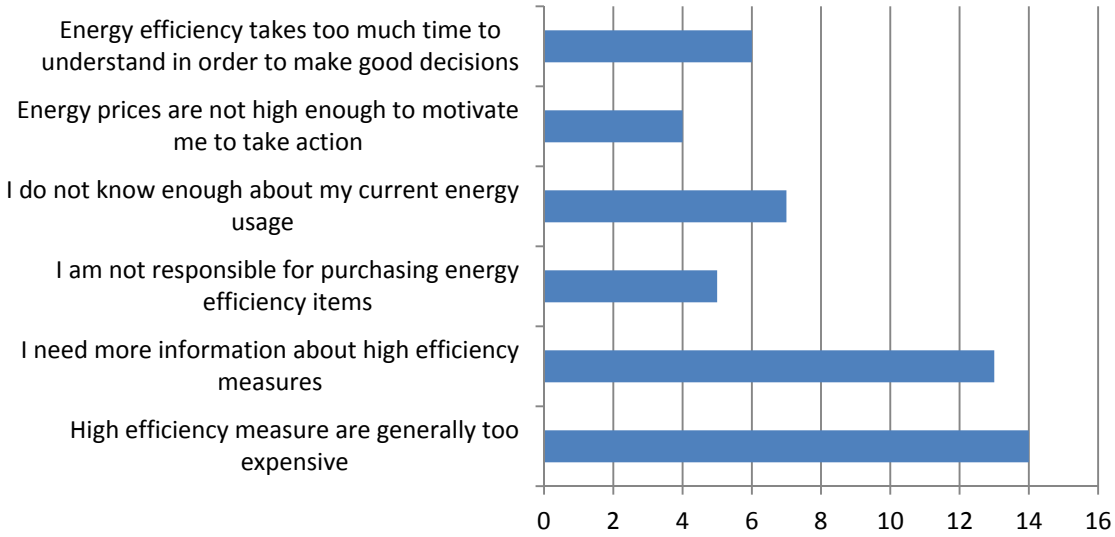

Figure 8-17: Respondents Indicating a Level of Agreement of "4" or "5"

Question 7 asked respondents whether or not they were aware of MDU's existing energy efficiency programs.

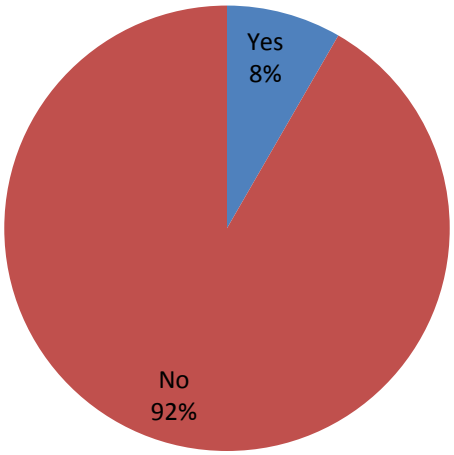

Figure 8-18: Responses to Question 7

Appendix D MEASURE DESCRIPTIONS

D.1 RESIDENTIAL MEASURES

The table below lists the entire list of residential measures assessed as part of the study. Note, these measures reflect all technically feasible measures, many of which are not cost-effective.

Residential Measures	
1-Watt Standby Power	Hot Water Pipe Insulation
1 kWh/day Refrigerator	Infiltration Control (Caulk, Weather Strip, etc.) Blower-Door test
Advanced Cold-Climate Heat Pump	Insulation (Basement - Wall) 2*4
Air Conditioner - Central (2.5 ton unit)	Insulation (Ceiling/Attic)
Air Conditioner - Central (3.0 ton unit)	Insulation (Duct)
Air Conditioner - Room (Individual Rooms) (10,000 BTU/HR)	Insulation (Floor)
Air Source Heat_Pump	Insulation (Rim And Band Joist)
Air-to-Air Heat Exchangers	Insulation (Slab)
Blinds - Fixed Angle/Automatic	Insulation (Wall) 2*4
Canned Lighting Air Tight Sealing	Insulation (Wall) 2*6
Ceiling Fan	Leak Proof Duct Fittings
CFL Fixtures, 15W	LED Christmas Lighting
CFL Fixtures, 20W	LED Interior Lighting (White), 13W
CFL Fixtures, 25W	LED Interior Lighting (White), 7W
CFL Lamps, 15W	LED Interior Lighting (White), 9W
CFL Lamps, 20W	Low-Flow Showerheads
CFL Lamps, 25W	Micro Channel Heat Exchangers (Evaporator)
CFL Lighting - 3-Way	Motor - ECM Motor
CFL Torchieries, Medium Use	O&M Tune-up
Clothes Dryer with Moisture Sensor - Early Replacement	Occupancy Sensors
Clothes Dryer With Moisture Sensor	Outlet Gasket
Clothes Washer	Pool Pump Timers
Clothes Washer - Early Replacement	Pool Pumps - VSD
Construction - ICF	Power supply transformer/converter - External power adapters
Construction - SIP	Powerstrip with Occupancy Sensor
Convection Oven	Proper Sizing - Central Air Conditioner
Cool Roofs	Proper Sizing - Heat Pump
Daylighting Controls (Photocell) - Indoor/Outdoors	PTCS Aerosol-Based Duct Sealing
Dishwasher	PTCS Duct Sealing
Dishwasher - Existing	Radiant Barrier (Ceiling)
Doors	Radiant Electric Ceiling Panels

Residential Measures	
Doors - Weatherization	Radiant Electric Floor Heating
Drain Water Heat Recovery	Refrigerator eCube
Duct Location	Refrigerator/Freezer - Early Replacement
Duct Sealing	Refrigerator/Freezer - Energy Star
Duct Sealing - Aerosol-Based	Refrigerator/Freezer - Removal of Secondary
Ductless Mini-Split Heat Pump	Solar Attic Fan
Energy Star Battery Chargers	Solar Water Heater
Energy Star Dehumidifiers	Solid state refrigeration (cool chips™) for heat pumps
Energy Star Digital Set Top Receiver	Spray in insulation 2*6 Wall
Energy Star DVD System	Stand-Alone Freezer - Early Replacement
Energy Star HDTV	Stand-Alone Freezer - Removal
Energy Star Home Audio System	Storm Windows
Energy Star Office Computer	Tankless Water_Heater
Energy Star Office Copiers	Thermostat - Clock/Programmable
Energy Star Office Monitor	Thermostat - Multi-Zone
Energy Star Office Printer	Time Clocks (Exterior Lighting)
Energy Star TV	VSD Fan
Energy Star VCR	VSD Motor - ECM
Evaporative Space Cooling	Water_Heater (40 Gallon Electric)
Faucet Aerators	Water_Heater Tank Blanket/Insulation
Freezer - Stand-Alone	Water_Heater Thermostat Setback
Green Roof	Whole-House Dehumidifier
Heat Pump Water Heater	Whole-House Fan
Heat_Pump - Ground or Water-Source - Closed Loop (Desuperheater)	Windows
Heat_Pump - Ground or Water-Source (Desuperheater)	

D.2 COMMERCIAL MEASURES

The table below lists the entire list of commercial measures assessed as part of the study. Note, these measures reflect all technically feasible measures, many of which are not cost-effective.

Commercial Measures	
(DX) Packaged Air Conditioner System, Advanced-Efficiency 12.5 EER Rooftop Unit Tier 3	High-efficiency coin-op washer w/o Electric Water Heat
(DX) Packaged Air Conditioner System, High-Efficiency 11.5 EER Rooftop Unit (CEE Tier 1)	High-efficiency washer
(DX) Packaged Air Conditioner System, Premium-Efficiency 12.0 EER Rooftop Unit (CEE Tier 2)	Hot Water (DHW) Pipe Insulation
4' T5 HO fixture - 54 W - 4 lamp	Hotel Key Card Room Energy Control System
4' T5 HO fixture - 54 W - 6 lamp	Hotel Occupancy Sensors
4' T8 High Bay fixture - 32 W - 6 lamps HPF	Induction High Bay Lighting
4' T8 High Bay fixture - 32 W - 8 lamps HPF	Induction Street Lighting
80 Plus® PC-desktop	Infiltration Control (Caulking, Weather Stripping, etc.)
Air Comp Improvements	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)
Air Compressor Optimization	Insulation - Floor (Non-Slab), R-19
Air-Source Heat Pump - High Efficiency, High-Efficiency EER=11.0, COP=3.5	Insulation (Ceiling), R-20 (Code)
Air-Source Heat Pump - Premium Efficiency, Premium-Efficiency EER=11.8, COP=3.8	Insulation (Ceiling), R-38
Anti-sweat heat (ASH) controls - Cooler	Insulation (Duct) (Unconditioned Spaces), R-5
Automated Exhaust VFD Control - Parking Garage CO sensor, CO Sensors	Insulation (Duct) (Unconditioned Spaces), R-8
Automated Ventilation VFD Control, Demand Controlled Ventilation	Insulation (Wall), R-13 + R-7.5 (Code)
Beverage machine control	Leak Proof Duct Fittings
Central lighting control system	LED Case Lighting
Centrifugal Chiller - VSD Remodel for Existing, VSD motor	LED Case Lighting - Occupancy Sensor
Ceramic Metal Halide lamp	LED exit sign - 1 sided
CFL Lamp - 21 Watt	LED exit sign -2 sided
Chilled Water Piping Loop w/ VSD Control, VSD for Secondary Chilled Water Loop	LED Lamp - 12 Watt
Chilled Water Reset, Install Chilled Water Reset	LED Lamp PAR - 12 Watt
Chiller - Premium Efficiency, 0.507 kW/ton	LED or equivalent sign lighting
Chiller - Advanced Technology, 0.461 kW/ton	LED or equivalent sign lighting -1 sided
Chiller - High Efficiency, 0.574 kW/ton	LED or equivalent sign lighting -2 sided
Chiller-Water Side Economizer, Install Economizer	LED Retrofit Tube
Cold-Climate Heat Pump,	LED Street Lighting
Commercial Hot Food Holding Cabinets (Energy Star)	Low Power Ballast Replacement
Commissioning - New Building Commissioning, Commissioning	Low-Flow Showerheads

Commercial Measures	
Commissioning - Retro Building Commissioning, Commissioning	Low-temperature dish machine
Compressor VSD	Motor - CEE Premium-Efficiency, CEE PE Motors for HVAC Applications
Compressor VSD retrofit	Motor - Fan System - Variable Speed Control
Cooking Hood Controls	Motor - Pump System - Variable Speed Control
Cooling DX Package-Air Side Economizer, Air-Side Economizer	Motor - VAV Box High-Efficiency, ECM Motors
Cooling Tower-Decrease Approach Temperature, 6 Deg F	Motor Improvements Bundle - Industrial Model
Cooling Tower-Two-Speed Fan Motor, Two-Speed Tower Fans replace Single-Speed	Motor Retrocommissioning
Cooling Tower-VSD Fan Control, Variable-Speed Tower Fans replace Two-Speed	Motors Rewind, Motor Rewind NEMA Premium
Data Center - Server/Storage Virtualization	Motors: Rewind 125-200 HP
Demand Control Ventilation (DCV)	Motors: Rewind 201-500 HP
Demand Defrost Electric	Motors: Rewind 20-50 HP
Demand Hot Gas Defrost	Motors: Rewind 500+ HP
Direct / Indirect Evaporative Cooling, Pre-Cooling, Direct	Motors: Rewind 51-100 HP
Direct Digital Control System-Installation, DDC Retrofit	Multi Lamp Hard Wired CFL
Direct Digital Control System-Optimization, DDC System (Optimized)	No-heat glass doors
Direct Digital Control System-Wireless Performance Monitoring	Non-cooled snack control
Duct Repair And Sealing, Reduction In Duct Losses to 5%	Occupancy sensor controls/Smart Strip
Duct-Less Heat Pumps, 15 SEER, 9.0 HSPF	Occupancy sensor, wall or ceiling mounted
Dusk to Dawn	Optimized Variable Volume Lab Hood Design,
eCube	Other cold product control
EE Transformer - CSL 3	PC network power management
Efficient compressor motor - scroll	Photocell dimming control
Efficient, low-temp reach-in	Photoluminescent Exit Sign
Electric combination oven	Pipe Insulation, R-6
Electric Steam cooker	Premium Efficiency T8 Lighting Replacement (25W lamps)
Energy Star - Water Cooler	Premium Efficiency T8 Lighting Replacement (32W lamps with low power factor ballasts)
ENERGY STAR® Office Equipment	Quick acting freezer doors
EnergyStar dishwasher	Reach-in Cooler: PSC to ECM: 1-37 Watt
EnergyStar refrigerator	Reach-in Cooler: Shaded Pole to ECM: 1-37 Watt
EnergyStar vending machine	Reach-in Freezer: Shaded Pole to ECM: 1-14 Watt
Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery	Reach-in PSC to ECM Evaporator Fan Motor
Exhaust Hood Demand Controlled Ventilation	Reach-in Shaded Pole to ECM Evaporator Fan Motor
Exhaust Hood Makeup Air	Red LED Traffic Light

Commercial Measures	
Faucet Aerators	Refrigeration Commissioning
Floating head pressure controller	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices
Fluorescent walk-in light fixture	Solar Water Heater
Green LED Traffic Light	Strip curtains for walk-ins
Green Roof, Vegetation on Roof	Thermostat - Programmable, Energy Star Programmable Thermostat
Hand/Man LED	Turbocor Compressor, 0.35 kW/Ton
HE Lighting Fixtures/Design 15% better than code	Ultrasonic Faucet Control
HE Lighting Fixtures/Design 25% better than code	Variable Speed Drives on Process Equipment (1 hp - 100hp)
Heat Pump - Ground Source (Closed Loop), GSHP: COP=3.1, EER=13.4	VAV Boxes, Variable Air Volume
Heat Pump - Ground Source (Closed Loop), GSHP: COP=4.0, EER=20	Vertical night covers
Heat Pump - Water Source (Closed Loop), WSHP: COP=4.2, EER=12.0	VFD on cooling tower fans
Heat Pump - Water Source (Closed Loop), WSHP: COP=4.8, EER=14.5	Walk-in Cooler: PSC to ECM: 16-49 Watt
Heat Pump Water Heater (air source)	Walk-in Cooler: Shaded Pole to ECM: 16-49 Watt
Heat Recovery Unit	Walk-in Freezer: PSC to ECM: 16-49 Watt
High Efficiency Fryers (Energy Star)	Walk-in Freezer: Shaded Pole to ECM: 16-49 Watt
High Efficiency Griddle	Walk-in PSC to ECM
High Efficiency Ice Machine Self Contained	Walk-in Shaded Pole to ECM
High Efficiency Ice Makers	Water Heater Thermostat Setback
High Efficiency Induction Cooking	Windows, U = 0.35
High Efficiency Water Heater (Electric) EF .93, 28-50 Gal	Windows, U = 0.45 (Code)
High R-Value Glass Doors	Yellow LED Traffic Light
High-efficiency coin-op washer w/ Electric water heat	

D.3 INDUSTRIAL MEASURES

The table below lists the entire list of industrial measures assessed as part of the study. Note, these measures reflect all technically feasible measures, many of which are not cost-effective.

Industrial Measures	
Adjustable speed drive on compressors	LED (High Bay)
Agricultural Engine Block Heater Timers	Lighting Controls
Air Compressor Demand Reduction	Linear Fluorescent (High Bay)
Air Compressor Equipment	Low Pressure-drop Filters
Air Compressor Optimization	Material Handling
Air Source Heat Pump 65 to 135 kBTU/hr - High	Material Handling VFD
Air Source Heat Pump 65 to 135 kBTU/hr - Premium	Metal Halide (High Bay)
Automatic Milker Takeoffs	Milk Precoolers
Bldg Improvements	Motor rewinds
Chillers <150 tons (screw) - Advanced Efficiency	Motors Other
Chillers <150 tons (screw) - High Efficiency	Motors: Rewind 101-200 HP
Chillers <150 tons (screw) - Premium Efficiency	Motors: Rewind 201-500 HP
Circulating Fans	Motors: Rewind 20-50 HP
Circulating Fans	Motors: Rewind 500+ HP
Cold Storage Retrofit	Motors: Rewind 51-100 HP
Cold Storage Tune-up	Optimization of operating parameters
DX Package 65 to 135 kBTU/hr - High Efficiency	Outside Air Intake
DX Package 65 to 135 kBTU/hr - Premium Efficiency	Panel: Hydraulic Press
Efficient Centrifugal Fan	Process Heat O&M
Efficient Metal Halide (High Bay)	Programmable Ventilation Controllers
Equipment: Chillers	Properly Sized Fans
Evaporative Cooler replaces DX Package 65 to 135	Pump Equipment Upgrade
Facility Energy Management	Pump System Optimization
Fan Equipment Upgrade	Receiver Capacity Addition
Fan System Optimization	Recommissioning / Facility Energy Management
Food: Cooling and Storage	Refrigerated Cycling Dryers
Ground Source Heat Pump Replacing Air Source Heat	Screw Base CFL
Heat Lamp Setback (Microzone)	Screw Base EISA Backstop Incandescent
Heat Lamp/Heating Pad Controller	Screw Base EISA Compliant Incandescent
Heat Lamps	Screw Base LED
Heat Reclaimers	SIS
High efficiency Compressor motors	Switch from Belt drive to Direct Drive
High Efficiency Motors	Synchronous Belts
High-efficiency Livestock Waterers	T5 Linear Florescent
High-efficiency Ventilation Systems	T8 High Performance Linear Florescent
Improved Controls - Air Compressor	T8 Linear Florescent
Improved Controls - Fans	T8 Reduced Wattage Linear Florescent
Improved Controls - HVAC	Transformers

Industrial Measures	
Improved Controls - Motors	VFD Controlled Compressor
Improved Controls - Process Cooling	VFDs - Potato / Onion Shed
Improved Controls - Process Heating	VFDs for Dairy Vacuum Pumps
Induction (High Bay)	Zero Loss Condensate Drain
Irrigation System Improvements	

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Electric Energy Efficiency Potential Study – Appendices E and F

Submitted to Montana-Dakota Utilities Co.

Submitted By Nexant

December 7, 2012

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Nexant

Table of Contents – Measure Appendix

Appendix E. Measure Definitions

This appendix presents descriptions of every measure analyzed in the energy efficiency potentials assessment. Measures are organized by sector, type, and major end use category.

E.1 Residential Sector Measures

Electric Non-Equipment Measures

Cooking Oven

Convection Oven. Operates at lower temperatures and achieves quicker cook times than a standard oven, due to fans that circulate heat evenly throughout the oven by moving hot air past the food. The baseline is a standard commercial oven.

Dryer

Clothes Dryer with Moisture Sensor - Early Replacement. Replacing equipment before the end of its useful life is advantageous because of the significant inefficiencies in older clothes dryer, resulting in excessive energy consumption. Existing units are replaced with standard models that have moisture sensors.

HVAC Auxiliary

Motor – ECM Motor. Electronically commutated motors (ECM) consume less power than a standard motor. The cost difference for operating the ECM motor ranges from about 30% lower during high flow rate conditions to about 70% lower during turndown. For existing construction, ECM motors have a technical feasibility of 65% for cooling and varying amounts for HVAC auxiliary (gas or electric heating as the primary fuel). This 65% feasibility for cooling (Central AC) could be underestimating the total potential for this specific application. One reason for the lower feasibility for HVAC auxiliary measures is to account for the percentage of homes that currently use this type of equipment to heat their homes. Typically this is taken into account in equipment fuel shares and saturations, but because of the HVAC auxiliary end use these factors had to be taken into account in the technical feasibility.

VSD Fan. Controls the rotational speed of a piece of motor-driven equipment, through adjusting the frequency of the voltage applied to the motor. Baseline for this measure is a constant speed fan motor.

HVAC & Envelope

Advanced Cold Climate Heat Pump. Cold-climate heat pumps are air-to-air heat pumps that have been optimized for colder climates. The performance of these heat pumps is expected to be approximately the same as ground-source heat pumps (GSHP).

Air-to-Air Heat Exchangers. An air-to-air heat exchanger mechanically ventilates and dehumidifies homes in colder climates. During the winter it transfers heat from the air being exhausted, to the fresh, outside air entering the home. Fifty to eighty percent of the heat normally lost in exhausted air is returned to the house. Air-to-air heat exchangers can be installed as part of a central heating and cooling system or in walls or windows. Wall and window-mounted units resemble air conditioners and will ventilate one room or area.[1]

[1] http://www.blueflame.org/datasheets/humidity.html

Blinds – Fixed Angle/Automatic. A covering for a window or door, usually attached to the interior side of a window that reduces sunlight, thus blocking unwanted heat from the summer sun and holding in heat in cold weather. Automatic blinds adjust to the appropriate angle at the appropriate time, and make hard to reach blinds accessible for adjustment. The baseline for this measure is no interior blinds.

Canned Lighting Air-Tight Sealing. Proper sealing around recessed lighting fixtures prevents unwanted heat loss through these air spaces due to air pressure differentials in conditioned and unconditioned spaces in homes. The baseline is no sealing.

Ceiling Fan. ENERGY STAR®-qualified ceiling fans use improved motors and blade designs, allowing the user to decrease the thermostat a couple of degrees yet still feel at least 5° cooler. The fans do not create cooler temperatures. The kit does not include light fixtures; all savings are associated with the improved fan design.

Construction – ICF. Building a concrete home with insulating concrete forms (ICFs) saves energy and money. The greater insulation, tighter construction, and temperature-moderating mass of the walls conserve heating and cooling energy much better than conventional wood-frame walls.

Construction – SIP. Structural insulated panels use continuous foam insulation throughout the panel that provides excellent energy efficiency and low levels of air infiltration. Baseline is standard wood framing.

Cool Roof. ENERGY STAR-qualified cool roofs can lower roof surface temperature by up to 100ºF, thereby decreasing the amount of heat transferred into a building. Cool roofs can help reduce the amount of air conditioning needed in buildings, and can reduce peak cooling demand by 20%.[2] This measure could be considered as a passive measure.

Doors – R-5. Composite doors with a foam core increase overall insulation, which slows heat loss. This measure includes adding a thermal door with a resistance value of R-5 to houses with neither thermal nor storm doors.

Doors – R-11. A steel door with a polyurethane foam core offers an insulating value of about R-11. The steel surface holds up well to normal wear and tear, and any dents can be repaired easily with auto-body putty.

Doors – Weatherization. To minimize infiltration door sweep, weather stripping mounts to the bottom of the door. It consists of an extruded aluminum strip that holds a flexible vinyl strip to block the air space between the door frame and the door. The baseline for this measure is no weather stripping.

Duct Location. In many homes, ducts are run through unconditioned areas such as attics, garages, crawlspaces, and basements for convenience and practical reasons. Ducts in unconditioned areas lose energy because of large temperature differences between conditioned air in the ducts and the surrounding space. Locating ducts in conditioned spaces helps to reduce wasted heat loss.[3]

Duct Sealing. Duct sealing cost effectively saves energy, improves air and thermal distribution (comfort and ventilation), and reduces cross contamination between different zones in the building (i.e., smoking vs. non-smoking, bio-aerosols, localized indoor air pollutants).

Duct Sealing – Aerosol Based. A significant amount of energy use in residential buildings is associated with duct losses due to leakage. This is an aerosol duct-sealing technology that seals holes in ducts up to ¼" in diameter from the inside by spraying atomized latex aerosol into a pressurized duct system.

[2] http://www.aceee.org/pubs/a042_s5.pdf

[3] http://www.toolbase.org/pdf/techinv/ductsinconditionedspace_techspec.pdf

Ductless Mini-Split Heat Pump. Ductless heat pumps, similar to mini-split systems, are used to provide heating and cooling to multiple zones without duct-work. A ductless heat pump stores the compressor outside and pipes the refrigerant to the individual units located in each zone/room inside where the heating or cooling takes place. Energy is saved by eliminating duct losses.

Evaporative Space Cooling. A direct evaporative cooler is a low-energy system that evaporates water into the air stream, thus reducing the temperature of the air, but increasing the humidity. An indirect evaporative cooler uses a secondary air stream that is cooled by water and goes through a heat exchanger with the primary air stream, cooling it but not affecting the humidity. A direct/indirect system will cool the air stream first through an indirect cooler, then cool it further through a direct cooler.

Green Roof. The added mass and thermal resistance of green roofs reduces the heating and cooling loads of the building. These systems reduce the ambient temperature around the roof, decreasing the building's urban heat island effect; reduce the ambient temperature of the roof's surface; and slow the transfer of heat into the building, reducing cooling costs. They also provide added insulation to the roof structure, reducing heating requirements in the winter.[4]

Heat Pump – Ground or Water-Source – Open Loop. Ground-source heat pumps use the natural heat storage capacity of the earth or ground water to provide energy efficient heating and cooling. In an open loop application, the system draws well water for use as the heat source or heat sink and, after use, returns the well water to a drainage field or another well. This measure compares an efficient model with an Energy Efficient Ratio (EER) of 16.2 and a Coefficient of Performance (COP) of 3.6 to the baseline model air-source heat pump with a 11.3 EER and 3.2 COP. [5]

Heat Pump – Ground or Water-Source – Closed Loop. In a closed-loop or earth-coupled loop, the system uses a water and antifreeze solution that is circulated in a ground loop of pipes to extract heat from the earth. Ground loops can be installed in a vertical well or a horizontal loop. Vertical wells are usually more expensive and used where space is limited. This measure compares several models to the baseline systems and is summarized in Table.[6]

Table: Closed Loop Heat Pump Comparison

Measure EER/COP	Baseline EER/COP
14.1 EER/3.3 COP	11.3 EER/3.2 COP

Infiltration Control (Caulk, Weather Strip, etc.) Blower – Door Test. Sealing air leaks in windows, doors, roof, crawlspaces, and outside walls decreases overall heating and cooling losses. Filling gaps in windows with synthetic filler prevents drafts and heating/cooling loss.

Insulation (Basement – Wall) 2x4. Adding insulation to the basement or crawlspace walls increases the thermal performance of the concrete foundation. Only for existing homes. Table summarizes the different resistance values compared in the measure.

Table :Wall R-Value Comparison

[4] http://www.toolbase.org/Technology-Inventory/Roofs/green-roofs
[5] http://www.toolbase.org/Technology-Inventory/HVAC/geothermal-heat-pumps
[6] http://www.toolbase.org/Technology-Inventory/HVAC/geothermal-heat-pumps

Measure Insulation	Baseline Insulation
R-13 (code)	R-0
R-13 (code)	R-7 existing wall
R-13 + R-5	R-13

Insulation (Ceiling/Attic). This measure represents an increase in R-value. Adding insulation in existing buildings increases the thermal performance and brings the resistance value up to and past code, depending on vintage. Table summarizes the different resistance values compared in the measure.

Table: Ceiling R-Value Comparison

Measure Insulation	Baseline Insulation
R-49	R-0
R-49	R-11
R-49	R-19

Insulation (Duct). Adding insulation around the ducts in the heating system reduces heat loss to unconditioned spaces. Table summarizes the different resistance values compared in the measure.

Table:Duct R-Value Comparison

Measure Insulation	Baseline Insulation
R-6 (code)	R-0
R-8	R-6 (code)

Insulation (Floor). Adding insulation to the floor increases the overall resistance value and slow heat transfer from the basement to the upper levels. Table summarizes the different resistance values compared in the measure.

Table:Floor R-Value Comparison

Measure Insulation	Baseline Insulation
R-30 (code)	R-0
R-30 (code)	R-19 existing floor
R-38	R-30 (code)

Insulation (Rim and Band Joist). An un-insulated band joist can account for a significant portion of a building's heat loss, as the only thing separating inside from outside is 2 inches of wood and the siding material covering it. The heat loss through an un-insulated band joist increases when the basement is kept warmer, or contains heating or water heating equipment. Insulating a band joist is an easy way to improve a building's energy efficiency. The baseline is no insulation.

Insulation (Slab). A substantial amount of heat is lost through an un-insulated slab, resulting in cold, uncomfortable floors. Even if the foundation wall is insulated vertically under the slab, significant heat is still lost from the slab edge that is closest to the cold outside air. Table compares the different slab insulations for this measure.

Table:Slab Insulation Measures

Measure Insulation	Baseline Insulation
R-10 (code)	R-0
R-15	R-10 (code)

Insulation (Wall) 2x4. Wall insulation can help slow the transfer of heat and reduce both the heating and cooling loads in houses. **Error! Reference source not found.** compares the different insulations for 2x4 framing.

Table: 2x4 Wall Insulation Measures

Measure Insulation	Baseline Insulation
R-13	R-0
R-13 + R-5 Sheathing	R-13

Insulation (Wall) 2x6. Wall insulation can help slow the transfer of heat and reduce both the heating and cooling loads in houses. Table compares the different insulations for 2x6 framing.

Table:2x6 Wall Insulation Measures

Measure Insulation	Baseline Insulation
R-20	R-0
R-20 + R-5 Sheathing	R-20 (Code)

Leak Proof Duct Fittings. A system of mechanically fastened fittings (couplings, boots, plenums, wyes) for flex and hard ducts that snap together to create a long-lasting seal.

Micro Channel Heat Exchanger (Evaporator). A microchannel heat exchanger allows for a longer dwell time for the air passing over it, as compared to a standard fit-tube heat exchanger. This results in an increase in heat exchanger effectiveness.

Motor - ECM Motor. Electronically commutated motors (ECM) provide precisely timed voltages to the coils and use rotation position sensors for timing. This results in greater efficiency than a standard motor.

O&M Tune Up. Proper system tune-up/maintenance ensures that both refrigerant charge and airflow through the evaporator coil are properly tested and correctly adjusted – two factors that affect system efficiency. Maintenance includes changing filters and cleaning coils to maintain the overall performance and efficiency of the unit.

Outlet Gasket. Provide sealing around electrical outlets to reduce drafts and heat loss through small air spaces.

Proper Sizing – Central Air Conditioner. Properly sized central air conditioners operate for long periods of time (rather than frequently cycling on and off), resulting in optimum equipment operating efficiency and better control. [7]

Proper Sizing – Heat Pump. Properly sized heat pumps operate for long periods of time (rather than frequently cycling on and off), resulting in optimum equipment operating efficiency and better control.[8]

[7] http://www.toolbase.org/Technology-Inventory/HVAC/hvac-sizing-practice

PTCS Aerosol-Based Duct Sealing. Aerosol duct testing and sealing in accordance with the standards set for by the Performance Tested Comfort Systems (PTCS™) program.

PTCS Duct Sealing. Duct testing and sealing in accordance with the standards set for by the Performance Tested Comfort Systems (PTCS™) program.

Radiant Barrier (ceiling). Radiant barriers generally consist of a thin piece of aluminum that are installed in buildings to help reduce the solar heat gain from the sun during the summer, as well as helping to trap heat in during winter. They work by reducing heat transfer between the air space of the roof deck and the attic floor.

Radiant Electric Ceiling Panels. Radiant heating systems rely on infrared radiation to heat objects, people, and surfaces. The effect is that radiant energy as received by people (directly from the heater and indirectly from other surfaces) allows them to perceive a comfort condition temperature that is 4° to 5° higher than the actual air temperature. This allows a radiant heater to operate at lower air temperatures thus decreasing the use of heating fuel by reducing air stratification within the space, side-wall and ceiling as well as building heat losses.

Radiant Electric Floor Heating. Radiant heating systems rely on radiation to heat objects, people, and surfaces. The effect is that radiant energy as received by people (directly from the heater and indirectly from other surfaces) allows them to perceive a comfort condition temperature that is 4° to 5° higher than the actual air temperature. This allows a radiant heater to operate at lower air temperatures thus decreasing the use of heating fuel by reducing air stratification within the space, side-wall and ceiling as well as building heat losses.

Solar Attic Fan. Forced attic fan ventilation reduces residential heat gains from the ceiling. The baseline uses passive ventilation without a fan.

Solid State Refrigeration for Heat Pumps. Using thermoelectric devices to convert electricity for cooling is only starting to become economical due to advances in efficiency levels.

Spray-in Insulation 2x6 Wall. Unlike traditional insulation materials like fiberglass or cellulose, spray foam insulation seals and fills tiny cracks and seams, which virtually eliminates energy-wasting air infiltration. This measure proposes to increase the resistance value to R-37, compared to the baseline of R-20.

Storm Windows. This measure is adding a storm window to a single pane excising window.

Thermostat – Clock/Programmable. A programmable thermostat controls the set point temperatures automatically, ensuring the HVAC system is not running during low-occupancy hours.

Thermostat – Multi-Zone. A multi-zone programmable thermostat controls the set point temperatures automatically for multiple areas (rooms or zones), ensuring the HVAC system is not running during low-occupancy hours.

VSD Motor – ECM. Controls the rotational speed of a piece of motor-driven equipment, through adjusting the frequency of the voltage applied to the motor. Baseline for this measure is a constant speed fan motor.

Whole-House Dehumidifier. A high capacity whole-house dehumidifier can be run standalone in a basement or ducted into an existing central air conditioning system. These units remove moisture content from the air and prevent mold, mildew and damp conditions.

Whole-House Fan. Draws cool outdoor air inside through open windows and exhausts hot indoor air through the attic to the outside. A whole house fan is a simple and inexpensive method of cooling a house when outdoor temperatures are lower than indoor temperatures.

Windows. This measure represents an increase in building performance by reducing the U-value in existing construction and new construction windows, as shown in Table The cost for all increments of windows does not include any labor costs associated with installing the windows. If this value was included, it will only be included in the cost associated with going from Existing windows to a lower more efficiency window. Adding this additional labor for a single family home would increase the cost by approximately $2000 and would decrease the overall total resource cost effectiveness.

Table:High Efficiency Window Measures

Measure U-Value	Baseline U-Value
0.35 (code)	Existing Windows 0.65
0.35 (code)	Existing Windows 0.40
0.32	0.35 (code)
0.30	0.35 (code)
0.19	0.35 (code)

The code for either new construction or window replacement states the customer must go to code (U=0.35) at a minimum when installing new windows.

Lighting

CFL Lighting – 3-Way. Three-way lights allow for different stages of illumination using different input Wattages. This measure compares a 3-way compact florescent lamp (CFL) lamp with 13 Watt, 20 Watt, and 25 Watt increments to a three-way incandescent lamp using 30 Watts, 75 Watts, and 100 Watts.

Compact Fluorescent Lamps & Fixtures. Combining the energy efficiency of fluorescent lighting with the convenience and popularity of incandescent fixtures, CFLs: (1) save up to 75% of the initial lighting energy by replacing incandescent that are roughly 3 – 4 times their Wattage, and (2) create further savings by lasting 6–15 times longer (6,000–15,000 hours). The incandescent lamp baselines and their equivalent CFL wattages are shown in Table below. The CFL fixtures are assumed to use two lamps per fixture.

Table:CFL Lamp and Fixture Wattages

Measure Wattage	Baseline Wattage
15 W	60 W
20 W	75W
25 W	100 W

CFL Torchieres. A compact fluorescent torchiere is a table or floor lamp designed to direct light upward for indirect illumination. Most of the light is thrown against the ceiling and reflected back. This measure compares a standard 180 Watt halogen lamp to a 55 Watt CFL.

Daylighting Controls (Photocell) – Indoor/Outdoors. Photocells are used to adjust lighting levels according to the level of daylight the room is receiving. Baseline is no daylighting controls.

LED Christmas Lighting. Typical Christmas tree lighting uses incandescent bulbs that can be costly, as well as a fire hazard. LED lights use a low wattage bulb and can save up to 90% of holiday lighting costs.

LED Interior Lighting (White). Light emitting diodes (LEDs) are solid-state devices that convert electricity to light, potentially with very high efficiency and long life. Recently, lighting manufacturers have been able to produce "cool" white LED lighting indirectly, using ultraviolet LEDs to excite phosphors that emit a white-appearing light. These lights are viewed as a replacement for compact fluorescent lamps and their equivalent wattages are found in Table: below.

Table: LED Lamps

Measure Wattage	Baseline Wattage
7 W	15 W
9 W	20W
13 W	25 W

Occupancy Sensors. If a space is unoccupied for a designated amount of time, an occupancy sensor will turn off the lights. The lights will turn on again once the sensor detects a person has entered the space.

Time Clocks (Exterior Lighting). Allows the user to program times to automatically turn lights on and off outside the residence. Programmed exterior lighting saves energy by ensuring that lights are not accidentally left on during the daytime.

Plug Load

1-watt Standby Power. Standby power is the electricity used by electrical equipment when it is switched off, or not performing its main function. Minimizing this loss to one watt or less can reduce this standby energy consumption by more than 50%.

ENERGY STAR Battery Chargers. Battery charging systems recharge a wide variety of cordless products, including power tools, small household appliances, and personal care products like electric shavers. Conventional battery chargers — even when not actively charging a product – draw as much as 5 to 20 times more energy than actually stored in the battery. Advanced energy-saving designs are now available that, on average, use 35% less energy. The baseline is a standard battery charger.[9]

ENERGY STAR Dehumidifiers. ENERGY STAR® qualified models have more efficient refrigeration coils, compressors, and fans than conventional models, which means they use less energy to remove moisture. These qualified models remove the same amount of moisture as a similarly-sized standard unit, but uses 10% – 20% less energy. The baseline for this measure is a standard dehumidifier.

ENERGY STAR Digital Set Top Receiver. Set-top boxes that have earned the ENERGY STAR are at least 30 percent more efficient than conventional models[10]. ENERGY STAR receivers must consume less than 7 Watts for satellite and 5 Watts for Low Noise Blockers to qualify. The baseline measure is a standard receiver.

ENERGY STAR DVD System. ENERGY STAR® qualified DVD products that meet the new requirements use up to 60% less energy than standard models[11]. ENERGY STAR® DVD players use as little as one fourth of the energy used by standard models in the "off" mode. Baseline measure is a standard DVD player.

[9] http://www.energystar.gov/index.cfm?c=battery_chargers.pr_battery_chargers

[10] http://www.energystar.gov/index.cfm?c=settop_boxes.settop_boxes

ENERGY STAR HDTV. Short for High-Definition Televisions, ENERGY STAR qualified TVs use about 30% less energy than standard units[12]. ENERGY STAR models are required to consume less than 1 Watt when switched to the off position. The baseline is a standard television, generally consuming more than 3 Watts when off.

ENERGY STAR Home Audio System. According to ENERGY STAR products, a 6% energy savings can be achieved over standard home audio systems.[13]

ENERGY STAR Office Computers. ENERGY STAR® computers consume less power in "idle", "sleep", and "off" mode than conventional units.

ENERGY STAR Home Office Copiers. ENERGY STAR copy machines enter sleep mode after inactivity for at least 30 minutes. This reduces their total power consumption.[14]

ENERGY STAR Home Office Monitor. ENERGY STAR® monitors feature: (1) "on" mode, where the maximum allowed power varies based on the computer monitor's resolution; (2) "sleep" mode, where computer monitor models must consume 2 Watts or less; and, (3) "off" mode, where computer monitor models must consume 1 Watt or less. The baseline equipment does not include these features.[15]

ENERGY STAR Office Printer. Printers are required by ENERGY STAR standards to deploy a maximum time delay to sleep depending upon the size of the equipment. This reduces power consumption during periods of inactivity.[16]

ENERGY STAR TV. ENERGY STAR® certified televisions use approximately 30% less energy than standard models and consume less than 1 Watt when idle.

ENERGY STAR VCR. ENERGY STAR® certified VCRs use approximately 30% less energy than standard models and consume less than 1 Watt when idle.

Power Supply Transformer/Converter - External Power Adapters. Energy Star power adapters provide more efficient electricity conversion for a variety of devices.

Powerstrip with Occupancy Sensor. Energy-saving products such as power strips with an occupancy sensor are found in workstations where power strips are commonly used. The sensor will turn on and off the power to all devices such as computers, desk lights, and audio equipment that are plugged into the power strip based on occupancy within the work area.

Pool Pumps

Pool Pump Timers. Setting a pool pump to run during off-peak times (starting after 8 p.m. and cycling off before 10 a.m.) reduces energy costs. Cycling pumps further reduce monthly costs. Baseline is a continuously running pump.

Pool Pumps – VSD. Enables the pool pump motor to run at variable speeds as opposed to constantly running at full power.

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11 http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=DP
12 http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=TV
13 http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=HA
14 http://www.energystar.gov/ia/products/fap/IE_Prog_Req.pdf
15 http://www.energystar.gov/index.cfm?fuseaction=find_a_product.ShowProductGroup&pgw_code=MO
16 http://www.energystar.gov/ia/products/fap/IE_Prog_Req.pdf

Refrigeration / Freezer

1 kWh per day Refrigerator. Reducing the energy use of a refrigerator to less than 1 kWh/day will result in over 25% reduction in energy use from a baseline refrigerator.

Refrigerator eCube. The eCube is placed in a refrigerated area and monitors the temperature of the product and not the temperature of the air. The thermostat is connected to the compressor, which cycles on and off to maintain the set point, based on the product temperature. The cycles of the compressor are reduced because the temperature is now based on the product and not the air.[17]

Refrigerator//Freezer – Early Replacement. Replacing equipment before the end of its useful life is advantageous because of the significant inefficiencies in older refrigerator/freezers, resulting in excessive energy consumption. Existing units are replaced with standard (code) models.

Refrigerator//Freezer – Removal of Secondary. This refers to the environmentally friendly disposal of unneeded appliances such as secondary refrigerators or stand-alone freezers.

Solid State Refrigerator. Using thermoelectric devices to convert electricity for cooling (refrigeration) is only starting to become economical due to advances in efficiency levels.

Stand-Alone Freezer –Early Replacement Replacing equipment before the end of its useful life is advantageous because of the significant inefficiencies in older freezers, resulting in excessive energy consumption. Existing units are replaced with standard (code) models.

Stand-Alone Freezer – Removal. Removal of stand-alone freezers is beneficial due to their inefficient use of energy. Proper disposal is required, as they use hazardous materials such as Freon & CFCs.

Water Heating

Clothes Washer. Several Modified Energy Factor (MEF) models were compared in this measure, as shown in Table

Table:Clothes Washer Modified Energy Factor Comparisons

Measure MEF	Baseline MEF
1.83 ENERGY STAR	1.66 (Existing average)
2.07	1.66
2.32	1.66

Clothes Washer - Early Replacement. Replacing equipment before the end of its useful life is advantageous because of the significant inefficiencies in older clothes washers, resulting in excessive energy consumption. Existing units are replaced with the average existing models.

Dishwasher. Due to the large implementation of ENERGY STAR dishwashers, this measure compares a high efficiency dishwasher (EF = 0.77) to the baseline of an ENERGY STAR dishwasher (EF = 0.65). Table shows the following energy factors compared in this measure.

Table:Dishwasher Energy Factor Comparisons

[17] http://www.senergysolution.com/sEnergySolution/eCube.aspx

Measure Energy Factor	Baseline Energy Factor
0.65 ENERGY STAR	0.46 Existing Unit
0.77	0.65 ENERGY STAR

Drain Water Heat Recovery. Drain water heat recovery devices recover heat energy from domestic drain water and are used to pre-heat cold water entering the hot water tank. This minimizes the temperature difference between the heating set point and the entering water temperature.

Faucet Aerators. Faucet aerators, by mixing water and air, reduce the amount of water that flows through the faucet. The faucet aerator creates a fine water spray with a screen that is inserted in the faucet head. Flow rate requirements for this measure are presented in Table B.25.

Table:Faucet Aerator Flow Rates

Measure Flow Rate	Baseline Flow Rate (GPM)
2.2	3.0 (existing)
1.5	2.2
0.5	2.2

* Gallons per minute

Heat Pump Water Heater. The water-heating heat pump moves heat from a warm reservoir (such as air) into the hot water system. The system employs an evaporator, compressor, condenser, expansion valve, hot water circulating pump and controls to accomplish this function.[18]

Heat Pump - Ground or Water-Source (Desuperheater). Desuperheaters are heat recovery devices that transfer heat from the air conditioning unit to the domestic water heater, that would normally be transferred to the ground. A desuperheater provides supplemental water heating only when the heat pump operates in the cooling mode.[19]

Hot Water Pipe Insulation. Adding R-4 insulation around the pipes will decrease heat loss.

Low-Flow Showerheads. Low-flow showerheads mix water and air to reduce the amount of water that flows through the showerhead. The showerhead creates a fine water spray through an inserted screen in the showerhead. Flow rate requirements for this measure are presented in Table B.26.

Table:Low-Flow Showerhead Flow Rates

Measure Flow Rate (GPM)	Baseline Flow Rate (GPM)
2.5 Federal code	3.0 (Existing)
2.0	2.5 Federal code

Solar Water Heater. Solar water heating systems include storage tanks and solar collectors. There are two types of solar water heating systems: active, which have circulating pumps and controls, and passive, which don't. Either system

[18] Description source: U.S. Department of Energy

[19] http://www1.eere.energy.gov/femp/procurement/eep_groundsource_heatpumps.html

actively increases the entering water temperature to the storage tank, reducing the amount of energy required by the hot water heater to achieve the set point temperature.[20]

Tankless Water Heater. Tankless water heaters produce the majority of energy savings by avoiding standby losses that occur when a normal storage tank is not in use. Tankless water heaters provide hot water at a preset temperature when needed without storage, thereby reducing or eliminating standby losses. An energy factor of 0.95 was used for the tankless system and compared to a standard electric water heater with an 0.92 EF.[21]

Water Heater Tank Blanket. Install R-5 insulation on older models with no insulation, which helps reduce stand-by losses.

Water Heater Thermostat Setback. This measure generates savings by reducing the set point temperature from 135° to 120°. Often, the set point temperature on a hot water system is set higher than necessary.

Electric Equipment Measures

Air Conditioner – Central (2.5 ton unit). This unit has a 30,000 BTU/hr cooling capacity. This measure compares several different SEER models, which are summarized in Table below.

Air Conditioner – Central (3.0 ton unit). This unit has a 36,000 BTU/hr cooling capacity. This measure compares several different SEER models, as summarized below in Table B.27.

Table:Central AC SEER Comparison

Measure SEER	Baseline SEER
14 SEER 16 SEER 18 SEER	13 SEER (federal code)

Air Conditioner – Room (Individual Rooms) (10,000 BTU/HR). ENERGY STAR® qualified room air conditioners use less energy than conventional models through improved energy performance as well as timers for better temperature control. ENERGY STAR® qualified room air conditioners have a 10.8 EER value compared to a standard model that has 9.8 EER.

Air Source Heat Pump. Electric air-source heat pumps use the difference between outdoor air temperatures and indoor air temperatures to cool and heat the home. Table B.28. displays the different models compared in this measure.

Table:Heat Pump SEER/HSPF Comparisons

Measure SEER & HSPF	Baseline SEER & HSPF
14 SEER, 8.5 HSPF 16 SEER, 8.8 HSPF 18 SEER, 9.0 HSPF	13 SEER, 7.7 HSPF

[20] http://www.eere.energy.gov/consumer/your_home/water_heating/index.cfm/mytopic=12850

[21] http://www.toolbase.org/Technology-Inventory/Plumbing/tankless-water-heaters

Clothes Dryer with Moisture Sensor. High efficiency dryers have a moisture sensor that stops the drying cycle when the humidity in the drum falls below a certain level. Conventional drying equipment uses thermostats or timers that do not determine when clothes are dry, thereby causing excessive energy consumption due to extended run time.

Freezer – Stand-Alone. ENERGY STAR® qualified freezer models use at least 10% less energy than required by current federal standards from the National Appliance Energy Conservation Act (NAECA).

Refrigerator/Freezer. ENERGY STAR® residential grade refrigerators use at least 10% less energy than required by current federal standards and 40% less energy than conventional models sold in 2001.

Water Heater (Electric). High efficiency water heaters are more efficient than standard electric water heaters due to reduced standby losses. This measure assumes an energy factor (EF) for the high efficiency water heaters of 0.95, an increase from the code minimum of 0.92.

E.2 Commercial Sector Measures

Cooking

Electric Combination Oven. An oven that combines the function of hot air convection (oven mode), and superheated steam heating, or a combination of both.

High Efficiency Griddle. These griddles consume up to 15 percent less energy than a standard efficiency griddle.

High Efficiency Induction Cooking. These cooking systems utilize induction heating to directly heat a cooking vessel, as opposed to using heat transfer from electrical coils in a traditional stove. This enables more efficient heating by allowing instant control of cooking energy similar to a gas burner.

Hot Food Holding Cabinets – Commercial. ENERGY STAR® hot food-holding cabinets use a maximum of 40Watts/cubic foot, less than the baseline measure, a conventional holding cabinet.[22] The baseline efficiency is 67% for a non-ENERGY STAR commercial hot food holding cabinet.

Steam Cookers – Commercial. Commercial ENERGY STAR® electric steam cookers have a cooking efficiency of 50%, with idle energy rates that vary depending upon pan size.[23] The baseline efficiency is 35% for an non-ENERGY STAR commercial steam cooker.

Cooking Fryers – Commercial. Commercial ENERGY STAR® electric fryers have a heavy load cooking efficiency of 80% or better, and when idle, uses less than 1,000 Watt.[24] The baseline efficiency is 70% for an non-ENERGY STAR commercial fryer.

Oven – Convection – Commercial. Commercial ENERGY STAR® electric convection ovens have a cooking efficiency of 70% or better, with idle energy rates that vary depending upon size.[25] Standard electric convection ovens have a 65 percent cooking energy efficiency and an idle energy rate of 2 kW; whereas ENERGY STAR® qualified electric convection ovens must meet the specification requirements of 70 percent cooking energy efficiency and an idle energy rate of 1.6 kW.

HVAC Auxiliary

Automated Exhaust VFD Control – Parking Garage CO Sensor. This measure allows the ventilation system to run only when CO levels are above a specified level. The ventilation system would run constantly without this measure.

Cooking Hood Controls. Utilizing sensors and two-speed or variable speed fans, hood controls reduce exhaust (and makeup) airflow when appliances are not at capacity (or have been turned off). The baseline for this measure is no hood controls.

HVAC Motors – Premium Efficiency. Premium efficiency motors are more efficient than standard efficiency motors. This measure specifically relates to HVAC motors, ranging from 1 HP to 200 HP, depending on the building size.

Motors – Pump and Fan System – Variable Speed Control. Variable speed controls allow for pump and fan motors to operate at a lower speed while still maintaining the set points during partial load conditions. Energy is reduced when motor operation can vary with load rather than run at a constant speed.

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22 http://www.energystar.gov/index.cfm?c=hfhc.pr_hfhc

23 http://www.energystar.gov/index.cfm?c=steamcookers.pr_steamcookers

24 http://www.energystar.gov/index.cfm?c=fryers.pr_fryers

25 http://www.energystar.gov/index.cfm?c=ovens.pr_comm_ovens

Motors – Variable Air Volume (VAV) Box High Efficiency. High efficiency fan-powered boxes prevent hot and cold spots by maintaining room air circulation while supply-air temperature is modulated to match load. Energy is saved by re-circulating warm air from zones that have less heating requirements to zones with greater heating requirements. This measure applies to the motor efficiency as an upgrade. An electronically commutated motor (ECM) powers the fan in each VAV box. An ECM is a brushless DC motor with all of its speed and torque controls built in electronically, which allows the motor to adjust its speed to ensure the optimal airflow at all times. The baseline assumes a standard VAV with induction motors including silicon controlled rectifier (SCR) speed control. [26]

Variable Air Volume (VAV) Boxes - Installation. High efficiency fan-powered boxes prevent hot and cold spots by maintaining room air circulation while supply-air temperature is modulated to match load. Energy is saved by re-circulating warm air from zones that have less heating requirements to zones with greater heating requirements. This measure applies to the installation of VAV control where the baseline assumes constant volume.

Motors Rewind. Replacing windings with lower resistance wire can reduce electrical I^2R losses, resulting in improved motor efficiency.

Optimized Variable Volume Lab Hood Design. Allows the volumetric flow rate to vary, which causes a constant speed through the duct, regardless of sash opening. For buildings such as universities, schools, and hospitals that use lab hoods, a small savings can be obtained by using a variable, rather than constant, volume lab hood. The baseline measure is a constant volume lab hood.

HVAC & Envelope

Air Source Heat Pump (High & Premium Efficiency). Electric air-source heat pumps use the difference between outdoor air temperatures and indoor air temperatures to cool and heat the home.

Automatic Ventilation VFD Control (occupancy/CO_2 sensors). The ventilation system automatically adjusts air flow when CO_2 levels are above a specified level. When using CO_2 control, a minimum ventilation rate is maintained at all times to control non-occupant contaminants like off-gassing from furniture, equipment and building components. Without it, as a baseline, the ventilation system would run constantly.

Building Commissioning and Retro-Commissioning. Commissioning ensures that energy-using systems that have been installed are operating in an optimal fashion in order to maximize energy efficiency. The commissioning process can be applied to existing buildings to restore them to optimal performance. Retro-commissioning is a systematic, documented process that identifies low-cost operational and maintenance improvements in existing buildings and brings the buildings up to the design intentions of its current operation.[27,28] The baseline measure is no commissioning. The cost for this measure is derived by taking the cost of the initial commissioning for the first year and then taking a 40% commissioning cost in each year for the life of the measure (10 years). It is feasible to only perform retro-commissioning every three years. If this step is performed the total cost of the measure would go down, which would make the measure more cost effective than shown in this study. This change could potentially make the measure pass a cost effectiveness screen and would raise the total estimate for the total economic potential.

Centrifugal Chiller – Variable Speed Drive (VSD) Remodel for Existing. The VSD controls the rotational speed of the chiller compressor to match the output capacity with the part load cooling demand while maintaining full load efficiency. Baseline for this measure is a constant speed compressor motor with inlet vane control.

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[26] LEED qualified Justice Center reported by DCJ.com and Minnesota Power Incentive Program

[27] http://www.green.ca.gov/CommissioningGuidelines/default.htm

[28] http://cbs.lbl.gov/BPA/cct.html

Chilled Water Piping Loop with Variable Speed Drive (VSD) Control. A VSD controller, with two-way valves at the cooling coils, controls the chilled water pump to vary pump speed and chilled water flow to match the varying cooling load, thus reducing pumping energy requirements. The baseline is a constant speed pump with three-way valves.

Chilled Water Reset. Varies the temperature of the chilled water in a loop, allowing for an increase of water temperature as the cooling requirement decreases. The baseline measure is no chilled water reset.

Chiller – Water Cooled/Screw (Advanced, High Efficiency, Premium Efficiency). Screw compressors are positive displacement devices. The refrigerant chamber is actively compressed to a smaller volume by the twisting motion of two interlocking, rotating screws. Refrigerant trapped in the space enclosed between the two rotating screws is compressed as it makes its way from the inlet to the outlet of the compressor. A slide valve is used to adjust the compression effect by varying the amount of compression that occurs before the refrigerant is discharged. Screw chillers are generally used for small- to medium-sized buildings. This unit uses water to cool the refrigerant.

Table:Screw Chiller kW/ton Comparison

Measure kW/ton	Baseline kW/ton
0.461	0.634 (state code replacement)
0.507	0.634 (state code replacement)
0.574	0.634 (state code replacement)

Chiller Water-Side Economizer. Consists of a heat exchanger attached to a condenser water piping loop that operates when outdoor conditions can produce condenser water colder than the mixed air temperature. A water side economizer is used if an outdoor-air economizer is not practical. The baseline measure is no economizer.

Cooling Tower – Decrease Approach Temperature. An oversized cooling tower allows a reduced approach temperature, which saves energy. The approach temperature is the difference between the tower water leaving and the wet-bulb temperature. This measure assumes a 6 degree delta compared to the baseline of a 10 degree temperature delta.

Cooling Tower – Two-Speed Fan Motor. A two-speed fan cycles between off, low, and high speed to maintain the tower set point. The low-speed setting option uses less energy than a single, high speed fan. The baseline measure is a single-speed fan motor.

Cooling Tower – VSD Fan Control. One step more sophisticated than the two-speed fan motor is the variable speed drive (VSD). A VSD drive modulates the air flow so that the heat rejection exactly matches the load at the desired set point. The baseline measure is a single-speed fan motor.

Cold Climate Heat Pump. Cold-climate heat pumps are air-to-air heat pumps that have been optimized for colder climates. The performance of these heat pumps is expected to be approximately the same as ground-source heat pumps (GSHP).

Cooling DX Package Air-Side Economizer. An air-side economizer uses already cooled air (return air) mixed with a proportion of outside air to cool indoor spaces. Using the return air results in energy savings, as less air needs to be cooled.

Direct Expansion (DX) Packaged Air Conditioner System (Advanced, High & Premium Efficiency. Direct Expansion (DX) system use a refrigerant piping circuit, compressor, and refrigerant coils to transfer heat. All components are in a single package typically installed on the building roof. As a measurement of efficiency, commercial sized units are normally rated as Energy Efficient Ratio (EER). Table displays the different models compared in this measure.

Table:DX AC Unit EER Comparisons

Measure EER	Baseline EER
11.5	11.2 (state code)
12.0	11.2 (state code)
12.5	11.2 (state code)

Direct/Indirect Evaporative Cooling, Pre-Cooling. A direct evaporative cooler is a low-energy system that evaporates water into the air stream, thus reducing the temperature of the air, but increasing the humidity. An indirect evaporative cooler uses a secondary air stream that is cooled by water and goes through a heat exchanger with the primary air stream, cooling the air but not affecting the humidity. A direct/indirect system cools the air stream first through an indirect cooler, and then cools it further through a direct cooler. Including an evaporative cooler before the DX system will reduce the overall cooling load.

Direct Digital Control System – Install. Direct digitally controlled (DDC) systems allow for both HVAC and lighting to be controlled and monitored using an electronic or digital system. For lighting, replacing the manually operated wall switches with a digital interface allows for direct control of lights at a remote location at anytime. For HVAC, the entire system, including pumps, motors, fans, and set points, can be digitally programmed for each unit to further increase tighter control of the system.

Direct Digital Control System – ***Optimization***. Allows for digital monitoring and control of HVAC and lighting systems. The optimization of the control system is upgrading a high-efficiency energy management system to a premium efficiency system.

Direct Digital Control System – Wireless Performance Monitoring. These are second-generation building automation systems that allow for wireless optimization and operation of building systems such as HVAC through computerized monitoring and control software and interfaces.

Duct Repair and Sealing. The repair and sealing of leaky ducts creates significant energy savings by ensuring conditioned air only goes to occupied spaces, thereby reducing an excessive runtime/load on the HVAC system.

Duct-Less Heat Pumps. Duct-less systems combine the flexibility of room heat pumps with the whole building heating and cooling of central systems. By piping refrigerant to individual coils within air handlers mounted throughout a building (rather than a single centralized refrigerant coil/air handler and ductwork). System energy losses are reduced because distribution takes place through insulated refrigeration lines rather than ductwork.

Exhaust Air to Ventilation Air Heat Recovery. Captures air that is exhausted out of a building during the heating season, which is warmer than the air outside. Transferring this heat to the incoming air lowers the overall heating load.

Exhaust Hood Makeup Air. Provides exhaust air at the hood instead of allowing the hood to exhaust the conditioned air in the room. The baseline measure is for conditioned air to be expelled through exhaust hoods.

Green Roof. A green roof is a living roof that supports soil and plant growth. A series of carefully engineered layers are applied to the roof deck. These layers are watertight, lightweight, and long lasting. Green roofs can be incorporated into new buildings as long as load requirements are met. They are suited for roofs that have slopes ranging up to 20° and are most successful when sufficient attention has been paid to selecting plants that will thrive in the local climate and conditions. One of the most significant advantages is that a green roof can last up to three times longer than a standard roof. A green roof can also buffer temperature extremes, which improves a building's energy performance by dropping the temperatures on the roof 3° – 7°, resulting in approximately 10 to 12% reduction in cooling loads.

Heat Pump – Ground Source. Geothermal or ground source heat pumps (GSHP) utilize the constant temperature of the earth as the exchange medium instead of the outside air temperature that is used by Air Source Heat Pumps (ASHP). This allows higher efficiencies on the coldest nights, compared to air-source heat pumps.[29] Table shows the measure and baseline energy efficiency requirements.

Table: Ground Source Heat Pump Efficiency Requirements

Measure Efficiency – GSHP	Baseline Efficiency – ASHP
COP=3.1, EER=13.4 COP=4.0, EER=20	COP=3.2, EER=10.1

Heat Pump – Water Source (closed loop). Groundwater source heat pumps use natural wells or man-made lakes as heat sources or sinks. A closed recirculating loop of refrigerant is immersed in the groundwater where it exchanges heat with the body of groundwater. The fluid is then pumped into the building to provide heating or cooling.

Hotel Key Card Energy Control System. This is a key card system used to control room HVAC and lighting during non-occupied periods. Occupancy is determined by the presence of a key card and/or additional sensors. The central system sets heating and cooling to a minimum, and turns off lighting when the key card is removed. Once the guest returns and inserts the key card, the guest has full control of the room systems.

Infiltration Control (Caulking, Weather Stripping, etc.). Sealing air leaks in windows, doors, roof, crawlspaces, and outside walls decreases overall heating and cooling losses. Baseline and measure values are presented in Table.

Table: Infiltration Reduction Measures

Measure (ACH)	Baseline (ACH)
0.65	1.00

Insulation – Floor (Non-Slab). These measures represent an increase in R-value to current code levels of R-19 for the floor space (non-slab) and better. Baseline and measure values are presented in Table.

Table:Floor Insulation Measures

Measure	Baseline
R-10	R-0
R-19	R-10

[29] Description source: EERE

Insulation – Ceiling. These measures represent an increase in R-value to current code values of R-21 or better. Baseline and measure values are presented in Table.

Table:Ceiling Insulation Measures

Measure	Baseline
R-20	R-0
R-20	Existing ceiling insulation
R-38	R-20

Insulation – Duct. Packaged Direct Expansion (DX) and heat-pump equipment are generally coupled with a ducting system inside the building. Insulating the ducts reduces energy loss in the unoccupied plenum space. This measure assumes that R-5 or R-8 insulation will be installed, or R-5 insulation will be replaced with R-8.

Insulation – Wall. Wall insulation installed with a current code R-value of R-13 + R-7.5 or better. Baseline and measure values are presented in Table.

Table:Wall Insulation Measures

Measure	Baseline
R-13 + R-7.5 (Code)	R-0
R-13 + R-7.5 (Code)	Existing wall insulation

Leak Proof Duct Fittings. A system of mechanically fastened fittings (couplings, boots, plenums, wyes) for flex and hard ducts that snap together to create a long-lasting seal.

Pipe Insulation. Adding R-6 insulation around the pipes decreases temperature losses, thereby reducing demand on water heaters and chilled water systems.

Sensible and Total Heat Recovery Devices. Sensible heat recovery devices transfer energy (heat) from the return air stream back into the supply air stream, which avoids heat losses in exhausted air. This raises the incoming outdoor air temperature in the winter and cools it in the summer. Energy savings results from reduced needs for mechanical heating or cooling. Total heat devices, also called enthalpy recovery, transfer both sensible and latent heat. Latent heat significantly raises the humidity of the outdoor air in the winter and reduces it in the summer. Dehumidification in the summer can be costly and total recovery devices help reduce this.[30]

Thermostat – Programmable. A programmable thermostat controls the set point temperature automatically, ensuring the HVAC system is not running during low-occupancy hours.

Turbocor Compressor. A totally oil-free compressor that incorporates leading edge thermodynamic and electronic technologies with magnetic bearing systems to achieve significantly higher efficiencies than compressors in a similar capacity range.

[30] http://www.mcquay.com/mcquaybiz/marketing_tools/mt_corporate/EngNews/0701.pdf

Windows – ***High-Efficiency***. This measure represents an increase in building performance by reducing the U-value in existing construction and new construction windows, as shown in Table.

Table:High-efficiency Window Measures

Measure U-Value	Baseline U-Value
0.45 (Code)	0.65
0.35	0.45 (Code)

Lighting

HE Lighting Fixtures/Design. This measure is a generic way to indicate improved lighting efficiency for florescent fixtures. The baseline lighting technology is representative of all available technologies that make up the total Watts per square foot for that particular building type. This includes all overhead lighting such as T12, T8, T5 tubes, etc. The lighting reduction package measures reduce the lighting power density (W/sqft) by installing higher efficiency technologies such as high performance T8 or T5 tubes, high-efficiency ballasts, reflective lighting fixtures, etc. A low reduction package results in a 15% decrease in power density and high reduction results in a 25% decrease in lighting power density. Lighting reduction packages such as T5HO (High Output) for high bay applications, in warehouse and grocery, can reduce the power density by 35%.

Florescent Refrigerated Walk-in Light Fixture: Replacing standard 60 to 100 watt incandescent bulbd with a high efficiency 28 or 32 watt T8 light fixture.

Lighting Improvements **(CFL and High Bay).** Replace lamps or fixtures with more efficient lighting. CFL measures include: hard-wired 2-lamp CFL fixtures and single lamp 15, 21 watt CFLs. The baseline consisted of 60 watt incandescent lamps and fixtures. High Bay measures include: 4-lamp T-5 HO (High Output), 6-lamp T-5 HO (High Output), 6-lamp 4 foot T-8 32 watt lamp, and 2-lamp 8 foot T-8 HO 86 watt lamp, ceramic metal halide, induction high bay. The baseline consisted of 400 or 250 watt HID (High Intensity Discharge) metal halide lamps.

Lighting Linear Fluorescent Improvements (Premium Efficiency T8, T5 HO,): *Linear fluorescent lighting measures that achieve energy savings by replacing standard T12 linear florescent lamps.*

Light-Emitting Diodes (LED) - Lamps, street Lighting, Exit Signs & Retrofit Tubes. LED fixtures use a fraction of the wattage that incandescent and compact fluorescent (CFL) signs use while lasting over 50,000 hours. The baseline measure is incandescent and CFL signs, or 32 W T8 lamps for retrofit tubes.

LED Refrigeration Case Lights & Occupancy Sensor. Light-emitting diodes (LEDs) are highly efficient bulbs that can be used for refrigeration case lights, a 55% energy savings over a standard 60 W fluorescent refrigeration case light. The occupancy sensor will turn the LED lights off when no movement (people) are sensed, thus saving energy.

Low Power Ballast Replacement. Typically conducted in combination with lamp replacement to a 32watt T8. Replacing the lighting ballasts to a more efficient electronic ballasts, savings energy.

Lighting Controls. Turns off and/or reduces lumen output in lighting in areas where activity is not detected. Measures include occupancy sensor, photocell dimming control, central lighting control system, and dusk to dawn timing control.

Photoluminescent Exit Sign. Exit sign that glows in the dark and does not require the need of electricity to replace. Baseline is incandescent sign.

Street Lighting (Induction & LED). Efficient lighting technology replacing HID lamps.

Motors

Air Compressor Improvements & Optimization. Improvements made to air compressor maintenance practices, retrofit & replacement with higher efficiency equipment, and/or improvements by optimizing system design.

Exhaust Hood Demand Controlled Ventilation. Ventilation controllers vary the speed of ventilation fans to meet immediate needs of a facility. Ventilation controllers ensure proper ventilation and temperature control, while minimizing run times of ventilation fans.

Motor Improvements Bundle (Industrial Model). Improvements to motors not specific to fans or pumps. This would include using higher efficiency motors, improved rewind practices and correct motor sizing. In the mining industry, this would also include milling technique improvements.

Motor Retro-Commissioning. Motor commissioning ensures that motor systems that have been installed are operating in an optimal fashion in order to maximize energy efficiency. The commissioning process can be applied to existing buildings to restore them to optimal performance. Retro-commissioning is a systematic, documented process that identifies low-cost operational and maintenance improvements in existing buildings and brings the buildings up to the design intentions of its current operation. The baseline measure is no commissioning.

Variable Speed Drives on Process Equipment. Controls the rotational speed of a piece of motor-driven equipment, through adjusting the frequency of the voltage applied to the motor. Baseline for this measure is a constant speed fan motor.

Other

Energy Efficient (EE) Transformers. Energy efficient transformers that provide improved power quality while minimizing losses.

Plug Load

Energy Star Office Equipment. Generic set of office equipment upgrades from standard to Energy Star. Equipment includes copiers, fax machines, monitors, printers, scanners, etc.

Clothes Washer. Several Modified Energy Factor (MEF) models were compared in this measure, as shown in Table

Table:Clothes Washer Modified Energy Factor Comparisons

Measure MEF	Baseline MEF
1.83 ENERGY STAR	1.66 (Existing average)
2.07	1.66
2.32	1.66

Dishwasher. Due to the large implementation of ENERGY STAR dishwashers, this measure compares a high efficiency dishwasher (EF = 0.77) to the baseline of an ENERGY STAR dishwasher (EF = 0.65).

Low Temperature Dish(washer) Machine. Unlike a traditional dishwasher which heats tap water to 180 degrees farenheit to kill germs and remove grease, low temperature dishwashers use a chemical bath to sanitize dishes without increasing the temperature of the tap water.

PC Network Power Management. On an individual basis, the energy wasted by a computer that remains in the full-power "on" state no matter how long it remains idle is almost insignificant. But for a corporation with hundreds or thousands of workstations operating on a local area network (LAN) or a wide area network (WAN), that wasted energy can be quite significant, easily translating to tens of thousands of dollars in unnecessary electricity expenditures each year. The energy-savings potential of implementing a PC power-management policy across a LAN will vary depending on the equipment attached to the network and how that equipment is being used.

80 Plus PC Desktop. Applies to the 80 PLUS performance specification requirements for power supplies in computers and servers. 80 PLUS specifies 80% or greater efficiency at 20%, 50% and 100% of rated load with a true power factor of 0.9 or greater.[31]

Occupancy Sensor/Smart Strip. Energy-saving products such as power strips with an occupancy sensor are found in workstations where power strips are commonly used. The sensor will turn on and off the power to all devices such as computers, desk lights, and audio equipment that are plugged into the power strip based on occupancy within the work area.

Residential-Size Refrigerator/Freezer. ENERGY STAR® residential grade refrigerators use at least 10% less energy than required by current federal standards and 40% less energy than conventional models sold in 2001.

Server Virtualization. Virtualization involves the replacement of multiple under-utilized servers with one server operating at a higher level of utility. Many data center servers operate at 10% of capacity or less, allowing their functions to be consolidated into "virtual" servers on one unit that will operate in the range of 85% of capacity. This measure applies to plug load, although it has a savings effect on the cooling load by reducing power and, therefore, the heat generated by equipment.

Vending Machines Upgrades. ENERGY STAR® new and rebuilt refrigerated beverage vending machines are up to 40% more energy efficient than the standard model, through more efficient compressors, fan motors, lighting systems, and low-power mode options during non-use periods.[32]

Vending Miser (Machine Control, Snack Control, Cold Product Control). Senses occupancy and cycles off the cooling of the vending machine when no occupancy is detected.

Water Coolers. ENERGY STAR® coolers providing only cold water consume less than 0.16 kWh per day; a unit providing both hot and cold water consumes less than 1.20 kWh per day.[33]

Refrigeration

Anti-Sweat Controls – Cooler/Freezer. Enables the user to turn refrigeration display case anti-sweat heaters off when ambient relative humidity is low enough that sweating will not occur. Without the control, the heaters generally run continuously.

Commercial Reach-in Refrigerators (Reach-in Cooler/Freezer, PSC/Shaded Pole to ESM Evaporator Fan). ENERGY STAR labeled commercial solid door refrigerators and freezers are designed with high efficiency components such as ECM evaporator and condenser fan motors, hot gas anti-sweat heaters, or high-efficiency compressors. Compared to

[31] www.80PLUS.org
[32] ENERGY STAR
[33] http://www.energystar.gov/index.cfm?c=water_coolers.pr_water_coolers

standard models with standard motors, ENERGY STAR labeled commercial solid door refrigerators and freezers save energy.[34]

Compressor VSD/Retrofit. Modulates motor speed in response to changes in load. When low-load conditions exist, the current to the compressor motor is decreased, slowing the compressor motor down. Baseline is a constant-speed compressor.

Demand Defrost – Hot Gas/Electric. When frost collects on the evaporator, it reduces coil capacity by acting as a layer of insulation and reducing the airflow between the fins. In demand defrost, refrigerant vapor from either the compressor discharge or the high pressure receiver is used to warm the evaporator coil and melt the frost that has collected there.[35]

Efficient, Low Temp Reach-In. Refrigerated display cases achieve a higher performance efficiency and reduce overall energy consumption by incorporating hot gas defrost, anti-sweat controls, high performance evaporative fans, defrost control, improved insulation and liquid suction heat exchangers.[36]

Floating Head Pressure Controls. Allow more heat to be rejected through the condenser at low outside air temperatures, thereby increasing the compressor efficiency.

High Efficiency Ice Makers (Self Contained). High efficiency commercial ice makers use high efficiency compressors and fan motors, thicker insulation, and other measures to achieve 15% more efficiency than the baseline measure, which is a conventional automatic commercial ice maker.[37]

Efficient Compressor Motors (ECM) - Scroll. The case fan is one of the components of the refrigeration system. ECM are smaller variable speed motors that operate from a single-phase power source with an electronic controller mounted in or on the motor. The baseline measure is a High-Efficiency Case Fan Motor.

Refrigeration Commissioning. Commissioning ensures that refrigeration systems that have been installed are operating in an optimal fashion in order to maximize energy efficiency. Retro-commissioning is checking previously commissioned equipment to ensure that it is continuing to run efficiently. The baseline measure is no commissioning.[38] The cost for this measure is derived by taking the cost of the initial commissioning for the first year and then on a yearly basis taking a 40% commissioning cost in each year for the life of the measure (10 years). It is feasible to only perform retro-commissioning every three years and will still only involve 40% of the initial cost for commissioning. If this step is performed, the total cost of the measure would go down making the measure cost effective than it is shown in this study.

Refrigerator eCube. Refrigerator units usually monitor circulating air temperatures to determine when to switch on and off. However, when the refrigerator door is opened, the circulating air temperature increases more rapidly than the food temperature, which causes the equipment to work harder than necessary to maintain food at the set point. Instead of measuring air temperature, the eCube, a device used to simulate the heat transfer characteristics of food, allows the refrigerator to monitor the more stable food temperature, resulting in less frequent cycling of the compressor.

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34 ENERGY STAR
35 Parker Refrigeration Specialists
36 OakRidge National Laboratory for the US DOE-1996
37 Consortium for Energy Efficiency (CEE)
38 http://cbs.lbl.gov/BPA/cct.html

High R-Value Glass doors/ No-Heat Glass Doors. "Low-E," double pane thermal glass doors reduce cooling loses in refrigerated reach-in cases.

Strip Curtains for Walk-Ins. Strip curtains on walk-in refrigerators reduce the infiltration of warm air into the refrigerated space by improving the barrier between the cold space and the ambient air.

Vertical Night Covers (for Display Cases). Night covers help to eliminate wasted refrigeration cooling by insulating display cases. In addition, they reduce the heating load of buildings through less escaped refrigerated air needing to be reheated.

VFD on Cooling Tower Fans. One step more sophisticated than the two-speed fan motor is the variable frequency drive (VFD). A VFD drive modulates the air flow so that the heat rejection exactly matches the load at the desired set point. The baseline measure is a single-speed fan motor.

Quick Acting Freezer Doors. Doors designed to close more quickly than standard freezer doors, thus lower cooling loos in the freezer system.

Walk-in Coolers/Freezers (Walk-in Cooler/Freezer, PSC/Shaded Pole to ESM Evaporator Fan). ENERGY STAR labeled commercial solid door refrigerators and freezers are designed with high efficiency components such as ECM evaporator and condenser fan motors, hot gas anti-sweat heaters, or high-efficiency compressors. Compared to standard models with standard motors, ENERGY STAR labeled commercial solid door refrigerators and freezers save energy.[39]

Water Heating

Clothes Washer Commercial (Coin-Op Washer). ENERGY STAR® qualified commercial washers have more capacity than conventional top-load models with an agitator. Some front-loaders can wash over 20 pounds of laundry at once, compared to 10–15 pounds for a standard top-loader. This means residents can do fewer loads and avoid having to bring big, bulky items to the laundromat.[40]

Drain Water Heat Recovery (Power-Pipe) – Heat Recovery Water Heater. Drain water heat recovery devices recover heat energy from drain water and are used to pre-heat cold water entering the hot water tank. This minimizes the temperature difference between the heating set point and the entering water temperature.[41]

Faucet Aerators. Faucet aerators, by mixing water and air, reduce the amount of water that flows through the faucet. The faucet aerator creates a fine water spray through an inserted screen in the faucet head. Flow rate requirements for this measure are presented in Table.

Table: Faucet Aerator Flow Rates

Measure Flow Rate	Baseline Flow Rate (GPM)
1.5	2.5
2.5	4.0

* Gallons per minute

[39] ENERGY STAR

[40] http://www.energystar.gov/index.cfm?c=clotheswash.pr_clothes_washers_comm

[41] www.toolbase.org/Techinventory/TechDetails.aspx?ContentDetailID=858&BucketID=6&CategoryID=9

Heat Pump Water Heater. The water heating heat pump moves heat from a warm reservoir (such as air) and transfers this heat into the hot water system.[42]

High Efficiency Water Heater (Electric). High efficiency water heaters are more efficient than standard electric water heaters due to reduced standby losses. This measure assumes an energy factor (EF) for the high efficiency water heaters of 0.93, an increase from the code minimum of 0.92.

Hot Water Supply Pipe Insulation. R-4 insulation added around hot water pipes decreases heat loss. Only for existing construction. The baseline measure is no insulation.

Low-Flow Showerheads. Low-flow showerheads mix water and air to reduce the amount of water that flows through the showerhead. The showerhead creates a fine water spray through an inserted screen in the showerhead. Flow rate requirements for this measure are presented in Table.

Table:Low-Flow Showerhead Flow Rates

Measure Flow Rate (GPM)	Baseline Flow Rate (GPM)
2.0	2.5
2.5	4.5

Solar Water Heating. A solar water heater is generally mounted on the roof of a building and is designed to use the sun indirectly to heat water through a heat exchanger, rather than electricity or gas. Note that this is a passive process, not one that involves photovoltaic cells.

Ultrasonic Faucet Control. Ultrasonic sensors automatically turn on and off faucet water when motion is detected at the sink. This eliminates the water running continuously while washing hands.

Water Heater Thermostat Setback. This measure generates savings by reducing the set point temperature from 130°F to 120°F.

[42] Description source: U.S. Department of Energy

E.3 Industrial Measure Descriptions

Fans

Circulating Fans: Circulating fans move ventilation air through buildings efficiently, ensuring adequate temperature control and ventilation. Fans meeting performance standards provide required ventilation efficiently, and use less energy than fans not meeting these performance standards

Fan System Improvements (Fan Equipment Upgrade, Fan System Optimization, Efficient Centrifugal Fan): Includes savings from equipment upgrades (e.g. using variable speed drives rather than single speed drives), and/or improved design of the fan system such as better fans, ducting, flow design and adjustments to system parameters.

Properly Sized Fans. This measure achieves energy savings through improved matching of fan size to system load. This eliminates over- and under-sized fans to allow the system to operate at its peak efficiency.

HVAC

***Air Source Heat Pump 65 to 135 kBTU/hr - High Efficiency & Premium Efficiency*:** Air Source Heat Pump 65 to 135 kBTU/hr - High Efficiency at 11.5 EER, 3.4 COP or Premium Efficiency at 12.0 EER, 3.8 COP replacing an Air Source Heat Pump 65 to 135 kBTU/hr - Standard Efficiency at 11.0 EER, 3.3 COP.

Chillers <150 tons (screw) - High Efficiency, Advanced Efficiency & Premium Efficiency: Chillers <150 tons (screw) - Advanced Efficiency at 0.58 kW/ton, Premium Efficiency at 0.63 kW/ton, or High Efficiency at 0.71 kW/ton (full load) replacing a standard chiller at 0.775 kW/ton (full load)

***DX Package 65 to 135 kBTU/hr - High Efficiency & Premium Efficiency*:** DX Package 65 to 135 kBTU/hr - High Efficiency at 11.5 EER or Premium Efficiency at 12.0 EER replacing a DX Package 65 to 135 kBTU/hr - Standard Efficiency - 11.2 EER

***Evaporative Cooler replaces DX Package 65 to 135 kBTU/hr - Advanced Efficiency*:** Evaporative Cooler replaces DX Package 65 to 135 kBTU/hr - Advanced Efficiency replacing a DX Package 65 to 135 kBTU/hr - Standard Efficiency - 11.2 EER

***Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBTU/hr - Advanced Efficiency*:** Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBTU/hr - Standard Efficiency replacing an Air Source Heat Pump 65 to 135 kBTU/hr - Standard Efficiency at 11.0 EER, 3.3 COP

Recommissioning/Facility Energy Management This measure achieves energy savings for HVAC systems through improved monitoring and verification of building systems. Measurements of operating parameters, analysis of systems, and performance monitoring all lead to energy and demand savings opportunities.

Lighting

Lighting High Bay Improvements (Metal Halide, Induction, Efficient Metal Halide, LED, Linear Florescent): *Lighting measures that achieve energy savings by replacing high pressure sodium bulbs.*

Lighting Linear Fluorescent Improvements (T8 Reduced Wattage, T8 High Performance, T8, T5): *Linear fluorescent lighting measures that achieve energy savings by replacing standard T12 linear florescent lamps.*

Lighting Screw Base Socket Improvements (EISA Compliant Incandescent, EISA Backstop Incandescent, CFL, LED): *Screw base lighting measures that achieve energy savings by replacing standard incandescent bulb.*

Motors

Motors Other: Efficiency measures which improve motor lubrication and mechanical energy recovery.

Motor Rewinds (Rewind 20-500+). This measure involves the rewinding to motors in a controlled environment to minimize or eliminate efficiency losses. Motor rewinds assume rewind techniques consistent with the Green Motors Practices Group™.

Switch From Belt Drive to Direct Drive. This measure improves efficiency through reduction of losses associated with belt drive systems.

Other

Building Improvements. Any improvements to the physical plant that result in improved efficiency, productivity, or equipment usage.

Transformers. Energy efficient transformers that provide improved power quality while minimizing losses.

Process (Air Compressor, Cooling, Heating, Refrigeration, Other)

Air Compressor Improvements (Demand Reduction, Optimization, Equipment Upgrade) – Process Air Compressor. These measures involve the overall improvement of the compressed air system including improved system design, leak repair, usage practices, more efficient dryer and storage systems, and compressor upgrades.

Clean Room Improvements (Change Filter Strategy, Chiller Optimize, HVAC) – Process Cooling. These measures aim to save energy through improved clean room equipment and practices. Savings are attributable to optimization of chiller operating parameters, upgrading to more efficient equipment, and improving filter replacement strategies.

Cold Storage Retrofit – Process Refrigeration. Upgrading mechanical equipment responsible for providing cooling to cold storage areas within each facility type. Retrofits may include compressors, heat rejection equipment, evaporators and fans, or other equipment resulting in greater system efficiency.

Cold Storage Tune-up – Process Refrigeration. Maintaining and enhancing equipment responsible for providing cooling to cold storage areas within each facility type. Tune-up may include refrigerant charge, equipment cleaning, general maintenance, and improved practices.

Electric Chip Fab Improvements (Eliminate Exhaust, Exhaust Injector, Reduce Gas Pressure, Solidstate Chiller) – Process Other. These general improvements increase efficiency in the electric chip fabrication process.

Equipment: Chillers (Process Cool): This measure involves upgrading of chilling systems that provide process cooling. Savings results from improved chiller efficiencies.

General Process Improvements (Paper: Premium Fan, Paper: Large Material Handling, Paper: Material Handling, Paper: Premium Control Large Material, Panel: Hydraulic Press, Paper: Efficient Pulp Screen, Kraft: Efficient Agitator, Kraft: Effluent Treatment System, Mechanical Pulp: Premium Process, Mechanical Pulp: Refine Plate Improvement, Wood: Replace Pneumatic Conveyor, Metal: New Arc Furnace, Material Handling, Material Handling VFD). Generic process improvements/O&M measures that include upgrading equipment, replacing hydraulic/pneumatic equipment with electrical equipment and using optimum size and capacity equipment.

High efficiency Compressor motors (Process Air Compressor). Upgrading air compressor motors to higher name plate efficiency values.

Low Pressure-drop Filters (Process Air Compressor). A type of coalescing filter designed to remove solids and aerosols from compressed air systems. These filters induce a lower pressure drop as compared to standard air filters, therefore requiring less fan energy to move air across them. These filters also have a longer useful life than standard filters.

Outside Air Intake (Process Air Compressor). Air compressor system design retrofit which pulls in air from a cooler outside environment (as opposed to the warmer room in which the air compressor is located). Cooler air is denser, thus increasing the mass flow rate of air into the compressor and improving system efficiency.

Process Heat O&M (Process Heating). Operation and maintenance practices for process heating equipment including equipment maintenance, using optimum size and capacity equipment, and developing best-practices guidelines.

Receiver Capacity Addition (Process Air Compressor). Adding receiver volume to a compressed air system allows the compressor to cycle less frequently, permits the system to operate at lower average pressure, and reduces average compressor power.

Refrigeration Improvements (Food: Cooling and Storage, Optimization of Operating Parameters) – Process Cooling: *Refrigeration improvements can include isolating hot equipment from refrigerated area, using highest allowable temperature for refrigerated space or modifying refrigeration system to operate at a lower pressure.*

Refrigerated Cycling Dryers (Process Air Compressor). When compressed air flow is less than full rated capacity, a cycling refrigerated dryer shuts off, thus using less energy than a non-cycling dryer (which runs continuously regardless of air flow).

VFD Controlled Compressor (Process Air Compressor). This measure improves energy efficiency of compressed air systems by modulating compressors to match facility demand for compressed air. Energy is saved by throttling compressors back during non-peak periods.

Zero Loss Condensate Drain (Process Air Compressor). Condensate drains are used to remove liquid water from compressed air systems. Zero loss drains allow condensate water to drain out of the system as needed without venting compressed air, thus improving system efficiency.

Pumps

Pump Equipment Upgrade. Efficient pumps achieve energy savings through improved pump design and sizing.

Pump System Optimization. This measure involves the overall optimization of the pump system including improved system design, enhanced flow design, better maintenance practices, and adjustments to system parameters.

Multiple End Uses

Facility Energy Management (Fans, Lighting, Motors, Other, Process, Pumps): Includes the synergistic savings opportunities of plant-wide energy management and improvements across multiple systems such as compressed air, pumping and fan systems. For the purposes of this study, facility energy management includes only operational and maintenance (non-equipment) measures.

High Efficiency Motors (Fans, Motors, Process Air Compressors, Pumps) . This measure involves upgrading motors to higher name plate efficiency values. Since NEMA Premium motors are becoming the baseline code requirement in 2010, this measure is based off of Super Premium motors. Super Premium motors have efficiency levels at least one efficiency band above NEMA Premium

Improved Controls (Fans, HVAC, Motors, Process –Air Compressors, Process-Cooling, Process Heat): These measures includes savings from equipment upgrades (such as variable speed drives) as well as energy improvements from enhanced monitoring, data collection, and load matching for each system.

Synchronous Belts (Fans, Motors, Process-Refrigeration, Pumps). Synchronous belts contain grooves that mate with corresponding grooves in the drive sprocket, preventing slip and thus reducing energy losses.

Irrigation Electric Measure Descriptions

High Efficiency Motors (Irrigation). This measure involves upgrading motors to higher name plate efficiency values. Since NEMA Premium motors are becoming the baseline code requirement in 2010, this measure is based off of Super Premium motors. Super Premium motors have efficiency levels at least one efficiency band above NEMA Premium.

Scientific Irrigation Scheduling. SIS allows irrigators to use a scientific approach to their irrigation practices including timing and volume.

System Improvements. These irrigation improvements include replacing worn equipment, fixing leaks, adopting low pressure irrigation system, and other general irrigation maintenance and upgrades.

Agriculture Measure Descriptions

Agricultural Engine Block Heater Timers: Block heaters are electrical heaters designed to keep tractors and other diesel engines warm, protecting them from freeze damage and to ease starting in cold weather. A block heater is only required for a few hours to sufficiently warm an engine block, but typically operate overnight. A block heater timer saves energy by reducing the number of hours the heater runs.

Automatic Milker Takeoffs: The automatic take-off system presets flow levels at which milking claws are removed, preventing over-milking and reducing run-times of vacuum systems.

Heat Lamp Setback (Microzone). This measure saves energy by automatically adjusting power to heat lamps compensating for fluctuations in room temperature. Lamp life is also extended due to reduced usage. One additional benefit results from power being restored slowly after a power outage, reducing peak demand on the power utility or a backup generator.

Heat Lamp/Heating Pad Controller. This measure allows producers to adjust the heat output of bulbs or pads. By applying only the minimum power needed, energy waste is reduced and equipment life extended.

Heat Lamps. This measure provides radiant heat, warming pigs, chicks, lambs, or calves. Changing to lower wattage, higher-efficiency heat lamps helps save electricity.

Heat Reclaimer. Hot water is used to clean milk pipes and sanitize work areas. A heat reclaimer takes waste heat from the milk refrigeration process, using it to preheat water to reduce heating loads on primary water heaters.

High-Efficiency Ventilation System. These ventilation systems ensure adequate temperature controls and ventilation for livestock by bringing in or exhausting air to facilities. Fans meeting performance standards provide the required ventilation efficiently, using less energy than fans not meeting these performance standards.

Livestock Waterers. Energy-efficient livestock waterers have 2 inches or more of insulation, completely surrounding the inside of the waterer, and an adjustable thermostat.

Milk Precooler. Milk coming from an automatic milker must be cooled to help preserve it, and to prepare it for processing and shipment. The milk pre-cooler is a heat exchanger using well water to begin cooling the milk before it enters the bulk cooling tank. Precooling lowers the load on the refrigeration system, and is more efficient. The additional pump energy is more than offset by reductions in compressor energy consumption.

Programmable Ventilation Controller. Programmable ventilation controllers vary the speed of ventilation fans to meet immediate needs of a facility. Ventilation controllers ensure proper ventilation and temperature control, while minimizing run times of ventilation fans.

VFDs – Potato/Onion Shed. These measures improve energy efficiency by matching energy used by pumps and fans with required loads. Energy is saved when systems operate at a partial load, and full pump/fan capacity is not needed.

VFDs for Dairy Vacuum Pumps. These measures improve energy efficiency by matching energy used by pumps and fans with required loads. Energy is saved when systems operate at a partial load, and full pump/fan capacity is not needed.

Appendix F. Measure Details & Cost Effectiveness Summary

This appendix presents the key inputs and outputs for every measure analyzed in the potentials assessment, by sector. The fields included are:

- Segment/Industry: Sector building type and/or industry the measure is applied to (e.g. single family, retail).
- End Use: Equipment end use within the building the measure is applied to (e.g. lighting, space cooling, etc.)
- Vintage – Defines the construction vintage (new, turnover, early or existing) that the measure is applied to. Measures may be applicable to only one vintage or to both.[43]
- Measure Name – The general name of the measure being anzlyzed
- Measure Description – Brief description of the measure (characteristics, efficiency level, etc.)
- Baseline Description – As appropriate, the assumed baseline condition that savings are calculated from. Depending on the measure and application, this may represent average existing conditions or current codes or standards
- Life – The expected useful life (EUL) of the measure, measured in years.
- Incremental Cost – The full or incremental cost (depending on application) of installing the measure. This cost includes labor, where appropriate.[44]
- $/kWh Saved – Incremental cost of installing a measure divided by energy savings (kWh).
- Energy Savings (kWh) – The calculated incremental energy savings (kWh) of the efficient case over the baseline condition of the measure.
- Savings as % (of End Use) – The percent of the baseline end use consumption that can be saved by installing the measure.
- Summer Peak Savings at Meter (kW) – Calculated summer peak savings (kW) of each measure given MDU's load profile for each end use type.
- RIM Benefit-Cost Ratio – The measure's benefit-to-cost ratio based on the Ratepayer Impact Ratio.
- PAC Benefit-Cost Ratio – The measure's benefit-to-cost ratio based on the Program Administrator Cost Ratio.
- TRC Benefit-Cost Ratio – The measure's benefit-to-cost ratio based on the Total Resource Cost Test. A measure with a TRC of greater than 1.0 is considered to be cost-effective. The TRC test was used as the proxy to determine percentage of measures passing cost-effectiveness.

[43] Not applicable in the industrial sector.

[44] Indstrial costs in terms of cost per first-year kWh saved. These estimates are then applied to industry-wide savings to calculate levelized costs.

F.1 Residential Measures

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Manufactured	Central_AC	Existing	Air Conditioner - Central (2.5 ton unit)	SEER 14	15	$231.55	$5.35	43	7.1%	0.012	0.23	0.28	0.14
Manufactured	Central_AC	Existing	Air Conditioner - Central (2.5 ton unit)	SEER 16	15	$694.65	$6.11	114	18.8%	0.030	0.20	0.25	0.12
Manufactured	Central_AC	Existing	Air Conditioner - Central (2.5 ton unit)	SEER 18	15	$1,157.73	$6.87	168	27.8%	0.045	0.18	0.22	0.11
Manufactured	Central_AC	New	Air Conditioner - Central (2.5 ton unit)	SEER 14	15	$231.55	$5.35	43	7.1%	0.012	0.23	0.28	0.14
Manufactured	Central_AC	New	Air Conditioner - Central (2.5 ton unit)	SEER 16	15	$694.65	$6.11	114	18.8%	0.030	0.20	0.25	0.12
Manufactured	Central_AC	New	Air Conditioner - Central (2.5 ton unit)	SEER 18	15	$1,157.73	$6.87	168	27.8%	0.045	0.18	0.22	0.11
Multi_Family	Central_AC	Existing	Air Conditioner - Central (2.5 ton unit)	SEER 14	15	$231.55	$4.23	55	7.1%	0.015	0.27	0.35	0.18
Multi_Family	Central_AC	Existing	Air Conditioner - Central (2.5 ton unit)	SEER 16	15	$694.65	$4.84	144	18.8%	0.038	0.24	0.31	0.16
Multi_Family	Central_AC	Existing	Air Conditioner - Central (2.5 ton unit)	SEER 18	15	$1,157.73	$5.44	213	27.8%	0.057	0.22	0.28	0.14
Multi_Family	Central_AC	New	Air Conditioner - Central (2.5 ton unit)	SEER 14	15	$231.55	$4.23	55	7.1%	0.015	0.27	0.35	0.18
Multi_Family	Central_AC	New	Air Conditioner - Central (2.5 ton unit)	SEER 16	15	$694.65	$4.84	144	18.8%	0.038	0.24	0.31	0.16
Multi_Family	Central_AC	New	Air Conditioner - Central (2.5 ton unit)	SEER 18	15	$1,157.73	$5.44	213	27.8%	0.057	0.22	0.28	0.14
Single_Family	Central_AC	Existing	Air Conditioner - Central (3.0 ton unit)	SEER 14	15	$277.86	$4.77	58	7.1%	0.016	0.25	0.32	0.16

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Central_AC	Existing	Air Conditioner - Central (3.0 ton unit)	SEER 16	15	$833.58	$5.45	153	18.8%	0.041	0.22	0.28	0.14
Single_Family	Central_AC	Existing	Air Conditioner - Central (3.0 ton unit)	SEER 18	15	$1,389.27	$6.13	227	27.8%	0.061	0.20	0.25	0.12
Single_Family	Central_AC	New	Air Conditioner - Central (3.0 ton unit)	SEER 14	15	$277.86	$4.77	58	7.1%	0.016	0.25	0.32	0.16
Single_Family	Central_AC	New	Air Conditioner - Central (3.0 ton unit)	SEER 16	15	$833.58	$5.45	153	18.8%	0.041	0.22	0.28	0.14
Single_Family	Central_AC	New	Air Conditioner - Central (3.0 ton unit)	SEER 18	15	$1,389.27	$6.13	227	27.8%	0.061	0.20	0.25	0.12
Manufactured	Central_AC	Existing	Air-to-Air Heat Exchangers	Air-to-Air Heat Exchangers	15	$902.70	$9.42	96	10.0%	0.026	0.14	0.16	0.08
Manufactured	Central_AC	New	Air-to-Air Heat Exchangers	Air-to-Air Heat Exchangers	15	$902.70	$17.19	52	10.0%	0.014	0.08	0.09	0.04
Multi_Family	Central_AC	Existing	Air-to-Air Heat Exchangers	Air-to-Air Heat Exchangers	15	$902.70	$10.77	84	10.0%	0.022	0.13	0.14	0.07
Multi_Family	Central_AC	New	Air-to-Air Heat Exchangers	Air-to-Air Heat Exchangers	15	$902.70	$13.61	66	10.0%	0.018	0.10	0.11	0.06
Single_Family	Central_AC	Existing	Air-to-Air Heat Exchangers	Air-to-Air Heat Exchangers	15	$902.70	$10.12	89	10.0%	0.024	0.13	0.15	0.08
Single_Family	Central_AC	New	Air-to-Air Heat Exchangers	Air-to-Air Heat Exchangers	15	$902.70	$12.79	71	10.0%	0.019	0.11	0.12	0.06
Manufactured	Central_AC	Existing	Blinds - Fixed Angle/Automatic	Install Blinds (Reduce Window SHGC by 50%)	10	$559.03	$1.41	395	41.3%	0.106	0.44	0.75	0.39
Manufactured	Central_AC	New	Blinds - Fixed Angle/Automatic	Install Blinds (Reduce Window SHGC by 50%)	10	$559.03	$2.58	217	41.3%	0.058	0.30	0.43	0.22
Multi_Family	Central_AC	Existing	Blinds - Fixed Angle/Automatic	Install Blinds (Reduce Window SHGC by 50%)	10	$559.03	$1.62	346	41.3%	0.093	0.41	0.66	0.34

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Central_AC	New	Blinds - Fixed Angle/Automatic	Install Blinds (Reduce Window SHGC by 50%)	10	$559.03	$2.04	274	41.3%	0.073	0.35	0.53	0.27
Single_Family	Central_AC	Existing	Blinds - Fixed Angle/Automatic	Install Blinds (Reduce Window SHGC by 50%)	10	$559.03	$1.52	368	41.3%	0.099	0.42	0.70	0.36
Single_Family	Central_AC	New	Blinds - Fixed Angle/Automatic	Install Blinds (Reduce Window SHGC by 50%)	10	$559.03	$1.92	291	41.3%	0.078	0.37	0.56	0.29
Manufactured	Central_AC	Existing	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$144.38	$4.64	31	3.3%	0.008	0.35	0.48	0.24
Manufactured	Central_AC	New	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$144.38	$8.46	17	3.3%	0.005	0.22	0.27	0.13
Multi_Family	Central_AC	Existing	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$36.10	$1.32	27	3.3%	0.007	0.71	1.59	0.83
Multi_Family	Central_AC	New	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$36.10	$1.67	22	3.3%	0.006	0.64	1.28	0.66
Single_Family	Central_AC	Existing	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$144.38	$4.98	29	3.3%	0.008	0.33	0.45	0.23
Single_Family	Central_AC	New	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$144.38	$6.29	23	3.3%	0.006	0.28	0.36	0.18
Manufactured	Central_AC	Existing	Ceiling Fan	Ceiling Fan	10	$92.28	$29.99	3	0.3%	0.001	0.04	0.04	0.02
Manufactured	Central_AC	New	Ceiling Fan	Ceiling Fan	10	$92.28	$54.72	2	0.3%	0.000	0.02	0.02	0.01
Multi_Family	Central_AC	Existing	Ceiling Fan	Ceiling Fan	10	$92.28	$34.27	3	0.3%	0.001	0.03	0.03	0.02
Multi_Family	Central_AC	New	Ceiling Fan	Ceiling Fan	10	$92.28	$43.31	2	0.3%	0.001	0.03	0.03	0.01
Single_Family	Central_AC	Existing	Ceiling Fan	Ceiling Fan	10	$92.28	$32.20	3	0.3%	0.001	0.03	0.04	0.02

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Central_AC	New	Ceiling Fan	Ceiling Fan	10	$92.28	$40.84	2	0.3%	0.001	0.03	0.03	0.01
Manufactured	Central_AC	New	Construction - ICF	Concrete Framing	30	$6,616.02	$39.38	168	32.0%	0.045	0.06	0.06	0.03
Multi_Family	Central_AC	New	Construction - ICF	Concrete Framing	30	$2,772.50	$13.06	212	32.0%	0.057	0.15	0.17	0.09
Single_Family	Central_AC	New	Construction - ICF	Concrete Framing	30	$11,147.05	$49.34	226	32.0%	0.060	0.04	0.05	0.02
Manufactured	Central_AC	New	Construction - SIP	Specialty Framing	30	$9,534.39	$129.73	73	14.0%	0.020	0.02	0.02	0.01
Multi_Family	Central_AC	New	Construction - SIP	Specialty Framing	30	$3,995.47	$43.02	93	14.0%	0.025	0.05	0.05	0.03
Single_Family	Central_AC	New	Construction - SIP	Specialty Framing	30	$16,243.32	$164.33	99	14.0%	0.026	0.01	0.01	0.01
Manufactured	Central_AC	Existing	Cool Roofs	Lighter Colored Shingles (White)	20	$64.66	$0.34	192	20.0%	0.051	0.90	4.09	2.31
Manufactured	Central_AC	New	Cool Roofs	Lighter Colored Shingles (White)	20	$86.92	$0.83	105	20.0%	0.028	0.72	1.93	1.02
Multi_Family	Central_AC	Existing	Cool Roofs	Lighter Colored Shingles (White)	20	$45.58	$0.27	168	20.0%	0.045	0.93	4.81	2.78
Multi_Family	Central_AC	New	Cool Roofs	Lighter Colored Shingles (White)	20	$63.60	$0.48	133	20.0%	0.036	0.84	3.09	1.69
Single_Family	Central_AC	Existing	Cool Roofs	Lighter Colored Shingles (White)	20	$53.93	$0.30	178	20.0%	0.048	0.92	4.45	2.54
Single_Family	Central_AC	New	Cool Roofs	Lighter Colored Shingles (White)	20	$63.07	$0.45	141	20.0%	0.038	0.85	3.27	1.80
Manufactured	Central_AC	Existing	Doors	R-11 (Steel Doors with foam core)	30	$110.00	$8.20	13	1.4%	0.004	0.23	0.27	0.14

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Manufactured	Central_AC	Existing	Doors	R-5 (Composite Doors with foam core)	12	$40.00	$5.22	8	0.8%	0.002	0.20	0.25	0.12
Manufactured	Central_AC	New	Doors	R-11 (Steel Doors with foam core)	30	$110.00	$14.97	7	1.4%	0.002	0.14	0.15	0.08
Manufactured	Central_AC	New	Doors	R-5 (Composite Doors with foam core)	12	$40.00	$9.52	4	0.8%	0.001	0.12	0.14	0.07
Multi_Family	Central_AC	Existing	Doors	R-11 (Steel Doors with foam core)	30	$55.00	$9.37	6	0.7%	0.002	0.20	0.24	0.12
Multi_Family	Central_AC	Existing	Doors	R-5 (Composite Doors with foam core)	12	$20.00	$5.96	3	0.4%	0.001	0.18	0.22	0.11
Multi_Family	Central_AC	New	Doors	R-11 (Steel Doors with foam core)	30	$55.00	$11.84	5	0.7%	0.001	0.17	0.19	0.10
Multi_Family	Central_AC	New	Doors	R-5 (Composite Doors with foam core)	12	$20.00	$7.54	3	0.4%	0.001	0.15	0.17	0.09
Single_Family	Central_AC	Existing	Doors	R-11 (Steel Doors with foam core)	30	$110.00	$8.81	12	1.4%	0.003	0.21	0.26	0.13
Single_Family	Central_AC	Existing	Doors	R-5 (Composite Doors with foam core)	12	$40.00	$5.60	7	0.8%	0.002	0.19	0.23	0.12
Single_Family	Central_AC	New	Doors	R-11 (Steel Doors with foam core)	30	$110.00	$11.13	10	1.4%	0.003	0.17	0.20	0.10
Single_Family	Central_AC	New	Doors	R-5 (Composite Doors with foam core)	12	$40.00	$7.08	6	0.8%	0.002	0.16	0.18	0.09
Manufactured	Central_AC	Existing	Doors - Weatherization	Weatherstripping And Adding Door Sweeps	6	$69.32	$4.02	17	1.8%	0.005	0.15	0.18	0.09
Multi_Family	Central_AC	Existing	Doors - Weatherization	Weatherstripping And Adding Door Sweeps	6	$34.66	$4.59	8	0.9%	0.002	0.14	0.16	0.08
Single_Family	Central_AC	Existing	Doors - Weatherization	Weatherstripping And Adding Door Sweeps	6	$69.32	$4.32	16	1.8%	0.004	0.14	0.17	0.09

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Manufactured	Central_AC	New	Duct Location	Conditioned Space Design - Duct Loss Is Not A Concern	30	$161.18	$3.84	42	8.0%	0.011	0.40	0.58	0.29
Multi_Family	Central_AC	New	Duct Location	Conditioned Space Design - Duct Loss Is Not A Concern	30	$117.94	$2.22	53	8.0%	0.014	0.56	0.98	0.50
Single_Family	Central_AC	New	Duct Location	Conditioned Space Design - Duct Loss Is Not A Concern	30	$233.91	$4.14	56	8.0%	0.015	0.38	0.54	0.27
Manufactured	Central_AC	Existing	Duct Sealing	Duct Sealing	20	$425.00	$2.96	144	15.0%	0.038	0.39	0.59	0.30
Manufactured	Central_AC	New	Duct Sealing	Duct Sealing	20	$425.00	$5.40	79	15.0%	0.021	0.25	0.33	0.16
Multi_Family	Central_AC	Existing	Duct Sealing	Duct Sealing	20	$425.00	$3.38	126	15.0%	0.034	0.36	0.51	0.26
Multi_Family	Central_AC	New	Duct Sealing	Duct Sealing	20	$425.00	$4.27	100	15.0%	0.027	0.30	0.41	0.21
Single_Family	Central_AC	Existing	Duct Sealing	Duct Sealing	20	$425.00	$3.18	134	15.0%	0.036	0.37	0.55	0.28
Single_Family	Central_AC	New	Duct Sealing	Duct Sealing	20	$425.00	$4.01	106	15.0%	0.028	0.32	0.44	0.22
Manufactured	Central_AC	Existing	Duct Sealing - Aerosol-Based	Spray-in ductwork sealant to minimize duct leaks	25	$900.00	$4.94	182	19.0%	0.049	0.31	0.41	0.21
Manufactured	Central_AC	New	Duct Sealing - Aerosol-Based	Spray-in ductwork sealant to minimize duct leaks	25	$900.00	$9.02	100	19.0%	0.027	0.19	0.23	0.11
Multi_Family	Central_AC	Existing	Duct Sealing - Aerosol-Based	Spray-in ductwork sealant to minimize duct leaks	25	$900.00	$5.65	159	19.0%	0.043	0.28	0.36	0.18
Multi_Family	Central_AC	New	Duct Sealing - Aerosol-Based	Spray-in ductwork sealant to minimize duct leaks	25	$900.00	$7.14	126	19.0%	0.034	0.23	0.29	0.15
Single_Family	Central_AC	Existing	Duct Sealing - Aerosol-Based	Spray-in ductwork sealant to minimize duct leaks	25	$900.00	$5.31	170	19.0%	0.045	0.29	0.39	0.19

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Central_AC	New	Duct Sealing - Aerosol-Based	Spray-in ductwork sealant to minimize duct leaks	25	$900.00	$6.71	134	19.0%	0.036	0.25	0.31	0.15
Manufactured	Central_AC	New	Ductless Mini-Split Heat Pump	3 ton, SEER 15, HSPF 9.0	15	$1,672.11	$28.69	58	11.1%	0.016	0.05	0.05	0.03
Multi_Family	Central_AC	New	Ductless Mini-Split Heat Pump	3 ton, SEER 15, HSPF 9.0	15	$2,053.73	$27.89	74	11.1%	0.020	0.05	0.05	0.03
Single_Family	Central_AC	New	Ductless Mini-Split Heat Pump	3 ton, SEER 15, HSPF 9.0	15	$1,450.29	$18.51	78	11.1%	0.021	0.08	0.08	0.04
Manufactured	Central_AC	Existing	Evaporative Space Cooling	SEER 40	10	$2,355.45	$3.51	671	70.0%	0.180	0.24	0.32	0.16
Manufactured	Central_AC	New	Evaporative Space Cooling	SEER 40	10	$2,355.45	$6.41	367	70.0%	0.098	0.15	0.18	0.09
Multi_Family	Central_AC	Existing	Evaporative Space Cooling	SEER 40	10	$2,355.45	$4.01	587	70.0%	0.157	0.22	0.28	0.14
Multi_Family	Central_AC	New	Evaporative Space Cooling	SEER 40	10	$2,355.45	$5.07	464	70.0%	0.124	0.18	0.22	0.11
Single_Family	Central_AC	Existing	Evaporative Space Cooling	SEER 40	10	$2,080.68	$3.33	625	70.0%	0.167	0.25	0.33	0.17
Single_Family	Central_AC	New	Evaporative Space Cooling	SEER 40	10	$2,080.68	$4.21	494	70.0%	0.132	0.21	0.26	0.13
Manufactured	Central_AC	New	Green Roof	ecoroof	40	$32,040.33	$938.95	34	6.5%	0.009	0.00	0.00	0.00
Multi_Family	Central_AC	New	Green Roof	ecoroof	40	$16,329.89	$378.70	43	6.5%	0.012	0.01	0.01	0.00
Single_Family	Central_AC	New	Green Roof	ecoroof	40	$23,199.95	$505.52	46	6.5%	0.012	0.00	0.01	0.00
Manufactured	Central_AC	Existing	Infiltration Control (Caulk, Weather Strip, etc.) Blower-Door test	Install Caulking And Weatherstripping, perform blower-door test	15	$1,370.23	$14.30	96	10.0%	0.026	0.10	0.11	0.05

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Central_AC	Existing	Infiltration Control (Caulk, Weather Strip, etc.) Blower-Door test	Install Caulking And Weatherstripping, perform blower-door test	15	$1,135.11	$13.54	84	10.0%	0.022	0.10	0.11	0.06
Single_Family	Central_AC	Existing	Infiltration Control (Caulk, Weather Strip, etc.) Blower-Door test	Install Caulking And Weatherstripping, perform blower-door test	15	$1,370.23	$15.36	89	10.0%	0.024	0.09	0.10	0.05
Single_Family	Central_AC	Existing	Insulation (Basement - Wall) 2*4	R-13 (state code)	25	$479.54	$9.04	53	5.9%	0.014	0.19	0.23	0.11
Single_Family	Central_AC	Existing	Insulation (Basement - Wall) 2*4	R-13 (state code)	25	$479.54	$19.60	24	2.7%	0.007	0.10	0.11	0.05
Single_Family	Central_AC	Existing	Insulation (Basement - Wall) 2*4	R-13 + R-5 sheathing	25	$718.61	$266.19	3	0.3%	0.001	0.01	0.01	0.00
Single_Family	Central_AC	New	Insulation (Basement - Wall) 2*4	R-13 + R-5 sheathing	25	$777.14	$22.74	34	4.8%	0.009	0.09	0.09	0.05
Manufactured	Central_AC	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,509.78	$17.46	144	15.0%	0.038	0.11	0.12	0.06
Manufactured	Central_AC	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,509.78	$100.75	25	2.6%	0.007	0.02	0.02	0.01
Manufactured	Central_AC	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,509.78	$261.95	10	1.0%	0.003	0.01	0.01	0.00
Multi_Family	Central_AC	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$1,769.19	$14.07	126	15.0%	0.034	0.13	0.15	0.07
Multi_Family	Central_AC	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$1,769.19	$81.17	22	2.6%	0.006	0.03	0.03	0.01
Multi_Family	Central_AC	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$1,769.19	$211.03	8	1.0%	0.002	0.01	0.01	0.00
Single_Family	Central_AC	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,093.19	$15.64	134	15.0%	0.036	0.12	0.13	0.07
Single_Family	Central_AC	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,093.19	$90.23	23	2.6%	0.006	0.02	0.02	0.01

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Central_AC	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,093.19	$234.60	9	1.0%	0.002	0.01	0.01	0.00
Manufactured	Central_AC	Existing	Insulation (Duct)	R-6	25	$470.03	$18.69	25	2.6%	0.007	0.10	0.11	0.06
Manufactured	Central_AC	Existing	Insulation (Duct)	R-8	25	$531.53	$17.61	30	3.2%	0.008	0.11	0.12	0.06
Multi_Family	Central_AC	Existing	Insulation (Duct)	R-6	25	$331.33	$15.06	22	2.6%	0.006	0.12	0.14	0.07
Multi_Family	Central_AC	Existing	Insulation (Duct)	R-8	25	$374.68	$14.19	26	3.2%	0.007	0.13	0.15	0.07
Single_Family	Central_AC	Existing	Insulation (Duct)	R-6	25	$784.03	$33.48	23	2.6%	0.006	0.06	0.06	0.03
Single_Family	Central_AC	Existing	Insulation (Duct)	R-8	25	$886.60	$31.55	28	3.2%	0.008	0.06	0.07	0.03
Manufactured	Central_AC	Existing	Insulation (Floor)	R-30 (state code)	25	$1,721.56	$138.22	12	1.3%	0.003	0.01	0.02	0.01
Manufactured	Central_AC	Existing	Insulation (Floor)	R-30 (state code)	25	$1,721.56	$2,764.39	1	0.1%	0.000	0.00	0.00	0.00
Manufactured	Central_AC	Existing	Insulation (Floor)	R-38	25	$277.10	$444.95	1	0.1%	0.000	0.00	0.00	0.00
Manufactured	Central_AC	New	Insulation (Floor)	R-38	25	$372.49	$1,103.35	0	0.1%	0.000	0.00	0.00	0.00
Multi_Family	Central_AC	Existing	Insulation (Floor)	R-30 (state code)	25	$1,213.56	$111.35	11	1.3%	0.003	0.02	0.02	0.01
Multi_Family	Central_AC	Existing	Insulation (Floor)	R-30 (state code)	25	$1,213.56	$2,227.03	1	0.1%	0.000	0.00	0.00	0.00
Multi_Family	Central_AC	Existing	Insulation (Floor)	R-38	25	$195.33	$358.46	1	0.1%	0.000	0.01	0.01	0.00

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Central_AC	New	Insulation (Floor)	R-38	25	$272.55	$632.06	0	0.1%	0.000	0.00	0.00	0.00
Single_Family	Central_AC	Existing	Insulation (Floor)	R-30 (state code)	25	$1,435.81	$123.79	12	1.3%	0.003	0.02	0.02	0.01
Single_Family	Central_AC	Existing	Insulation (Floor)	R-30 (state code)	25	$1,435.81	$2,475.74	1	0.1%	0.000	0.00	0.00	0.00
Single_Family	Central_AC	Existing	Insulation (Floor)	R-38	25	$231.10	$398.49	1	0.1%	0.000	0.01	0.01	0.00
Single_Family	Central_AC	New	Insulation (Floor)	R-38	25	$270.28	$588.94	0	0.1%	0.000	0.00	0.00	0.00
Single_Family	Central_AC	Existing	Insulation (Rim And Band Joist)	R-10	25	$182.09	$27.21	7	0.8%	0.002	0.07	0.08	0.04
Single_Family	Central_AC	Existing	Insulation (Rim And Band Joist)	R-19	25	$218.87	$3.50	62	7.0%	0.017	0.39	0.58	0.29
Single_Family	Central_AC	New	Insulation (Rim And Band Joist)	R-10	25	$196.92	$10.94	18	2.6%	0.005	0.16	0.19	0.09
Single_Family	Central_AC	New	Insulation (Rim And Band Joist)	R-19	25	$236.69	$4.79	49	7.0%	0.013	0.32	0.43	0.22
Multi_Family	Central_AC	Existing	Insulation (Slab)	R-10 (state code)	25	$970.95	$22.06	44	5.3%	0.012	0.09	0.09	0.05
Multi_Family	Central_AC	Existing	Insulation (Slab)	R-15	25	$258.29	$21.50	12	1.4%	0.003	0.09	0.10	0.05
Multi_Family	Central_AC	New	Insulation (Slab)	R-15	25	$348.55	$36.66	10	1.4%	0.003	0.05	0.06	0.03
Single_Family	Central_AC	Existing	Insulation (Slab)	R-10 (state code)	25	$1,303.80	$27.83	47	5.3%	0.013	0.07	0.07	0.04
Single_Family	Central_AC	Existing	Insulation (Slab)	R-15	25	$363.01	$28.39	13	1.4%	0.003	0.07	0.07	0.04

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Central_AC	New	Insulation (Slab)	R-15	25	$413.72	$40.88	10	1.4%	0.003	0.05	0.05	0.03
Manufactured	Central_AC	Existing	Insulation (Wall) 2*4	R-13	25	$2,957.30	$30.87	96	10.0%	0.026	0.06	0.07	0.03
Manufactured	Central_AC	Existing	Insulation (Wall) 2*4	R-13 + R5 Sheathing (state code)	25	$1,297.20	$60.17	22	2.3%	0.006	0.03	0.03	0.02
Multi_Family	Central_AC	Existing	Insulation (Wall) 2*4	R-13	25	$1,216.38	$14.51	84	10.0%	0.022	0.13	0.14	0.07
Multi_Family	Central_AC	Existing	Insulation (Wall) 2*4	R-13 + R5 Sheathing (state code)	25	$533.56	$28.29	19	2.3%	0.005	0.07	0.07	0.04
Single_Family	Central_AC	Existing	Insulation (Wall) 2*4	R-13	25	$5,401.48	$60.54	89	10.0%	0.024	0.03	0.03	0.02
Single_Family	Central_AC	Existing	Insulation (Wall) 2*4	R-13 + R5 Sheathing (state code)	25	$2,369.32	$118.02	20	2.3%	0.005	0.02	0.02	0.01
Manufactured	Central_AC	Existing	Insulation (Wall) 2*6	R-20 (State Code)	25	$3,334.89	$26.78	125	13.0%	0.033	0.07	0.08	0.04
Manufactured	Central_AC	Existing	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$1,297.20	$270.79	5	0.5%	0.001	0.01	0.01	0.00
Manufactured	Central_AC	New	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$1,504.00	$572.98	3	0.5%	0.001	0.00	0.00	0.00
Multi_Family	Central_AC	Existing	Insulation (Wall) 2*6	R-20 (State Code)	25	$1,371.69	$12.59	109	13.0%	0.029	0.15	0.16	0.08
Multi_Family	Central_AC	Existing	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$533.56	$127.29	4	0.5%	0.001	0.02	0.02	0.01
Multi_Family	Central_AC	New	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$630.26	$190.01	3	0.5%	0.001	0.01	0.01	0.01
Single_Family	Central_AC	Existing	Insulation (Wall) 2*6	R-20 (State Code)	25	$6,091.14	$52.51	116	13.0%	0.031	0.04	0.04	0.02

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Central_AC	Existing	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$2,369.32	$531.10	4	0.5%	0.001	0.00	0.00	0.00
Single_Family	Central_AC	New	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$2,562.30	$725.81	4	0.5%	0.001	0.00	0.00	0.00
Manufactured	Central_AC	Existing	Leak Proof Duct Fittings	Quick connect fittings that do not require mastic or drawbands (6 per unit)	30	$190.04	$1.32	144	15.0%	0.038	0.71	1.60	0.83
Manufactured	Central_AC	New	Leak Proof Duct Fittings	Quick connect fittings that do not require mastic or drawbands (6 per unit)	30	$190.04	$2.41	79	15.0%	0.021	0.53	0.90	0.46
Multi_Family	Central_AC	Existing	Leak Proof Duct Fittings	Quick connect fittings that do not require mastic or drawbands (6 per unit)	30	$190.04	$1.51	126	15.0%	0.034	0.67	1.41	0.73
Multi_Family	Central_AC	New	Leak Proof Duct Fittings	Quick connect fittings that do not require mastic or drawbands (6 per unit)	30	$190.04	$1.91	100	15.0%	0.027	0.60	1.13	0.58
Single_Family	Central_AC	Existing	Leak Proof Duct Fittings	Quick connect fittings that do not require mastic or drawbands (6 per unit)	30	$253.38	$1.89	134	15.0%	0.036	0.61	1.14	0.58
Single_Family	Central_AC	New	Leak Proof Duct Fittings	Quick connect fittings that do not require mastic or drawbands (6 per unit)	30	$253.38	$2.39	106	15.0%	0.028	0.53	0.91	0.47
Manufactured	Central_AC	Existing	Motor - ECM Motor	ECM motor for Central Air Conditioner	15	$320.76	$7.44	43	4.5%	0.012	0.17	0.20	0.10
Manufactured	Central_AC	New	Motor - ECM Motor	ECM motor for Central Air Conditioner	15	$320.76	$13.58	24	4.5%	0.006	0.10	0.11	0.06
Multi_Family	Central_AC	Existing	Motor - ECM Motor	ECM motor for Central Air Conditioner	15	$320.76	$8.50	38	4.5%	0.010	0.15	0.18	0.09
Multi_Family	Central_AC	New	Motor - ECM Motor	ECM motor for Central Air Conditioner	15	$320.76	$10.74	30	4.5%	0.008	0.13	0.14	0.07

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Central_AC	Existing	Motor - ECM Motor	ECM motor for Central Air Conditioner	15	$320.76	$7.99	40	4.5%	0.011	0.16	0.19	0.10
Single_Family	Central_AC	New	Motor - ECM Motor	ECM motor for Central Air Conditioner	15	$320.76	$10.10	32	4.5%	0.009	0.13	0.15	0.08
Manufactured	Central_AC	Existing	O&M Tune-up	Tune-up/Maintenance	5	$225.00	$2.35	96	10.0%	0.026	0.20	0.26	0.13
Manufactured	Central_AC	New	O&M Tune-up	Tune-up/Maintenance	5	$225.00	$4.29	52	10.0%	0.014	0.13	0.14	0.07
Multi_Family	Central_AC	Existing	O&M Tune-up	Tune-up/Maintenance	5	$225.00	$2.68	84	10.0%	0.022	0.18	0.23	0.12
Multi_Family	Central_AC	New	O&M Tune-up	Tune-up/Maintenance	5	$225.00	$3.39	66	10.0%	0.018	0.15	0.18	0.09
Single_Family	Central_AC	Existing	O&M Tune-up	Tune-up/Maintenance	5	$225.00	$2.52	89	10.0%	0.024	0.19	0.24	0.12
Single_Family	Central_AC	New	O&M Tune-up	Tune-up/Maintenance	5	$225.00	$3.19	71	10.0%	0.019	0.16	0.19	0.10
Manufactured	Central_AC	Existing	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$5.33	$0.28	19	2.0%	0.005	0.61	1.67	0.96
Manufactured	Central_AC	New	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$5.33	$0.51	10	2.0%	0.003	0.50	1.04	0.57
Multi_Family	Central_AC	Existing	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$3.33	$0.20	17	2.0%	0.004	0.67	2.11	1.27
Multi_Family	Central_AC	New	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$3.33	$0.25	13	2.0%	0.004	0.63	1.80	1.05
Single_Family	Central_AC	Existing	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$6.67	$0.37	18	2.0%	0.005	0.56	1.33	0.75
Single_Family	Central_AC	New	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$6.67	$0.47	14	2.0%	0.004	0.52	1.10	0.60

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Manufactured	Central_AC	Existing	Proper Sizing - Central Air Conditioner	Correctly Sized Air Conditioner Unit	15	$1.00	$0.02	57	6.0%	0.015	1.04	13.09	11.40
Manufactured	Central_AC	New	Proper Sizing - Central Air Conditioner	Correctly Sized Air Conditioner Unit	15	$1.00	$0.03	31	6.0%	0.008	1.03	11.66	9.40
Multi_Family	Central_AC	Existing	Proper Sizing - Central Air Conditioner	Correctly Sized Air Conditioner Unit	15	$1.00	$0.02	50	6.0%	0.013	1.03	12.82	10.99
Multi_Family	Central_AC	New	Proper Sizing - Central Air Conditioner	Correctly Sized Air Conditioner Unit	15	$1.00	$0.03	40	6.0%	0.011	1.03	12.28	10.23
Single_Family	Central_AC	Existing	Proper Sizing - Central Air Conditioner	Correctly Sized Air Conditioner Unit	15	$1.00	$0.02	54	6.0%	0.014	1.04	12.95	11.19
Single_Family	Central_AC	New	Proper Sizing - Central Air Conditioner	Correctly Sized Air Conditioner Unit	15	$1.00	$0.02	42	6.0%	0.011	1.03	12.43	10.44
Manufactured	Central_AC	Existing	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$543.83	$8.47	64	6.7%	0.017	0.22	0.27	0.13
Manufactured	Central_AC	New	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$550.02	$15.64	35	6.7%	0.009	0.13	0.14	0.07
Multi_Family	Central_AC	Existing	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$383.35	$6.83	56	6.7%	0.015	0.26	0.33	0.17
Multi_Family	Central_AC	New	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$402.46	$9.05	44	6.7%	0.012	0.21	0.25	0.12
Single_Family	Central_AC	Existing	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$453.56	$7.59	60	6.7%	0.016	0.24	0.30	0.15
Single_Family	Central_AC	New	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$399.10	$8.44	47	6.7%	0.013	0.22	0.27	0.13
Manufactured	Central_AC	Existing	Solar Attic Fan	Solar electric attic ventilation	10	$1,000.00	$17.40	57	6.0%	0.015	0.06	0.07	0.03
Manufactured	Central_AC	New	Solar Attic Fan	Solar electric attic ventilation	10	$1,000.00	$31.75	31	6.0%	0.008	0.03	0.04	0.02

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Central_AC	Existing	Solar Attic Fan	Solar electric attic ventilation	10	$1,000.00	$19.88	50	6.0%	0.013	0.05	0.06	0.03
Multi_Family	Central_AC	New	Solar Attic Fan	Solar electric attic ventilation	10	$1,000.00	$25.12	40	6.0%	0.011	0.04	0.05	0.02
Single_Family	Central_AC	Existing	Solar Attic Fan	Solar electric attic ventilation	10	$1,000.00	$18.68	54	6.0%	0.014	0.06	0.06	0.03
Single_Family	Central_AC	New	Solar Attic Fan	Solar electric attic ventilation	10	$1,000.00	$23.61	42	6.0%	0.011	0.05	0.05	0.02
Manufactured	Central_AC	New	Spray in insulation 2*6 Wall	2*6Wall - closed cell foam insulation R-33	25	$7,497.57	$1,428.17	5	1.0%	0.001	0.00	0.00	0.00
Multi_Family	Central_AC	New	Spray in insulation 2*6 Wall	2*6Wall - closed cell foam insulation R-33	25	$3,141.92	$473.60	7	1.0%	0.002	0.00	0.00	0.00
Single_Family	Central_AC	New	Spray in insulation 2*6 Wall	2*6Wall - closed cell foam insulation R-33	25	$12,773.28	$1,809.11	7	1.0%	0.002	0.00	0.00	0.00
Manufactured	Central_AC	Existing	Thermostat - Clock/Programmable	Programmable Thermostat	15	$26.00	$0.40	65	6.8%	0.017	0.82	3.08	1.71
Manufactured	Central_AC	New	Thermostat - Clock/Programmable	Programmable Thermostat	15	$26.00	$0.73	36	6.8%	0.010	0.70	1.85	0.99
Multi_Family	Central_AC	Existing	Thermostat - Clock/Programmable	Programmable Thermostat	15	$26.00	$0.46	57	6.8%	0.015	0.80	2.76	1.52
Multi_Family	Central_AC	New	Thermostat - Clock/Programmable	Programmable Thermostat	15	$26.00	$0.58	45	6.8%	0.012	0.75	2.27	1.23
Single_Family	Central_AC	Existing	Thermostat - Clock/Programmable	Programmable Thermostat	15	$26.00	$0.43	61	6.8%	0.016	0.81	2.91	1.61
Single_Family	Central_AC	New	Thermostat - Clock/Programmable	Programmable Thermostat	15	$26.00	$0.54	48	6.8%	0.013	0.77	2.39	1.30
Single_Family	Central_AC	Existing	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	12	$1,327.35	$21.25	62	7.0%	0.017	0.06	0.06	0.03

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Central_AC	New	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	12	$1,327.35	$26.86	49	7.0%	0.013	0.05	0.05	0.02
Manufactured	Central_AC	Existing	VSD Motor - ECM	Variable Speed Motor (ECM) for Central Air Conditioner	20	$295.76	$2.29	129	13.5%	0.035	0.45	0.75	0.38
Manufactured	Central_AC	New	VSD Motor - ECM	Variable Speed Motor (ECM) for Central Air Conditioner	20	$295.76	$4.17	71	13.5%	0.019	0.31	0.42	0.21
Multi_Family	Central_AC	Existing	VSD Motor - ECM	Variable Speed Motor (ECM) for Central Air Conditioner	20	$295.76	$2.61	113	13.5%	0.030	0.42	0.66	0.34
Multi_Family	Central_AC	New	VSD Motor - ECM	Variable Speed Motor (ECM) for Central Air Conditioner	20	$295.76	$3.30	90	13.5%	0.024	0.36	0.53	0.27
Single_Family	Central_AC	Existing	VSD Motor - ECM	Variable Speed Motor (ECM) for Central Air Conditioner	20	$295.76	$2.46	120	13.5%	0.032	0.44	0.70	0.36
Single_Family	Central_AC	New	VSD Motor - ECM	Variable Speed Motor (ECM) for Central Air Conditioner	20	$295.76	$3.10	95	13.5%	0.026	0.38	0.56	0.28
Manufactured	Central_AC	Existing	Whole-House Dehumidifier	Whole-House Dehumidifier	11	$1,357.72	$23.62	57	6.0%	0.015	0.05	0.05	0.03
Manufactured	Central_AC	New	Whole-House Dehumidifier	Whole-House Dehumidifier	11	$1,357.72	$43.10	31	6.0%	0.008	0.03	0.03	0.01
Multi_Family	Central_AC	Existing	Whole-House Dehumidifier	Whole-House Dehumidifier	11	$1,357.72	$26.99	50	6.0%	0.013	0.04	0.05	0.02
Multi_Family	Central_AC	New	Whole-House Dehumidifier	Whole-House Dehumidifier	11	$1,357.72	$34.11	40	6.0%	0.011	0.03	0.04	0.02
Single_Family	Central_AC	Existing	Whole-House Dehumidifier	Whole-House Dehumidifier	11	$1,357.72	$25.36	54	6.0%	0.014	0.05	0.05	0.02
Single_Family	Central_AC	New	Whole-House Dehumidifier	Whole-House Dehumidifier	11	$1,357.72	$32.05	42	6.0%	0.011	0.04	0.04	0.02
Manufactured	Central_AC	Existing	Whole-House Fan	Whole-House Fan	15	$1,368.95	$6.49	211	22.0%	0.056	0.19	0.23	0.12

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Manufactured	Central_AC	New	Whole-House Fan	Whole-House Fan	15	$1,368.95	$11.85	115	22.0%	0.031	0.12	0.13	0.06
Multi_Family	Central_AC	Existing	Whole-House Fan	Whole-House Fan	15	$1,368.95	$7.42	184	22.0%	0.049	0.17	0.20	0.10
Multi_Family	Central_AC	New	Whole-House Fan	Whole-House Fan	15	$1,368.95	$9.38	146	22.0%	0.039	0.14	0.16	0.08
Single_Family	Central_AC	Existing	Whole-House Fan	Whole-House Fan	15	$1,368.95	$6.97	196	22.0%	0.053	0.18	0.22	0.11
Single_Family	Central_AC	New	Whole-House Fan	Whole-House Fan	15	$1,368.95	$8.81	155	22.0%	0.042	0.15	0.17	0.09
Manufactured	Central_AC	Existing	Windows	U=0.19	25	$2,791.30	$16.65	168	17.5%	0.045	0.11	0.12	0.06
Manufactured	Central_AC	Existing	Windows	U=0.30	25	$528.31	$12.25	43	4.5%	0.012	0.15	0.17	0.08
Manufactured	Central_AC	Existing	Windows	U=0.32	25	$278.06	$11.85	23	2.5%	0.006	0.15	0.17	0.09
Manufactured	Central_AC	Existing	Windows	U=0.35	25	$5,516.42	$115.15	48	5.0%	0.013	0.02	0.02	0.01
Manufactured	Central_AC	Existing	Windows	U=0.35	25	$5,516.42	$18.28	302	31.5%	0.081	0.10	0.11	0.06
Manufactured	Central_AC	New	Windows	U=0.19	25	$3,236.29	$64.89	50	9.5%	0.013	0.03	0.03	0.02
Manufactured	Central_AC	New	Windows	U=0.30	25	$612.54	$25.93	24	4.5%	0.006	0.08	0.08	0.04
Manufactured	Central_AC	New	Windows	U=0.32	25	$322.39	$25.07	13	2.5%	0.003	0.08	0.08	0.04
Multi_Family	Central_AC	Existing	Windows	U=0.19	25	$956.75	$6.52	147	17.5%	0.039	0.25	0.31	0.16

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Multi_Family	Central_AC	Existing	Windows	U=0.30	25	$181.09	$4.80	38	4.5%	0.010	0.32	0.43	0.21
Multi_Family	Central_AC	Existing	Windows	U=0.32	25	$95.31	$4.64	21	2.5%	0.005	0.32	0.44	0.22
Multi_Family	Central_AC	Existing	Windows	U=0.35	25	$1,890.83	$45.11	42	5.0%	0.011	0.04	0.05	0.02
Multi_Family	Central_AC	Existing	Windows	U=0.35	25	$1,890.83	$7.16	264	31.5%	0.071	0.23	0.29	0.14
Multi_Family	Central_AC	New	Windows	U=0.19	25	$1,356.20	$21.52	63	9.5%	0.017	0.09	0.10	0.05
Multi_Family	Central_AC	New	Windows	U=0.30	25	$256.69	$8.60	30	4.5%	0.008	0.20	0.24	0.12
Multi_Family	Central_AC	New	Windows	U=0.32	25	$135.10	$8.31	16	2.5%	0.004	0.21	0.25	0.12
Single_Family	Central_AC	Existing	Windows	U=0.19	25	$5,098.28	$32.65	156	17.5%	0.042	0.06	0.06	0.03
Single_Family	Central_AC	Existing	Windows	U=0.30	25	$964.96	$24.03	40	4.5%	0.011	0.08	0.09	0.04
Single_Family	Central_AC	Existing	Windows	U=0.32	25	$507.87	$23.23	22	2.5%	0.006	0.08	0.09	0.04
Single_Family	Central_AC	Existing	Windows	U=0.35	25	$10,075.69	$225.85	45	5.0%	0.012	0.01	0.01	0.00
Single_Family	Central_AC	Existing	Windows	U=0.35	25	$10,075.69	$35.85	281	31.5%	0.075	0.06	0.06	0.03
Single_Family	Central_AC	New	Windows	U=0.19	25	$5,513.53	$82.20	67	9.5%	0.018	0.02	0.03	0.01
Single_Family	Central_AC	New	Windows	U=0.30	25	$1,043.56	$32.84	32	4.5%	0.009	0.06	0.06	0.03

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Central_AC	New	Windows	U=0.32	25	$549.24	$31.75	17	2.5%	0.005	0.06	0.07	0.03
Manufactured	Central_Heat	Existing	Air-to-Air Heat Exchangers	Air-to-Air Heat Exchangers	15	$902.70	$0.72	1252	10.0%	0.006	0.41	1.08	0.57
Manufactured	Central_Heat	New	Air-to-Air Heat Exchangers	Air-to-Air Heat Exchangers	15	$902.70	$0.72	1252	10.0%	0.006	0.41	1.08	0.57
Multi_Family	Central_Heat	Existing	Air-to-Air Heat Exchangers	Air-to-Air Heat Exchangers	15	$902.70	$2.10	429	10.0%	0.002	0.25	0.40	0.21
Multi_Family	Central_Heat	New	Air-to-Air Heat Exchangers	Air-to-Air Heat Exchangers	15	$902.70	$2.10	429	10.0%	0.002	0.25	0.40	0.21
Single_Family	Central_Heat	Existing	Air-to-Air Heat Exchangers	Air-to-Air Heat Exchangers	15	$902.70	$0.67	1353	10.0%	0.007	0.42	1.15	0.62
Single_Family	Central_Heat	New	Air-to-Air Heat Exchangers	Air-to-Air Heat Exchangers	15	$902.70	$0.67	1353	10.0%	0.007	0.42	1.15	0.62
Manufactured	Central_Heat	Existing	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$144.38	$0.35	407	3.3%	0.002	0.60	2.94	1.65
Manufactured	Central_Heat	New	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$144.38	$0.35	407	3.3%	0.002	0.60	2.94	1.65
Multi_Family	Central_Heat	Existing	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$36.10	$0.26	140	3.3%	0.001	0.63	3.72	2.16
Multi_Family	Central_Heat	New	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$36.10	$0.26	140	3.3%	0.001	0.63	3.72	2.16
Single_Family	Central_Heat	Existing	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$144.38	$0.33	440	3.3%	0.002	0.61	3.12	1.76
Single_Family	Central_Heat	New	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$144.38	$0.33	440	3.3%	0.002	0.61	3.12	1.76
Manufactured	Central_Heat	New	Construction - ICF	Concrete Framing	30	$6,616.02	$1.20	5509	44.0%	0.027	0.44	1.03	0.53

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Multi_Family	Central_Heat	New	Construction - ICF	Concrete Framing	30	$2,772.50	$1.47	1889	44.0%	0.009	0.40	0.85	0.44
Single_Family	Central_Heat	New	Construction - ICF	Concrete Framing	30	$11,147.05	$1.87	5951	44.0%	0.029	0.36	0.68	0.35
Manufactured	Central_Heat	New	Construction - SIP	Specialty Framing	30	$9,534.39	$5.44	1753	14.0%	0.009	0.18	0.24	0.12
Multi_Family	Central_Heat	New	Construction - SIP	Specialty Framing	30	$3,995.47	$6.65	601	14.0%	0.003	0.16	0.20	0.10
Single_Family	Central_Heat	New	Construction - SIP	Specialty Framing	30	$16,243.32	$8.58	1894	14.0%	0.009	0.13	0.15	0.08
Manufactured	Central_Heat	Existing	Doors	R-11 (Steel Doors with foam core)	30	$110.00	$0.15	751	6.0%	0.004	0.66	5.42	3.40
Manufactured	Central_Heat	Existing	Doors	R-5 (Composite Doors with foam core)	12	$40.00	$0.08	501	4.0%	0.002	0.54	4.18	2.89
Manufactured	Central_Heat	New	Doors	R-11 (Steel Doors with foam core)	30	$110.00	$0.15	751	6.0%	0.004	0.66	5.42	3.40
Manufactured	Central_Heat	New	Doors	R-5 (Composite Doors with foam core)	12	$40.00	$0.08	501	4.0%	0.002	0.54	4.18	2.89
Multi_Family	Central_Heat	Existing	Doors	R-11 (Steel Doors with foam core)	30	$55.00	$0.43	129	3.0%	0.001	0.58	2.53	1.40
Multi_Family	Central_Heat	Existing	Doors	R-5 (Composite Doors with foam core)	12	$20.00	$0.23	86	2.0%	0.000	0.49	2.26	1.33
Multi_Family	Central_Heat	New	Doors	R-11 (Steel Doors with foam core)	30	$55.00	$0.43	129	3.0%	0.001	0.58	2.53	1.40
Multi_Family	Central_Heat	New	Doors	R-5 (Composite Doors with foam core)	12	$20.00	$0.23	86	2.0%	0.000	0.49	2.26	1.33
Single_Family	Central_Heat	Existing	Doors	R-11 (Steel Doors with foam core)	30	$110.00	$0.14	812	6.0%	0.004	0.67	5.67	3.60

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Single_Family	Central_Heat	Existing	Doors	R-5 (Composite Doors with foam core)	12	$40.00	$0.07	541	4.0%	0.003	0.54	4.32	3.03
Single_Family	Central_Heat	New	Doors	R-11 (Steel Doors with foam core)	30	$110.00	$0.14	812	6.0%	0.004	0.67	5.67	3.60
Single_Family	Central_Heat	New	Doors	R-5 (Composite Doors with foam core)	12	$40.00	$0.07	541	4.0%	0.003	0.54	4.32	3.03
Manufactured	Central_Heat	Existing	Doors - Weatherization	Weatherstripping And Adding Door Sweeps	6	$69.32	$0.14	488	3.9%	0.002	0.42	1.73	1.09
Multi_Family	Central_Heat	Existing	Doors - Weatherization	Weatherstripping And Adding Door Sweeps	6	$34.66	$0.41	84	2.0%	0.000	0.33	0.81	0.45
Single_Family	Central_Heat	Existing	Doors - Weatherization	Weatherstripping And Adding Door Sweeps	6	$69.32	$0.13	528	3.9%	0.003	0.43	1.81	1.15
Manufactured	Central_Heat	New	Duct Location	Conditioned Space Design - Duct Loss Is Not A Concern	30	$161.18	$0.16	1002	8.0%	0.005	0.66	5.12	3.17
Multi_Family	Central_Heat	New	Duct Location	Conditioned Space Design - Duct Loss Is Not A Concern	30	$117.94	$0.34	343	8.0%	0.002	0.61	3.01	1.70
Single_Family	Central_Heat	New	Duct Location	Conditioned Space Design - Duct Loss Is Not A Concern	30	$233.91	$0.22	1082	8.0%	0.005	0.64	4.22	2.51
Manufactured	Central_Heat	Existing	Duct Sealing	Duct Sealing	20	$425.00	$0.23	1878	15.0%	0.009	0.55	3.18	1.88
Manufactured	Central_Heat	New	Duct Sealing	Duct Sealing	20	$425.00	$0.23	1878	15.0%	0.009	0.55	3.18	1.88
Multi_Family	Central_Heat	Existing	Duct Sealing	Duct Sealing	20	$425.00	$0.66	644	15.0%	0.003	0.45	1.37	0.73
Multi_Family	Central_Heat	New	Duct Sealing	Duct Sealing	20	$425.00	$0.66	644	15.0%	0.003	0.45	1.37	0.73
Single_Family	Central_Heat	Existing	Duct Sealing	Duct Sealing	20	$425.00	$0.21	2029	15.0%	0.010	0.56	3.36	2.00

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Single_Family	Central_Heat	New	Duct Sealing	Duct Sealing	20	$425.00	$0.21	2029	15.0%	0.010	0.56	3.36	2.00
Manufactured	Central_Heat	Existing	Duct Sealing - Aerosol-Based	Spray-in ductwork sealant to minimize duct leaks	25	$900.00	$0.38	2379	19.0%	0.012	0.57	2.55	1.42
Manufactured	Central_Heat	New	Duct Sealing - Aerosol-Based	Spray-in ductwork sealant to minimize duct leaks	25	$900.00	$0.38	2379	19.0%	0.012	0.57	2.55	1.42
Multi_Family	Central_Heat	Existing	Duct Sealing - Aerosol-Based	Spray-in ductwork sealant to minimize duct leaks	25	$900.00	$1.10	816	19.0%	0.004	0.42	1.01	0.53
Multi_Family	Central_Heat	New	Duct Sealing - Aerosol-Based	Spray-in ductwork sealant to minimize duct leaks	25	$900.00	$1.10	816	19.0%	0.004	0.42	1.01	0.53
Single_Family	Central_Heat	Existing	Duct Sealing - Aerosol-Based	Spray-in ductwork sealant to minimize duct leaks	25	$900.00	$0.35	2570	19.0%	0.013	0.57	2.71	1.52
Single_Family	Central_Heat	New	Duct Sealing - Aerosol-Based	Spray-in ductwork sealant to minimize duct leaks	25	$900.00	$0.35	2570	19.0%	0.013	0.57	2.71	1.52
Manufactured	Central_Heat	New	Ductless Mini-Split Heat Pump	3 ton, SEER 15, HSPF 9.0	15	$1,907.11	$0.21	9162	73.2%	0.045	0.53	2.88	1.72
Multi_Family	Central_Heat	New	Ductless Mini-Split Heat Pump	3 ton, SEER 15, HSPF 9.0	15	$2,288.73	$0.73	3142	73.2%	0.016	0.40	1.07	0.57
Single_Family	Central_Heat	New	Ductless Mini-Split Heat Pump	3 ton, SEER 15, HSPF 9.0	15	$1,685.29	$0.17	9898	73.2%	0.049	0.54	3.28	2.01
Manufactured	Central_Heat	New	Green Roof	ecoroof	40	$32,040.33	$39.37	814	6.5%	0.004	0.04	0.04	0.02
Multi_Family	Central_Heat	New	Green Roof	ecoroof	40	$16,329.89	$58.52	279	6.5%	0.001	0.02	0.03	0.01
Single_Family	Central_Heat	New	Green Roof	ecoroof	40	$23,199.95	$26.39	879	6.5%	0.004	0.05	0.06	0.03
Manufactured	Central_Heat	Existing	Infiltration Control (Caulk, Weather Strip, etc.) Blower-Door test	Install Caulking And Weatherstripping, perform blower-door test	15	$1,370.23	$1.09	1252	10.0%	0.006	0.35	0.74	0.39

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Multi_Family	Central_Heat	Existing	Infiltration Control (Caulk, Weather Strip, etc.) Blower-Door test	Install Caulking And Weatherstripping, perform blower-door test	15	$1,135.11	$2.64	429	10.0%	0.002	0.22	0.32	0.16
Single_Family	Central_Heat	Existing	Infiltration Control (Caulk, Weather Strip, etc.) Blower-Door test	Install Caulking And Weatherstripping, perform blower-door test	15	$1,370.23	$1.01	1353	10.0%	0.007	0.36	0.80	0.42
Single_Family	Central_Heat	Existing	Insulation (Basement - Wall) 2*4	R-13 (state code)	25	$479.54	$0.60	804	5.9%	0.004	0.51	1.75	0.94
Single_Family	Central_Heat	Existing	Insulation (Basement - Wall) 2*4	R-13 (state code)	25	$479.54	$1.29	371	2.7%	0.002	0.40	0.88	0.45
Single_Family	Central_Heat	Existing	Insulation (Basement - Wall) 2*4	R-13 + R-5 sheathing	25	$718.61	$17.56	41	0.3%	0.000	0.06	0.07	0.03
Single_Family	Central_Heat	New	Insulation (Basement - Wall) 2*4	R-13 + R-5 sheathing	25	$777.14	$1.19	655	4.8%	0.003	0.41	0.95	0.49
Manufactured	Central_Heat	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,509.78	$0.53	4758	38.0%	0.023	0.53	1.94	1.06
Manufactured	Central_Heat	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,509.78	$1.24	2028	16.2%	0.010	0.40	0.91	0.47
Manufactured	Central_Heat	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,509.78	$2.86	876	7.0%	0.004	0.26	0.41	0.21
Multi_Family	Central_Heat	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$1,769.19	$1.08	1631	38.0%	0.008	0.43	1.03	0.54
Multi_Family	Central_Heat	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$1,769.19	$2.54	696	16.2%	0.003	0.28	0.46	0.24
Multi_Family	Central_Heat	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$1,769.19	$5.89	301	7.0%	0.001	0.16	0.20	0.10
Single_Family	Central_Heat	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,093.19	$0.41	5140	38.0%	0.025	0.56	2.40	1.33
Single_Family	Central_Heat	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,093.19	$0.96	2191	16.2%	0.011	0.45	1.16	0.61

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Single_Family	Central_Heat	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,093.19	$2.21	947	7.0%	0.005	0.31	0.53	0.27
Manufactured	Central_Heat	Existing	Insulation (Duct)	R-6	25	$470.03	$1.06	443	3.5%	0.002	0.43	1.05	0.55
Manufactured	Central_Heat	Existing	Insulation (Duct)	R-8	25	$531.53	$1.00	532	4.3%	0.003	0.44	1.11	0.58
Multi_Family	Central_Heat	Existing	Insulation (Duct)	R-6	25	$331.33	$2.18	152	3.5%	0.001	0.31	0.54	0.27
Multi_Family	Central_Heat	Existing	Insulation (Duct)	R-8	25	$374.68	$2.05	182	4.3%	0.001	0.32	0.57	0.29
Single_Family	Central_Heat	Existing	Insulation (Duct)	R-6	25	$784.03	$1.64	479	3.5%	0.002	0.36	0.70	0.36
Single_Family	Central_Heat	Existing	Insulation (Duct)	R-8	25	$886.60	$1.54	575	4.3%	0.003	0.37	0.74	0.38
Manufactured	Central_Heat	Existing	Insulation (Floor)	R-30 (state code)	25	$1,721.56	$2.12	814	6.5%	0.004	0.31	0.55	0.28
Manufactured	Central_Heat	Existing	Insulation (Floor)	R-30 (state code)	25	$1,721.56	$7.05	244	2.0%	0.001	0.14	0.17	0.09
Manufactured	Central_Heat	Existing	Insulation (Floor)	R-38	25	$326.02	$2.00	163	1.3%	0.001	0.32	0.58	0.30
Manufactured	Central_Heat	New	Insulation (Floor)	R-38	25	$438.26	$2.69	163	1.3%	0.001	0.27	0.44	0.22
Multi_Family	Central_Heat	Existing	Insulation (Floor)	R-30 (state code)	25	$1,213.56	$4.35	279	6.5%	0.001	0.20	0.27	0.14
Multi_Family	Central_Heat	Existing	Insulation (Floor)	R-30 (state code)	25	$1,213.56	$14.50	84	2.0%	0.000	0.07	0.08	0.04
Multi_Family	Central_Heat	Existing	Insulation (Floor)	R-38	25	$229.82	$4.12	56	1.3%	0.000	0.21	0.29	0.15

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Central_Heat	New	Insulation (Floor)	R-38	25	$320.68	$5.75	56	1.3%	0.000	0.16	0.21	0.11
Single_Family	Central_Heat	Existing	Insulation (Floor)	R-30 (state code)	25	$1,435.81	$1.63	879	6.5%	0.004	0.36	0.70	0.36
Single_Family	Central_Heat	Existing	Insulation (Floor)	R-30 (state code)	25	$1,435.81	$5.44	264	2.0%	0.001	0.17	0.22	0.11
Single_Family	Central_Heat	Existing	Insulation (Floor)	R-38	25	$271.91	$1.55	176	1.3%	0.001	0.37	0.74	0.38
Single_Family	Central_Heat	New	Insulation (Floor)	R-38	25	$318.00	$1.81	176	1.3%	0.001	0.34	0.64	0.33
Single_Family	Central_Heat	Existing	Insulation (Rim And Band Joist)	R-10	25	$182.09	$1.35	135	1.0%	0.001	0.39	0.84	0.44
Single_Family	Central_Heat	Existing	Insulation (Rim And Band Joist)	R-19	25	$218.87	$0.23	947	7.0%	0.005	0.61	3.68	2.17
Single_Family	Central_Heat	New	Insulation (Rim And Band Joist)	R-10	25	$196.92	$0.43	460	3.4%	0.002	0.55	2.31	1.28
Single_Family	Central_Heat	New	Insulation (Rim And Band Joist)	R-19	25	$236.69	$0.25	947	7.0%	0.005	0.60	3.48	2.03
Multi_Family	Central_Heat	Existing	Insulation (Slab)	R-10 (state code)	25	$970.95	$4.31	225	5.3%	0.001	0.20	0.28	0.14
Multi_Family	Central_Heat	Existing	Insulation (Slab)	R-15	25	$258.29	$4.20	62	1.4%	0.000	0.20	0.28	0.14
Multi_Family	Central_Heat	New	Insulation (Slab)	R-15	25	$348.55	$5.66	62	1.4%	0.000	0.16	0.21	0.11
Single_Family	Central_Heat	Existing	Insulation (Slab)	R-10 (state code)	25	$1,303.80	$1.84	710	5.3%	0.004	0.34	0.63	0.32
Single_Family	Central_Heat	Existing	Insulation (Slab)	R-15	25	$363.01	$1.87	194	1.4%	0.001	0.33	0.62	0.32

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Central_Heat	New	Insulation (Slab)	R-15	25	$413.72	$2.13	194	1.4%	0.001	0.31	0.55	0.28
Manufactured	Central_Heat	Existing	Insulation (Wall) 2*4	R-13	25	$2,957.30	$0.54	5509	44.0%	0.027	0.53	1.92	1.04
Manufactured	Central_Heat	Existing	Insulation (Wall) 2*4	R-13 + R5 Sheathing (state code)	25	$1,297.20	$1.23	1058	8.5%	0.005	0.41	0.92	0.48
Multi_Family	Central_Heat	Existing	Insulation (Wall) 2*4	R-13	25	$1,216.38	$0.64	1889	44.0%	0.009	0.50	1.64	0.88
Multi_Family	Central_Heat	Existing	Insulation (Wall) 2*4	R-13 + R5 Sheathing (state code)	25	$533.56	$1.47	363	8.5%	0.002	0.38	0.78	0.40
Single_Family	Central_Heat	Existing	Insulation (Wall) 2*4	R-13	25	$5,401.48	$0.91	5951	44.0%	0.029	0.45	1.21	0.64
Single_Family	Central_Heat	Existing	Insulation (Wall) 2*4	R-13 + R5 Sheathing (state code)	25	$2,369.32	$2.07	1143	8.5%	0.006	0.32	0.56	0.29
Manufactured	Central_Heat	Existing	Insulation (Wall) 2*6	R-20 (State Code)	25	$3,334.89	$0.54	6135	49.0%	0.030	0.53	1.90	1.03
Manufactured	Central_Heat	Existing	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$1,297.20	$3.14	413	3.3%	0.002	0.25	0.38	0.19
Manufactured	Central_Heat	New	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$1,504.00	$3.64	413	3.3%	0.002	0.23	0.33	0.17
Multi_Family	Central_Heat	Existing	Insulation (Wall) 2*6	R-20 (State Code)	25	$1,371.69	$0.65	2104	49.0%	0.010	0.50	1.62	0.87
Multi_Family	Central_Heat	Existing	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$533.56	$3.77	142	3.3%	0.001	0.22	0.32	0.16
Multi_Family	Central_Heat	New	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$630.26	$4.45	142	3.3%	0.001	0.20	0.27	0.14
Single_Family	Central_Heat	Existing	Insulation (Wall) 2*6	R-20 (State Code)	25	$6,091.14	$0.92	6628	49.0%	0.033	0.45	1.20	0.63

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Central_Heat	Existing	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$2,369.32	$5.31	446	3.3%	0.002	0.17	0.23	0.11
Single_Family	Central_Heat	New	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$2,562.30	$5.74	446	3.3%	0.002	0.16	0.21	0.11
Manufactured	Central_Heat	Existing	Leak Proof Duct Fittings	Quick connect fittings that do not require mastic or drawbands (6 per unit)	30	$190.04	$0.10	1878	15.0%	0.009	0.68	6.64	4.42
Manufactured	Central_Heat	New	Leak Proof Duct Fittings	Quick connect fittings that do not require mastic or drawbands (6 per unit)	30	$190.04	$0.10	1878	15.0%	0.009	0.68	6.64	4.42
Multi_Family	Central_Heat	Existing	Leak Proof Duct Fittings	Quick connect fittings that do not require mastic or drawbands (6 per unit)	30	$190.04	$0.30	644	15.0%	0.003	0.62	3.38	1.94
Multi_Family	Central_Heat	New	Leak Proof Duct Fittings	Quick connect fittings that do not require mastic or drawbands (6 per unit)	30	$190.04	$0.30	644	15.0%	0.003	0.62	3.38	1.94
Single_Family	Central_Heat	Existing	Leak Proof Duct Fittings	Quick connect fittings that do not require mastic or drawbands (6 per unit)	30	$253.38	$0.12	2029	15.0%	0.010	0.67	5.94	3.82
Single_Family	Central_Heat	New	Leak Proof Duct Fittings	Quick connect fittings that do not require mastic or drawbands (6 per unit)	30	$253.38	$0.12	2029	15.0%	0.010	0.67	5.94	3.82
Manufactured	Central_Heat	Existing	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$5.33	$0.02	250	2.0%	0.001	0.46	2.93	2.49
Manufactured	Central_Heat	New	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$5.33	$0.02	250	2.0%	0.001	0.46	2.93	2.49
Multi_Family	Central_Heat	Existing	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$3.33	$0.04	86	2.0%	0.000	0.45	2.56	2.00
Multi_Family	Central_Heat	New	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$3.33	$0.04	86	2.0%	0.000	0.45	2.56	2.00

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Central_Heat	Existing	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$6.67	$0.02	271	2.0%	0.001	0.46	2.85	2.38
Single_Family	Central_Heat	New	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$6.67	$0.02	271	2.0%	0.001	0.46	2.85	2.38
Manufactured	Central_Heat	Existing	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$543.83	$2.17	250	2.0%	0.001	0.33	0.59	0.30
Manufactured	Central_Heat	New	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$550.02	$2.20	250	2.0%	0.001	0.33	0.58	0.30
Multi_Family	Central_Heat	Existing	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$383.35	$4.46	86	2.0%	0.000	0.21	0.29	0.15
Multi_Family	Central_Heat	New	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$402.46	$4.69	86	2.0%	0.000	0.20	0.28	0.14
Single_Family	Central_Heat	Existing	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$453.56	$1.68	271	2.0%	0.001	0.38	0.75	0.39
Single_Family	Central_Heat	New	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$399.10	$1.48	271	2.0%	0.001	0.40	0.85	0.44
Manufactured	Central_Heat	New	Spray in insulation 2*6 Wall	2*6Wall - closed cell foam insulation R-33	25	$7,497.57	$6.30	1189	9.5%	0.006	0.15	0.19	0.10
Multi_Family	Central_Heat	New	Spray in insulation 2*6 Wall	2*6Wall - closed cell foam insulation R-33	25	$3,141.92	$7.70	408	9.5%	0.002	0.13	0.16	0.08
Single_Family	Central_Heat	New	Spray in insulation 2*6 Wall	2*6Wall - closed cell foam insulation R-33	25	$12,773.28	$9.94	1285	9.5%	0.006	0.10	0.12	0.06
Manufactured	Central_Heat	Existing	Storm Windows	Storm Window	20	$1,083.44	$3.46	313	2.5%	0.002	0.20	0.29	0.15
Manufactured	Central_Heat	New	Storm Windows	Storm Window	20	$1,256.17	$4.01	313	2.5%	0.002	0.18	0.25	0.13
Multi_Family	Central_Heat	Existing	Storm Windows	Storm Window	20	$371.36	$3.46	107	2.5%	0.001	0.20	0.29	0.15

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Central_Heat	New	Storm Windows	Storm Window	20	$526.41	$4.90	107	2.5%	0.001	0.16	0.21	0.10
Single_Family	Central_Heat	Existing	Storm Windows	Storm Window	20	$1,978.89	$5.85	338	2.5%	0.002	0.14	0.17	0.09
Single_Family	Central_Heat	New	Storm Windows	Storm Window	20	$2,140.07	$6.33	338	2.5%	0.002	0.13	0.16	0.08
Manufactured	Central_Heat	Existing	Thermostat - Clock/Programmable	Programmable Thermostat	15	$26.00	$0.03	851	6.8%	0.004	0.59	6.79	5.50
Manufactured	Central_Heat	New	Thermostat - Clock/Programmable	Programmable Thermostat	15	$26.00	$0.03	851	6.8%	0.004	0.59	6.79	5.50
Multi_Family	Central_Heat	Existing	Thermostat - Clock/Programmable	Programmable Thermostat	15	$26.00	$0.09	292	6.8%	0.001	0.57	4.69	3.19
Multi_Family	Central_Heat	New	Thermostat - Clock/Programmable	Programmable Thermostat	15	$26.00	$0.09	292	6.8%	0.001	0.57	4.69	3.19
Single_Family	Central_Heat	Existing	Thermostat - Clock/Programmable	Programmable Thermostat	15	$26.00	$0.03	920	6.8%	0.005	0.59	6.91	5.66
Single_Family	Central_Heat	New	Thermostat - Clock/Programmable	Programmable Thermostat	15	$26.00	$0.03	920	6.8%	0.005	0.59	6.91	5.66
Single_Family	Central_Heat	Existing	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	12	$1,327.35	$1.40	947	7.0%	0.005	0.28	0.50	0.26
Single_Family	Central_Heat	New	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	12	$1,327.35	$1.40	947	7.0%	0.005	0.28	0.50	0.26
Manufactured	Central_Heat	Existing	Windows	U=0.19	25	$2,791.30	$2.79	1002	8.0%	0.005	0.27	0.42	0.21
Manufactured	Central_Heat	Existing	Windows	U=0.30	25	$528.31	$2.11	250	2.0%	0.001	0.31	0.55	0.28
Manufactured	Central_Heat	Existing	Windows	U=0.32	25	$278.06	$2.02	138	1.1%	0.001	0.32	0.58	0.29

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Manufactured	Central_Heat	Existing	Windows	U=0.35	25	$5,516.42	$20.03	275	2.2%	0.001	0.06	0.06	0.03
Manufactured	Central_Heat	Existing	Windows	U=0.35	25	$5,516.42	$3.39	1628	13.0%	0.008	0.24	0.35	0.18
Manufactured	Central_Heat	New	Windows	U=0.19	25	$3,236.29	$1.44	2254	18.0%	0.011	0.38	0.79	0.41
Manufactured	Central_Heat	New	Windows	U=0.30	25	$612.54	$2.45	250	2.0%	0.001	0.29	0.48	0.24
Manufactured	Central_Heat	New	Windows	U=0.32	25	$322.39	$2.34	138	1.1%	0.001	0.30	0.50	0.26
Multi_Family	Central_Heat	Existing	Windows	U=0.19	25	$956.75	$2.79	343	8.0%	0.002	0.27	0.42	0.22
Multi_Family	Central_Heat	Existing	Windows	U=0.30	25	$181.09	$2.11	86	2.0%	0.000	0.31	0.55	0.28
Multi_Family	Central_Heat	Existing	Windows	U=0.32	25	$95.31	$2.02	47	1.1%	0.000	0.32	0.58	0.29
Multi_Family	Central_Heat	Existing	Windows	U=0.35	25	$1,890.83	$20.02	94	2.2%	0.000	0.06	0.06	0.03
Multi_Family	Central_Heat	Existing	Windows	U=0.35	25	$1,890.83	$3.39	558	13.0%	0.003	0.24	0.35	0.18
Multi_Family	Central_Heat	New	Windows	U=0.19	25	$1,356.20	$1.75	773	18.0%	0.004	0.35	0.66	0.34
Multi_Family	Central_Heat	New	Windows	U=0.30	25	$256.69	$2.99	86	2.0%	0.000	0.26	0.39	0.20
Multi_Family	Central_Heat	New	Windows	U=0.32	25	$135.10	$2.86	47	1.1%	0.000	0.26	0.41	0.21
Single_Family	Central_Heat	Existing	Windows	U=0.19	25	$5,098.28	$4.71	1082	8.0%	0.005	0.19	0.25	0.13

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Central_Heat	Existing	Windows	U=0.30	25	$964.96	$3.57	271	2.0%	0.001	0.23	0.33	0.17
Single_Family	Central_Heat	Existing	Windows	U=0.32	25	$507.87	$3.41	149	1.1%	0.001	0.23	0.35	0.18
Single_Family	Central_Heat	Existing	Windows	U=0.35	25	$10,075.69	$33.86	298	2.2%	0.001	0.03	0.04	0.02
Single_Family	Central_Heat	Existing	Windows	U=0.35	25	$10,075.69	$5.73	1758	13.0%	0.009	0.16	0.21	0.11
Single_Family	Central_Heat	New	Windows	U=0.19	25	$5,513.53	$2.26	2435	18.0%	0.012	0.30	0.52	0.26
Single_Family	Central_Heat	New	Windows	U=0.30	25	$1,043.56	$3.86	271	2.0%	0.001	0.22	0.31	0.16
Single_Family	Central_Heat	New	Windows	U=0.32	25	$549.24	$3.69	149	1.1%	0.001	0.22	0.32	0.16
Manufactured	Cooking_Oven	Existing	Convection Oven	Convection Oven (wall oven)	15	$411.00	$4.06	101	23.0%	0.019	0.24	0.32	0.16
Manufactured	Cooking_Oven	New	Convection Oven	Convection Oven (wall oven)	15	$411.00	$4.06	101	23.0%	0.019	0.24	0.32	0.16
Multi_Family	Cooking_Oven	Existing	Convection Oven	Convection Oven (wall oven)	15	$411.00	$4.06	101	23.0%	0.019	0.24	0.32	0.16
Multi_Family	Cooking_Oven	New	Convection Oven	Convection Oven (wall oven)	15	$411.00	$4.06	101	23.0%	0.019	0.24	0.32	0.16
Single_Family	Cooking_Oven	Existing	Convection Oven	Convection Oven (wall oven)	15	$411.00	$4.06	101	23.0%	0.019	0.24	0.32	0.16
Single_Family	Cooking_Oven	New	Convection Oven	Convection Oven (wall oven)	15	$411.00	$4.06	101	23.0%	0.019	0.24	0.32	0.16
Manufactured	Dryer	Existing	Clothes Dryer With Moisture Sensor	High-Efficiency Clothes Dryer With Moisture Sensor	18	$55.00	$0.40	139	15.0%	0.020	0.70	2.80	1.56

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Manufactured	Dryer	New	Clothes Dryer With Moisture Sensor	High-Efficiency Clothes Dryer With Moisture Sensor	18	$55.00	$0.40	139	15.0%	0.020	0.70	2.80	1.56
Multi_Family	Dryer	Existing	Clothes Dryer With Moisture Sensor	High-Efficiency Clothes Dryer With Moisture Sensor	18	$55.00	$0.40	139	15.0%	0.020	0.70	2.80	1.56
Multi_Family	Dryer	New	Clothes Dryer With Moisture Sensor	High-Efficiency Clothes Dryer With Moisture Sensor	18	$55.00	$0.40	139	15.0%	0.020	0.70	2.80	1.56
Single_Family	Dryer	Existing	Clothes Dryer With Moisture Sensor	High-Efficiency Clothes Dryer With Moisture Sensor	18	$55.00	$0.40	139	15.0%	0.020	0.70	2.80	1.56
Single_Family	Dryer	New	Clothes Dryer With Moisture Sensor	High-Efficiency Clothes Dryer With Moisture Sensor	18	$55.00	$0.40	139	15.0%	0.020	0.70	2.80	1.56
Manufactured	Dryer	Existing	Clothes Dryer with Moisture Sensor - Early Replacement	Standard Dryer with Moisture Sensor	18	$410.00	$2.46	166	18.0%	0.024	0.34	0.54	0.28
Multi_Family	Dryer	Existing	Clothes Dryer with Moisture Sensor - Early Replacement	Standard Dryer with Moisture Sensor	18	$410.00	$2.46	166	18.0%	0.024	0.34	0.54	0.28
Single_Family	Dryer	Existing	Clothes Dryer with Moisture Sensor - Early Replacement	Standard Dryer with Moisture Sensor	18	$410.00	$2.46	166	18.0%	0.024	0.34	0.54	0.28
Manufactured	Freezer	Existing	Freezer - Stand-Alone	Energy Star 14.8 cu ft Chest Freezer	20	$22.00	$0.46	48	10.0%	0.006	0.69	2.61	1.43
Manufactured	Freezer	New	Freezer - Stand-Alone	Energy Star 14.8 cu ft Chest Freezer	20	$22.00	$0.46	48	10.0%	0.006	0.69	2.61	1.43
Multi_Family	Freezer	Existing	Freezer - Stand-Alone	Energy Star 14.8 cu ft Chest Freezer	20	$22.00	$0.46	48	10.0%	0.006	0.69	2.61	1.43
Multi_Family	Freezer	New	Freezer - Stand-Alone	Energy Star 14.8 cu ft Chest Freezer	20	$22.00	$0.46	48	10.0%	0.006	0.69	2.61	1.43
Single_Family	Freezer	Existing	Freezer - Stand-Alone	Energy Star 14.8 cu ft Chest Freezer	20	$22.00	$0.46	48	10.0%	0.006	0.69	2.61	1.43
Single_Family	Freezer	New	Freezer - Stand-Alone	Energy Star 14.8 cu ft Chest Freezer	20	$22.00	$0.46	48	10.0%	0.006	0.69	2.61	1.43
Manufactured	Freezer	Existing	Stand-Alone Freezer - Early Replacement	Energy Star Freezer	20	$504.00	$3.34	151	20.0%	0.020	0.28	0.41	0.21
Multi_Family	Freezer	Existing	Stand-Alone Freezer - Early Replacement	Energy Star Freezer	20	$504.00	$3.34	151	20.0%	0.020	0.28	0.41	0.21

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Freezer	Existing	Stand-Alone Freezer - Early Replacement	Energy Star Freezer	20	$504.00	$3.34	151	20.0%	0.020	0.28	0.41	0.21
Manufactured	Freezer	Existing	Stand-Alone Freezer - Removal	Proper Disposal of Freezer	10	$100.00	$0.05	1878	248.7%	0.251	0.72	5.82	4.32
Multi_Family	Freezer	Existing	Stand-Alone Freezer - Removal	Proper Disposal of Freezer	10	$100.00	$0.05	1878	248.7%	0.251	0.72	5.82	4.32
Single_Family	Freezer	Existing	Stand-Alone Freezer - Removal	Proper Disposal of Freezer	10	$100.00	$0.05	1878	248.7%	0.251	0.72	5.82	4.32
Multi_Family	Heat_Pump	Existing	Advanced Cold-Climate Heat Pump	16 SEER, 9.6 HSPF	15	$3,500.00	$7.60	461	14.0%	0.020	0.11	0.13	0.06
Multi_Family	Heat_Pump	New	Advanced Cold-Climate Heat Pump	16 SEER, 9.6 HSPF	15	$3,500.00	$7.68	456	14.0%	0.020	0.11	0.13	0.06
Single_Family	Heat_Pump	Existing	Advanced Cold-Climate Heat Pump	16 SEER, 9.6 HSPF	15	$3,500.00	$2.74	1279	14.0%	0.057	0.23	0.35	0.18
Single_Family	Heat_Pump	New	Advanced Cold-Climate Heat Pump	16 SEER, 9.6 HSPF	15	$3,500.00	$2.77	1264	14.0%	0.056	0.23	0.34	0.17
Multi_Family	Heat_Pump	Existing	Air Source Heat_Pump	2.5 ton, 14 SEER, 8.5 HSPF	15	$244.85	$1.52	162	4.9%	0.007	0.33	0.61	0.31
Multi_Family	Heat_Pump	Existing	Air Source Heat_Pump	2.5 ton, 16 SEER, 8.8 HSPF	15	$734.53	$3.01	244	7.4%	0.011	0.22	0.32	0.16
Multi_Family	Heat_Pump	Existing	Air Source Heat_Pump	2.5 ton, 18 SEER, 9.0 HSPF	15	$1,224.20	$4.04	303	9.2%	0.013	0.18	0.24	0.12
Multi_Family	Heat_Pump	New	Air Source Heat_Pump	2.5 ton, 14 SEER, 8.5 HSPF	15	$244.85	$1.52	162	4.9%	0.007	0.33	0.61	0.31
Multi_Family	Heat_Pump	New	Air Source Heat_Pump	2.5 ton, 16 SEER, 8.8 HSPF	15	$734.53	$3.01	244	7.4%	0.011	0.22	0.32	0.16
Multi_Family	Heat_Pump	New	Air Source Heat_Pump	2.5 ton, 18 SEER, 9.0 HSPF	15	$1,224.20	$4.04	303	9.2%	0.013	0.18	0.24	0.12
Single_Family	Heat_Pump	Existing	Air Source Heat_Pump	3 ton, 14 SEER, 8.5 HSPF	15	$293.82	$0.66	448	4.9%	0.020	0.46	1.30	0.70

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Heat_Pump	Existing	Air Source Heat_Pump	3 ton, 16 SEER, 8.8 HSPF	15	$881.43	$1.30	677	7.4%	0.030	0.36	0.70	0.36
Single_Family	Heat_Pump	Existing	Air Source Heat_Pump	3 ton, 18 SEER, 9.0 HSPF	15	$1,469.04	$1.75	842	9.2%	0.037	0.31	0.53	0.27
Single_Family	Heat_Pump	New	Air Source Heat_Pump	3 ton, 14 SEER, 8.5 HSPF	15	$293.82	$0.66	448	4.9%	0.020	0.46	1.30	0.70
Single_Family	Heat_Pump	New	Air Source Heat_Pump	3 ton, 16 SEER, 8.8 HSPF	15	$881.43	$1.30	677	7.4%	0.030	0.36	0.70	0.36
Single_Family	Heat_Pump	New	Air Source Heat_Pump	3 ton, 18 SEER, 9.0 HSPF	15	$1,469.04	$1.75	842	9.2%	0.037	0.31	0.53	0.27
Multi_Family	Heat_Pump	Existing	Air-to-Air Heat Exchangers	Air-to-Air Heat Exchangers	15	$902.70	$2.74	329	10.0%	0.015	0.23	0.35	0.18
Multi_Family	Heat_Pump	New	Air-to-Air Heat Exchangers	Air-to-Air Heat Exchangers	15	$902.70	$2.77	325	10.0%	0.014	0.23	0.34	0.17
Single_Family	Heat_Pump	Existing	Air-to-Air Heat Exchangers	Air-to-Air Heat Exchangers	15	$902.70	$0.99	914	10.0%	0.040	0.40	0.90	0.47
Single_Family	Heat_Pump	New	Air-to-Air Heat Exchangers	Air-to-Air Heat Exchangers	15	$902.70	$1.00	903	10.0%	0.040	0.40	0.89	0.47
Multi_Family	Heat_Pump	Existing	Blinds - Fixed Angle/Automatic	Install Blinds (Reduce Window SHGC by 50%)	10	$559.03	$4.68	119	3.6%	0.005	0.12	0.15	0.08
Multi_Family	Heat_Pump	New	Blinds - Fixed Angle/Automatic	Install Blinds (Reduce Window SHGC by 50%)	10	$559.03	$4.74	118	3.6%	0.005	0.12	0.15	0.08
Single_Family	Heat_Pump	Existing	Blinds - Fixed Angle/Automatic	Install Blinds (Reduce Window SHGC by 50%)	10	$559.03	$1.69	332	3.6%	0.015	0.25	0.40	0.21
Single_Family	Heat_Pump	New	Blinds - Fixed Angle/Automatic	Install Blinds (Reduce Window SHGC by 50%)	10	$559.03	$1.71	328	3.6%	0.014	0.25	0.40	0.21
Multi_Family	Heat_Pump	Existing	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$36.10	$0.34	107	3.3%	0.005	0.67	3.37	1.90

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Multi_Family	Heat_Pump	New	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$36.10	$0.34	106	3.3%	0.005	0.67	3.34	1.88
Single_Family	Heat_Pump	Existing	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$144.38	$0.49	297	3.3%	0.013	0.63	2.52	1.38
Single_Family	Heat_Pump	New	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$144.38	$0.49	294	3.3%	0.013	0.63	2.49	1.36
Multi_Family	Heat_Pump	Existing	Ceiling Fan	Ceiling Fan	10	$92.28	$99.23	1	0.0%	0.000	0.01	0.01	0.00
Multi_Family	Heat_Pump	New	Ceiling Fan	Ceiling Fan	10	$92.28	$100.39	1	0.0%	0.000	0.01	0.01	0.00
Single_Family	Heat_Pump	Existing	Ceiling Fan	Ceiling Fan	10	$92.28	$35.75	3	0.0%	0.000	0.02	0.02	0.01
Single_Family	Heat_Pump	New	Ceiling Fan	Ceiling Fan	10	$92.28	$36.17	3	0.0%	0.000	0.02	0.02	0.01
Multi_Family	Heat_Pump	New	Construction - ICF	Concrete Framing	30	$2,772.50	$1.98	1397	42.9%	0.062	0.38	0.71	0.36
Single_Family	Heat_Pump	New	Construction - ICF	Concrete Framing	30	$11,147.05	$2.87	3879	42.9%	0.171	0.31	0.50	0.25
Multi_Family	Heat_Pump	New	Construction - SIP	Specialty Framing	30	$3,995.47	$8.77	456	14.0%	0.020	0.14	0.17	0.08
Single_Family	Heat_Pump	New	Construction - SIP	Specialty Framing	30	$16,243.32	$12.85	1264	14.0%	0.056	0.10	0.11	0.06
Multi_Family	Heat_Pump	Existing	Cool Roofs	Lighter Colored Shingles (White)	20	$45.58	$0.79	58	1.8%	0.003	0.47	1.30	0.69
Multi_Family	Heat_Pump	New	Cool Roofs	Lighter Colored Shingles (White)	20	$63.60	$1.11	57	1.8%	0.003	0.42	0.95	0.50
Single_Family	Heat_Pump	Existing	Cool Roofs	Lighter Colored Shingles (White)	20	$53.93	$0.34	161	1.8%	0.007	0.58	2.64	1.49

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Heat_Pump	New	Cool Roofs	Lighter Colored Shingles (White)	20	$63.07	$0.40	159	1.8%	0.007	0.56	2.32	1.29
Multi_Family	Heat_Pump	Existing	Doors	R-11 (Steel Doors with foam core)	30	$55.00	$0.60	92	2.8%	0.004	0.60	2.12	1.14
Multi_Family	Heat_Pump	Existing	Doors	R-5 (Composite Doors with foam core)	12	$20.00	$0.33	61	1.9%	0.003	0.51	1.96	1.11
Multi_Family	Heat_Pump	New	Doors	R-11 (Steel Doors with foam core)	30	$55.00	$0.60	91	2.8%	0.004	0.60	2.09	1.13
Multi_Family	Heat_Pump	New	Doors	R-5 (Composite Doors with foam core)	12	$20.00	$0.33	60	1.9%	0.003	0.51	1.94	1.10
Single_Family	Heat_Pump	Existing	Doors	R-11 (Steel Doors with foam core)	30	$110.00	$0.22	511	5.6%	0.023	0.71	4.68	2.78
Single_Family	Heat_Pump	Existing	Doors	R-5 (Composite Doors with foam core)	12	$40.00	$0.12	340	3.7%	0.015	0.59	3.83	2.49
Single_Family	Heat_Pump	New	Doors	R-11 (Steel Doors with foam core)	30	$110.00	$0.22	505	5.6%	0.022	0.71	4.64	2.76
Single_Family	Heat_Pump	New	Doors	R-5 (Composite Doors with foam core)	12	$40.00	$0.12	336	3.7%	0.015	0.58	3.81	2.47
Multi_Family	Heat_Pump	Existing	Doors - Weatherization	Weatherstripping And Adding Door Sweeps	6	$34.66	$0.57	61	1.9%	0.003	0.33	0.70	0.38
Single_Family	Heat_Pump	Existing	Doors - Weatherization	Weatherstripping And Adding Door Sweeps	6	$69.32	$0.20	339	3.7%	0.015	0.44	1.54	0.92
Multi_Family	Heat_Pump	New	Duct Location	Conditioned Space Design - Duct Loss Is Not A Concern	30	$117.94	$0.45	260	8.0%	0.012	0.64	2.67	1.47
Single_Family	Heat_Pump	New	Duct Location	Conditioned Space Design - Duct Loss Is Not A Concern	30	$233.91	$0.32	723	8.0%	0.032	0.67	3.48	1.97
Multi_Family	Heat_Pump	New	Green Roof	ecoroof	40	$16,329.89	$77.22	211	6.5%	0.009	0.02	0.02	0.01

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Heat_Pump	New	Green Roof	ecoroof	40	$23,199.95	$39.52	587	6.5%	0.026	0.04	0.04	0.02
Multi_Family	Heat_Pump	New	Heat_Pump - Ground or Water-Source - Closed Loop (Desuperheater)	EER = 14.1, COP = 3.3	18	$14,583.03	$72.80	200	6.2%	0.009	0.01	0.02	0.01
Single_Family	Heat_Pump	New	Heat_Pump - Ground or Water-Source - Closed Loop (Desuperheater)	EER = 14.1, COP = 3.3	18	$15,399.63	$27.70	556	6.2%	0.025	0.04	0.04	0.02
Multi_Family	Heat_Pump	New	Heat_Pump - Ground or Water-Source - Open Loop (Desuperheater)	EER = 16.2, COP = 3.6	18	$14,583.03	$26.65	547	16.8%	0.024	0.04	0.04	0.02
Single_Family	Heat_Pump	New	Heat_Pump - Ground or Water-Source - Open Loop (Desuperheater)	EER = 16.2, COP = 3.6	18	$15,399.63	$10.14	1519	16.8%	0.067	0.09	0.11	0.05
Multi_Family	Heat_Pump	Existing	Infiltration Control (Caulk, Weather Strip, etc.) Blower-Door test	Install Caulking And Weatherstripping, perform blower-door test	15	$1,135.11	$3.45	329	10.0%	0.015	0.20	0.28	0.14
Single_Family	Heat_Pump	Existing	Infiltration Control (Caulk, Weather Strip, etc.) Blower-Door test	Install Caulking And Weatherstripping, perform blower-door test	15	$1,370.23	$1.50	914	10.0%	0.040	0.33	0.61	0.32
Single_Family	Heat_Pump	Existing	Insulation (Basement - Wall) 2*4	R-13 (state code)	25	$479.54	$0.35	1358	14.9%	0.060	0.63	2.98	1.67
Single_Family	Heat_Pump	Existing	Insulation (Basement - Wall) 2*4	R-13 (state code)	25	$479.54	$0.77	627	6.9%	0.028	0.53	1.56	0.83
Single_Family	Heat_Pump	Existing	Insulation (Basement - Wall) 2*4	R-13 + R-5 sheathing	25	$718.61	$1.30	553	6.1%	0.024	0.44	0.96	0.50
Single_Family	Heat_Pump	New	Insulation (Basement - Wall) 2*4	R-13 + R-5 sheathing	25	$777.14	$1.42	547	6.1%	0.024	0.42	0.89	0.46
Multi_Family	Heat_Pump	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$1,769.19	$1.49	1184	36.0%	0.052	0.41	0.85	0.44

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Multi_Family	Heat_Pump	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$1,769.19	$3.62	489	14.9%	0.022	0.25	0.36	0.18
Multi_Family	Heat_Pump	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$1,769.19	$8.30	213	6.5%	0.009	0.13	0.16	0.08
Single_Family	Heat_Pump	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,093.19	$0.64	3287	36.0%	0.145	0.56	1.83	0.98
Single_Family	Heat_Pump	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,093.19	$1.54	1357	14.9%	0.060	0.41	0.82	0.42
Single_Family	Heat_Pump	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,093.19	$3.54	591	6.5%	0.026	0.25	0.37	0.19
Multi_Family	Heat_Pump	Existing	Insulation (Duct)	R-6	25	$331.33	$2.91	114	3.5%	0.005	0.29	0.45	0.23
Multi_Family	Heat_Pump	Existing	Insulation (Duct)	R-8	25	$374.68	$2.74	137	4.2%	0.006	0.30	0.47	0.24
Single_Family	Heat_Pump	Existing	Insulation (Duct)	R-6	25	$784.03	$2.48	316	3.5%	0.014	0.32	0.52	0.27
Single_Family	Heat_Pump	Existing	Insulation (Duct)	R-8	25	$886.60	$2.34	379	4.2%	0.017	0.33	0.55	0.28
Multi_Family	Heat_Pump	Existing	Insulation (Floor)	R-30 (state code)	25	$1,213.56	$6.10	199	6.0%	0.009	0.17	0.22	0.11
Multi_Family	Heat_Pump	Existing	Insulation (Floor)	R-30 (state code)	25	$1,213.56	$20.66	59	1.8%	0.003	0.06	0.06	0.03
Multi_Family	Heat_Pump	Existing	Insulation (Floor)	R-38	25	$229.82	$5.86	39	1.2%	0.002	0.18	0.23	0.11
Multi_Family	Heat_Pump	New	Insulation (Floor)	R-38	25	$320.68	$8.27	39	1.2%	0.002	0.13	0.16	0.08
Single_Family	Heat_Pump	Existing	Insulation (Floor)	R-30 (state code)	25	$1,435.81	$2.60	552	6.0%	0.024	0.31	0.50	0.25

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Single_Family	Heat_Pump	Existing	Insulation (Floor)	R-30 (state code)	25	$1,435.81	$8.81	163	1.8%	0.007	0.13	0.15	0.08
Single_Family	Heat_Pump	Existing	Insulation (Floor)	R-38	25	$271.91	$2.50	109	1.2%	0.005	0.32	0.52	0.26
Single_Family	Heat_Pump	New	Insulation (Floor)	R-38	25	$318.00	$2.96	108	1.2%	0.005	0.28	0.44	0.22
Single_Family	Heat_Pump	Existing	Insulation (Rim And Band Joist)	R-10	25	$182.09	$2.04	89	1.0%	0.004	0.35	0.63	0.32
Single_Family	Heat_Pump	Existing	Insulation (Rim And Band Joist)	R-19	25	$218.87	$0.34	640	7.0%	0.028	0.64	3.05	1.72
Single_Family	Heat_Pump	New	Insulation (Rim And Band Joist)	R-10	25	$196.92	$0.66	300	3.3%	0.013	0.55	1.78	0.96
Single_Family	Heat_Pump	New	Insulation (Rim And Band Joist)	R-19	25	$236.69	$0.37	632	7.0%	0.028	0.63	2.84	1.59
Multi_Family	Heat_Pump	Existing	Insulation (Slab)	R-10 (state code)	25	$970.95	$5.62	173	5.3%	0.008	0.18	0.24	0.12
Multi_Family	Heat_Pump	Existing	Insulation (Slab)	R-15	25	$258.29	$5.47	47	1.4%	0.002	0.19	0.24	0.12
Multi_Family	Heat_Pump	New	Insulation (Slab)	R-15	25	$348.55	$7.47	47	1.4%	0.002	0.15	0.18	0.09
Single_Family	Heat_Pump	Existing	Insulation (Slab)	R-10 (state code)	25	$1,303.80	$2.72	480	5.3%	0.021	0.30	0.48	0.24
Single_Family	Heat_Pump	Existing	Insulation (Slab)	R-15	25	$363.01	$2.77	131	1.4%	0.006	0.30	0.47	0.24
Single_Family	Heat_Pump	New	Insulation (Slab)	R-15	25	$413.72	$3.20	129	1.4%	0.006	0.27	0.41	0.21
Multi_Family	Heat_Pump	Existing	Insulation (Wall) 2*4	R-13	25	$1,216.38	$0.90	1350	41.0%	0.060	0.50	1.35	0.71

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Multi_Family	Heat_Pump	Existing	Insulation (Wall) 2*4	R-13 + R5 Sheathing (state code)	25	$533.56	$2.05	260	7.9%	0.012	0.35	0.63	0.32
Single_Family	Heat_Pump	Existing	Insulation (Wall) 2*4	R-13	25	$5,401.48	$1.44	3747	41.0%	0.166	0.42	0.87	0.45
Single_Family	Heat_Pump	Existing	Insulation (Wall) 2*4	R-13 + R5 Sheathing (state code)	25	$2,369.32	$3.28	722	7.9%	0.032	0.27	0.40	0.20
Multi_Family	Heat_Pump	Existing	Insulation (Wall) 2*6	R-20 (State Code)	25	$1,371.69	$0.91	1509	45.8%	0.067	0.50	1.34	0.70
Multi_Family	Heat_Pump	Existing	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$533.56	$5.31	101	3.1%	0.004	0.19	0.25	0.13
Multi_Family	Heat_Pump	New	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$630.26	$6.34	99	3.1%	0.004	0.17	0.21	0.11
Single_Family	Heat_Pump	Existing	Insulation (Wall) 2*6	R-20 (State Code)	25	$6,091.14	$1.45	4188	45.8%	0.185	0.42	0.87	0.45
Single_Family	Heat_Pump	Existing	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$2,369.32	$8.49	279	3.1%	0.012	0.13	0.16	0.08
Single_Family	Heat_Pump	New	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$2,562.30	$9.29	276	3.1%	0.012	0.12	0.14	0.07
Multi_Family	Heat_Pump	Existing	Leak Proof Duct Fittings	Quick connect fittings that do not require mastic or drawbands (6 per unit)	30	$190.04	$0.38	494	15.0%	0.022	0.66	3.04	1.70
Multi_Family	Heat_Pump	New	Leak Proof Duct Fittings	Quick connect fittings that do not require mastic or drawbands (6 per unit)	30	$190.04	$0.39	488	15.0%	0.022	0.66	3.01	1.68
Single_Family	Heat_Pump	Existing	Leak Proof Duct Fittings	Quick connect fittings that do not require mastic or drawbands (6 per unit)	30	$253.38	$0.18	1371	15.0%	0.061	0.72	5.18	3.14
Single_Family	Heat_Pump	New	Leak Proof Duct Fittings	Quick connect fittings that do not require mastic or drawbands (6 per unit)	30	$253.38	$0.19	1355	15.0%	0.060	0.72	5.14	3.11

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Heat_Pump	Existing	Micro Channel Heat Exchangers (Evaporator)	Micro Channel Heat Exchangers (5 ton unit)	18	$3,552.00	$21.58	165	5.0%	0.007	0.05	0.05	0.03
Multi_Family	Heat_Pump	New	Micro Channel Heat Exchangers (Evaporator)	Micro Channel Heat Exchangers (5 ton unit)	18	$3,552.00	$21.83	163	5.0%	0.007	0.05	0.05	0.03
Single_Family	Heat_Pump	Existing	Micro Channel Heat Exchangers (Evaporator)	Micro Channel Heat Exchangers (5 ton unit)	18	$3,552.00	$7.77	457	5.0%	0.020	0.12	0.14	0.07
Single_Family	Heat_Pump	New	Micro Channel Heat Exchangers (Evaporator)	Micro Channel Heat Exchangers (5 ton unit)	18	$3,552.00	$7.87	452	5.0%	0.020	0.12	0.14	0.07
Multi_Family	Heat_Pump	Existing	Motor - ECM Motor	ECM motor for Heat Pump	15	$320.76	$7.80	41	1.3%	0.002	0.11	0.12	0.06
Multi_Family	Heat_Pump	New	Motor - ECM Motor	ECM motor for Heat Pump	15	$320.76	$7.89	41	1.3%	0.002	0.11	0.12	0.06
Single_Family	Heat_Pump	Existing	Motor - ECM Motor	ECM motor for Heat Pump	15	$320.76	$2.81	114	1.3%	0.005	0.23	0.34	0.17
Single_Family	Heat_Pump	New	Motor - ECM Motor	ECM motor for Heat Pump	15	$320.76	$2.84	113	1.3%	0.005	0.23	0.33	0.17
Multi_Family	Heat_Pump	Existing	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$3.33	$0.05	66	2.0%	0.003	0.50	2.63	1.97
Multi_Family	Heat_Pump	New	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$3.33	$0.05	65	2.0%	0.003	0.50	2.62	1.96
Single_Family	Heat_Pump	Existing	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$6.67	$0.04	183	2.0%	0.008	0.50	2.91	2.29
Single_Family	Heat_Pump	New	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$6.67	$0.04	181	2.0%	0.008	0.50	2.90	2.28
Multi_Family	Heat_Pump	Existing	Proper Sizing - Heat Pump	Correctly Sized Heat_Pump (Cooling And Heating Unit)	15	$1.00	$0.00	282	8.6%	0.012	0.67	9.50	9.18
Multi_Family	Heat_Pump	New	Proper Sizing - Heat Pump	Correctly Sized Heat_Pump (Cooling And Heating Unit)	15	$1.00	$0.00	279	8.6%	0.012	0.67	9.49	9.17

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Heat_Pump	Existing	Proper Sizing - Heat Pump	Correctly Sized Heat_Pump (Cooling And Heating Unit)	15	$1.00	$0.00	784	8.6%	0.035	0.67	9.71	9.59
Single_Family	Heat_Pump	New	Proper Sizing - Heat Pump	Correctly Sized Heat_Pump (Cooling And Heating Unit)	15	$1.00	$0.00	775	8.6%	0.034	0.67	9.71	9.58
Multi_Family	Heat_Pump	Existing	PTCS Aerosol-Based Duct Sealing	Spray-in ductwork sealant to minimize duct leaks	25	$900.00	$1.44	625	19.0%	0.028	0.42	0.88	0.45
Multi_Family	Heat_Pump	New	PTCS Aerosol-Based Duct Sealing	Spray-in ductwork sealant to minimize duct leaks	25	$900.00	$1.46	618	19.0%	0.027	0.42	0.87	0.45
Single_Family	Heat_Pump	Existing	PTCS Aerosol-Based Duct Sealing	Spray-in ductwork sealant to minimize duct leaks	25	$900.00	$0.52	1736	19.0%	0.077	0.59	2.18	1.19
Single_Family	Heat_Pump	New	PTCS Aerosol-Based Duct Sealing	Spray-in ductwork sealant to minimize duct leaks	25	$900.00	$0.52	1716	19.0%	0.076	0.59	2.16	1.17
Multi_Family	Heat_Pump	Existing	PTCS Duct Sealing	PTCS Duct Sealing	20	$425.00	$0.86	494	15.0%	0.022	0.46	1.20	0.63
Multi_Family	Heat_Pump	New	PTCS Duct Sealing	PTCS Duct Sealing	20	$425.00	$0.87	488	15.0%	0.022	0.46	1.19	0.62
Single_Family	Heat_Pump	Existing	PTCS Duct Sealing	PTCS Duct Sealing	20	$425.00	$0.31	1371	15.0%	0.061	0.59	2.81	1.60
Single_Family	Heat_Pump	New	PTCS Duct Sealing	PTCS Duct Sealing	20	$425.00	$0.31	1355	15.0%	0.060	0.59	2.78	1.58
Multi_Family	Heat_Pump	Existing	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$383.35	$4.83	79	2.4%	0.004	0.22	0.30	0.15
Multi_Family	Heat_Pump	New	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$402.46	$5.13	79	2.4%	0.003	0.21	0.28	0.14
Single_Family	Heat_Pump	Existing	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$453.56	$2.06	221	2.4%	0.010	0.38	0.68	0.35
Single_Family	Heat_Pump	New	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$399.10	$1.83	218	2.4%	0.010	0.40	0.76	0.39

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Heat_Pump	Existing	Solar Attic Fan	Solar electric attic ventilation	10	$1,000.00	$57.57	17	0.5%	0.001	0.01	0.01	0.01
Multi_Family	Heat_Pump	New	Solar Attic Fan	Solar electric attic ventilation	10	$1,000.00	$58.24	17	0.5%	0.001	0.01	0.01	0.01
Single_Family	Heat_Pump	Existing	Solar Attic Fan	Solar electric attic ventilation	10	$1,000.00	$20.74	48	0.5%	0.002	0.03	0.03	0.02
Single_Family	Heat_Pump	New	Solar Attic Fan	Solar electric attic ventilation	10	$1,000.00	$20.98	48	0.5%	0.002	0.03	0.03	0.02
Multi_Family	Heat_Pump	Existing	Solid state refrigeration (cool chips™) for heat pumps	Solid State Thermoelectric cooling system	18	$2,000.00	$3.38	592	18.0%	0.026	0.22	0.32	0.16
Multi_Family	Heat_Pump	New	Solid state refrigeration (cool chips™) for heat pumps	Solid State Thermoelectric cooling system	18	$2,000.00	$3.41	586	18.0%	0.026	0.22	0.32	0.16
Single_Family	Heat_Pump	Existing	Solid state refrigeration (cool chips™) for heat pumps	Solid State Thermoelectric cooling system	18	$2,000.00	$1.22	1645	18.0%	0.073	0.40	0.84	0.44
Single_Family	Heat_Pump	New	Solid state refrigeration (cool chips™) for heat pumps	Solid State Thermoelectric cooling system	18	$2,000.00	$1.23	1626	18.0%	0.072	0.39	0.84	0.43
Multi_Family	Heat_Pump	New	Spray in insulation 2*6 Wall	2*6Wall - closed cell foam insulation R-33	25	$3,141.92	$11.03	285	8.8%	0.013	0.11	0.12	0.06
Single_Family	Heat_Pump	New	Spray in insulation 2*6 Wall	2*6Wall - closed cell foam insulation R-33	25	$12,773.28	$16.16	790	8.8%	0.035	0.08	0.08	0.04
Multi_Family	Heat_Pump	Existing	Storm Windows	Storm Window	20	$371.36	$4.95	75	2.3%	0.003	0.17	0.23	0.12
Multi_Family	Heat_Pump	New	Storm Windows	Storm Window	20	$526.41	$7.10	74	2.3%	0.003	0.13	0.16	0.08
Single_Family	Heat_Pump	Existing	Storm Windows	Storm Window	20	$1,978.89	$9.50	208	2.3%	0.009	0.10	0.12	0.06
Single_Family	Heat_Pump	New	Storm Windows	Storm Window	20	$2,140.07	$10.39	206	2.3%	0.009	0.10	0.11	0.06

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Heat_Pump	Existing	Thermostat - Clock/Programmable	Programmable Thermostat	15	$26.00	$0.12	224	6.8%	0.010	0.62	4.55	2.96
Multi_Family	Heat_Pump	New	Thermostat - Clock/Programmable	Programmable Thermostat	15	$26.00	$0.12	221	6.8%	0.010	0.62	4.52	2.93
Single_Family	Heat_Pump	Existing	Thermostat - Clock/Programmable	Programmable Thermostat	15	$26.00	$0.04	621	6.8%	0.027	0.65	6.93	5.35
Single_Family	Heat_Pump	New	Thermostat - Clock/Programmable	Programmable Thermostat	15	$26.00	$0.04	614	6.8%	0.027	0.65	6.91	5.32
Single_Family	Heat_Pump	Existing	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	12	$1,327.35	$2.08	640	7.0%	0.028	0.25	0.38	0.20
Single_Family	Heat_Pump	New	Thermostat - Multi-Zone	Individual Room Temperature Control for Major Occupied Rooms	12	$1,327.35	$2.10	632	7.0%	0.028	0.24	0.38	0.19
Multi_Family	Heat_Pump	Existing	VSD Motor - ECM	Variable Speed Motor (ECM) for Heat Pump	20	$295.76	$2.40	123	3.8%	0.005	0.28	0.46	0.24
Multi_Family	Heat_Pump	New	VSD Motor - ECM	Variable Speed Motor (ECM) for Heat Pump	20	$295.76	$2.42	122	3.8%	0.005	0.28	0.46	0.23
Single_Family	Heat_Pump	Existing	VSD Motor - ECM	Variable Speed Motor (ECM) for Heat Pump	20	$295.76	$0.86	343	3.8%	0.015	0.46	1.19	0.63
Single_Family	Heat_Pump	New	VSD Motor - ECM	Variable Speed Motor (ECM) for Heat Pump	20	$295.76	$0.87	339	3.8%	0.015	0.46	1.18	0.62
Multi_Family	Heat_Pump	Existing	Whole-House Fan	Whole-House Fan	15	$1,368.95	$21.49	64	1.9%	0.003	0.04	0.05	0.02
Multi_Family	Heat_Pump	New	Whole-House Fan	Whole-House Fan	15	$1,368.95	$21.74	63	1.9%	0.003	0.04	0.05	0.02
Single_Family	Heat_Pump	Existing	Whole-House Fan	Whole-House Fan	15	$1,368.95	$7.74	177	1.9%	0.008	0.11	0.13	0.06
Single_Family	Heat_Pump	New	Whole-House Fan	Whole-House Fan	15	$1,368.95	$7.83	175	1.9%	0.008	0.11	0.12	0.06

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Heat_Pump	Existing	Windows	U=0.19	25	$956.75	$2.84	336	10.2%	0.015	0.29	0.46	0.23
Multi_Family	Heat_Pump	Existing	Windows	U=0.30	25	$181.09	$2.48	73	2.2%	0.003	0.32	0.52	0.27
Multi_Family	Heat_Pump	Existing	Windows	U=0.32	25	$95.31	$2.38	40	1.2%	0.002	0.32	0.54	0.28
Multi_Family	Heat_Pump	Existing	Windows	U=0.35	25	$1,890.83	$23.48	81	2.4%	0.004	0.05	0.06	0.03
Multi_Family	Heat_Pump	Existing	Windows	U=0.35	25	$1,890.83	$3.93	481	14.6%	0.021	0.24	0.33	0.17
Multi_Family	Heat_Pump	New	Windows	U=0.19	25	$1,356.20	$3.15	430	13.2%	0.019	0.27	0.41	0.21
Multi_Family	Heat_Pump	New	Windows	U=0.30	25	$256.69	$3.55	72	2.2%	0.003	0.25	0.37	0.19
Multi_Family	Heat_Pump	New	Windows	U=0.32	25	$135.10	$3.41	40	1.2%	0.002	0.26	0.38	0.20
Single_Family	Heat_Pump	Existing	Windows	U=0.19	25	$5,098.28	$5.46	934	10.2%	0.041	0.19	0.24	0.12
Single_Family	Heat_Pump	Existing	Windows	U=0.30	25	$964.96	$4.76	203	2.2%	0.009	0.21	0.28	0.14
Single_Family	Heat_Pump	Existing	Windows	U=0.32	25	$507.87	$4.56	111	1.2%	0.005	0.21	0.29	0.15
Single_Family	Heat_Pump	Existing	Windows	U=0.35	25	$10,075.69	$45.08	224	2.4%	0.010	0.03	0.03	0.01
Single_Family	Heat_Pump	Existing	Windows	U=0.35	25	$10,075.69	$7.54	1336	14.6%	0.059	0.14	0.18	0.09
Single_Family	Heat_Pump	New	Windows	U=0.19	25	$5,513.53	$4.62	1194	13.2%	0.053	0.21	0.29	0.14

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Heat_Pump	New	Windows	U=0.30	25	$1,043.56	$5.20	200	2.2%	0.009	0.19	0.25	0.13
Single_Family	Heat_Pump	New	Windows	U=0.32	25	$549.24	$4.99	110	1.2%	0.005	0.20	0.26	0.13
Manufactured	HVAC_Aux	Existing	Motor - ECM Motor	ECM Motor for Forced Air Electric Furnace	15	$320.76	$2.13	151	25.0%	0.004	0.26	0.42	0.22
Manufactured	HVAC_Aux	Existing	Motor - ECM Motor	ECM Motor for Forced Air Gas Furnace	15	$320.76	$2.13	151	25.0%	0.004	0.26	0.42	0.22
Manufactured	HVAC_Aux	New	Motor - ECM Motor	ECM Motor for Forced Air Electric Furnace	15	$320.76	$2.13	151	25.0%	0.004	0.26	0.42	0.22
Manufactured	HVAC_Aux	New	Motor - ECM Motor	ECM Motor for Forced Air Gas Furnace	15	$320.76	$2.13	151	25.0%	0.004	0.26	0.42	0.22
Multi_Family	HVAC_Aux	Existing	Motor - ECM Motor	ECM Motor for Forced Air Electric Furnace	15	$320.76	$5.81	55	25.0%	0.002	0.13	0.16	0.08
Multi_Family	HVAC_Aux	Existing	Motor - ECM Motor	ECM Motor for Forced Air Gas Furnace	15	$320.76	$5.81	55	25.0%	0.002	0.13	0.16	0.08
Multi_Family	HVAC_Aux	New	Motor - ECM Motor	ECM Motor for Forced Air Electric Furnace	15	$320.76	$5.81	55	25.0%	0.002	0.13	0.16	0.08
Multi_Family	HVAC_Aux	New	Motor - ECM Motor	ECM Motor for Forced Air Gas Furnace	15	$320.76	$5.81	55	25.0%	0.002	0.13	0.16	0.08
Single_Family	HVAC_Aux	Existing	Motor - ECM Motor	ECM Motor for Forced Air Electric Furnace	15	$320.76	$2.60	123	25.0%	0.003	0.23	0.35	0.18
Single_Family	HVAC_Aux	Existing	Motor - ECM Motor	ECM Motor for Forced Air Gas Furnace	15	$320.76	$2.60	123	25.0%	0.003	0.23	0.35	0.18
Single_Family	HVAC_Aux	New	Motor - ECM Motor	ECM Motor for Forced Air Electric Furnace	15	$320.76	$2.60	123	25.0%	0.003	0.23	0.35	0.18
Single_Family	HVAC_Aux	New	Motor - ECM Motor	ECM Motor for Forced Air Gas Furnace	15	$320.76	$2.60	123	25.0%	0.003	0.23	0.35	0.18

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Manufactured	HVAC_Aux	Existing	VSD Fan	Variable Speed Fan - Electric Furnace	20	$395.76	$0.87	453	75.0%	0.013	0.44	1.13	0.60
Manufactured	HVAC_Aux	Existing	VSD Fan	Variable Speed Fan - Gas Furnace	20	$395.76	$0.87	453	75.0%	0.013	0.44	1.13	0.60
Manufactured	HVAC_Aux	New	VSD Fan	Variable Speed Fan - Electric Furnace	20	$395.76	$0.87	453	75.0%	0.013	0.44	1.13	0.60
Manufactured	HVAC_Aux	New	VSD Fan	Variable Speed Fan - Gas Furnace	20	$395.76	$0.87	453	75.0%	0.013	0.44	1.13	0.60
Multi_Family	HVAC_Aux	Existing	VSD Fan	Variable Speed Fan - Electric Furnace	20	$395.76	$2.39	166	75.0%	0.005	0.27	0.44	0.23
Multi_Family	HVAC_Aux	Existing	VSD Fan	Variable Speed Fan - Gas Furnace	20	$395.76	$2.39	166	75.0%	0.005	0.27	0.44	0.23
Multi_Family	HVAC_Aux	New	VSD Fan	Variable Speed Fan - Electric Furnace	20	$395.76	$2.39	166	75.0%	0.005	0.27	0.44	0.23
Multi_Family	HVAC_Aux	New	VSD Fan	Variable Speed Fan - Gas Furnace	20	$395.76	$2.39	166	75.0%	0.005	0.27	0.44	0.23
Single_Family	HVAC_Aux	Existing	VSD Fan	Variable Speed Fan - Electric Furnace	20	$395.76	$1.07	370	75.0%	0.010	0.41	0.94	0.49
Single_Family	HVAC_Aux	Existing	VSD Fan	Variable Speed Fan - Gas Furnace	20	$395.76	$1.07	370	75.0%	0.010	0.41	0.94	0.49
Single_Family	HVAC_Aux	New	VSD Fan	Variable Speed Fan - Electric Furnace	20	$395.76	$1.07	370	75.0%	0.010	0.41	0.94	0.49
Single_Family	HVAC_Aux	New	VSD Fan	Variable Speed Fan - Gas Furnace	20	$395.76	$1.07	370	75.0%	0.010	0.41	0.94	0.49
Manufactured	Lighting	Existing	CFL Fixtures, 15W	2-15 W CFLs, 2.3 hr/day	20	$12.25	$0.12	98	6.8%	0.010	0.73	5.80	3.73
Manufactured	Lighting	New	CFL Fixtures, 15W	2-15 W CFLs, 2.3 hr/day	20	$12.25	$0.12	98	6.8%	0.010	0.73	5.80	3.73
Multi_Family	Lighting	Existing	CFL Fixtures, 15W	2-15 W CFLs, 2.3 hr/day	20	$12.25	$0.17	74	6.8%	0.007	0.72	4.92	3.03
Multi_Family	Lighting	New	CFL Fixtures, 15W	2-15 W CFLs, 2.3 hr/day	20	$12.25	$0.17	74	6.8%	0.007	0.72	4.92	3.03

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Single_Family	Lighting	Existing	CFL Fixtures, 15W	2-15 W CFLs, 2.3 hr/day	20	$12.25	$0.17	71	4.1%	0.007	0.72	4.78	2.93
Single_Family	Lighting	New	CFL Fixtures, 15W	2-15 W CFLs, 2.3 hr/day	20	$12.25	$0.17	71	4.1%	0.007	0.72	4.78	2.93
Manufactured	Lighting	Existing	CFL Fixtures, 20W	2-20 W CFLs, 2.3 hr/day	20	$12.25	$0.10	120	8.3%	0.012	0.74	6.45	4.28
Manufactured	Lighting	New	CFL Fixtures, 20W	2-20 W CFLs, 2.3 hr/day	20	$12.25	$0.10	120	8.3%	0.012	0.74	6.45	4.28
Multi_Family	Lighting	Existing	CFL Fixtures, 20W	2-20 W CFLs, 2.3 hr/day	20	$12.25	$0.14	91	8.3%	0.009	0.73	5.54	3.52
Multi_Family	Lighting	New	CFL Fixtures, 20W	2-20 W CFLs, 2.3 hr/day	20	$12.25	$0.14	91	8.3%	0.009	0.73	5.54	3.52
Single_Family	Lighting	Existing	CFL Fixtures, 20W	2-20 W CFLs, 2.3 hr/day	20	$12.25	$0.14	87	5.1%	0.008	0.73	5.40	3.41
Single_Family	Lighting	New	CFL Fixtures, 20W	2-20 W CFLs, 2.3 hr/day	20	$12.25	$0.14	87	5.1%	0.008	0.73	5.40	3.41
Manufactured	Lighting	Existing	CFL Fixtures, 25W	2-25 W CFLs, 2.3 hr/day	20	$12.25	$0.07	164	11.3%	0.016	0.76	7.45	5.22
Manufactured	Lighting	New	CFL Fixtures, 25W	2-25 W CFLs, 2.3 hr/day	20	$12.25	$0.07	164	11.3%	0.016	0.76	7.45	5.22
Multi_Family	Lighting	Existing	CFL Fixtures, 25W	2-25 W CFLs, 2.3 hr/day	20	$12.25	$0.10	124	11.3%	0.012	0.75	6.55	4.37
Multi_Family	Lighting	New	CFL Fixtures, 25W	2-25 W CFLs, 2.3 hr/day	20	$12.25	$0.10	124	11.3%	0.012	0.75	6.55	4.37
Single_Family	Lighting	Existing	CFL Fixtures, 25W	2-25 W CFLs, 2.3 hr/day	20	$12.25	$0.10	118	6.9%	0.011	0.74	6.40	4.24
Single_Family	Lighting	New	CFL Fixtures, 25W	2-25 W CFLs, 2.3 hr/day	20	$12.25	$0.10	118	6.9%	0.011	0.74	6.40	4.24
Manufactured	Lighting	Existing	CFL Lamps, 15W	One CFL 15W, 2.3 hr/day	6	$2.75	$0.06	49	3.4%	0.005	0.59	3.42	2.51
Manufactured	Lighting	New	CFL Lamps, 15W	One CFL 15W, 2.3 hr/day	6	$2.75	$0.06	49	3.4%	0.005	0.59	3.42	2.51
Multi_Family	Lighting	Existing	CFL Lamps, 15W	One CFL 15W, 2.3 hr/day	6	$2.75	$0.07	37	3.4%	0.004	0.58	3.06	2.15
Multi_Family	Lighting	New	CFL Lamps, 15W	One CFL 15W, 2.3 hr/day	6	$2.75	$0.07	37	3.4%	0.004	0.58	3.06	2.15
Single_Family	Lighting	Existing	CFL Lamps, 15W	One CFL 15W, 2.3 hr/day	6	$2.75	$0.08	35	2.1%	0.003	0.57	3.00	2.09
Single_Family	Lighting	New	CFL Lamps, 15W	One CFL 15W, 2.3 hr/day	6	$2.75	$0.08	35	2.1%	0.003	0.57	3.00	2.09
Manufactured	Lighting	Existing	CFL Lamps, 20W	One CFL 20W, 2.3 hr/day	6	$2.75	$0.05	60	4.1%	0.006	0.60	3.66	2.78
Manufactured	Lighting	New	CFL Lamps, 20W	One CFL 20W, 2.3 hr/day	6	$2.75	$0.05	60	4.1%	0.006	0.60	3.66	2.78

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Lighting	Existing	CFL Lamps, 20W	One CFL 20W, 2.3 hr/day	6	$2.75	$0.06	45	4.1%	0.004	0.59	3.32	2.41
Multi_Family	Lighting	New	CFL Lamps, 20W	One CFL 20W, 2.3 hr/day	6	$2.75	$0.06	45	4.1%	0.004	0.59	3.32	2.41
Single_Family	Lighting	Existing	CFL Lamps, 20W	One CFL 20W, 2.3 hr/day	6	$2.75	$0.06	43	2.5%	0.004	0.58	3.26	2.35
Single_Family	Lighting	New	CFL Lamps, 20W	One CFL 20W, 2.3 hr/day	6	$2.75	$0.06	43	2.5%	0.004	0.58	3.26	2.35
Manufactured	Lighting	Existing	CFL Lamps, 25W	One CFL 25W, 2.3 hr/day	6	$2.75	$0.03	82	5.6%	0.008	0.60	3.99	3.19
Manufactured	Lighting	New	CFL Lamps, 25W	One CFL 25W, 2.3 hr/day	6	$2.75	$0.03	82	5.6%	0.008	0.60	3.99	3.19
Multi_Family	Lighting	Existing	CFL Lamps, 25W	One CFL 25W, 2.3 hr/day	6	$2.75	$0.04	62	5.7%	0.006	0.60	3.69	2.82
Multi_Family	Lighting	New	CFL Lamps, 25W	One CFL 25W, 2.3 hr/day	6	$2.75	$0.04	62	5.7%	0.006	0.60	3.69	2.82
Single_Family	Lighting	Existing	CFL Lamps, 25W	One CFL 25W, 2.3 hr/day	6	$2.75	$0.05	59	3.5%	0.006	0.59	3.64	2.76
Single_Family	Lighting	New	CFL Lamps, 25W	One CFL 25W, 2.3 hr/day	6	$2.75	$0.05	59	3.5%	0.006	0.59	3.64	2.76
Manufactured	Lighting	Existing	CFL Lighting - 3-Way	13 W, 20W And 25W	5	$12.25	$0.21	58	4.0%	0.006	0.47	1.46	0.87
Manufactured	Lighting	New	CFL Lighting - 3-Way	13 W, 20W And 25W	5	$12.25	$0.21	58	4.0%	0.006	0.47	1.46	0.87
Multi_Family	Lighting	Existing	CFL Lighting - 3-Way	13 W, 20W And 25W	5	$12.25	$0.28	44	4.0%	0.004	0.44	1.19	0.69
Multi_Family	Lighting	New	CFL Lighting - 3-Way	13 W, 20W And 25W	5	$12.25	$0.28	44	4.0%	0.004	0.44	1.19	0.69
Single_Family	Lighting	Existing	CFL Lighting - 3-Way	13 W, 20W And 25W	5	$12.25	$0.29	42	2.5%	0.004	0.43	1.16	0.66
Single_Family	Lighting	New	CFL Lighting - 3-Way	13 W, 20W And 25W	5	$12.25	$0.29	42	2.5%	0.004	0.43	1.16	0.66
Manufactured	Lighting	Existing	CFL Torchieries, Medium Use	55 W CFL	6	$29.00	$0.21	136	9.4%	0.013	0.50	1.70	1.01
Manufactured	Lighting	New	CFL Torchieries, Medium Use	55 W CFL	6	$29.00	$0.21	136	9.4%	0.013	0.50	1.70	1.01
Multi_Family	Lighting	Existing	CFL Torchieries, Medium Use	55 W CFL	6	$29.00	$0.28	103	9.4%	0.010	0.47	1.40	0.80
Multi_Family	Lighting	New	CFL Torchieries, Medium Use	55 W CFL	6	$29.00	$0.28	103	9.4%	0.010	0.47	1.40	0.80
Single_Family	Lighting	Existing	CFL Torchieries, Medium Use	55 W CFL	6	$29.00	$0.29	99	5.8%	0.010	0.47	1.35	0.77
Single_Family	Lighting	New	CFL Torchieries, Medium Use	55 W CFL	6	$29.00	$0.29	99	5.8%	0.010	0.47	1.35	0.77

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Manufactured	Lighting	Existing	Daylighting Controls (Photocell) - Indoor/Outdoors	Install Photocell	10	$136.90	$2.12	65	4.5%	0.006	0.25	0.37	0.19
Manufactured	Lighting	New	Daylighting Controls (Photocell) - Indoor/Outdoors	Install Photocell	10	$136.90	$2.12	65	4.5%	0.006	0.25	0.37	0.19
Multi_Family	Lighting	Existing	Daylighting Controls (Photocell) - Indoor/Outdoors	Install Photocell	10	$136.90	$2.81	49	4.5%	0.005	0.21	0.28	0.14
Multi_Family	Lighting	New	Daylighting Controls (Photocell) - Indoor/Outdoors	Install Photocell	10	$136.90	$2.81	49	4.5%	0.005	0.21	0.28	0.14
Single_Family	Lighting	Existing	Daylighting Controls (Photocell) - Indoor/Outdoors	Install Photocell	10	$136.90	$1.79	76	4.5%	0.007	0.28	0.43	0.22
Single_Family	Lighting	New	Daylighting Controls (Photocell) - Indoor/Outdoors	Install Photocell	10	$136.90	$1.79	76	4.5%	0.007	0.28	0.43	0.22
Manufactured	Lighting	Existing	LED Christmas Lighting	LED Christmas Lighting	13	$10.00	$2.06	5	0.3%	0.000	0.29	0.47	0.24
Manufactured	Lighting	New	LED Christmas Lighting	LED Christmas Lighting	13	$10.00	$2.06	5	0.3%	0.000	0.29	0.47	0.24
Multi_Family	Lighting	Existing	LED Christmas Lighting	LED Christmas Lighting	13	$10.00	$2.74	4	0.3%	0.000	0.25	0.35	0.18
Multi_Family	Lighting	New	LED Christmas Lighting	LED Christmas Lighting	13	$10.00	$2.74	4	0.3%	0.000	0.25	0.35	0.18
Single_Family	Lighting	Existing	LED Christmas Lighting	LED Christmas Lighting	13	$10.00	$1.75	6	0.3%	0.001	0.32	0.54	0.28
Single_Family	Lighting	New	LED Christmas Lighting	LED Christmas Lighting	13	$10.00	$1.75	6	0.3%	0.001	0.32	0.54	0.28
Manufactured	Lighting	Existing	LED Interior Lighting (White), 13W	One LED 13W, 2.3 hr/day	20	$46.49	$3.27	14	1.0%	0.001	0.27	0.39	0.20
Manufactured	Lighting	New	LED Interior Lighting (White), 13W	One LED 13W, 2.3 hr/day	20	$46.49	$3.27	14	1.0%	0.001	0.27	0.39	0.20
Multi_Family	Lighting	Existing	LED Interior Lighting (White), 13W	One LED 13W, 2.3 hr/day	20	$46.49	$4.32	11	1.0%	0.001	0.22	0.29	0.15
Multi_Family	Lighting	New	LED Interior Lighting (White), 13W	One LED 13W, 2.3 hr/day	20	$46.49	$4.32	11	1.0%	0.001	0.22	0.29	0.15

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Lighting	Existing	LED Interior Lighting (White), 13W	One LED 13W, 2.3 hr/day	20	$46.49	$4.52	10	0.6%	0.001	0.21	0.28	0.14
Single_Family	Lighting	New	LED Interior Lighting (White), 13W	One LED 13W, 2.3 hr/day	20	$46.49	$4.52	10	0.6%	0.001	0.21	0.28	0.14
Manufactured	Lighting	Existing	LED Interior Lighting (White), 7W	One LED 7W, 2.3 hr/day	20	$36.49	$4.18	9	0.6%	0.001	0.22	0.30	0.15
Manufactured	Lighting	New	LED Interior Lighting (White), 7W	One LED 7W, 2.3 hr/day	20	$36.49	$4.18	9	0.6%	0.001	0.22	0.30	0.15
Multi_Family	Lighting	Existing	LED Interior Lighting (White), 7W	One LED 7W, 2.3 hr/day	20	$36.49	$5.53	7	0.6%	0.001	0.18	0.23	0.12
Multi_Family	Lighting	New	LED Interior Lighting (White), 7W	One LED 7W, 2.3 hr/day	20	$36.49	$5.53	7	0.6%	0.001	0.18	0.23	0.12
Single_Family	Lighting	Existing	LED Interior Lighting (White), 7W	One LED 7W, 2.3 hr/day	20	$36.49	$5.78	6	0.4%	0.001	0.18	0.22	0.11
Single_Family	Lighting	New	LED Interior Lighting (White), 7W	One LED 7W, 2.3 hr/day	20	$36.49	$5.78	6	0.4%	0.001	0.18	0.22	0.11
Manufactured	Lighting	Existing	LED Interior Lighting (White), 9W	One LED 9W, 2.3 hr/day	20	$41.49	$3.46	12	0.8%	0.001	0.26	0.37	0.19
Manufactured	Lighting	New	LED Interior Lighting (White), 9W	One LED 9W, 2.3 hr/day	20	$41.49	$3.46	12	0.8%	0.001	0.26	0.37	0.19
Multi_Family	Lighting	Existing	LED Interior Lighting (White), 9W	One LED 9W, 2.3 hr/day	20	$41.49	$4.58	9	0.8%	0.001	0.21	0.28	0.14
Multi_Family	Lighting	New	LED Interior Lighting (White), 9W	One LED 9W, 2.3 hr/day	20	$41.49	$4.58	9	0.8%	0.001	0.21	0.28	0.14
Single_Family	Lighting	Existing	LED Interior Lighting (White), 9W	One LED 9W, 2.3 hr/day	20	$41.49	$4.78	9	0.5%	0.001	0.20	0.27	0.13
Single_Family	Lighting	New	LED Interior Lighting (White), 9W	One LED 9W, 2.3 hr/day	20	$41.49	$4.78	9	0.5%	0.001	0.20	0.27	0.13
Manufactured	Lighting	Existing	Occupancy Sensors	Wall-Switch Occupancy Sensors	10	$56.08	$0.28	201	13.9%	0.020	0.56	2.17	1.25

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Manufactured	Lighting	New	Occupancy Sensors	Wall-Switch Occupancy Sensors	10	$56.08	$0.28	201	13.9%	0.020	0.56	2.17	1.25
Multi_Family	Lighting	Existing	Occupancy Sensors	Wall-Switch Occupancy Sensors	10	$56.08	$0.37	151	13.9%	0.015	0.53	1.75	0.98
Multi_Family	Lighting	New	Occupancy Sensors	Wall-Switch Occupancy Sensors	10	$56.08	$0.37	151	13.9%	0.015	0.53	1.75	0.98
Single_Family	Lighting	Existing	Occupancy Sensors	Wall-Switch Occupancy Sensors	10	$56.08	$0.24	237	13.9%	0.023	0.58	2.45	1.44
Single_Family	Lighting	New	Occupancy Sensors	Wall-Switch Occupancy Sensors	10	$56.08	$0.24	237	13.9%	0.023	0.58	2.45	1.44
Manufactured	Lighting	Existing	Time Clocks (Exterior Lighting)	Exterior Lighting on a Time Clock	10	$82.29	$1.97	42	2.9%	0.004	0.26	0.40	0.20
Manufactured	Lighting	New	Time Clocks (Exterior Lighting)	Exterior Lighting on a Time Clock	10	$82.29	$1.97	42	2.9%	0.004	0.26	0.40	0.20
Multi_Family	Lighting	Existing	Time Clocks (Exterior Lighting)	Exterior Lighting on a Time Clock	10	$82.29	$2.61	32	2.9%	0.003	0.22	0.30	0.15
Multi_Family	Lighting	New	Time Clocks (Exterior Lighting)	Exterior Lighting on a Time Clock	10	$82.29	$2.61	32	2.9%	0.003	0.22	0.30	0.15
Single_Family	Lighting	Existing	Time Clocks (Exterior Lighting)	Exterior Lighting on a Time Clock	10	$82.29	$1.67	49	2.9%	0.005	0.29	0.47	0.24
Single_Family	Lighting	New	Time Clocks (Exterior Lighting)	Exterior Lighting on a Time Clock	10	$82.29	$1.67	49	2.9%	0.005	0.29	0.47	0.24
Manufactured	Plug_Load	Existing	1-Watt Standby Power	1W or less standby power use for small appliances	7	$30.00	$0.87	34	2.4%	0.003	0.34	0.63	0.33
Manufactured	Plug_Load	New	1-Watt Standby Power	1W or less standby power use for small appliances	7	$30.00	$0.87	34	2.4%	0.003	0.34	0.63	0.33
Multi_Family	Plug_Load	Existing	1-Watt Standby Power	1W or less standby power use for small appliances	7	$30.00	$1.19	25	2.3%	0.002	0.29	0.47	0.24
Multi_Family	Plug_Load	New	1-Watt Standby Power	1W or less standby power use for small appliances	7	$30.00	$1.19	25	2.3%	0.002	0.29	0.47	0.24
Single_Family	Plug_Load	Existing	1-Watt Standby Power	1W or less standby power use for small appliances	7	$30.00	$0.90	33	1.9%	0.003	0.33	0.61	0.32
Single_Family	Plug_Load	New	1-Watt Standby Power	1W or less standby power use for small appliances	7	$30.00	$0.90	33	1.9%	0.003	0.33	0.61	0.32
Manufactured	Plug_Load	Existing	Energy Star Battery Chargers	Energy Star Battery Chargers	7	$4.00	$1.17	3	0.2%	0.000	0.29	0.48	0.25

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Manufactured	Plug_Load	New	Energy Star Battery Chargers	Energy Star Battery Chargers	7	$4.00	$1.17	3	0.2%	0.000	0.29	0.48	0.25
Multi_Family	Plug_Load	Existing	Energy Star Battery Chargers	Energy Star Battery Chargers	7	$4.00	$1.61	2	0.2%	0.000	0.24	0.36	0.18
Multi_Family	Plug_Load	New	Energy Star Battery Chargers	Energy Star Battery Chargers	7	$4.00	$1.61	2	0.2%	0.000	0.24	0.36	0.18
Single_Family	Plug_Load	Existing	Energy Star Battery Chargers	Energy Star Battery Chargers	7	$4.00	$1.21	3	0.2%	0.000	0.28	0.46	0.24
Single_Family	Plug_Load	New	Energy Star Battery Chargers	Energy Star Battery Chargers	7	$4.00	$1.21	3	0.2%	0.000	0.28	0.46	0.24
Manufactured	Plug_Load	Existing	Energy Star Dehumidifiers	Energy Star Dehumidifiers	10	$12.00	$0.23	53	3.6%	0.005	0.58	2.51	1.48
Manufactured	Plug_Load	New	Energy Star Dehumidifiers	Energy Star Dehumidifiers	10	$12.00	$0.23	53	3.6%	0.005	0.58	2.51	1.48
Multi_Family	Plug_Load	Existing	Energy Star Dehumidifiers	Energy Star Dehumidifiers	10	$12.00	$0.31	38	3.5%	0.004	0.55	1.99	1.13
Multi_Family	Plug_Load	New	Energy Star Dehumidifiers	Energy Star Dehumidifiers	10	$12.00	$0.31	38	3.5%	0.004	0.55	1.99	1.13
Single_Family	Plug_Load	Existing	Energy Star Dehumidifiers	Energy Star Dehumidifiers	10	$12.00	$0.24	51	2.9%	0.005	0.58	2.45	1.44
Single_Family	Plug_Load	New	Energy Star Dehumidifiers	Energy Star Dehumidifiers	10	$12.00	$0.24	51	2.9%	0.005	0.58	2.45	1.44
Manufactured	Plug_Load	Existing	Energy Star Digital Set Top Receiver	Energy Star Digital Set Top Receiver	6	$35.00	$0.55	63	4.4%	0.006	0.38	0.82	0.44
Manufactured	Plug_Load	New	Energy Star Digital Set Top Receiver	Energy Star Digital Set Top Receiver	6	$35.00	$0.55	63	4.4%	0.006	0.38	0.82	0.44
Multi_Family	Plug_Load	Existing	Energy Star Digital Set Top Receiver	Energy Star Digital Set Top Receiver	6	$35.00	$0.76	46	4.2%	0.004	0.33	0.62	0.33

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Plug_Load	New	Energy Star Digital Set Top Receiver	Energy Star Digital Set Top Receiver	6	$35.00	$0.76	46	4.2%	0.004	0.33	0.62	0.33
Single_Family	Plug_Load	Existing	Energy Star Digital Set Top Receiver	Energy Star Digital Set Top Receiver	6	$35.00	$0.57	61	3.5%	0.006	0.38	0.79	0.43
Single_Family	Plug_Load	New	Energy Star Digital Set Top Receiver	Energy Star Digital Set Top Receiver	6	$35.00	$0.57	61	3.5%	0.006	0.38	0.79	0.43
Manufactured	Plug_Load	Existing	Energy Star DVD System	Energy Star DVD System	7	$4.99	$0.19	27	1.9%	0.003	0.54	2.13	1.29
Manufactured	Plug_Load	New	Energy Star DVD System	Energy Star DVD System	7	$4.99	$0.19	27	1.9%	0.003	0.54	2.13	1.29
Multi_Family	Plug_Load	Existing	Energy Star DVD System	Energy Star DVD System	7	$4.99	$0.26	20	1.8%	0.002	0.51	1.71	1.00
Multi_Family	Plug_Load	New	Energy Star DVD System	Energy Star DVD System	7	$4.99	$0.26	20	1.8%	0.002	0.51	1.71	1.00
Single_Family	Plug_Load	Existing	Energy Star DVD System	Energy Star DVD System	7	$4.99	$0.19	26	1.5%	0.003	0.54	2.08	1.26
Single_Family	Plug_Load	New	Energy Star DVD System	Energy Star DVD System	7	$4.99	$0.19	26	1.5%	0.003	0.54	2.08	1.26
Manufactured	Plug_Load	Existing	Energy Star HDTV	Energy Star HDTV	9	$100.00	$0.78	129	8.9%	0.012	0.40	0.86	0.46
Manufactured	Plug_Load	New	Energy Star HDTV	Energy Star HDTV	9	$100.00	$0.78	129	8.9%	0.012	0.40	0.86	0.46
Multi_Family	Plug_Load	Existing	Energy Star HDTV	Energy Star HDTV	9	$100.00	$1.07	94	8.6%	0.009	0.35	0.65	0.34
Multi_Family	Plug_Load	New	Energy Star HDTV	Energy Star HDTV	9	$100.00	$1.07	94	8.6%	0.009	0.35	0.65	0.34
Single_Family	Plug_Load	Existing	Energy Star HDTV	Energy Star HDTV	9	$100.00	$0.80	124	7.2%	0.012	0.39	0.84	0.44

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Plug_Load	New	Energy Star HDTV	Energy Star HDTV	9	$100.00	$0.80	124	7.2%	0.012	0.39	0.84	0.44
Manufactured	Plug_Load	Existing	Energy Star Home Audio System	Energy Star Home Audio System	7	$20.00	$0.47	42	2.9%	0.004	0.43	1.07	0.58
Manufactured	Plug_Load	New	Energy Star Home Audio System	Energy Star Home Audio System	7	$20.00	$0.47	42	2.9%	0.004	0.43	1.07	0.58
Multi_Family	Plug_Load	Existing	Energy Star Home Audio System	Energy Star Home Audio System	7	$20.00	$0.65	31	2.8%	0.003	0.38	0.82	0.44
Multi_Family	Plug_Load	New	Energy Star Home Audio System	Energy Star Home Audio System	7	$20.00	$0.65	31	2.8%	0.003	0.38	0.82	0.44
Single_Family	Plug_Load	Existing	Energy Star Home Audio System	Energy Star Home Audio System	7	$20.00	$0.49	41	2.4%	0.004	0.43	1.04	0.57
Single_Family	Plug_Load	New	Energy Star Home Audio System	Energy Star Home Audio System	7	$20.00	$0.49	41	2.4%	0.004	0.43	1.04	0.57
Manufactured	Plug_Load	Existing	Energy Star Office Computer	Energy Star Office Computer	4	$15.00	$0.11	135	9.3%	0.013	0.49	1.74	1.14
Manufactured	Plug_Load	New	Energy Star Office Computer	Energy Star Office Computer	4	$15.00	$0.11	135	9.3%	0.013	0.49	1.74	1.14
Multi_Family	Plug_Load	Existing	Energy Star Office Computer	Energy Star Office Computer	4	$15.00	$0.15	98	9.0%	0.010	0.46	1.45	0.91
Multi_Family	Plug_Load	New	Energy Star Office Computer	Energy Star Office Computer	4	$15.00	$0.15	98	9.0%	0.010	0.46	1.45	0.91
Single_Family	Plug_Load	Existing	Energy Star Office Computer	Energy Star Office Computer	4	$15.00	$0.12	130	7.5%	0.013	0.49	1.71	1.11
Single_Family	Plug_Load	New	Energy Star Office Computer	Energy Star Office Computer	4	$15.00	$0.12	130	7.5%	0.013	0.49	1.71	1.11
Manufactured	Plug_Load	Existing	Energy Star Office Copiers	Energy Star Office Copiers	6	$24.99	$1.20	21	1.4%	0.002	0.26	0.41	0.21

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Manufactured	Plug_Load	New	Energy Star Office Copiers	Energy Star Office Copiers	6	$24.99	$1.20	21	1.4%	0.002	0.26	0.41	0.21
Multi_Family	Plug_Load	Existing	Energy Star Office Copiers	Energy Star Office Copiers	6	$24.99	$1.65	15	1.4%	0.001	0.21	0.31	0.16
Multi_Family	Plug_Load	New	Energy Star Office Copiers	Energy Star Office Copiers	6	$24.99	$1.65	15	1.4%	0.001	0.21	0.31	0.16
Single_Family	Plug_Load	Existing	Energy Star Office Copiers	Energy Star Office Copiers	6	$24.99	$1.24	20	1.2%	0.002	0.26	0.40	0.21
Single_Family	Plug_Load	New	Energy Star Office Copiers	Energy Star Office Copiers	6	$24.99	$1.24	20	1.2%	0.002	0.26	0.40	0.21
Manufactured	Plug_Load	Existing	Energy Star Office Monitor	Energy Star Office Monitor	4	$9.99	$0.23	43	3.0%	0.004	0.42	1.10	0.65
Manufactured	Plug_Load	New	Energy Star Office Monitor	Energy Star Office Monitor	4	$9.99	$0.23	43	3.0%	0.004	0.42	1.10	0.65
Multi_Family	Plug_Load	Existing	Energy Star Office Monitor	Energy Star Office Monitor	4	$9.99	$0.32	31	2.9%	0.003	0.38	0.88	0.50
Multi_Family	Plug_Load	New	Energy Star Office Monitor	Energy Star Office Monitor	4	$9.99	$0.32	31	2.9%	0.003	0.38	0.88	0.50
Single_Family	Plug_Load	Existing	Energy Star Office Monitor	Energy Star Office Monitor	4	$9.99	$0.24	41	2.4%	0.004	0.42	1.08	0.63
Single_Family	Plug_Load	New	Energy Star Office Monitor	Energy Star Office Monitor	4	$9.99	$0.24	41	2.4%	0.004	0.42	1.08	0.63
Manufactured	Plug_Load	Existing	Energy Star Office Printer	Energy Star Office Printer	5	$10.00	$0.88	11	0.8%	0.001	0.28	0.46	0.24
Manufactured	Plug_Load	New	Energy Star Office Printer	Energy Star Office Printer	5	$10.00	$0.88	11	0.8%	0.001	0.28	0.46	0.24
Multi_Family	Plug_Load	Existing	Energy Star Office Printer	Energy Star Office Printer	5	$10.00	$1.20	8	0.8%	0.001	0.23	0.35	0.18

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Plug_Load	New	Energy Star Office Printer	Energy Star Office Printer	5	$10.00	$1.20	8	0.8%	0.001	0.23	0.35	0.18
Single_Family	Plug_Load	Existing	Energy Star Office Printer	Energy Star Office Printer	5	$10.00	$0.91	11	0.6%	0.001	0.27	0.45	0.24
Single_Family	Plug_Load	New	Energy Star Office Printer	Energy Star Office Printer	5	$10.00	$0.91	11	0.6%	0.001	0.27	0.45	0.24
Manufactured	Plug_Load	Existing	Energy Star TV	Energy Star TV	9	$5.03	$0.16	31	2.2%	0.003	0.60	2.90	1.80
Manufactured	Plug_Load	New	Energy Star TV	Energy Star TV	9	$5.03	$0.16	31	2.2%	0.003	0.60	2.90	1.80
Multi_Family	Plug_Load	Existing	Energy Star TV	Energy Star TV	9	$5.03	$0.22	23	2.1%	0.002	0.57	2.36	1.40
Multi_Family	Plug_Load	New	Energy Star TV	Energy Star TV	9	$5.03	$0.22	23	2.1%	0.002	0.57	2.36	1.40
Single_Family	Plug_Load	Existing	Energy Star TV	Energy Star TV	9	$5.03	$0.17	30	1.7%	0.003	0.59	2.84	1.75
Single_Family	Plug_Load	New	Energy Star TV	Energy Star TV	9	$5.03	$0.17	30	1.7%	0.003	0.59	2.84	1.75
Manufactured	Plug_Load	Existing	Energy Star VCR	Energy Star VCR/DVD Combo	4	$5.00	$0.28	18	1.3%	0.002	0.40	0.98	0.56
Manufactured	Plug_Load	New	Energy Star VCR	Energy Star VCR/DVD Combo	4	$5.00	$0.28	18	1.3%	0.002	0.40	0.98	0.56
Multi_Family	Plug_Load	Existing	Energy Star VCR	Energy Star VCR/DVD Combo	4	$5.00	$0.38	13	1.2%	0.001	0.36	0.77	0.43
Multi_Family	Plug_Load	New	Energy Star VCR	Energy Star VCR/DVD Combo	4	$5.00	$0.38	13	1.2%	0.001	0.36	0.77	0.43
Single_Family	Plug_Load	Existing	Energy Star VCR	Energy Star VCR/DVD Combo	4	$5.00	$0.29	18	1.0%	0.002	0.40	0.95	0.55

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Plug_Load	New	Energy Star VCR	Energy Star VCR/DVD Combo	4	$5.00	$0.29	18	1.0%	0.002	0.40	0.95	0.55
Manufactured	Plug_Load	Existing	Power supply transformer/converter - External power adapters	Power supply transformer/converter - High efficiency External power adapters	7	$7.49	$0.70	11	0.7%	0.001	0.37	0.76	0.41
Manufactured	Plug_Load	New	Power supply transformer/converter - External power adapters	Power supply transformer/converter - High efficiency External power adapters	7	$7.49	$0.70	11	0.7%	0.001	0.37	0.76	0.41
Multi_Family	Plug_Load	Existing	Power supply transformer/converter - External power adapters	Power supply transformer/converter - High efficiency External power adapters	7	$7.49	$0.96	8	0.7%	0.001	0.32	0.58	0.30
Multi_Family	Plug_Load	New	Power supply transformer/converter - External power adapters	Power supply transformer/converter - High efficiency External power adapters	7	$7.49	$0.96	8	0.7%	0.001	0.32	0.58	0.30
Single_Family	Plug_Load	Existing	Power supply transformer/converter - External power adapters	Power supply transformer/converter - High efficiency External power adapters	7	$7.49	$0.72	10	0.6%	0.001	0.37	0.74	0.39
Single_Family	Plug_Load	New	Power supply transformer/converter - External power adapters	Power supply transformer/converter - High efficiency External power adapters	7	$7.49	$0.72	10	0.6%	0.001	0.37	0.74	0.39
Manufactured	Plug_Load	Existing	Powerstrip with Occupancy Sensor	Powerstrip with Occupancy Sensor	10	$83.96	$4.53	19	1.3%	0.002	0.14	0.18	0.09
Manufactured	Plug_Load	New	Powerstrip with Occupancy Sensor	Powerstrip with Occupancy Sensor	10	$83.96	$4.53	19	1.3%	0.002	0.14	0.18	0.09
Multi_Family	Plug_Load	Existing	Powerstrip with Occupancy Sensor	Powerstrip with Occupancy Sensor	10	$83.96	$6.22	14	1.2%	0.001	0.11	0.13	0.07
Multi_Family	Plug_Load	New	Powerstrip with Occupancy Sensor	Powerstrip with Occupancy Sensor	10	$83.96	$6.22	14	1.2%	0.001	0.11	0.13	0.07
Single_Family	Plug_Load	Existing	Powerstrip with Occupancy Sensor	Powerstrip with Occupancy Sensor	10	$83.96	$4.69	18	1.0%	0.002	0.14	0.17	0.09

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Plug_Load	New	Powerstrip with Occupancy Sensor	Powerstrip with Occupancy Sensor	10	$83.96	$4.69	18	1.0%	0.002	0.14	0.17	0.09
Single_Family	Pool_Pump	Existing	Pool Pump Timers	Pool Pump Timers	10	$49.60	$0.07	751	50.0%	0.097	0.71	5.33	3.81
Single_Family	Pool_Pump	New	Pool Pump Timers	Pool Pump Timers	10	$49.60	$0.07	751	50.0%	0.097	0.71	5.33	3.81
Single_Family	Pool_Pump	Existing	Pool Pumps - VSD	Pool Pumps (VSD)	10	$680.00	$0.53	1276	85.0%	0.165	0.52	1.40	0.76
Single_Family	Pool_Pump	New	Pool Pumps - VSD	Pool Pumps (VSD)	10	$680.00	$0.53	1276	85.0%	0.165	0.52	1.40	0.76
Manufactured	Refrigerator	Existing	1 kWh/day Refrigerator	20 cf top-freezer using no more than 1 kWh/day	20	$70.00	$0.27	257	30.0%	0.032	0.72	3.72	2.15
Manufactured	Refrigerator	New	1 kWh/day Refrigerator	20 cf top-freezer using no more than 1 kWh/day	20	$70.00	$0.48	145	30.0%	0.018	0.65	2.37	1.30
Multi_Family	Refrigerator	Existing	1 kWh/day Refrigerator	20 cf top-freezer using no more than 1 kWh/day	20	$70.00	$0.27	257	30.0%	0.032	0.72	3.72	2.15
Multi_Family	Refrigerator	New	1 kWh/day Refrigerator	20 cf top-freezer using no more than 1 kWh/day	20	$70.00	$0.48	145	30.0%	0.018	0.65	2.37	1.30
Single_Family	Refrigerator	Existing	1 kWh/day Refrigerator	20 cf top-freezer using no more than 1 kWh/day	20	$70.00	$0.27	257	30.0%	0.032	0.72	3.72	2.15
Single_Family	Refrigerator	New	1 kWh/day Refrigerator	20 cf top-freezer using no more than 1 kWh/day	20	$70.00	$0.48	145	30.0%	0.018	0.65	2.37	1.30
Manufactured	Refrigerator	Existing	Refrigerator eCube	Refrigerator eCube	5	$225.00	$4.20	54	6.3%	0.007	0.10	0.11	0.06
Manufactured	Refrigerator	New	Refrigerator eCube	Refrigerator eCube	5	$225.00	$7.47	30	6.3%	0.004	0.06	0.06	0.03
Multi_Family	Refrigerator	Existing	Refrigerator eCube	Refrigerator eCube	5	$225.00	$4.20	54	6.3%	0.007	0.10	0.11	0.06

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Refrigerator	New	Refrigerator eCube	Refrigerator eCube	5	$225.00	$7.47	30	6.3%	0.004	0.06	0.06	0.03
Single_Family	Refrigerator	Existing	Refrigerator eCube	Refrigerator eCube	5	$225.00	$4.20	54	6.3%	0.007	0.10	0.11	0.06
Single_Family	Refrigerator	New	Refrigerator eCube	Refrigerator eCube	5	$225.00	$7.47	30	6.3%	0.004	0.06	0.06	0.03
Manufactured	Refrigerator	Existing	Refrigerator/Freezer - Early Replacement	Standard Refrigerator	20	$1,168.70	$3.41	343	40.0%	0.043	0.27	0.39	0.20
Multi_Family	Refrigerator	Existing	Refrigerator/Freezer - Early Replacement	Standard Refrigerator	20	$1,168.70	$3.41	343	40.0%	0.043	0.27	0.39	0.20
Single_Family	Refrigerator	Existing	Refrigerator/Freezer - Early Replacement	Standard Refrigerator	20	$1,168.70	$3.41	343	40.0%	0.043	0.27	0.39	0.20
Manufactured	Refrigerator	Existing	Refrigerator/Freezer - Energy Star	Energy Star Refrigerator	20	$28.64	$0.27	106	20.0%	0.013	0.74	3.87	2.24
Manufactured	Refrigerator	New	Refrigerator/Freezer - Energy Star	Energy Star Refrigerator	20	$28.64	$0.27	106	20.0%	0.013	0.74	3.87	2.24
Multi_Family	Refrigerator	Existing	Refrigerator/Freezer - Energy Star	Energy Star Refrigerator	20	$28.64	$0.27	106	20.0%	0.013	0.74	3.87	2.24
Multi_Family	Refrigerator	New	Refrigerator/Freezer - Energy Star	Energy Star Refrigerator	20	$28.64	$0.27	106	20.0%	0.013	0.74	3.87	2.24
Single_Family	Refrigerator	Existing	Refrigerator/Freezer - Energy Star	Energy Star Refrigerator	20	$28.64	$0.27	106	20.0%	0.013	0.74	3.87	2.24
Single_Family	Refrigerator	New	Refrigerator/Freezer - Energy Star	Energy Star Refrigerator	20	$28.64	$0.27	106	20.0%	0.013	0.74	3.87	2.24
Manufactured	Refrigerator	Existing	Refrigerator/Freezer - Removal of Secondary	Proper Disposal of Refrigerator/Freezer	10	$100.00	$0.04	2424	282.8%	0.304	0.72	6.20	4.80
Multi_Family	Refrigerator	Existing	Refrigerator/Freezer - Removal of Secondary	Proper Disposal of Refrigerator/Freezer	10	$100.00	$0.04	2424	282.8%	0.304	0.72	6.20	4.80

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Refrigerator	Existing	Refrigerator/Freezer - Removal of Secondary	Proper Disposal of Refrigerator/Freezer	10	$100.00	$0.04	2424	282.8%	0.304	0.72	6.20	4.80
Manufactured	Refrigerator	Existing	Solid state refrigeration (cool chips™) for refrigerators	Thermoelectric refrigerator, 1.7 cubic ft.	19	$53.76	$1.57	34	4.0%	0.004	0.43	0.83	0.43
Manufactured	Refrigerator	New	Solid state refrigeration (cool chips™) for refrigerators	Thermoelectric refrigerator, 1.7 cubic ft.	19	$53.76	$2.79	19	4.0%	0.002	0.31	0.48	0.24
Multi_Family	Refrigerator	Existing	Solid state refrigeration (cool chips™) for refrigerators	Thermoelectric refrigerator, 1.7 cubic ft.	19	$53.76	$1.57	34	4.0%	0.004	0.43	0.83	0.43
Multi_Family	Refrigerator	New	Solid state refrigeration (cool chips™) for refrigerators	Thermoelectric refrigerator, 1.7 cubic ft.	19	$53.76	$2.79	19	4.0%	0.002	0.31	0.48	0.24
Single_Family	Refrigerator	Existing	Solid state refrigeration (cool chips™) for refrigerators	Thermoelectric refrigerator, 1.7 cubic ft.	19	$53.76	$1.57	34	4.0%	0.004	0.43	0.83	0.43
Single_Family	Refrigerator	New	Solid state refrigeration (cool chips™) for refrigerators	Thermoelectric refrigerator, 1.7 cubic ft.	19	$53.76	$2.79	19	4.0%	0.002	0.31	0.48	0.24
Manufactured	Room_AC	Existing	Air Conditioner - Room (Individual Rooms) (10,000 BTU/HR)	EER = 10.8	9	$14.11	$0.61	23	9.3%	0.006	0.61	1.48	0.80
Manufactured	Room_AC	New	Air Conditioner - Room (Individual Rooms) (10,000 BTU/HR)	EER = 10.8	9	$14.11	$0.61	23	9.3%	0.006	0.61	1.48	0.80
Multi_Family	Room_AC	Existing	Air Conditioner - Room (Individual Rooms) (10,000 BTU/HR)	EER = 10.8	9	$14.11	$0.75	19	9.3%	0.005	0.56	1.23	0.65
Multi_Family	Room_AC	New	Air Conditioner - Room (Individual Rooms) (10,000 BTU/HR)	EER = 10.8	9	$14.11	$0.75	19	9.3%	0.005	0.56	1.23	0.65
Single_Family	Room_AC	Existing	Air Conditioner - Room (Individual Rooms) (10,000 BTU/HR)	EER = 10.8	9	$21.17	$0.69	31	9.3%	0.008	0.58	1.33	0.71

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Room_AC	New	Air Conditioner - Room (Individual Rooms) (10,000 BTU/HR)	EER = 10.8	9	$21.17	$0.69	31	9.3%	0.008	0.58	1.33	0.71
Manufactured	Room_AC	Existing	Blinds - Fixed Angle/Automatic	Install Blinds (Reduce Window SHGC by 50%)	10	$559.03	$5.40	104	41.3%	0.028	0.17	0.21	0.10
Manufactured	Room_AC	New	Blinds - Fixed Angle/Automatic	Install Blinds (Reduce Window SHGC by 50%)	10	$559.03	$5.58	100	41.3%	0.027	0.17	0.20	0.10
Multi_Family	Room_AC	Existing	Blinds - Fixed Angle/Automatic	Install Blinds (Reduce Window SHGC by 50%)	10	$559.03	$6.71	83	41.3%	0.022	0.14	0.17	0.08
Multi_Family	Room_AC	New	Blinds - Fixed Angle/Automatic	Install Blinds (Reduce Window SHGC by 50%)	10	$559.03	$6.94	81	41.3%	0.022	0.14	0.16	0.08
Single_Family	Room_AC	Existing	Blinds - Fixed Angle/Automatic	Install Blinds (Reduce Window SHGC by 50%)	10	$559.03	$4.09	137	41.3%	0.037	0.22	0.27	0.14
Single_Family	Room_AC	New	Blinds - Fixed Angle/Automatic	Install Blinds (Reduce Window SHGC by 50%)	10	$559.03	$4.24	132	41.3%	0.035	0.21	0.26	0.13
Manufactured	Room_AC	Existing	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$144.38	$17.70	8	3.3%	0.002	0.12	0.13	0.06
Manufactured	Room_AC	New	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$144.38	$18.30	8	3.3%	0.002	0.11	0.12	0.06
Multi_Family	Room_AC	Existing	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$36.10	$5.50	7	3.2%	0.002	0.31	0.41	0.20
Multi_Family	Room_AC	New	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$36.10	$5.68	6	3.3%	0.002	0.30	0.39	0.20
Single_Family	Room_AC	Existing	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$144.38	$13.42	11	3.3%	0.003	0.15	0.17	0.08
Single_Family	Room_AC	New	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$144.38	$13.89	10	3.3%	0.003	0.14	0.16	0.08
Manufactured	Room_AC	Existing	Ceiling Fan	Ceiling Fan	10	$92.28	$114.46	1	0.3%	0.000	0.01	0.01	0.00

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Manufactured	Room_AC	New	Ceiling Fan	Ceiling Fan	10	$92.28	$118.81	1	0.3%	0.000	0.01	0.01	0.00
Multi_Family	Room_AC	Existing	Ceiling Fan	Ceiling Fan	10	$92.28	$142.22	1	0.3%	0.000	0.01	0.01	0.00
Multi_Family	Room_AC	New	Ceiling Fan	Ceiling Fan	10	$92.28	$147.04	1	0.3%	0.000	0.01	0.01	0.00
Single_Family	Room_AC	Existing	Ceiling Fan	Ceiling Fan	10	$92.28	$86.80	1	0.3%	0.000	0.01	0.01	0.01
Single_Family	Room_AC	New	Ceiling Fan	Ceiling Fan	10	$92.28	$89.82	1	0.3%	0.000	0.01	0.01	0.01
Manufactured	Room_AC	New	Construction - ICF	Concrete Framing	30	$6,616.02	$85.16	78	32.0%	0.021	0.03	0.03	0.01
Multi_Family	Room_AC	New	Construction - ICF	Concrete Framing	30	$2,772.50	$44.34	63	32.0%	0.017	0.05	0.05	0.03
Single_Family	Room_AC	New	Construction - ICF	Concrete Framing	30	$11,147.05	$108.91	102	32.0%	0.027	0.02	0.02	0.01
Manufactured	Room_AC	New	Construction - SIP	Specialty Framing	30	$9,534.39	$280.51	34	14.0%	0.009	0.01	0.01	0.00
Multi_Family	Room_AC	New	Construction - SIP	Specialty Framing	30	$3,995.47	$146.07	27	14.0%	0.007	0.02	0.02	0.01
Single_Family	Room_AC	New	Construction - SIP	Specialty Framing	30	$16,243.32	$362.74	45	14.0%	0.012	0.01	0.01	0.00
Manufactured	Room_AC	Existing	Cool Roofs	Lighter Colored Shingles (White)	20	$64.66	$1.29	50	20.0%	0.013	0.61	1.29	0.67
Manufactured	Room_AC	New	Cool Roofs	Lighter Colored Shingles (White)	20	$86.92	$1.79	49	20.0%	0.013	0.52	0.95	0.49
Multi_Family	Room_AC	Existing	Cool Roofs	Lighter Colored Shingles (White)	20	$45.58	$1.13	40	20.0%	0.011	0.64	1.46	0.76

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Room_AC	New	Cool Roofs	Lighter Colored Shingles (White)	20	$63.60	$1.63	39	20.0%	0.010	0.55	1.04	0.53
Single_Family	Room_AC	Existing	Cool Roofs	Lighter Colored Shingles (White)	20	$53.93	$0.81	66	20.0%	0.018	0.73	1.96	1.03
Single_Family	Room_AC	New	Cool Roofs	Lighter Colored Shingles (White)	20	$63.07	$0.99	64	20.0%	0.017	0.68	1.65	0.86
Manufactured	Room_AC	Existing	Doors	R-11 (Steel Doors with foam core)	30	$110.00	$31.30	4	1.4%	0.001	0.07	0.07	0.04
Manufactured	Room_AC	Existing	Doors	R-5 (Composite Doors with foam core)	12	$40.00	$19.92	2	0.8%	0.001	0.06	0.07	0.03
Manufactured	Room_AC	New	Doors	R-11 (Steel Doors with foam core)	30	$110.00	$32.36	3	1.4%	0.001	0.07	0.07	0.04
Manufactured	Room_AC	New	Doors	R-5 (Composite Doors with foam core)	12	$40.00	$20.59	2	0.8%	0.001	0.06	0.06	0.03
Multi_Family	Room_AC	Existing	Doors	R-11 (Steel Doors with foam core)	30	$55.00	$38.90	1	0.7%	0.000	0.06	0.06	0.03
Multi_Family	Room_AC	Existing	Doors	R-5 (Composite Doors with foam core)	12	$20.00	$24.81	1	0.4%	0.000	0.05	0.05	0.03
Multi_Family	Room_AC	New	Doors	R-11 (Steel Doors with foam core)	30	$55.00	$40.21	1	0.7%	0.000	0.05	0.06	0.03
Multi_Family	Room_AC	New	Doors	R-5 (Composite Doors with foam core)	12	$20.00	$25.75	1	0.4%	0.000	0.05	0.05	0.03
Single_Family	Room_AC	Existing	Doors	R-11 (Steel Doors with foam core)	30	$110.00	$23.74	5	1.4%	0.001	0.09	0.10	0.05
Single_Family	Room_AC	Existing	Doors	R-5 (Composite Doors with foam core)	12	$40.00	$15.11	3	0.8%	0.001	0.08	0.09	0.04
Single_Family	Room_AC	New	Doors	R-11 (Steel Doors with foam core)	30	$110.00	$24.56	4	1.4%	0.001	0.09	0.09	0.05

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Room_AC	New	Doors	R-5 (Composite Doors with foam core)	12	$40.00	$15.63	3	0.8%	0.001	0.08	0.08	0.04
Manufactured	Room_AC	Existing	Doors - Weatherization	Weatherstripping And Adding Door Sweeps	6	$69.32	$15.34	5	1.8%	0.001	0.05	0.05	0.02
Multi_Family	Room_AC	Existing	Doors - Weatherization	Weatherstripping And Adding Door Sweeps	6	$34.66	$19.06	2	0.9%	0.000	0.04	0.04	0.02
Single_Family	Room_AC	Existing	Doors - Weatherization	Weatherstripping And Adding Door Sweeps	6	$69.32	$11.64	6	1.8%	0.002	0.06	0.06	0.03
Manufactured	Room_AC	New	Ductless Mini-Split Heat Pump	3 ton, SEER 15, HSPF 9.0	15	$3,809.52	$52.13	73	30.1%	0.020	0.03	0.03	0.01
Multi_Family	Room_AC	New	Ductless Mini-Split Heat Pump	3 ton, SEER 15, HSPF 9.0	15	$3,809.52	$64.77	59	30.1%	0.016	0.02	0.02	0.01
Single_Family	Room_AC	New	Ductless Mini-Split Heat Pump	3 ton, SEER 15, HSPF 9.0	15	$3,869.52	$40.19	96	30.1%	0.026	0.04	0.04	0.02
Manufactured	Room_AC	New	Green Roof	ecoroof	40	$32,040.33	$2,030.36	16	6.5%	0.004	0.00	0.00	0.00
Multi_Family	Room_AC	New	Green Roof	ecoroof	40	$16,329.89	$1,285.83	13	6.5%	0.003	0.00	0.00	0.00
Single_Family	Room_AC	New	Green Roof	ecoroof	40	$23,199.95	$1,115.89	21	6.5%	0.006	0.00	0.00	0.00
Manufactured	Room_AC	Existing	Infiltration Control (Caulk, Weather Strip, etc.) Blower-Door test	Install Caulking And Weatherstripping, perform blower-door test	15	$1,370.23	$54.59	25	10.0%	0.007	0.03	0.03	0.01
Multi_Family	Room_AC	Existing	Infiltration Control (Caulk, Weather Strip, etc.) Blower-Door test	Install Caulking And Weatherstripping, perform blower-door test	15	$1,135.11	$56.19	20	10.0%	0.005	0.03	0.03	0.01
Single_Family	Room_AC	Existing	Infiltration Control (Caulk, Weather Strip, etc.) Blower-Door test	Install Caulking And Weatherstripping, perform blower-door test	15	$1,370.23	$41.40	33	10.0%	0.009	0.04	0.04	0.02

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Room_AC	Existing	Insulation (Basement - Wall) 2*4	R-13 (state code)	25	$479.54	$24.38	20	5.9%	0.005	0.08	0.09	0.04
Single_Family	Room_AC	Existing	Insulation (Basement - Wall) 2*4	R-13 (state code)	25	$479.54	$52.82	9	2.7%	0.002	0.04	0.04	0.02
Single_Family	Room_AC	Existing	Insulation (Basement - Wall) 2*4	R-13 + R-5 sheathing	25	$718.61	$718.61	1	0.3%	0.000	0.00	0.00	0.00
Single_Family	Room_AC	New	Insulation (Basement - Wall) 2*4	R-13 + R-5 sheathing	25	$777.14	$50.19	15	4.8%	0.004	0.04	0.04	0.02
Manufactured	Room_AC	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,509.78	$66.66	38	15.0%	0.010	0.03	0.03	0.02
Manufactured	Room_AC	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,509.78	$384.58	7	2.6%	0.002	0.01	0.01	0.00
Manufactured	Room_AC	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,509.78	$1,000.69	3	1.0%	0.001	0.00	0.00	0.00
Multi_Family	Room_AC	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$1,769.19	$58.39	30	15.0%	0.008	0.03	0.04	0.02
Multi_Family	Room_AC	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$1,769.19	$336.86	5	2.6%	0.001	0.01	0.01	0.00
Multi_Family	Room_AC	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$1,769.19	$875.83	2	1.0%	0.001	0.00	0.00	0.00
Single_Family	Room_AC	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,093.19	$42.16	50	15.0%	0.013	0.05	0.05	0.02
Single_Family	Room_AC	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,093.19	$243.22	9	2.6%	0.002	0.01	0.01	0.00
Single_Family	Room_AC	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,093.19	$632.38	3	1.0%	0.001	0.00	0.00	0.00
Manufactured	Room_AC	Existing	Insulation (Duct)	R-6	25	$470.03	$71.34	7	2.6%	0.002	0.03	0.03	0.01

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Manufactured	Room_AC	Existing	Insulation (Duct)	R-8	25	$531.53	$67.23	8	3.2%	0.002	0.03	0.03	0.02
Multi_Family	Room_AC	Existing	Insulation (Duct)	R-6	25	$331.33	$62.49	5	2.6%	0.001	0.03	0.03	0.02
Multi_Family	Room_AC	Existing	Insulation (Duct)	R-8	25	$374.68	$58.88	6	3.2%	0.002	0.03	0.04	0.02
Single_Family	Room_AC	Existing	Insulation (Duct)	R-6	25	$784.03	$90.24	9	2.6%	0.002	0.02	0.02	0.01
Single_Family	Room_AC	Existing	Insulation (Duct)	R-8	25	$886.60	$85.03	10	3.2%	0.003	0.02	0.02	0.01
Manufactured	Room_AC	Existing	Insulation (Floor)	R-30 (state code)	25	$1,721.56	$527.60	3	1.3%	0.001	0.00	0.00	0.00
Manufactured	Room_AC	Existing	Insulation (Floor)	R-30 (state code)	25	$1,721.56	$10,941.04	0	0.1%	0.000	0.00	0.00	0.00
Manufactured	Room_AC	Existing	Insulation (Floor)	R-38	25	$326.02	$2,071.97	0	0.1%	0.000	0.00	0.00	0.00
Manufactured	Room_AC	New	Insulation (Floor)	R-38	25	$438.26	$2,788.31	0	0.1%	0.000	0.00	0.00	0.00
Multi_Family	Room_AC	Existing	Insulation (Floor)	R-30 (state code)	25	$1,213.56	$462.47	3	1.3%	0.001	0.00	0.00	0.00
Multi_Family	Room_AC	Existing	Insulation (Floor)	R-30 (state code)	25	$1,213.56	$9,545.22	0	0.1%	0.000	0.00	0.00	0.00
Multi_Family	Room_AC	Existing	Insulation (Floor)	R-38	25	$229.82	$1,807.64	0	0.1%	0.000	0.00	0.00	0.00
Multi_Family	Room_AC	New	Insulation (Floor)	R-38	25	$320.68	$2,525.03	0	0.1%	0.000	0.00	0.00	0.00
Single_Family	Room_AC	Existing	Insulation (Floor)	R-30 (state code)	25	$1,435.81	$333.68	4	1.3%	0.001	0.01	0.01	0.00

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Room_AC	Existing	Insulation (Floor)	R-30 (state code)	25	$1,435.81	$6,892.00	0	0.1%	0.000	0.00	0.00	0.00
Single_Family	Room_AC	Existing	Insulation (Floor)	R-38	25	$271.91	$1,305.18	0	0.1%	0.000	0.00	0.00	0.00
Single_Family	Room_AC	New	Insulation (Floor)	R-38	25	$318.00	$1,529.56	0	0.1%	0.000	0.00	0.00	0.00
Single_Family	Room_AC	Existing	Insulation (Rim And Band Joist)	R-10	25	$182.09	$73.35	2	0.8%	0.001	0.03	0.03	0.01
Single_Family	Room_AC	Existing	Insulation (Rim And Band Joist)	R-19	25	$218.87	$9.45	23	7.0%	0.006	0.19	0.22	0.11
Single_Family	Room_AC	New	Insulation (Rim And Band Joist)	R-10	25	$196.92	$24.14	8	2.6%	0.002	0.08	0.09	0.04
Single_Family	Room_AC	New	Insulation (Rim And Band Joist)	R-19	25	$236.69	$10.57	22	7.0%	0.006	0.17	0.20	0.10
Multi_Family	Room_AC	Existing	Insulation (Slab)	R-10 (state code)	25	$970.95	$91.56	11	5.3%	0.003	0.02	0.02	0.01
Multi_Family	Room_AC	Existing	Insulation (Slab)	R-15	25	$258.29	$89.21	3	1.4%	0.001	0.02	0.02	0.01
Multi_Family	Room_AC	New	Insulation (Slab)	R-15	25	$348.55	$124.46	3	1.4%	0.001	0.02	0.02	0.01
Single_Family	Room_AC	Existing	Insulation (Slab)	R-10 (state code)	25	$1,303.80	$75.03	17	5.3%	0.005	0.03	0.03	0.01
Single_Family	Room_AC	Existing	Insulation (Slab)	R-15	25	$363.01	$76.51	5	1.4%	0.001	0.03	0.03	0.01
Single_Family	Room_AC	New	Insulation (Slab)	R-15	25	$413.72	$90.24	5	1.4%	0.001	0.02	0.02	0.01
Manufactured	Room_AC	Existing	Insulation (Wall) 2*4	R-13	25	$2,957.30	$117.82	25	10.0%	0.007	0.02	0.02	0.01

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Manufactured	Room_AC	Existing	Insulation (Wall) 2*4	R-13 + R5 Sheathing (state code)	25	$1,297.20	$229.69	6	2.3%	0.002	0.01	0.01	0.00
Multi_Family	Room_AC	Existing	Insulation (Wall) 2*4	R-13	25	$1,216.38	$60.22	20	10.0%	0.005	0.03	0.03	0.02
Multi_Family	Room_AC	Existing	Insulation (Wall) 2*4	R-13 + R5 Sheathing (state code)	25	$533.56	$117.39	5	2.3%	0.001	0.02	0.02	0.01
Single_Family	Room_AC	Existing	Insulation (Wall) 2*4	R-13	25	$5,401.48	$163.19	33	10.0%	0.009	0.01	0.01	0.01
Single_Family	Room_AC	Existing	Insulation (Wall) 2*4	R-13 + R5 Sheathing (state code)	25	$2,369.32	$318.14	7	2.3%	0.002	0.01	0.01	0.00
Manufactured	Room_AC	Existing	Insulation (Wall) 2*6	R-20 (State Code)	25	$3,334.89	$102.20	33	13.0%	0.009	0.02	0.02	0.01
Manufactured	Room_AC	Existing	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$1,297.20	$1,037.76	1	0.5%	0.000	0.00	0.00	0.00
Manufactured	Room_AC	New	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$1,504.00	$1,243.95	1	0.5%	0.000	0.00	0.00	0.00
Multi_Family	Room_AC	Existing	Insulation (Wall) 2*6	R-20 (State Code)	25	$1,371.69	$52.23	26	13.0%	0.007	0.04	0.04	0.02
Multi_Family	Room_AC	Existing	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$533.56	$528.27	1	0.5%	0.000	0.00	0.00	0.00
Multi_Family	Room_AC	New	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$630.26	$645.16	1	0.5%	0.000	0.00	0.00	0.00
Single_Family	Room_AC	Existing	Insulation (Wall) 2*6	R-20 (State Code)	25	$6,091.14	$141.56	43	13.0%	0.012	0.01	0.01	0.01
Single_Family	Room_AC	Existing	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$2,369.32	$1,431.61	2	0.5%	0.000	0.00	0.00	0.00
Single_Family	Room_AC	New	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$2,562.30	$1,602.16	2	0.5%	0.000	0.00	0.00	0.00

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Manufactured	Room_AC	Existing	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$5.33	$1.06	5	2.0%	0.001	0.35	0.54	0.28
Manufactured	Room_AC	New	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$5.33	$1.10	5	2.0%	0.001	0.34	0.53	0.27
Multi_Family	Room_AC	Existing	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$3.33	$0.83	4	2.0%	0.001	0.40	0.68	0.36
Multi_Family	Room_AC	New	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$3.33	$0.85	4	2.0%	0.001	0.39	0.66	0.35
Single_Family	Room_AC	Existing	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$6.67	$1.01	7	2.0%	0.002	0.36	0.57	0.30
Single_Family	Room_AC	New	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$6.67	$1.04	6	2.0%	0.002	0.35	0.55	0.29
Manufactured	Room_AC	Existing	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$543.83	$32.34	17	6.7%	0.005	0.07	0.07	0.04
Manufactured	Room_AC	New	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$550.02	$33.81	16	6.7%	0.004	0.06	0.07	0.03
Multi_Family	Room_AC	Existing	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$383.35	$28.33	14	6.7%	0.004	0.08	0.08	0.04
Multi_Family	Room_AC	New	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$402.46	$30.74	13	6.7%	0.004	0.07	0.07	0.04
Single_Family	Room_AC	Existing	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$453.56	$20.45	22	6.7%	0.006	0.10	0.11	0.06
Single_Family	Room_AC	New	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$399.10	$18.62	21	6.7%	0.006	0.11	0.12	0.06
Manufactured	Room_AC	New	Spray in insulation 2*6 Wall	2*6Wall - closed cell foam insulation R-33	25	$7,497.57	$3,088.24	2	1.0%	0.001	0.00	0.00	0.00
Multi_Family	Room_AC	New	Spray in insulation 2*6 Wall	2*6Wall - closed cell foam insulation R-33	25	$3,141.92	$1,609.79	2	1.0%	0.001	0.00	0.00	0.00

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Room_AC	New	Spray in insulation 2*6 Wall	2*6Wall - closed cell foam insulation R-33	25	$12,773.28	$3,993.46	3	1.0%	0.001	0.00	0.00	0.00
Manufactured	Room_AC	Existing	Windows	U=0.19	25	$2,791.30	$63.55	44	17.5%	0.012	0.03	0.03	0.02
Manufactured	Room_AC	Existing	Windows	U=0.30	25	$528.31	$46.77	11	4.5%	0.003	0.04	0.04	0.02
Manufactured	Room_AC	Existing	Windows	U=0.32	25	$278.06	$45.22	6	2.5%	0.002	0.04	0.05	0.02
Manufactured	Room_AC	Existing	Windows	U=0.35	25	$5,516.42	$439.56	13	5.0%	0.003	0.00	0.00	0.00
Manufactured	Room_AC	Existing	Windows	U=0.35	25	$5,516.42	$69.77	79	31.5%	0.021	0.03	0.03	0.01
Manufactured	Room_AC	New	Windows	U=0.19	25	$3,236.29	$140.32	23	9.5%	0.006	0.01	0.01	0.01
Manufactured	Room_AC	New	Windows	U=0.30	25	$612.54	$56.07	11	4.5%	0.003	0.04	0.04	0.02
Manufactured	Room_AC	New	Windows	U=0.32	25	$322.39	$54.20	6	2.5%	0.002	0.04	0.04	0.02
Multi_Family	Room_AC	Existing	Windows	U=0.19	25	$956.75	$27.07	35	17.5%	0.009	0.07	0.08	0.04
Multi_Family	Room_AC	Existing	Windows	U=0.30	25	$181.09	$19.92	9	4.5%	0.002	0.10	0.10	0.05
Multi_Family	Room_AC	Existing	Windows	U=0.32	25	$95.31	$19.26	5	2.5%	0.001	0.10	0.11	0.05
Multi_Family	Room_AC	Existing	Windows	U=0.35	25	$1,890.83	$187.21	10	5.0%	0.003	0.01	0.01	0.01
Multi_Family	Room_AC	Existing	Windows	U=0.35	25	$1,890.83	$29.72	64	31.5%	0.017	0.07	0.07	0.04

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Room_AC	New	Windows	U=0.19	25	$1,356.20	$73.07	19	9.5%	0.005	0.03	0.03	0.01
Multi_Family	Room_AC	New	Windows	U=0.30	25	$256.69	$29.20	9	4.5%	0.002	0.07	0.07	0.04
Multi_Family	Room_AC	New	Windows	U=0.32	25	$135.10	$28.22	5	2.5%	0.001	0.07	0.07	0.04
Single_Family	Room_AC	Existing	Windows	U=0.19	25	$5,098.28	$88.02	58	17.5%	0.016	0.02	0.02	0.01
Single_Family	Room_AC	Existing	Windows	U=0.30	25	$964.96	$64.78	15	4.5%	0.004	0.03	0.03	0.02
Single_Family	Room_AC	Existing	Windows	U=0.32	25	$507.87	$62.63	8	2.5%	0.002	0.03	0.03	0.02
Single_Family	Room_AC	Existing	Windows	U=0.35	25	$10,075.69	$608.80	17	5.0%	0.004	0.00	0.00	0.00
Single_Family	Room_AC	Existing	Windows	U=0.35	25	$10,075.69	$96.64	104	31.5%	0.028	0.02	0.02	0.01
Single_Family	Room_AC	New	Windows	U=0.19	25	$5,513.53	$181.45	30	9.5%	0.008	0.01	0.01	0.01
Single_Family	Room_AC	New	Windows	U=0.30	25	$1,043.56	$72.50	14	4.5%	0.004	0.03	0.03	0.01
Single_Family	Room_AC	New	Windows	U=0.32	25	$549.24	$70.09	8	2.5%	0.002	0.03	0.03	0.01
Manufactured	Room_Heat	Existing	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$144.38	$2.96	49	3.3%	0.000	0.28	0.44	0.22
Manufactured	Room_Heat	New	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$144.38	$2.96	49	3.3%	0.000	0.28	0.44	0.22
Multi_Family	Room_Heat	Existing	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$36.10	$0.74	49	3.3%	0.000	0.51	1.59	0.84

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Room_Heat	New	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$36.10	$0.74	49	3.3%	0.000	0.51	1.59	0.84
Single_Family	Room_Heat	Existing	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$144.38	$2.96	49	3.3%	0.000	0.28	0.44	0.22
Single_Family	Room_Heat	New	Canned Lighting Air Tight Sealing	Canned Lighting Air Tight Sealing	30	$144.38	$2.96	49	3.3%	0.000	0.28	0.44	0.22
Manufactured	Room_Heat	New	Construction - ICF	Concrete Framing	30	$6,616.02	$10.02	660	44.0%	0.003	0.11	0.13	0.07
Multi_Family	Room_Heat	New	Construction - ICF	Concrete Framing	30	$2,772.50	$4.20	660	44.0%	0.003	0.22	0.31	0.16
Single_Family	Room_Heat	New	Construction - ICF	Concrete Framing	30	$11,147.05	$16.89	660	44.0%	0.003	0.07	0.08	0.04
Manufactured	Room_Heat	New	Construction - SIP	Specialty Framing	30	$9,534.39	$45.40	210	14.0%	0.001	0.03	0.03	0.01
Multi_Family	Room_Heat	New	Construction - SIP	Specialty Framing	30	$3,995.47	$19.03	210	14.0%	0.001	0.06	0.07	0.04
Single_Family	Room_Heat	New	Construction - SIP	Specialty Framing	30	$16,243.32	$77.35	210	14.0%	0.001	0.02	0.02	0.01
Manufactured	Room_Heat	Existing	Doors	R-11 (Steel Doors with foam core)	30	$110.00	$1.22	90	6.0%	0.000	0.43	1.01	0.52
Manufactured	Room_Heat	Existing	Doors	R-5 (Composite Doors with foam core)	12	$40.00	$0.67	60	4.0%	0.000	0.38	0.98	0.52
Manufactured	Room_Heat	New	Doors	R-11 (Steel Doors with foam core)	30	$110.00	$1.22	90	6.0%	0.000	0.43	1.01	0.52
Manufactured	Room_Heat	New	Doors	R-5 (Composite Doors with foam core)	12	$40.00	$0.67	60	4.0%	0.000	0.38	0.98	0.52
Multi_Family	Room_Heat	Existing	Doors	R-11 (Steel Doors with foam core)	30	$55.00	$1.22	45	3.0%	0.000	0.43	1.01	0.52

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Room_Heat	Existing	Doors	R-5 (Composite Doors with foam core)	12	$20.00	$0.67	30	2.0%	0.000	0.38	0.98	0.52
Multi_Family	Room_Heat	New	Doors	R-11 (Steel Doors with foam core)	30	$55.00	$1.22	45	3.0%	0.000	0.43	1.01	0.52
Multi_Family	Room_Heat	New	Doors	R-5 (Composite Doors with foam core)	12	$20.00	$0.67	30	2.0%	0.000	0.38	0.98	0.52
Single_Family	Room_Heat	Existing	Doors	R-11 (Steel Doors with foam core)	30	$110.00	$1.22	90	6.0%	0.000	0.43	1.01	0.52
Single_Family	Room_Heat	Existing	Doors	R-5 (Composite Doors with foam core)	12	$40.00	$0.67	60	4.0%	0.000	0.38	0.98	0.52
Single_Family	Room_Heat	New	Doors	R-11 (Steel Doors with foam core)	30	$110.00	$1.22	90	6.0%	0.000	0.43	1.01	0.52
Single_Family	Room_Heat	New	Doors	R-5 (Composite Doors with foam core)	12	$40.00	$0.67	60	4.0%	0.000	0.38	0.98	0.52
Manufactured	Room_Heat	Existing	Doors - Weatherization	Weatherstripping And Adding Door Sweeps	6	$69.32	$1.18	59	3.9%	0.000	0.21	0.33	0.17
Multi_Family	Room_Heat	Existing	Doors - Weatherization	Weatherstripping And Adding Door Sweeps	6	$34.66	$1.18	29	2.0%	0.000	0.21	0.33	0.17
Single_Family	Room_Heat	Existing	Doors - Weatherization	Weatherstripping And Adding Door Sweeps	6	$69.32	$1.18	59	3.9%	0.000	0.21	0.33	0.17
Manufactured	Room_Heat	New	Ductless Mini-Split Heat Pump	3 ton, SEER 15, HSPF 9.0	15	$4,380.12	$4.70	931	62.1%	0.005	0.14	0.18	0.09
Multi_Family	Room_Heat	New	Ductless Mini-Split Heat Pump	3 ton, SEER 15, HSPF 9.0	15	$4,380.12	$4.70	931	62.1%	0.005	0.14	0.18	0.09
Single_Family	Room_Heat	New	Ductless Mini-Split Heat Pump	3 ton, SEER 15, HSPF 9.0	15	$4,750.32	$5.10	931	62.1%	0.005	0.13	0.17	0.09
Manufactured	Room_Heat	New	Green Roof	ecoroof	40	$32,040.33	$328.62	98	6.5%	0.000	0.00	0.00	0.00

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Room_Heat	New	Green Roof	ecoroof	40	$16,329.89	$167.49	98	6.5%	0.000	0.01	0.01	0.00
Single_Family	Room_Heat	New	Green Roof	ecoroof	40	$23,199.95	$237.95	98	6.5%	0.000	0.01	0.01	0.00
Manufactured	Room_Heat	Existing	Infiltration Control (Caulk, Weather Strip, etc.) Blower-Door test	Install Caulking And Weatherstripping, perform blower-door test	15	$1,370.23	$9.13	150	10.0%	0.001	0.08	0.10	0.05
Multi_Family	Room_Heat	Existing	Infiltration Control (Caulk, Weather Strip, etc.) Blower-Door test	Install Caulking And Weatherstripping, perform blower-door test	15	$1,135.11	$7.57	150	10.0%	0.001	0.10	0.12	0.06
Single_Family	Room_Heat	Existing	Infiltration Control (Caulk, Weather Strip, etc.) Blower-Door test	Install Caulking And Weatherstripping, perform blower-door test	15	$1,370.23	$9.13	150	10.0%	0.001	0.08	0.10	0.05
Single_Family	Room_Heat	Existing	Insulation (Basement - Wall) 2*4	R-13 (state code)	25	$479.54	$5.38	89	5.9%	0.000	0.17	0.22	0.11
Single_Family	Room_Heat	Existing	Insulation (Basement - Wall) 2*4	R-13 (state code)	25	$479.54	$11.66	41	2.7%	0.000	0.09	0.10	0.05
Single_Family	Room_Heat	Existing	Insulation (Basement - Wall) 2*4	R-13 + R-5 sheathing	25	$718.61	$158.33	5	0.3%	0.000	0.01	0.01	0.00
Single_Family	Room_Heat	New	Insulation (Basement - Wall) 2*4	R-13 + R-5 sheathing	25	$777.14	$10.70	73	4.8%	0.000	0.10	0.11	0.06
Manufactured	Room_Heat	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,509.78	$4.65	540	36.0%	0.003	0.19	0.26	0.13
Manufactured	Room_Heat	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,509.78	$10.33	243	16.2%	0.001	0.10	0.12	0.06
Manufactured	Room_Heat	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,509.78	$23.90	105	7.0%	0.001	0.05	0.05	0.03
Multi_Family	Room_Heat	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$1,769.19	$3.28	540	36.0%	0.003	0.24	0.36	0.18

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Room_Heat	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$1,769.19	$7.28	243	16.2%	0.001	0.13	0.17	0.08
Multi_Family	Room_Heat	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$1,769.19	$16.85	105	7.0%	0.001	0.07	0.07	0.04
Single_Family	Room_Heat	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,093.19	$3.88	540	36.0%	0.003	0.22	0.31	0.16
Single_Family	Room_Heat	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,093.19	$8.61	243	16.2%	0.001	0.12	0.14	0.07
Single_Family	Room_Heat	Existing	Insulation (Ceiling/Attic)	R-49 (state code)	25	$2,093.19	$19.94	105	7.0%	0.001	0.06	0.06	0.03
Manufactured	Room_Heat	Existing	Insulation (Duct)	R-6	25	$470.03	$8.85	53	3.5%	0.000	0.11	0.14	0.07
Manufactured	Room_Heat	Existing	Insulation (Duct)	R-8	25	$531.53	$8.34	64	4.3%	0.000	0.12	0.14	0.07
Multi_Family	Room_Heat	Existing	Insulation (Duct)	R-6	25	$331.33	$6.24	53	3.5%	0.000	0.15	0.19	0.10
Multi_Family	Room_Heat	Existing	Insulation (Duct)	R-8	25	$374.68	$5.88	64	4.3%	0.000	0.16	0.20	0.10
Single_Family	Room_Heat	Existing	Insulation (Duct)	R-6	25	$784.03	$14.76	53	3.5%	0.000	0.07	0.08	0.04
Single_Family	Room_Heat	Existing	Insulation (Duct)	R-8	25	$886.60	$13.91	64	4.3%	0.000	0.08	0.09	0.04
Manufactured	Room_Heat	Existing	Insulation (Floor)	R-30 (state code)	25	$1,721.56	$17.66	98	6.5%	0.000	0.06	0.07	0.03
Manufactured	Room_Heat	Existing	Insulation (Floor)	R-30 (state code)	25	$1,721.56	$58.86	29	2.0%	0.000	0.02	0.02	0.01
Manufactured	Room_Heat	Existing	Insulation (Floor)	R-38	25	$326.02	$16.72	20	1.3%	0.000	0.07	0.07	0.04

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Manufactured	Room_Heat	New	Insulation (Floor)	R-38	25	$438.26	$22.47	20	1.3%	0.000	0.05	0.05	0.03
Multi_Family	Room_Heat	Existing	Insulation (Floor)	R-30 (state code)	25	$1,213.56	$12.45	98	6.5%	0.000	0.09	0.10	0.05
Multi_Family	Room_Heat	Existing	Insulation (Floor)	R-30 (state code)	25	$1,213.56	$41.49	29	2.0%	0.000	0.03	0.03	0.01
Multi_Family	Room_Heat	Existing	Insulation (Floor)	R-38	25	$229.82	$11.79	20	1.3%	0.000	0.09	0.10	0.05
Multi_Family	Room_Heat	New	Insulation (Floor)	R-38	25	$320.68	$16.44	20	1.3%	0.000	0.07	0.07	0.04
Single_Family	Room_Heat	Existing	Insulation (Floor)	R-30 (state code)	25	$1,435.81	$14.73	98	6.5%	0.000	0.07	0.08	0.04
Single_Family	Room_Heat	Existing	Insulation (Floor)	R-30 (state code)	25	$1,435.81	$49.09	29	2.0%	0.000	0.02	0.02	0.01
Single_Family	Room_Heat	Existing	Insulation (Floor)	R-38	25	$271.91	$13.94	20	1.3%	0.000	0.08	0.09	0.04
Single_Family	Room_Heat	New	Insulation (Floor)	R-38	25	$318.00	$16.31	20	1.3%	0.000	0.07	0.07	0.04
Single_Family	Room_Heat	Existing	Insulation (Rim And Band Joist)	R-10	25	$182.09	$16.19	11	0.8%	0.000	0.07	0.07	0.04
Single_Family	Room_Heat	Existing	Insulation (Rim And Band Joist)	R-19	25	$218.87	$2.08	105	7.0%	0.001	0.32	0.56	0.29
Single_Family	Room_Heat	New	Insulation (Rim And Band Joist)	R-10	25	$196.92	$5.15	38	2.6%	0.000	0.18	0.23	0.12
Single_Family	Room_Heat	New	Insulation (Rim And Band Joist)	R-19	25	$236.69	$2.25	105	7.0%	0.001	0.30	0.52	0.26
Multi_Family	Room_Heat	Existing	Insulation (Slab)	R-10 (state code)	25	$970.95	$12.33	79	5.3%	0.000	0.09	0.10	0.05

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Room_Heat	Existing	Insulation (Slab)	R-15	25	$258.29	$12.01	22	1.4%	0.000	0.09	0.10	0.05
Multi_Family	Room_Heat	New	Insulation (Slab)	R-15	25	$348.55	$16.21	22	1.4%	0.000	0.07	0.07	0.04
Single_Family	Room_Heat	Existing	Insulation (Slab)	R-10 (state code)	25	$1,303.80	$16.56	79	5.3%	0.000	0.07	0.07	0.04
Single_Family	Room_Heat	Existing	Insulation (Slab)	R-15	25	$363.01	$16.88	22	1.4%	0.000	0.07	0.07	0.04
Single_Family	Room_Heat	New	Insulation (Slab)	R-15	25	$413.72	$19.24	22	1.4%	0.000	0.06	0.06	0.03
Manufactured	Room_Heat	Existing	Insulation (Wall) 2*4	R-13	25	$2,957.30	$4.48	660	44.0%	0.003	0.19	0.27	0.13
Manufactured	Room_Heat	Existing	Insulation (Wall) 2*4	R-13 + R5 Sheathing (state code)	25	$1,297.20	$10.23	127	8.5%	0.001	0.10	0.12	0.06
Multi_Family	Room_Heat	Existing	Insulation (Wall) 2*4	R-13	25	$1,216.38	$1.84	660	44.0%	0.003	0.34	0.63	0.32
Multi_Family	Room_Heat	Existing	Insulation (Wall) 2*4	R-13 + R5 Sheathing (state code)	25	$533.56	$4.21	127	8.5%	0.001	0.20	0.28	0.14
Single_Family	Room_Heat	Existing	Insulation (Wall) 2*4	R-13	25	$5,401.48	$8.18	660	44.0%	0.003	0.12	0.15	0.07
Single_Family	Room_Heat	Existing	Insulation (Wall) 2*4	R-13 + R5 Sheathing (state code)	25	$2,369.32	$18.69	127	8.5%	0.001	0.06	0.06	0.03
Manufactured	Room_Heat	Existing	Insulation (Wall) 2*6	R-20 (State Code)	25	$3,334.89	$4.54	735	49.0%	0.004	0.19	0.26	0.13
Manufactured	Room_Heat	Existing	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$1,297.20	$26.21	50	3.3%	0.000	0.04	0.05	0.02
Manufactured	Room_Heat	New	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$1,504.00	$30.38	50	3.3%	0.000	0.04	0.04	0.02

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Room_Heat	Existing	Insulation (Wall) 2*6	R-20 (State Code)	25	$1,371.69	$1.87	735	49.0%	0.004	0.33	0.62	0.32
Multi_Family	Room_Heat	Existing	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$533.56	$10.78	50	3.3%	0.000	0.10	0.11	0.06
Multi_Family	Room_Heat	New	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$630.26	$12.73	50	3.3%	0.000	0.08	0.10	0.05
Single_Family	Room_Heat	Existing	Insulation (Wall) 2*6	R-20 (State Code)	25	$6,091.14	$8.29	735	49.0%	0.004	0.12	0.15	0.07
Single_Family	Room_Heat	Existing	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$2,369.32	$47.87	50	3.3%	0.000	0.02	0.03	0.01
Single_Family	Room_Heat	New	Insulation (Wall) 2*6	R-20 + R5 Sheathing	25	$2,562.30	$51.76	50	3.3%	0.000	0.02	0.02	0.01
Manufactured	Room_Heat	Existing	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$5.33	$0.18	30	2.0%	0.000	0.38	1.28	0.78
Manufactured	Room_Heat	New	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$5.33	$0.18	30	2.0%	0.000	0.38	1.28	0.78
Multi_Family	Room_Heat	Existing	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$3.33	$0.11	30	2.0%	0.000	0.41	1.68	1.10
Multi_Family	Room_Heat	New	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$3.33	$0.11	30	2.0%	0.000	0.41	1.68	1.10
Single_Family	Room_Heat	Existing	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$6.67	$0.22	30	2.0%	0.000	0.37	1.10	0.65
Single_Family	Room_Heat	New	Outlet Gasket	Install Outlet Gasket (Reduce Air Leakage)	5	$6.67	$0.22	30	2.0%	0.000	0.37	1.10	0.65
Manufactured	Room_Heat	Existing	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$543.83	$18.13	30	2.0%	0.000	0.07	0.07	0.04
Manufactured	Room_Heat	New	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$550.02	$18.33	30	2.0%	0.000	0.07	0.07	0.04

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Room_Heat	Existing	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$383.35	$12.78	30	2.0%	0.000	0.09	0.10	0.05
Multi_Family	Room_Heat	New	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$402.46	$13.42	30	2.0%	0.000	0.09	0.10	0.05
Single_Family	Room_Heat	Existing	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$453.56	$15.12	30	2.0%	0.000	0.08	0.09	0.04
Single_Family	Room_Heat	New	Radiant Barrier (Ceiling)	Install Radiant Barrier	30	$399.10	$13.30	30	2.0%	0.000	0.09	0.10	0.05
Manufactured	Room_Heat	Existing	Radiant Electric Ceiling Panels	Radiant Electric Heating with Ceiling Panels	20	$4,068.69	$10.85	375	25.0%	0.002	0.08	0.09	0.05
Manufactured	Room_Heat	New	Radiant Electric Ceiling Panels	Radiant Electric Heating with Ceiling Panels	20	$4,068.69	$10.85	375	25.0%	0.002	0.08	0.09	0.05
Multi_Family	Room_Heat	Existing	Radiant Electric Ceiling Panels	Radiant Electric Heating with Ceiling Panels	20	$4,068.69	$10.85	375	25.0%	0.002	0.08	0.09	0.05
Multi_Family	Room_Heat	New	Radiant Electric Ceiling Panels	Radiant Electric Heating with Ceiling Panels	20	$4,068.69	$10.85	375	25.0%	0.002	0.08	0.09	0.05
Single_Family	Room_Heat	Existing	Radiant Electric Ceiling Panels	Radiant Electric Heating with Ceiling Panels	20	$4,068.69	$10.85	375	25.0%	0.002	0.08	0.09	0.05
Single_Family	Room_Heat	New	Radiant Electric Ceiling Panels	Radiant Electric Heating with Ceiling Panels	20	$4,068.69	$10.85	375	25.0%	0.002	0.08	0.09	0.05
Manufactured	Room_Heat	Existing	Radiant Electric Floor Heating	Radiant Heating with Electric Cables in Flooring	20	$3,084.64	$8.23	375	25.0%	0.002	0.11	0.12	0.06
Manufactured	Room_Heat	New	Radiant Electric Floor Heating	Radiant Heating with Electric Cables in Flooring	20	$3,084.64	$8.23	375	25.0%	0.002	0.11	0.12	0.06
Multi_Family	Room_Heat	Existing	Radiant Electric Floor Heating	Radiant Heating with Electric Cables in Flooring	20	$3,084.64	$8.23	375	25.0%	0.002	0.11	0.12	0.06
Multi_Family	Room_Heat	New	Radiant Electric Floor Heating	Radiant Heating with Electric Cables in Flooring	20	$3,084.64	$8.23	375	25.0%	0.002	0.11	0.12	0.06

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Room_Heat	Existing	Radiant Electric Floor Heating	Radiant Heating with Electric Cables in Flooring	20	$4,068.69	$10.85	375	25.0%	0.002	0.08	0.09	0.05
Single_Family	Room_Heat	New	Radiant Electric Floor Heating	Radiant Heating with Electric Cables in Flooring	20	$4,068.69	$10.85	375	25.0%	0.002	0.08	0.09	0.05
Manufactured	Room_Heat	New	Spray in insulation 2*6 Wall	2*6Wall - closed cell foam insulation R-33	25	$7,497.57	$52.61	143	9.5%	0.001	0.02	0.02	0.01
Multi_Family	Room_Heat	New	Spray in insulation 2*6 Wall	2*6Wall - closed cell foam insulation R-33	25	$3,141.92	$22.05	143	9.5%	0.001	0.05	0.06	0.03
Single_Family	Room_Heat	New	Spray in insulation 2*6 Wall	2*6Wall - closed cell foam insulation R-33	25	$12,773.28	$89.64	143	9.5%	0.001	0.01	0.01	0.01
Manufactured	Room_Heat	Existing	Storm Windows	Storm Window	20	$263.52	$7.03	38	2.5%	0.000	0.12	0.15	0.07
Manufactured	Room_Heat	New	Storm Windows	Storm Window	20	$305.53	$8.15	38	2.5%	0.000	0.11	0.13	0.06
Multi_Family	Room_Heat	Existing	Storm Windows	Storm Window	20	$90.32	$2.41	38	2.5%	0.000	0.26	0.41	0.21
Multi_Family	Room_Heat	New	Storm Windows	Storm Window	20	$128.04	$3.41	38	2.5%	0.000	0.21	0.30	0.15
Single_Family	Room_Heat	Existing	Storm Windows	Storm Window	20	$481.32	$12.84	38	2.5%	0.000	0.07	0.08	0.04
Single_Family	Room_Heat	New	Storm Windows	Storm Window	20	$520.52	$13.88	38	2.5%	0.000	0.07	0.07	0.04
Manufactured	Room_Heat	Existing	Windows	U=0.19	25	$2,791.30	$23.26	120	8.0%	0.001	0.05	0.05	0.03
Manufactured	Room_Heat	Existing	Windows	U=0.30	25	$528.31	$17.61	30	2.0%	0.000	0.06	0.07	0.03
Manufactured	Room_Heat	Existing	Windows	U=0.32	25	$278.06	$9.27	30	2.0%	0.000	0.11	0.13	0.07

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Manufactured	Room_Heat	Existing	Windows	U=0.35	25	$5,516.42	$167.16	33	2.2%	0.000	0.01	0.01	0.00
Manufactured	Room_Heat	Existing	Windows	U=0.35	25	$5,516.42	$28.29	195	13.0%	0.001	0.04	0.04	0.02
Manufactured	Room_Heat	New	Windows	U=0.19	25	$3,236.29	$11.99	270	18.0%	0.001	0.09	0.10	0.05
Manufactured	Room_Heat	New	Windows	U=0.30	25	$612.54	$20.42	30	2.0%	0.000	0.05	0.06	0.03
Manufactured	Room_Heat	New	Windows	U=0.32	25	$322.39	$10.75	30	2.0%	0.000	0.10	0.11	0.06
Multi_Family	Room_Heat	Existing	Windows	U=0.19	25	$956.75	$7.97	120	8.0%	0.001	0.13	0.15	0.08
Multi_Family	Room_Heat	Existing	Windows	U=0.30	25	$181.09	$6.04	30	2.0%	0.000	0.16	0.20	0.10
Multi_Family	Room_Heat	Existing	Windows	U=0.32	25	$95.31	$3.18	30	2.0%	0.000	0.25	0.37	0.19
Multi_Family	Room_Heat	Existing	Windows	U=0.35	25	$1,890.83	$57.30	33	2.2%	0.000	0.02	0.02	0.01
Multi_Family	Room_Heat	Existing	Windows	U=0.35	25	$1,890.83	$9.70	195	13.0%	0.001	0.11	0.12	0.06
Multi_Family	Room_Heat	New	Windows	U=0.19	25	$1,356.20	$5.02	270	18.0%	0.001	0.18	0.24	0.12
Multi_Family	Room_Heat	New	Windows	U=0.30	25	$256.69	$8.56	30	2.0%	0.000	0.12	0.14	0.07
Multi_Family	Room_Heat	New	Windows	U=0.32	25	$135.10	$4.50	30	2.0%	0.000	0.19	0.26	0.13
Single_Family	Room_Heat	Existing	Windows	U=0.19	25	$5,098.28	$42.49	120	8.0%	0.001	0.03	0.03	0.01

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Room_Heat	Existing	Windows	U=0.30	25	$964.96	$32.17	30	2.0%	0.000	0.04	0.04	0.02
Single_Family	Room_Heat	Existing	Windows	U=0.32	25	$507.87	$16.93	30	2.0%	0.000	0.07	0.07	0.04
Single_Family	Room_Heat	Existing	Windows	U=0.35	25	$10,075.69	$305.32	33	2.2%	0.000	0.00	0.00	0.00
Single_Family	Room_Heat	Existing	Windows	U=0.35	25	$10,075.69	$51.67	195	13.0%	0.001	0.02	0.02	0.01
Single_Family	Room_Heat	New	Windows	U=0.19	25	$5,513.53	$20.42	270	18.0%	0.001	0.05	0.06	0.03
Single_Family	Room_Heat	New	Windows	U=0.30	25	$1,043.56	$34.79	30	2.0%	0.000	0.03	0.03	0.02
Single_Family	Room_Heat	New	Windows	U=0.32	25	$549.24	$18.31	30	2.0%	0.000	0.06	0.07	0.03
Manufactured	Water_Heat	Existing	Clothes Washer	Energy Star MEF = 1.83 (top Load)	14	$123.99	$1.27	98	4.9%	0.009	0.39	0.77	0.40
Manufactured	Water_Heat	Existing	Clothes Washer	Tier 2. MEF = 2.07 (front load)	14	$351.43	$1.46	241	12.2%	0.023	0.37	0.68	0.35
Manufactured	Water_Heat	Existing	Clothes Washer	Tier 2. MEF = 2.32 (front load)	14	$420.46	$1.36	309	15.6%	0.029	0.38	0.72	0.38
Manufactured	Water_Heat	New	Clothes Washer	Energy Star MEF = 1.83 (top Load)	14	$123.99	$1.27	98	4.9%	0.009	0.39	0.77	0.40
Manufactured	Water_Heat	New	Clothes Washer	Tier 2. MEF = 2.07 (front load)	14	$351.43	$1.46	240	12.2%	0.023	0.37	0.68	0.35
Manufactured	Water_Heat	New	Clothes Washer	Tier 2. MEF = 2.32 (front load)	14	$420.46	$1.36	309	15.6%	0.029	0.38	0.72	0.37
Multi_Family	Water_Heat	Existing	Clothes Washer	Energy Star MEF = 1.83 (top Load)	14	$123.99	$1.43	86	4.9%	0.008	0.37	0.69	0.36

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Multi_Family	Water_Heat	Existing	Clothes Washer	Tier 2. MEF = 2.07 (front load)	14	$351.43	$1.65	213	12.2%	0.020	0.34	0.60	0.31
Multi_Family	Water_Heat	Existing	Clothes Washer	Tier 2. MEF = 2.32 (front load)	14	$420.46	$1.54	273	15.6%	0.026	0.36	0.65	0.33
Multi_Family	Water_Heat	New	Clothes Washer	Energy Star MEF = 1.83 (top Load)	14	$123.99	$1.44	86	4.9%	0.008	0.37	0.69	0.36
Multi_Family	Water_Heat	New	Clothes Washer	Tier 2. MEF = 2.07 (front load)	14	$351.43	$1.66	212	12.2%	0.020	0.34	0.60	0.31
Multi_Family	Water_Heat	New	Clothes Washer	Tier 2. MEF = 2.32 (front load)	14	$420.46	$1.54	273	15.6%	0.026	0.36	0.64	0.33
Single_Family	Water_Heat	Existing	Clothes Washer	Energy Star MEF = 1.83 (top Load)	14	$123.99	$1.06	117	4.9%	0.011	0.43	0.91	0.48
Single_Family	Water_Heat	Existing	Clothes Washer	Tier 2. MEF = 2.07 (front load)	14	$351.43	$1.22	288	12.2%	0.027	0.40	0.80	0.42
Single_Family	Water_Heat	Existing	Clothes Washer	Tier 2. MEF = 2.32 (front load)	14	$420.46	$1.14	370	15.6%	0.035	0.41	0.86	0.45
Single_Family	Water_Heat	New	Clothes Washer	Energy Star MEF = 1.83 (top Load)	14	$123.99	$1.06	117	4.9%	0.011	0.43	0.91	0.48
Single_Family	Water_Heat	New	Clothes Washer	Tier 2. MEF = 2.07 (front load)	14	$351.43	$1.22	287	12.2%	0.027	0.40	0.80	0.42
Single_Family	Water_Heat	New	Clothes Washer	Tier 2. MEF = 2.32 (front load)	14	$420.46	$1.14	369	15.6%	0.035	0.41	0.85	0.44
Manufactured	Water_Heat	Existing	Clothes Washer - Early Replacement	Standard Clothes Washer (1.66)	14	$453.22	$1.90	238	12.0%	0.023	0.32	0.53	0.27
Multi_Family	Water_Heat	Existing	Clothes Washer - Early Replacement	Standard Clothes Washer (1.66)	14	$453.22	$2.16	210	12.0%	0.020	0.30	0.47	0.24
Single_Family	Water_Heat	Existing	Clothes Washer - Early Replacement	Standard Clothes Washer (1.66)	14	$453.22	$1.59	285	12.0%	0.027	0.35	0.62	0.32

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Manufactured	Water_Heat	Existing	Dishwasher	EF = 0.72	12	$31.39	$2.25	14	0.7%	0.001	0.27	0.40	0.21
Manufactured	Water_Heat	New	Dishwasher	EF = 0.72	12	$31.39	$2.25	14	0.7%	0.001	0.26	0.40	0.20
Multi_Family	Water_Heat	Existing	Dishwasher	EF = 0.72	12	$31.39	$1.86	17	1.0%	0.002	0.30	0.48	0.25
Multi_Family	Water_Heat	New	Dishwasher	EF = 0.72	12	$31.39	$1.87	17	1.0%	0.002	0.30	0.48	0.25
Single_Family	Water_Heat	Existing	Dishwasher	EF = 0.72	12	$31.39	$1.98	16	0.7%	0.001	0.29	0.45	0.23
Single_Family	Water_Heat	New	Dishwasher	EF = 0.72	12	$31.39	$1.99	16	0.7%	0.001	0.29	0.45	0.23
Manufactured	Water_Heat	Existing	Dishwasher - Existing	EF = 0.65 (ENERGY STAR)	12	$624.76	$13.48	46	2.3%	0.004	0.06	0.07	0.03
Multi_Family	Water_Heat	Existing	Dishwasher - Existing	EF = 0.65 (ENERGY STAR)	12	$624.76	$11.20	56	3.2%	0.005	0.08	0.08	0.04
Single_Family	Water_Heat	Existing	Dishwasher - Existing	EF = 0.65 (ENERGY STAR)	12	$624.76	$11.92	52	2.2%	0.005	0.07	0.08	0.04
Manufactured	Water_Heat	Existing	Drain Water Heat Recovery	Drain Water Heat Recovery (GFX or Power-Pipe)	30	$576.61	$1.58	366	18.5%	0.035	0.48	0.99	0.51
Manufactured	Water_Heat	New	Drain Water Heat Recovery	Drain Water Heat Recovery (GFX or Power-Pipe)	30	$576.61	$1.58	365	18.5%	0.035	0.48	0.99	0.51
Multi_Family	Water_Heat	Existing	Drain Water Heat Recovery	Drain Water Heat Recovery (GFX or Power-Pipe)	30	$576.61	$1.78	324	18.5%	0.031	0.45	0.88	0.45
Multi_Family	Water_Heat	New	Drain Water Heat Recovery	Drain Water Heat Recovery (GFX or Power-Pipe)	30	$576.61	$1.79	323	18.5%	0.031	0.45	0.88	0.45
Single_Family	Water_Heat	Existing	Drain Water Heat Recovery	Drain Water Heat Recovery (GFX or Power-Pipe)	30	$576.61	$1.32	438	18.5%	0.042	0.52	1.17	0.61

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Water_Heat	New	Drain Water Heat Recovery	Drain Water Heat Recovery (GFX or Power-Pipe)	30	$576.61	$1.32	437	18.5%	0.041	0.52	1.17	0.61
Manufactured	Water_Heat	Existing	Faucet Aerators	0.5 GPM	9	$4.20	$0.05	82	4.1%	0.008	0.65	4.96	3.70
Manufactured	Water_Heat	Existing	Faucet Aerators	1.5 GPM	9	$3.70	$0.11	34	1.7%	0.003	0.62	3.57	2.34
Manufactured	Water_Heat	Existing	Faucet Aerators	2.2 GPM	9	$1.50	$0.04	38	1.9%	0.004	0.65	5.40	4.21
Manufactured	Water_Heat	New	Faucet Aerators	0.5 GPM	9	$4.20	$0.05	82	4.1%	0.008	0.65	4.96	3.70
Manufactured	Water_Heat	New	Faucet Aerators	1.5 GPM	9	$3.70	$0.11	34	1.7%	0.003	0.62	3.57	2.34
Multi_Family	Water_Heat	Existing	Faucet Aerators	0.5 GPM	9	$4.20	$0.05	82	4.7%	0.008	0.65	4.96	3.70
Multi_Family	Water_Heat	Existing	Faucet Aerators	1.5 GPM	9	$3.70	$0.11	34	1.9%	0.003	0.62	3.57	2.34
Multi_Family	Water_Heat	Existing	Faucet Aerators	2.2 GPM	9	$1.50	$0.04	38	2.2%	0.004	0.65	5.40	4.21
Multi_Family	Water_Heat	New	Faucet Aerators	0.5 GPM	9	$4.20	$0.05	82	4.7%	0.008	0.65	4.96	3.70
Multi_Family	Water_Heat	New	Faucet Aerators	1.5 GPM	9	$3.70	$0.11	34	1.9%	0.003	0.62	3.57	2.34
Single_Family	Water_Heat	Existing	Faucet Aerators	0.5 GPM	9	$6.30	$0.08	82	3.4%	0.008	0.63	4.24	2.95
Single_Family	Water_Heat	Existing	Faucet Aerators	1.5 GPM	9	$5.55	$0.17	34	1.4%	0.003	0.59	2.83	1.74
Single_Family	Water_Heat	Existing	Faucet Aerators	2.2 GPM	9	$2.25	$0.06	38	1.6%	0.004	0.64	4.73	3.46

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Water_Heat	New	Faucet Aerators	0.5 GPM	9	$6.30	$0.08	82	3.5%	0.008	0.63	4.24	2.95
Single_Family	Water_Heat	New	Faucet Aerators	1.5 GPM	9	$5.55	$0.17	34	1.4%	0.003	0.59	2.83	1.74
Manufactured	Water_Heat	Existing	Heat Pump Water Heater	EF=2.0	15	$2,148.01	$2.51	855	43.2%	0.081	0.28	0.42	0.22
Manufactured	Water_Heat	New	Heat Pump Water Heater	EF=2.0	15	$2,148.01	$2.52	852	43.2%	0.081	0.28	0.42	0.22
Multi_Family	Water_Heat	Existing	Heat Pump Water Heater	EF=2.0	15	$2,148.01	$2.84	756	43.2%	0.072	0.26	0.38	0.19
Multi_Family	Water_Heat	New	Heat Pump Water Heater	EF=2.0	15	$2,148.01	$2.85	753	43.2%	0.071	0.26	0.38	0.19
Single_Family	Water_Heat	Existing	Heat Pump Water Heater	EF=2.0	15	$2,148.01	$2.10	1023	43.2%	0.097	0.31	0.50	0.26
Single_Family	Water_Heat	New	Heat Pump Water Heater	EF=2.0	15	$2,148.01	$2.11	1020	43.2%	0.097	0.31	0.50	0.26
Manufactured	Water_Heat	Existing	Heat_Pump - Ground or Water-Source (Desuperheater)	Desuperheater	10	$213.91	$0.20	1092	55.2%	0.103	0.59	2.76	1.66
Manufactured	Water_Heat	New	Heat_Pump - Ground or Water-Source (Desuperheater)	Desuperheater	10	$213.91	$0.20	1089	55.2%	0.103	0.59	2.76	1.66
Multi_Family	Water_Heat	Existing	Heat_Pump - Ground or Water-Source (Desuperheater)	Desuperheater	10	$213.91	$0.22	965	55.2%	0.091	0.58	2.54	1.51
Multi_Family	Water_Heat	New	Heat_Pump - Ground or Water-Source (Desuperheater)	Desuperheater	10	$213.91	$0.22	962	55.2%	0.091	0.58	2.54	1.50
Single_Family	Water_Heat	Existing	Heat_Pump - Ground or Water-Source (Desuperheater)	Desuperheater	10	$213.91	$0.16	1307	55.2%	0.124	0.61	3.10	1.91
Single_Family	Water_Heat	New	Heat_Pump - Ground or Water-Source (Desuperheater)	Desuperheater	10	$213.91	$0.16	1303	55.2%	0.123	0.61	3.10	1.91

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Manufactured	Water_Heat	Existing	Hot Water Pipe Insulation	R-4 Wrap	5	$7.20	$0.18	40	2.0%	0.004	0.48	1.61	0.98
Manufactured	Water_Heat	New	Hot Water Pipe Insulation	R-4 Wrap	5	$7.20	$0.18	40	2.0%	0.004	0.48	1.61	0.98
Multi_Family	Water_Heat	Existing	Hot Water Pipe Insulation	R-4 Wrap	5	$7.20	$0.18	40	2.3%	0.004	0.48	1.61	0.98
Multi_Family	Water_Heat	New	Hot Water Pipe Insulation	R-4 Wrap	5	$7.20	$0.18	40	2.3%	0.004	0.48	1.61	0.98
Single_Family	Water_Heat	Existing	Hot Water Pipe Insulation	R-4 Wrap	5	$7.20	$0.18	40	1.7%	0.004	0.48	1.61	0.98
Single_Family	Water_Heat	New	Hot Water Pipe Insulation	R-4 Wrap	5	$7.20	$0.18	40	1.7%	0.004	0.48	1.61	0.98
Manufactured	Water_Heat	Existing	Low-Flow Showerheads	2.00GPM	10	$4.95	$0.04	112	5.7%	0.011	0.67	5.67	4.34
Manufactured	Water_Heat	Existing	Low-Flow Showerheads	2.5 GPM Federal Code	10	$12.00	$0.11	112	5.7%	0.011	0.64	3.95	2.60
Manufactured	Water_Heat	New	Low-Flow Showerheads	2.00GPM	10	$4.95	$0.04	112	5.7%	0.011	0.67	5.67	4.34
Multi_Family	Water_Heat	Existing	Low-Flow Showerheads	2.00GPM	10	$4.95	$0.04	112	6.4%	0.011	0.67	5.67	4.34
Multi_Family	Water_Heat	Existing	Low-Flow Showerheads	2.5 GPM Federal Code	10	$12.00	$0.11	112	6.4%	0.011	0.64	3.95	2.60
Multi_Family	Water_Heat	New	Low-Flow Showerheads	2.00GPM	10	$4.95	$0.04	112	6.4%	0.011	0.67	5.67	4.34
Single_Family	Water_Heat	Existing	Low-Flow Showerheads	2.00GPM	10	$9.90	$0.09	112	4.7%	0.011	0.65	4.34	2.95
Single_Family	Water_Heat	Existing	Low-Flow Showerheads	2.5 GPM Federal Code	10	$24.00	$0.21	112	4.7%	0.011	0.59	2.60	1.55

Segment	End Use	Vintage	Residential Measure Name	Residential Measure Description	Life (years)	Incremental Cost ($)	$/kWh Saved	Energy Savings (kWh)	Energy Savings %	Summer Peak Savings at Meter (kW)	RIM Test	PAC Test	TRC Test
Single_Family	Water_Heat	New	Low-Flow Showerheads	2.00GPM	10	$9.90	$0.09	112	4.7%	0.011	0.65	4.34	2.95
Manufactured	Water_Heat	Existing	Solar Water Heater	Solar thermal collector	20	$8,500.00	$9.67	879	44.4%	0.083	0.11	0.13	0.07
Manufactured	Water_Heat	New	Solar Water Heater	Solar thermal collector	20	$8,500.00	$9.13	931	47.2%	0.088	0.12	0.14	0.07
Multi_Family	Water_Heat	Existing	Solar Water Heater	Solar thermal collector	20	$4,250.00	$6.48	656	37.5%	0.062	0.16	0.20	0.10
Multi_Family	Water_Heat	New	Solar Water Heater	Solar thermal collector	20	$4,250.00	$6.26	679	38.9%	0.064	0.16	0.20	0.10
Single_Family	Water_Heat	Existing	Solar Water Heater	Solar thermal collector	20	$8,500.00	$8.36	1017	42.9%	0.096	0.13	0.15	0.08
Single_Family	Water_Heat	New	Solar Water Heater	Solar thermal collector	20	$8,500.00	$7.90	1075	45.5%	0.102	0.14	0.16	0.08
Manufactured	Water_Heat	Existing	Tankless Water_Heater	EF = 0.95, 4.0 gpm	20	$1,886.82	$30.20	62	3.2%	0.006	0.04	0.04	0.02
Manufactured	Water_Heat	New	Tankless Water_Heater	EF = 0.95, 4.0 gpm	20	$1,886.82	$30.28	62	3.2%	0.006	0.04	0.04	0.02
Multi_Family	Water_Heat	Existing	Tankless Water_Heater	EF = 0.95, 4.0 gpm	20	$1,886.82	$34.16	55	3.2%	0.005	0.04	0.04	0.02
Multi_Family	Water_Heat	New	Tankless Water_Heater	EF = 0.95, 4.0 gpm	20	$1,886.82	$34.26	55	3.2%	0.005	0.04	0.04	0.02
Single_Family	Water_Heat	Existing	Tankless Water_Heater	EF = 0.95, 4.0 gpm	20	$1,886.82	$25.22	75	3.2%	0.007	0.05	0.05	0.03
Single_Family	Water_Heat	New	Tankless Water_Heater	EF = 0.95, 4.0 gpm	20	$1,886.82	$25.30	75	3.2%	0.007	0.05	0.05	0.03
Manufactured	Water_Heat	Existing	Water_Heater (40 Gallon Electric)	EF = 0.95	18	$114.00	$1.82	63	3.2%	0.006	0.37	0.65	0.33

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Manufactured	Water_Heat	New	Water_Heater (40 Gallon Electric)	EF = 0.95	18	$114.00	$1.82	63	3.2%	0.006	0.37	0.65	0.33
Multi_Family	Water_Heat	Existing	Water_Heater (40 Gallon Electric)	EF = 0.95	18	$114.00	$2.06	55	3.2%	0.005	0.34	0.58	0.30
Multi_Family	Water_Heat	New	Water_Heater (40 Gallon Electric)	EF = 0.95	18	$114.00	$2.06	55	3.2%	0.005	0.34	0.58	0.30
Single_Family	Water_Heat	Existing	Water_Heater (40 Gallon Electric)	EF = 0.95	18	$114.00	$1.52	75	3.2%	0.007	0.40	0.77	0.40
Single_Family	Water_Heat	New	Water_Heater (40 Gallon Electric)	EF = 0.95	18	$114.00	$1.52	75	3.2%	0.007	0.40	0.77	0.40
Manufactured	Water_Heat	Existing	Water_Heater Tank Blanket/Insulation	Install Insulation (R-5)	10	$17.99	$0.14	129	6.5%	0.012	0.62	3.41	2.15
Multi_Family	Water_Heat	Existing	Water_Heater Tank Blanket/Insulation	Install Insulation (R-5)	10	$17.99	$0.16	114	6.5%	0.011	0.61	3.17	1.96
Single_Family	Water_Heat	Existing	Water_Heater Tank Blanket/Insulation	Install Insulation (R-5)	10	$17.99	$0.12	154	6.5%	0.015	0.63	3.77	2.45
Manufactured	Water_Heat	Existing	Water_Heater Thermostat Setback	120 degrees	4	$7.36	$0.06	119	6.0%	0.011	0.52	2.26	1.63
Manufactured	Water_Heat	New	Water_Heater Thermostat Setback	120 degrees	4	$7.36	$0.06	118	6.0%	0.011	0.52	2.25	1.63
Multi_Family	Water_Heat	Existing	Water_Heater Thermostat Setback	120 degrees	4	$7.36	$0.07	105	6.0%	0.010	0.51	2.15	1.52
Multi_Family	Water_Heat	New	Water_Heater Thermostat Setback	120 degrees	4	$7.36	$0.07	105	6.0%	0.010	0.51	2.15	1.52
Single_Family	Water_Heat	Existing	Water_Heater Thermostat Setback	120 degrees	4	$7.36	$0.05	142	6.0%	0.013	0.53	2.41	1.80
Single_Family	Water_Heat	New	Water_Heater Thermostat Setback	120 degrees	4	$7.36	$0.05	142	6.0%	0.013	0.53	2.41	1.79

F.2 Commercial Measures

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Healthcare	Chiller	Existing	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$750.00	$1.07	698	10.00%	0.181	0.65	1.29	0.67
Healthcare	Chiller	New	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$399.90	$0.61	659	10.00%	0.171	0.82	2.14	1.15
Lodging	Chiller	Existing	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$750.00	$4.15	181	2.0%	0.047	0.28	0.36	0.18
Lodging	Chiller	New	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$399.90	$2.30	174	2.0%	0.045	0.43	0.63	0.32
Office	Chiller	Existing	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$750.00	$1.14	659	10.00%	0.170	0.63	1.22	0.64
Office	Chiller	New	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$399.90	$0.64	622	10.00%	0.161	0.80	2.04	1.09
Healthcare	Chiller	Existing	Centrifugal Chiller - VSD Remodel for Existing, VSD motor		per Building Sq Ft	30	$0.12	$0.13	1	40.00%	0.000	1.31	9.73	6.22
Lodging	Chiller	Existing	Centrifugal Chiller - VSD Remodel for Existing, VSD motor		per Building Sq Ft	30	$0.12	$0.10	1	40.0%	0.000	1.33	11.16	7.44
Office	Chiller	Existing	Centrifugal Chiller - VSD Remodel for Existing, VSD motor		per Building Sq Ft	30	$0.12	$0.14	1	40.00%	0.000	1.30	9.41	5.96
Healthcare	Chiller	Existing	Chilled Water Piping Loop w/ VSD Control, VSD for Secondary Chilled Water Loop		per Ton	10	$212.33	$4.47	48	7.56%	0.012	0.20	0.25	0.12
Healthcare	Chiller	New	Chilled Water Piping Loop w/ VSD Control, VSD for Secondary Chilled Water Loop		per Ton	10	$212.33	$4.74	45	7.56%	0.012	0.20	0.23	0.12
Lodging	Chiller	Existing	Chilled Water Piping Loop w/ VSD Control, VSD for Secondary Chilled Water Loop		per Ton	10	$212.33	$3.46	61	7.6%	0.016	0.25	0.32	0.16
Lodging	Chiller	New	Chilled Water Piping Loop w/ VSD Control, VSD for Secondary Chilled Water Loop		per Ton	10	$212.33	$3.59	59	7.6%	0.015	0.24	0.30	0.15
Office	Chiller	Existing	Chilled Water Piping Loop w/ VSD Control, VSD for Secondary Chilled Water Loop		per Ton	10	$212.33	$4.37	49	7.56%	0.013	0.21	0.25	0.13
Office	Chiller	New	Chilled Water Piping Loop w/ VSD Control, VSD for Secondary Chilled Water Loop		per Ton	10	$212.33	$4.63	46	7.56%	0.012	0.20	0.24	0.12
Healthcare	Chiller	Existing	Chilled Water Reset, Install Chilled Water Reset		1 unit per 1,000 Sq Ft	10	$680.80	$5.85	116	5.00%	0.030	0.16	0.19	0.10

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Lodging	Chiller	Existing	Chilled Water Reset, Install Chilled Water Reset		1 unit per 1,000 Sq Ft	10	$680.80	$4.52	150	5.0%	0.039	0.20	0.24	0.12
Office	Chiller	Existing	Chilled Water Reset, Install Chilled Water Reset		1 unit per 1,000 Sq Ft	10	$680.80	$6.20	110	5.00%	0.028	0.16	0.18	0.09
Healthcare	Chiller	Existing	Chiller - Premium Efficiency, 0.507 kW/ton		per Ton	20	$108.00	$0.85	127	20.03%	0.033	0.80	1.91	1.007
Healthcare	Chiller	New	Chiller - Premium Efficiency, 0.507 kW/ton		per Ton	20	$108.00	$0.85	127	20.03%	0.033	0.80	1.91	1.007
Lodging	Chiller	Existing	Chiller - Premium Efficiency, 0.507 kW/ton		per Ton	20	$108.00	$0.66	163	20.0%	0.042	0.88	2.39	1.28
Lodging	Chiller	New	Chiller - Premium Efficiency, 0.507 kW/ton		per Ton	20	$108.00	$0.66	163	20.0%	0.042	0.88	2.39	1.28
Office	Chiller	Existing	Chiller - Premium Efficiency, 0.507 kW/ton		per Ton	20	$107.99	$0.83	129	20.03%	0.033	0.81	1.94	1.027
Office	Chiller	New	Chiller - Premium Efficiency, 0.507 kW/ton		per Ton	20	$108.00	$0.90	119	20.03%	0.031	0.79	1.81	0.952
Healthcare	Chiller	Existing	Chiller - Advanced Technology, 0.461 kW/ton		per Ton	20	$131.00	$0.76	173	27.29%	0.045	0.84	2.12	1.12
Healthcare	Chiller	New	Chiller - Advanced Technology, 0.461 kW/ton		per Ton	20	$131.00	$0.76	173	27.29%	0.045	0.84	2.12	1.12
Lodging	Chiller	Existing	Chiller - Advanced Technology, 0.461 kW/ton		per Ton	20	$131.00	$0.59	223	27.3%	0.058	0.91	2.64	1.42
Lodging	Chiller	New	Chiller - Advanced Technology, 0.461 kW/ton		per Ton	20	$131.00	$0.59	223	27.3%	0.058	0.91	2.64	1.42
Office	Chiller	Existing	Chiller - Advanced Technology, 0.461 kW/ton		per Ton	20	$131.01	$0.74	176	27.29%	0.046	0.84	2.15	1.15
Office	Chiller	New	Chiller - Advanced Technology, 0.461 kW/ton		per Ton	20	$131.00	$0.81	163	27.29%	0.042	0.82	2.01	1.06
Healthcare	Chiller	Existing	Chiller - High Efficiency, 0.574 kW/ton		per Ton	20	$48.01	$0.80	60	9.46%	0.015	0.82	2.01	1.07
Healthcare	Chiller	New	Chiller - High Efficiency, 0.574 kW/ton		per Ton	20	$48.01	$0.80	60	9.46%	0.015	0.82	2.01	1.07
Lodging	Chiller	Existing	Chiller - High Efficiency, 0.574 kW/ton		per Ton	20	$48.01	$0.62	77	9.5%	0.020	0.89	2.52	1.35
Lodging	Chiller	New	Chiller - High Efficiency, 0.574 kW/ton		per Ton	20	$48.01	$0.62	77	9.5%	0.020	0.89	2.52	1.35
Office	Chiller	Existing	Chiller - High Efficiency, 0.574 kW/ton		per Ton	20	$48.00	$0.79	61	9.46%	0.016	0.83	2.05	1.09
Office	Chiller	New	Chiller - High Efficiency, 0.574 kW/ton		per Ton	20	$48.01	$0.85	56	9.46%	0.015	0.80	1.91	1.009
Healthcare	Chiller	Existing	Chiller-Water Side Economizer, Install Economizer		per Ton	10	$492.99	$15.69	31	5.00%	0.008	0.07	0.07	0.04
Lodging	Chiller	Existing	Chiller-Water Side Economizer, Install Economizer		per Ton	10	$492.99	$12.13	41	5.0%	0.011	0.09	0.09	0.05
Office	Chiller	Existing	Chiller-Water Side Economizer, Install Economizer		per Ton	10	$493.01	$15.35	32	5.00%	0.008	0.07	0.07	0.04
Healthcare	Chiller	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$2.66	0	12.50%	0.000	0.13	0.14	0.07

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Lodging	Chiller	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$2.01	0	12.5%	0.000	0.16	0.18	0.09
Office	Chiller	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$2.82	0	12.50%	0.000	0.12	0.13	0.07
Healthcare	Chiller	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$0.68	0	12.50%	0.000	0.35	0.50	0.27
Lodging	Chiller	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$0.52	0	12.5%	0.000	0.40	0.63	0.34
Office	Chiller	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$0.72	0	12.50%	0.000	0.33	0.48	0.25
Healthcare	Chiller	Existing	Cooling Tower-Decrease Approach Temperature, 6 Deg F		per Ton	15	$21.00	$0.38	56	8.00%	0.014	0.93	3.18	1.78
Healthcare	Chiller	New	Cooling Tower-Decrease Approach Temperature, 6 Deg F		per Ton	15	$21.00	$0.32	66	8.00%	0.017	0.96	3.61	2.05
Lodging	Chiller	Existing	Cooling Tower-Decrease Approach Temperature, 6 Deg F		per Ton	15	$21.00	$0.29	72	8.0%	0.019	0.98	3.87	2.22
Lodging	Chiller	New	Cooling Tower-Decrease Approach Temperature, 6 Deg F		per Ton	15	$21.00	$0.24	87	8.0%	0.022	1.01	4.43	2.60
Office	Chiller	Existing	Cooling Tower-Decrease Approach Temperature, 6 Deg F		per Ton	15	$21.00	$0.37	57	8.00%	0.015	0.94	3.23	1.81
Office	Chiller	New	Cooling Tower-Decrease Approach Temperature, 6 Deg F		per Ton	15	$21.00	$0.34	62	8.00%	0.016	0.95	3.46	1.95
Healthcare	Chiller	Existing	Cooling Tower-Two-Speed Fan Motor, Two-Speed Tower Fans replace Single-Speed		per Ton	10	$2.34	$0.02	98	14.00%	0.025	1.09	9.06	7.59
Healthcare	Chiller	New	Cooling Tower-Two-Speed Fan Motor, Two-Speed Tower Fans replace Single-Speed		per Ton	10	$2.36	$0.02	115	14.00%	0.030	1.09	9.31	7.96
Lodging	Chiller	Existing	Cooling Tower-Two-Speed Fan Motor, Two-Speed Tower Fans replace Single-Speed		per Ton	10	$2.34	$0.02	126	14.0%	0.033	1.09	9.47	8.19
Lodging	Chiller	New	Cooling Tower-Two-Speed Fan Motor, Two-Speed Tower Fans replace Single-Speed		per Ton	10	$2.36	$0.02	152	14.0%	0.039	1.10	9.71	8.56
Office	Chiller	Existing	Cooling Tower-Two-Speed Fan Motor, Two-Speed Tower Fans replace Single-Speed		per Ton	10	$2.34	$0.02	100	14.00%	0.026	1.09	9.09	7.64
Office	Chiller	New	Cooling Tower-Two-Speed Fan Motor, Two-Speed Tower Fans replace Single-Speed		per Ton	10	$2.36	$0.02	109	14.00%	0.028	1.09	9.22	7.83
Healthcare	Chiller	Existing	Cooling Tower-VSD Fan Control, Variable-Speed Tower Fans replace Two-Speed		per Ton	10	$11.28	$0.09	126	18.00%	0.033	1.02	5.91	4.02
Healthcare	Chiller	New	Cooling Tower-VSD Fan Control, Variable-Speed Tower Fans replace Two-Speed		per Ton	10	$11.29	$0.08	148	18.00%	0.038	1.03	6.37	4.45
Lodging	Chiller	Existing	Cooling Tower-VSD Fan Control, Variable-Speed Tower Fans replace Two-Speed		per Ton	10	$11.28	$0.07	163	18.0%	0.042	1.04	6.62	4.70
Lodging	Chiller	New	Cooling Tower-VSD Fan Control, Variable-Speed Tower Fans replace Two-Speed		per Ton	10	$11.29	$0.06	196	18.0%	0.051	1.05	7.12	5.21
Office	Chiller	Existing	Cooling Tower-VSD Fan Control, Variable-Speed Tower Fans replace Two-Speed		per Ton	10	$11.28	$0.09	128	18.00%	0.033	1.02	5.98	4.07
Office	Chiller	New	Cooling Tower-VSD Fan Control, Variable-Speed Tower Fans replace Two-Speed		per Ton	10	$11.29	$0.08	140	18.00%	0.036	1.03	6.21	4.30

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Healthcare	Chiller	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$0.90	349	15.00%	0.090	0.40	0.62	0.33
Lodging	Chiller	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$0.69	451	15.0%	0.117	0.46	0.78	0.42
Office	Chiller	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$0.95	329	15.00%	0.085	0.39	0.59	0.31
Healthcare	Chiller	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.75	233	10.00%	0.060	0.44	0.73	0.39
Healthcare	Chiller	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.80	220	10.00%	0.057	0.43	0.69	0.37
Lodging	Chiller	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.58	301	10.0%	0.078	0.51	0.91	0.49
Lodging	Chiller	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.60	290	10.0%	0.075	0.50	0.88	0.48
Office	Chiller	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.80	220	10.00%	0.057	0.43	0.69	0.37
Office	Chiller	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.84	207	10.00%	0.054	0.42	0.66	0.35
Healthcare	Chiller	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$0.36	349	15.00%	0.090	0.62	1.35	0.75
Lodging	Chiller	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$0.28	451	15.0%	0.117	0.67	1.64	0.94
Office	Chiller	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$0.38	329	15.00%	0.085	0.60	1.29	0.72
Healthcare	Chiller	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$4.12	0	2.50%	0.000	0.31	0.40	0.20
Healthcare	Chiller	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$4.37	0	2.50%	0.000	0.30	0.38	0.19
Lodging	Chiller	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$3.19	0	2.5%	0.000	0.38	0.52	0.26
Lodging	Chiller	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$3.31	0	2.5%	0.000	0.37	0.50	0.25

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Office	Chiller	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$4.37	0	2.50%	0.000	0.30	0.38	0.19
Office	Chiller	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$4.63	0	2.50%	0.000	0.28	0.36	0.18
Healthcare	Chiller	Existing	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,452.00	$0.22	24619	4.50%	6.369	0.91	3.49	2.07
Healthcare	Chiller	New	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,452.00	$0.23	23232	4.50%	6.011	0.90	3.35	1.97
Lodging	Chiller	Existing	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,449.66	$1.43	3809	4.5%	0.985	0.46	0.73	0.38
Lodging	Chiller	New	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,449.66	$1.49	3668	4.5%	0.949	0.45	0.71	0.37
Office	Chiller	New	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,451.78	$1.01	5407	4.50%	1.399	0.56	1.01	0.53
Healthcare	Chiller	Existing	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$43.51	0	2.00%	0.000	0.05	0.05	0.03
Healthcare	Chiller	New	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$46.11	0	2.00%	0.000	0.05	0.05	0.02
Lodging	Chiller	Existing	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$33.66	0	5.0%	0.000	0.06	0.07	0.03
Lodging	Chiller	New	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$34.95	0	5.0%	0.000	0.06	0.06	0.03
Office	Chiller	Existing	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$46.14	0	5.00%	0.000	0.05	0.05	0.02
Office	Chiller	New	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$48.85	0	5.00%	0.000	0.04	0.05	0.02
Lodging	Chiller	Existing	Hotel Key Card Room Energy Control System, Key card system to control room HVAC and lighting during non-occupied periods		per room	15	$200.00	$0.66	301	25.0%	0.078	0.79	1.98	1.06
Lodging	Chiller	New	Hotel Key Card Room Energy Control System, Key card system to control room HVAC and lighting during non-occupied periods		per room	15	$200.00	$0.69	290	25.0%	0.075	0.78	1.92	1.022
Healthcare	Chiller	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$0.15	2	5.00%	0.000	0.97	4.44	2.77
Lodging	Chiller	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$0.24	1	5.0%	0.000	0.90	3.26	1.91
Office	Chiller	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$0.20	1	5.00%	0.000	0.93	3.70	2.22
Healthcare	Chiller	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$7.45	0	0.60%	0.000	0.23	0.27	0.14

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Lodging	Chiller	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$5.76	0	1.5%	0.000	0.28	0.35	0.18
Office	Chiller	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$7.89	0	1.50%	0.000	0.22	0.26	0.13
Healthcare	Chiller	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$11.60	0	0.20%	0.000	0.16	0.18	0.09
Healthcare	Chiller	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$12.29	0	0.20%	0.000	0.15	0.17	0.08
Lodging	Chiller	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$8.97	0	0.5%	0.000	0.20	0.23	0.11
Lodging	Chiller	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$9.31	0	0.5%	0.000	0.19	0.22	0.11
Office	Chiller	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$12.30	0	0.50%	0.000	0.15	0.17	0.08
Office	Chiller	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$13.02	0	0.50%	0.000	0.14	0.16	0.08
Healthcare	Chiller	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$4.83	0	0.48%	0.000	0.32	0.42	0.21
Healthcare	Chiller	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$4.58	0	1.20%	0.000	0.34	0.44	0.22
Lodging	Chiller	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$3.74	0	1.2%	0.000	0.39	0.54	0.27
Lodging	Chiller	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$3.54	0	3.0%	0.000	0.41	0.56	0.29
Office	Chiller	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$5.12	0	1.20%	0.000	0.31	0.39	0.20
Office	Chiller	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$4.86	0	3.00%	0.000	0.32	0.41	0.21
Healthcare	Chiller	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$10.52	0	0.40%	0.000	0.17	0.19	0.10
Healthcare	Chiller	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$11.15	0	0.40%	0.000	0.16	0.18	0.09
Lodging	Chiller	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$8.14	0	1.0%	0.000	0.21	0.25	0.13
Lodging	Chiller	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$8.45	0	1.0%	0.000	0.21	0.24	0.12
Office	Chiller	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$11.16	0	1.00%	0.000	0.16	0.18	0.09
Office	Chiller	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$11.81	0	1.00%	0.000	0.15	0.17	0.09
Healthcare	Chiller	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$1.44	1	3.00%	0.000	0.69	1.33	0.69
Lodging	Chiller	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$1.12	2	3.0%	0.000	0.78	1.69	0.88
Office	Chiller	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$1.53	1	3.00%	0.000	0.67	1.26	0.65
Healthcare	Chiller	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$1.58	2	4.40%	0.001	0.66	1.23	0.63
Healthcare	Chiller	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$0.90	$0.62	1	3.30%	0.000	0.96	2.84	1.53
Lodging	Chiller	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$1.22	3	4.4%	0.001	0.75	1.56	0.81

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Lodging	Chiller	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$0.90	$0.47	2	3.3%	0.000	1.03	3.59	1.97
Office	Chiller	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$1.67	2	4.40%	0.000	0.64	1.16	0.60
Office	Chiller	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$0.90	$0.66	1	3.30%	0.000	0.95	2.71	1.45
Healthcare	Chiller	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.97	1	10.00%	0.000	0.83	1.92	1.006
Healthcare	Chiller	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$1.94	0	5.00%	0.000	0.59	1.01	0.52
Lodging	Chiller	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$1.15	1	10.0%	0.000	0.77	1.65	0.86
Lodging	Chiller	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$2.29	0	5.0%	0.000	0.54	0.86	0.44
Office	Chiller	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$1.66	0	10.00%	0.000	0.65	1.17	0.60
Office	Chiller	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$3.31	0	5.00%	0.000	0.43	0.60	0.31
Healthcare	Chiller	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.09	3	7.50%	0.001	1.28	10.75	7.28
Lodging	Chiller	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.07	4	7.5%	0.001	1.30	12.15	8.63
Office	Chiller	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.10	3	7.50%	0.001	1.28	10.46	7.01
Healthcare	Chiller	Existing	Pipe Insulation, R-6		Linear Foot	15	$4.66	$0.77	6	1.30%	0.002	0.75	1.74	0.92
Lodging	Chiller	Existing	Pipe Insulation, R-6		Linear Foot	15	$4.66	$0.60	8	1.3%	0.002	0.82	2.18	1.17
Office	Chiller	Existing	Pipe Insulation, R-6		Linear Foot	15	$4.68	$0.82	6	1.30%	0.001	0.73	1.64	0.87
Healthcare	Chiller	Existing	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$2.11	$3.63	1	25.00%	0.000	0.24	0.30	0.15
Healthcare	Chiller	New	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$2.11	$3.84	1	25.00%	0.000	0.23	0.28	0.14
Lodging	Chiller	Existing	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$2.11	$2.80	1	25.0%	0.000	0.29	0.39	0.20
Lodging	Chiller	New	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$2.11	$2.91	1	25.0%	0.000	0.29	0.37	0.19

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Office	Chiller	Existing	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$2.11	$3.84	1	25.00%	0.000	0.23	0.28	0.14
Office	Chiller	New	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$2.11	$4.07	1	25.00%	0.000	0.22	0.27	0.14
Healthcare	Chiller	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$136.30	$0.04	3283	3.00%	0.849	1.17	10.69	8.27
Lodging	Chiller	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$139.19	$0.11	1270	3.0%	0.328	1.11	7.22	4.74
Office	Chiller	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$139.05	$0.07	1908	3.00%	0.494	1.14	8.75	6.16
Healthcare	Chiller	Existing	Turbocor Compressor, 0.35 kW/Ton Turbocor oil-free refrigerant compressor with variable frequency drive (VFD)		per Ton	20	$574.99	$2.04	282	44.79%	0.073	0.53	0.85	0.43
Healthcare	Chiller	New	Turbocor Compressor, 0.35 kW/Ton Turbocor oil-free refrigerant compressor with variable frequency drive (VFD)		per Ton	20	$574.99	$2.16	266	44.79%	0.069	0.51	0.80	0.41
Lodging	Chiller	Existing	Turbocor Compressor, 0.35 kW/Ton Turbocor oil-free refrigerant compressor with variable frequency drive (VFD)		per Ton	20	$574.99	$1.58	364	44.8%	0.094	0.61	1.08	0.56
Lodging	Chiller	New	Turbocor Compressor, 0.35 kW/Ton Turbocor oil-free refrigerant compressor with variable frequency drive (VFD)		per Ton	20	$574.99	$1.64	351	44.8%	0.091	0.60	1.04	0.54
Office	Chiller	Existing	Turbocor Compressor, 0.35 kW/Ton Turbocor oil-free refrigerant compressor with variable frequency drive (VFD)		per Ton	20	$575.00	$2.00	288	44.79%	0.074	0.53	0.87	0.44
Office	Chiller	New	Turbocor Compressor, 0.35 kW/Ton Turbocor oil-free refrigerant compressor with variable frequency drive (VFD)		per Ton	20	$574.99	$2.29	251	44.79%	0.065	0.49	0.76	0.39
Healthcare	Chiller	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$13.36	1	4.57%	0.000	0.17	0.19	0.09
Healthcare	Chiller	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$14.15	1	4.57%	0.000	0.16	0.17	0.09
Lodging	Chiller	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$15.77	1	6.2%	0.000	0.14	0.16	0.08
Lodging	Chiller	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$16.37	1	6.2%	0.000	0.14	0.15	0.08
Office	Chiller	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$22.80	1	3.56%	0.000	0.10	0.11	0.05
Office	Chiller	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$24.14	1	3.56%	0.000	0.10	0.10	0.05
Healthcare	Chiller	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$25.58	2	6.33%	0.001	0.09	0.10	0.05
Lodging	Chiller	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$30.20	2	8.5%	0.000	0.08	0.08	0.04

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Office	Chiller	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$43.65	1	4.93%	0.000	0.06	0.06	0.03
All	Cooking	New	Commercial Hot Food Holding Cabinets (Energy Star)	Standard Cabinet	Each	12	$1,500.00	$0.94	1,592	7%	0.253	0.57	1.04	0.55
All	Cooking	Turnover	Commercial Hot Food Holding Cabinets (Energy Star)	Standard Cabinet	Each	12	$1,500.00	$0.94	1,592	7%	0.253	0.57	1.04	0.55
All	Cooking	New	Electric combination oven	Standard Oven	Each	12	$16,884.00	$1.12	15,095	38%	2.401	0.52	0.89	0.46
All	Cooking	Turnover	Electric combination oven	Standard Oven	Each	12	$16,884.00	$1.12	15,095	38%	2.401	0.52	0.89	0.46
All	Cooking	New	Electric convection oven	Standard Oven	Each	15	$2,713.00	$1.20	2,262	19%	0.360	0.56	0.98	0.51
All	Cooking	Turnover	Electric convection oven	Standard Oven	Each	15	$2,713.00	$1.20	2,262	19%	0.360	0.56	0.98	0.51
All	Cooking	New	Electric Steam cooker	Standard Cooker	Each	12	$1,500.00	$0.40	3,745	8%	0.596	0.80	2.17	1.21
All	Cooking	Turnover	Electric Steam cooker	Standard Cooker	Each	12	$1,500.00	$0.40	3,745	8%	0.596	0.80	2.17	1.21
All	Cooking	New	High Efficiency Fryers (Energy Star)	Standard Fryer	Each	12	$1,271.00	$5.45	233	1%	0.037	0.17	0.20	0.10
All	Cooking	Turnover	High Efficiency Fryers (Energy Star)	Standard Fryer	Each	12	$1,271.00	$5.45	233	1%	0.037	0.17	0.20	0.10
All	Cooking	New	High Efficiency Griddle	Standard Griddle	Each	12	$1,700.00	$0.66	2,595	15%	0.413	0.67	1.44	0.77
All	Cooking	Turnover	High Efficiency Griddle	Standard Griddle	Each	12	$1,700.00	$0.66	2,595	15%	0.413	0.67	1.44	0.77
All	Cooking	New	High Efficiency Induction Cooking	Standard Cooking	Each	12	$2,213.00	$1.04	2,118	7%	0.337	0.54	0.95	0.50
All	Cooking	Turnover	High Efficiency Induction Cooking	Standard Cooking	Each	12	$2,213.00	$1.04	2,118	7%	0.337	0.54	0.95	0.50
Education	Fluorescent	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$1,288.69	$0.17	7,413	10%	0.978	1.00	4.40	2.69
Grocery	Fluorescent	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$322.15	$0.05	6,823	10%	0.900	1.12	8.19	6.20
Healthcare	Fluorescent	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$4,620.83	$0.08	57,906	10%	7.638	1.09	6.70	4.64
Lodging	Fluorescent	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$1,083.79	$0.20	5,551	10%	0.732	0.99	4.08	2.46
Misc	Fluorescent	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$384.57	$0.18	2,103	10%	0.277	1.00	4.26	2.59
Office	Fluorescent	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$1,297.63	$0.23	5,646	10%	0.745	0.96	3.65	2.15
Restaurant	Fluorescent	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$152.93	$0.08	1,880	10%	0.248	1.09	6.65	4.59
Retail	Fluorescent	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$425.98	$0.12	3,602	10%	0.475	1.05	5.52	3.58
Warehouse	Fluorescent	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$469.83	$0.42	1,128	10%	0.149	0.84	2.33	1.29
Education	Fluorescent	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$6,443.44	$0.35	18,534	25%	2.445	0.88	2.69	1.52
Grocery	Fluorescent	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$1,610.75	$0.09	17,059	25%	2.250	1.08	6.20	4.17

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Healthcare	Fluorescent	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$23,104.13	$0.16	144,764	25%	19.094	1.02	4.64	2.88
Lodging	Fluorescent	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$5,418.96	$0.39	13,878	25%	1.830	0.85	2.46	1.37
Misc	Fluorescent	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$1,922.84	$0.37	5,257	25%	0.693	0.87	2.59	1.45
Office	Fluorescent	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$6,488.14	$0.46	14,115	25%	1.862	0.81	2.15	1.18
Restaurant	Fluorescent	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$764.65	$0.16	4,700	25%	0.620	1.01	4.59	2.83
Retail	Fluorescent	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$2,129.89	$0.24	9,004	25%	1.188	0.95	3.58	2.10
Warehouse	Fluorescent	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$2,349.14	$0.83	2,819	25%	0.372	0.65	1.29	0.68
Education	Fluorescent	Turnover	LED Retrofit Tube	Replace (E) high efficiency 32 W T8 Lamp	Lamp	17	$65.00	$2.63	25	39%	0.003	0.35	0.48	0.25
Grocery	Fluorescent	Turnover	LED Retrofit Tube	Replace (E) high efficiency 32 W T8 Lamp	Lamp	6	$65.00	$0.91	72	39%	0.009	0.38	0.57	0.30
Healthcare	Fluorescent	Turnover	LED Retrofit Tube	Replace (E) high efficiency 32 W T8 Lamp	Lamp	9	$65.00	$1.37	47	39%	0.006	0.38	0.55	0.29
Lodging	Fluorescent	Turnover	LED Retrofit Tube	Replace (E) high efficiency 32 W T8 Lamp	Lamp	13	$65.00	$1.97	33	39%	0.004	0.37	0.53	0.27
Misc	Fluorescent	Turnover	LED Retrofit Tube	Replace (E) high efficiency 32 W T8 Lamp	Lamp	12	$65.00	$1.78	37	39%	0.005	0.38	0.55	0.28
Office	Fluorescent	Turnover	LED Retrofit Tube	Replace (E) high efficiency 32 W T8 Lamp	Lamp	12	$65.00	$1.91	34	39%	0.004	0.36	0.51	0.26
Restaurant	Fluorescent	Turnover	LED Retrofit Tube	Replace (E) high efficiency 32 W T8 Lamp	Lamp	8	$65.00	$1.23	53	39%	0.007	0.38	0.56	0.29
Retail	Fluorescent	Turnover	LED Retrofit Tube	Replace (E) high efficiency 32 W T8 Lamp	Lamp	8	$65.00	$1.31	50	39%	0.007	0.36	0.53	0.27
Warehouse	Fluorescent	Turnover	LED Retrofit Tube	Replace (E) high efficiency 32 W T8 Lamp	Lamp	13	$65.00	$1.97	33	39%	0.004	0.37	0.53	0.27
Education	Fluorescent	Turnover	Low Power Ballast Replacement	NPF high efficiency 32 W T8 Lamp Ballast - 2 lamp	Lamp	11	$2.55	$0.08	32	14%	0.004	1.00	5.35	3.71
Education	Fluorescent	Early	Low Power Ballast Replacement	NPF high efficiency 32 W T8 Lamp Ballast - 2 lamp	Lamp	11	$35.00	$1.09	32	14%	0.004	0.49	0.81	0.42
Grocery	Fluorescent	Turnover	Low Power Ballast Replacement	NPF high efficiency 32 W T8 Lamp Ballast - 2 lamp	Lamp	11	$2.55	$0.03	93	14%	0.012	1.06	7.52	6.19

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Grocery	Fluorescent	Early	Low Power Ballast Replacement	NPF high efficiency 32 W T8 Lamp Ballast - 2 lamp	Lamp	11	$60.38	$0.65	93	14%	0.012	0.63	1.28	0.69
Healthcare	Fluorescent	Turnover	Low Power Ballast Replacement	NPF high efficiency 32 W T8 Lamp Ballast - 2 lamp	Lamp	11	$2.55	$0.04	61	14%	0.008	1.04	6.78	5.24
Healthcare	Fluorescent	Early	Low Power Ballast Replacement	NPF high efficiency 32 W T8 Lamp Ballast - 2 lamp	Lamp	11	$59.93	$0.98	61	14%	0.008	0.52	0.89	0.47
Lodging	Fluorescent	Turnover	Low Power Ballast Replacement	NPF high efficiency 32 W T8 Lamp Ballast - 2 lamp	Lamp	11	$2.55	$0.06	43	14%	0.006	1.02	6.01	4.38
Lodging	Fluorescent	Early	Low Power Ballast Replacement	NPF high efficiency 32 W T8 Lamp Ballast - 2 lamp	Lamp	11	$35.00	$0.82	43	14%	0.006	0.57	1.05	0.55
Misc	Fluorescent	Turnover	Low Power Ballast Replacement	NPF high efficiency 32 W T8 Lamp Ballast - 2 lamp	Lamp	11	$2.55	$0.05	48	14%	0.006	1.03	6.24	4.62
Misc	Fluorescent	Early	Low Power Ballast Replacement	NPF high efficiency 32 W T8 Lamp Ballast - 2 lamp	Lamp	11	$35.00	$0.74	48	14%	0.006	0.59	1.15	0.61
Office	Fluorescent	Turnover	Low Power Ballast Replacement	NPF high efficiency 32 W T8 Lamp Ballast - 2 lamp	Lamp	11	$2.55	$0.06	44	14%	0.006	1.03	6.08	4.45
Office	Fluorescent	Early	Low Power Ballast Replacement	NPF high efficiency 32 W T8 Lamp Ballast - 2 lamp	Lamp	11	$35.00	$0.79	44	14%	0.006	0.57	1.08	0.57
Restaurant	Fluorescent	Turnover	Low Power Ballast Replacement	NPF high efficiency 32 W T8 Lamp Ballast - 2 lamp	Lamp	11	$2.55	$0.04	69	14%	0.009	1.05	6.99	5.50
Restaurant	Fluorescent	Early	Low Power Ballast Replacement	NPF high efficiency 32 W T8 Lamp Ballast - 2 lamp	Lamp	11	$35.00	$0.51	69	14%	0.009	0.69	1.57	0.86
Retail	Fluorescent	Turnover	Low Power Ballast Replacement	NPF high efficiency 32 W T8 Lamp Ballast - 2 lamp	Lamp	11	$2.55	$0.04	65	14%	0.009	1.05	6.87	5.36
Retail	Fluorescent	Early	Low Power Ballast Replacement	NPF high efficiency 32 W T8 Lamp Ballast - 2 lamp	Lamp	11	$35.00	$0.54	65	14%	0.009	0.68	1.49	0.81
Warehouse	Fluorescent	Turnover	Low Power Ballast Replacement	NPF high efficiency 32 W T8 Lamp Ballast - 2 lamp	Lamp	11	$2.55	$0.06	43	14%	0.006	1.02	6.01	4.38
Warehouse	Fluorescent	Early	Low Power Ballast Replacement	NPF high efficiency 32 W T8 Lamp Ballast - 2 lamp	Lamp	11	$35.00	$0.82	43	14%	0.006	0.57	1.05	0.55
Education	Fluorescent	Early	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$125.00	$0.33	379	30%	0.050	0.87	2.67	1.51
Education	Fluorescent	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.13	379	30%	0.050	1.02	4.95	3.16
Education	Fluorescent	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.13	379	30%	0.050	1.02	4.95	3.16

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Grocery	Fluorescent	Early	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$125.00	$0.11	1,096	30%	0.145	1.04	5.36	3.50
Grocery	Fluorescent	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.05	1,096	30%	0.145	1.10	7.89	6.00
Grocery	Fluorescent	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.05	1,096	30%	0.145	1.10	7.89	6.00
Healthcare	Fluorescent	Early	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$125.00	$0.17	725	30%	0.096	0.98	4.21	2.58
Healthcare	Fluorescent	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.07	725	30%	0.096	1.08	6.80	4.83
Healthcare	Fluorescent	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.07	725	30%	0.096	1.08	6.80	4.83
Lodging	Fluorescent	Early	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$125.00	$0.25	506	30%	0.067	0.93	3.31	1.93
Lodging	Fluorescent	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.10	506	30%	0.067	1.05	5.77	3.86
Lodging	Fluorescent	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.10	506	30%	0.067	1.05	5.77	3.86
Misc	Fluorescent	Early	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$125.00	$0.22	561	30%	0.074	0.94	3.56	2.10
Misc	Fluorescent	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.09	561	30%	0.074	1.06	6.07	4.12
Misc	Fluorescent	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.09	561	30%	0.074	1.06	6.07	4.12
Office	Fluorescent	Early	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$125.00	$0.24	523	30%	0.069	0.93	3.39	1.99
Office	Fluorescent	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.10	523	30%	0.069	1.05	5.87	3.94
Office	Fluorescent	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.10	523	30%	0.069	1.05	5.87	3.94
Restaurant	Fluorescent	Early	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$125.00	$0.15	809	30%	0.107	1.00	4.51	2.81
Restaurant	Fluorescent	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.06	809	30%	0.107	1.09	7.10	5.14
Restaurant	Fluorescent	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.06	809	30%	0.107	1.09	7.10	5.14
Retail	Fluorescent	Early	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$125.00	$0.16	762	30%	0.100	0.99	4.35	2.68
Retail	Fluorescent	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.07	762	30%	0.100	1.08	6.93	4.97
Retail	Fluorescent	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.07	762	30%	0.100	1.08	6.93	4.97
Warehouse	Fluorescent	Early	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$125.00	$0.25	506	30%	0.067	0.93	3.31	1.93
Warehouse	Fluorescent	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.10	506	30%	0.067	1.05	5.77	3.86
Warehouse	Fluorescent	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.10	506	30%	0.067	1.05	5.77	3.86
Education	Fluorescent	Early	Photocell dimming control	No prior dimming control	Photocell	9	$225.00	$0.36	632	50%	0.083	0.72	1.79	1.006
Education	Fluorescent	New	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.24	632	50%	0.083	0.80	2.42	1.42

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Education	Fluorescent	Turnover	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.24	632	50%	0.083	0.80	2.42	1.42
Grocery	Fluorescent	Early	Photocell dimming control	No prior dimming control	Photocell	9	$225.00	$0.12	1,826	50%	0.241	0.90	3.66	2.36
Grocery	Fluorescent	New	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.08	1,826	50%	0.241	0.94	4.49	3.09
Grocery	Fluorescent	Turnover	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.08	1,826	50%	0.241	0.94	4.49	3.09
Healthcare	Fluorescent	Early	Photocell dimming control	No prior dimming control	Photocell	9	$225.00	$0.19	1,208	50%	0.159	0.84	2.85	1.73
Healthcare	Fluorescent	New	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.12	1,208	50%	0.159	0.90	3.65	2.35
Healthcare	Fluorescent	Turnover	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.12	1,208	50%	0.159	0.90	3.65	2.35
Lodging	Fluorescent	Early	Photocell dimming control	No prior dimming control	Photocell	9	$225.00	$0.27	843	50%	0.111	0.78	2.23	1.29
Lodging	Fluorescent	New	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.18	843	50%	0.111	0.85	2.94	1.79
Lodging	Fluorescent	Turnover	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.18	843	50%	0.111	0.85	2.94	1.79
Misc	Fluorescent	Early	Photocell dimming control	No prior dimming control	Photocell	9	$225.00	$0.24	934	50%	0.123	0.80	2.40	1.40
Misc	Fluorescent	New	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.16	934	50%	0.123	0.87	3.14	1.94
Misc	Fluorescent	Turnover	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.16	934	50%	0.123	0.87	3.14	1.94
Office	Fluorescent	Early	Photocell dimming control	No prior dimming control	Photocell	9	$225.00	$0.26	871	50%	0.115	0.78	2.28	1.33
Office	Fluorescent	New	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.17	871	50%	0.115	0.85	3.00	1.84
Office	Fluorescent	Turnover	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.17	871	50%	0.115	0.85	3.00	1.84
Restaurant	Fluorescent	Early	Photocell dimming control	No prior dimming control	Photocell	9	$225.00	$0.17	1,348	50%	0.178	0.86	3.06	1.88
Restaurant	Fluorescent	New	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.11	1,348	50%	0.178	0.91	3.87	2.53
Restaurant	Fluorescent	Turnover	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.11	1,348	50%	0.178	0.91	3.87	2.53
Retail	Fluorescent	Early	Photocell dimming control	No prior dimming control	Photocell	9	$225.00	$0.18	1,270	50%	0.167	0.85	2.95	1.80
Retail	Fluorescent	New	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.12	1,270	50%	0.167	0.91	3.75	2.43
Retail	Fluorescent	Turnover	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.12	1,270	50%	0.167	0.91	3.75	2.43
Warehouse	Fluorescent	Early	Photocell dimming control	No prior dimming control	Photocell	9	$225.00	$0.27	843	50%	0.111	0.78	2.23	1.29
Warehouse	Fluorescent	New	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.18	843	50%	0.111	0.85	2.94	1.79
Warehouse	Fluorescent	Turnover	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.18	843	50%	0.111	0.85	2.94	1.79

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Education	Fluorescent	Turnover	Premium Efficiency T8 Lighting Replacement (25W lamps)	Replace (E) high efficiency 32 W T8 Lamp	Lamp	17	$2.02	$0.26	8	13%	0.001	0.98	3.68	2.14
Grocery	Fluorescent	Turnover	Premium Efficiency T8 Lighting Replacement (25W lamps)	Replace (E) high efficiency 32 W T8 Lamp	Lamp	6	$2.02	$0.09	23	13%	0.003	0.83	3.06	2.08
Healthcare	Fluorescent	Turnover	Premium Efficiency T8 Lighting Replacement (25W lamps)	Replace (E) high efficiency 32 W T8 Lamp	Lamp	9	$2.02	$0.13	15	13%	0.002	0.89	3.49	2.22
Lodging	Fluorescent	Turnover	Premium Efficiency T8 Lighting Replacement (25W lamps)	Replace (E) high efficiency 32 W T8 Lamp	Lamp	13	$2.02	$0.19	11	13%	0.001	0.95	3.73	2.25
Misc	Fluorescent	Turnover	Premium Efficiency T8 Lighting Replacement (25W lamps)	Replace (E) high efficiency 32 W T8 Lamp	Lamp	12	$2.02	$0.17	12	13%	0.002	0.94	3.75	2.30
Office	Fluorescent	Turnover	Premium Efficiency T8 Lighting Replacement (25W lamps)	Replace (E) high efficiency 32 W T8 Lamp	Lamp	12	$2.02	$0.19	11	13%	0.001	0.93	3.59	2.17
Restaurant	Fluorescent	Turnover	Premium Efficiency T8 Lighting Replacement (25W lamps)	Replace (E) high efficiency 32 W T8 Lamp	Lamp	8	$2.02	$0.12	17	13%	0.002	0.87	3.36	2.18
Retail	Fluorescent	Turnover	Premium Efficiency T8 Lighting Replacement (25W lamps)	Replace (E) high efficiency 32 W T8 Lamp	Lamp	8	$2.02	$0.13	16	13%	0.002	0.86	3.25	2.09
Warehouse	Fluorescent	Turnover	Premium Efficiency T8 Lighting Replacement (25W lamps)	Replace (E) high efficiency 32 W T8 Lamp	Lamp	13	$2.02	$0.19	11	13%	0.001	0.95	3.73	2.25
Education	Fluorescent	Turnover	Premium Efficiency T8 Lighting Replacement (28W lamps)	Replace (E) high efficiency 32 W T8 Lamp	Lamp	17	$2.32	$0.17	14	22%	0.002	1.05	4.89	3.01
Grocery	Fluorescent	Turnover	Premium Efficiency T8 Lighting Replacement (28W lamps)	Replace (E) high efficiency 32 W T8 Lamp	Lamp	6	$2.32	$0.06	40	22%	0.005	0.87	3.65	2.67
Healthcare	Fluorescent	Turnover	Premium Efficiency T8 Lighting Replacement (28W lamps)	Replace (E) high efficiency 32 W T8 Lamp	Lamp	9	$2.32	$0.09	26	22%	0.003	0.94	4.35	2.96
Lodging	Fluorescent	Turnover	Premium Efficiency T8 Lighting Replacement (28W lamps)	Replace (E) high efficiency 32 W T8 Lamp	Lamp	13	$2.32	$0.13	18	22%	0.002	1.00	4.81	3.09
Misc	Fluorescent	Turnover	Premium Efficiency T8 Lighting Replacement (28W lamps)	Replace (E) high efficiency 32 W T8 Lamp	Lamp	12	$2.32	$0.11	20	22%	0.003	0.99	4.80	3.13
Office	Fluorescent	Turnover	Premium Efficiency T8 Lighting Replacement (28W lamps)	Replace (E) high efficiency 32 W T8 Lamp	Lamp	12	$2.32	$0.12	19	22%	0.003	0.98	4.62	2.98
Restaurant	Fluorescent	Turnover	Premium Efficiency T8 Lighting Replacement (28W lamps)	Replace (E) high efficiency 32 W T8 Lamp	Lamp	8	$2.32	$0.08	29	22%	0.004	0.92	4.14	2.87
Retail	Fluorescent	Turnover	Premium Efficiency T8 Lighting Replacement (28W lamps)	Replace (E) high efficiency 32 W T8 Lamp	Lamp	8	$2.32	$0.08	28	22%	0.004	0.91	4.03	2.77

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Warehouse	Fluorescent	Turnover	Premium Efficiency T8 Lighting Replacement (28W lamps)	Replace (E) high efficiency 32 W T8 Lamp	Lamp	13	$2.32	$0.13	18	22%	0.002	1.00	4.81	3.09
Education	Fluorescent	Early	Premium Efficiency T8 Lighting Replacement (32W lamps with low power factor ballasts) - Bundle	Replace (E) T12 Lamp - Bundle	Fixture	15	$55.38	$0.71	78	25%	0.010	0.69	1.48	0.79
Grocery	Fluorescent	Early	Premium Efficiency T8 Lighting Replacement (32W lamps with low power factor ballasts) - Bundle	Replace (E) T12 Lamp - Bundle	Fixture	11	$55.38	$0.25	224	25%	0.030	0.85	2.77	1.62
Healthcare	Fluorescent	Early	Premium Efficiency T8 Lighting Replacement (32W lamps with low power factor ballasts) - Bundle	Replace (E) T12 Lamp - Bundle	Fixture	11	$55.38	$0.37	148	25%	0.020	0.77	2.03	1.13
Lodging	Fluorescent	Early	Premium Efficiency T8 Lighting Replacement (32W lamps with low power factor ballasts) - Bundle	Replace (E) T12 Lamp - Bundle	Fixture	10	$55.38	$0.53	104	25%	0.014	0.65	1.40	0.76
Misc	Fluorescent	Early	Premium Efficiency T8 Lighting Replacement (32W lamps with low power factor ballasts) - Bundle	Replace (E) T12 Lamp - Bundle	Fixture	11	$55.38	$0.48	115	25%	0.015	0.71	1.65	0.90
Office	Fluorescent	Early	Premium Efficiency T8 Lighting Replacement (32W lamps with low power factor ballasts) - Bundle	Replace (E) T12 Lamp - Bundle	Fixture	14	$55.38	$0.52	107	25%	0.014	0.76	1.86	1.012
Restaurant	Fluorescent	Early	Premium Efficiency T8 Lighting Replacement (32W lamps with low power factor ballasts) - Bundle	Replace (E) T12 Lamp - Bundle	Fixture	11	$55.38	$0.33	166	25%	0.022	0.79	2.21	1.25
Retail	Fluorescent	Early	Premium Efficiency T8 Lighting Replacement (32W lamps with low power factor ballasts) - Bundle	Replace (E) T12 Lamp - Bundle	Fixture	11	$55.38	$0.35	156	25%	0.021	0.78	2.11	1.18
Warehouse	Fluorescent	Early	Premium Efficiency T8 Lighting Replacement (32W lamps with low power factor ballasts) - Bundle	Replace (E) T12 Lamp - Bundle	Fixture	12	$55.38	$0.53	104	25%	0.014	0.70	1.62	0.88
Office	Heat_Pump	Existing	Air-Source Heat Pump - High Efficiency, High-Efficiency EER=11.0, COP=3.5		per Ton	15	$186.42	$5.84	32	2.39%	0.005	0.18	0.21	0.11
Office	Heat_Pump	New	Air-Source Heat Pump - High Efficiency, High-Efficiency EER=11.0, COP=3.5		per Ton	15	$186.42	$4.56	41	2.39%	0.006	0.23	0.27	0.14
Restaurant	Heat_Pump	Existing	Air-Source Heat Pump - High Efficiency, High-Efficiency EER=11.0, COP=3.5		per Ton	15	$186.44	$3.61	52	3.8%	0.008	0.27	0.34	0.17
Restaurant	Heat_Pump	New	Air-Source Heat Pump - High Efficiency, High-Efficiency EER=11.0, COP=3.5		per Ton	15	$186.43	$2.89	65	3.8%	0.010	0.32	0.43	0.22
Retail	Heat_Pump	Existing	Air-Source Heat Pump - High Efficiency, High-Efficiency EER=11.0, COP=3.5		per Ton	15	$186.44	$2.69	69	4.8%	0.011	0.34	0.46	0.23
Retail	Heat_Pump	New	Air-Source Heat Pump - High Efficiency, High-Efficiency EER=11.0, COP=3.5		per Ton	15	$186.43	$2.15	87	4.8%	0.014	0.40	0.57	0.29
Office	Heat_Pump	Existing	Air-Source Heat Pump - Premium Efficiency, Premium-Efficiency EER=11.8, COP=3.8		per Ton	15	$591.46	$5.31	111	8.35%	0.018	0.20	0.24	0.12
Office	Heat_Pump	New	Air-Source Heat Pump - Premium Efficiency, Premium-Efficiency EER=11.8, COP=3.8		per Ton	15	$591.45	$4.15	143	8.35%	0.023	0.24	0.30	0.15
Restaurant	Heat_Pump	Existing	Air-Source Heat Pump - Premium Efficiency, Premium-Efficiency EER=11.8, COP=3.8		per Ton	15	$591.47	$3.28	180	13.1%	0.029	0.29	0.38	0.19

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Restaurant	Heat_Pump	New	Air-Source Heat Pump - Premium Efficiency, Premium-Efficiency EER=11.8, COP=3.8		per Ton	15	$591.47	$2.62	225	13.1%	0.036	0.34	0.47	0.24
Retail	Heat_Pump	Existing	Air-Source Heat Pump - Premium Efficiency, Premium-Efficiency EER=11.8, COP=3.8		per Ton	15	$591.46	$2.44	242	16.6%	0.039	0.36	0.50	0.26
Retail	Heat_Pump	New	Air-Source Heat Pump - Premium Efficiency, Premium-Efficiency EER=11.8, COP=3.8		per Ton	15	$591.45	$1.95	303	16.6%	0.048	0.42	0.62	0.32
Office	Heat_Pump	Existing	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$750.00	$0.58	1294	10.00%	0.206	0.77	1.88	1.014
Office	Heat_Pump	New	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$399.90	$0.31	1284	10.00%	0.204	0.92	3.10	1.76
Office	Heat_Pump	Existing	Cold-Climate Heat Pump,		per Ton	20	$1,166.66	$11.11	105	7.88%	0.017	0.12	0.14	0.07
Office	Heat_Pump	New	Cold-Climate Heat Pump,		per Ton	20	$1,166.67	$8.75	133	7.88%	0.021	0.15	0.17	0.09
Restaurant	Heat_Pump	Existing	Cold-Climate Heat Pump,		per Ton	20	$1,166.67	$10.76	108	7.9%	0.017	0.13	0.14	0.07
Restaurant	Heat_Pump	New	Cold-Climate Heat Pump,		per Ton	20	$1,166.66	$8.68	134	7.9%	0.021	0.16	0.18	0.09
Retail	Heat_Pump	Existing	Cold-Climate Heat Pump,		per Ton	20	$1,166.66	$10.17	115	7.9%	0.018	0.13	0.15	0.08
Retail	Heat_Pump	New	Cold-Climate Heat Pump,		per Ton	20	$1,166.68	$8.20	142	7.9%	0.023	0.16	0.19	0.09
Office	Heat_Pump	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$1.36	1	12.50%	0.000	0.18	0.22	0.11
Restaurant	Heat_Pump	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$0.64	1	12.5%	0.000	0.31	0.44	0.24
Retail	Heat_Pump	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$0.81	1	12.5%	0.000	0.27	0.36	0.19
Office	Heat_Pump	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$0.37	1	12.50%	0.000	0.42	0.70	0.39
Restaurant	Heat_Pump	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$0.17	1	12.5%	0.000	0.57	1.20	0.73
Retail	Heat_Pump	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$0.22	1	12.5%	0.000	0.53	1.03	0.61
Office	Heat_Pump	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$0.48	647	15.00%	0.103	0.50	0.89	0.49

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Restaurant	Heat_Pump	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$0.23	1375	15.0%	0.219	0.66	1.59	0.94
Retail	Heat_Pump	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$0.29	1091	15.0%	0.174	0.61	1.35	0.77
Office	Heat_Pump	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.41	431	10.00%	0.069	0.54	1.03	0.57
Office	Heat_Pump	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.41	428	10.00%	0.068	0.54	1.02	0.57
Restaurant	Heat_Pump	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.19	917	10.0%	0.146	0.69	1.79	1.08
Restaurant	Heat_Pump	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.19	910	10.0%	0.145	0.69	1.78	1.08
Retail	Heat_Pump	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.24	728	10.0%	0.116	0.65	1.53	0.90
Retail	Heat_Pump	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.24	722	10.0%	0.115	0.65	1.52	0.89
Office	Heat_Pump	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$0.20	647	15.00%	0.103	0.69	1.77	1.06
Restaurant	Heat_Pump	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$0.09	1375	15.0%	0.219	0.80	2.72	1.84
Retail	Heat_Pump	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$0.12	1091	15.0%	0.174	0.77	2.42	1.57
Office	Heat_Pump	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$2.22	0	2.50%	0.000	0.43	0.62	0.32
Office	Heat_Pump	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$2.24	0	2.50%	0.000	0.42	0.61	0.31
Restaurant	Heat_Pump	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$1.05	0	2.5%	0.000	0.65	1.26	0.66
Restaurant	Heat_Pump	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$1.06	0	2.5%	0.000	0.65	1.25	0.65
Retail	Heat_Pump	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$1.32	0	2.5%	0.000	0.58	1.01	0.53

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Retail	Heat_Pump	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$1.33	0	2.5%	0.000	0.58	1.01	0.52
Office	Heat_Pump	Existing	Duct-Less Heat Pumps, 15 SEER, 9.0 HSPF		per Ton	15	$1,208.38	$3.36	360	30.00%	0.057	0.29	0.37	0.19
Office	Heat_Pump	New	Duct-Less Heat Pumps, 15 SEER, 9.0 HSPF		per Ton	15	$969.46	$2.72	357	30.00%	0.057	0.34	0.45	0.23
Restaurant	Heat_Pump	Existing	Duct-Less Heat Pumps, 15 SEER, 9.0 HSPF		per Ton	15	$1,208.39	$3.25	371	30.0%	0.059	0.29	0.38	0.19
Restaurant	Heat_Pump	New	Duct-Less Heat Pumps, 15 SEER, 9.0 HSPF		per Ton	15	$969.45	$2.63	368	30.0%	0.059	0.34	0.47	0.24
Retail	Heat_Pump	Existing	Duct-Less Heat Pumps, 15 SEER, 9.0 HSPF		per Ton	15	$1,208.38	$3.08	393	30.0%	0.062	0.31	0.40	0.20
Retail	Heat_Pump	New	Duct-Less Heat Pumps, 15 SEER, 9.0 HSPF		per Ton	15	$969.44	$2.49	390	30.0%	0.062	0.36	0.49	0.25
Office	Heat_Pump	Existing	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$1.31	$4.85	0	6.28%	0.000	0.16	0.19	0.10
Office	Heat_Pump	New	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$1.31	$4.89	0	6.28%	0.000	0.16	0.19	0.10
Restaurant	Heat_Pump	Existing	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$1.72	$1.90	1	9.9%	0.000	0.34	0.47	0.24
Restaurant	Heat_Pump	New	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$1.72	$1.92	1	9.9%	0.000	0.34	0.47	0.24
Retail	Heat_Pump	Existing	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$0.91	$1.00	1	12.5%	0.000	0.50	0.86	0.45
Retail	Heat_Pump	New	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$0.91	$1.00	1	12.5%	0.000	0.50	0.85	0.45
Restaurant	Heat_Pump	Existing	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,450.06	$3.43	1588	4.5%	0.253	0.22	0.27	0.14
Restaurant	Heat_Pump	New	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,450.06	$3.46	1576	4.5%	0.251	0.22	0.27	0.13
Retail	Heat_Pump	Existing	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,449.98	$1.55	3517	4.5%	0.559	0.39	0.57	0.29
Retail	Heat_Pump	New	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,449.98	$1.56	3489	4.5%	0.555	0.39	0.57	0.29
Office	Heat_Pump	Existing	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$45.31	0	3.83%	0.000	0.04	0.04	0.02
Office	Heat_Pump	New	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$45.72	0	3.83%	0.000	0.04	0.04	0.02
Restaurant	Heat_Pump	Existing	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$16.82	1	6.6%	0.000	0.10	0.11	0.06

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Restaurant	Heat_Pump	New	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$16.95	1	6.6%	0.000	0.10	0.11	0.06
Retail	Heat_Pump	Existing	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$16.70	1	8.3%	0.000	0.11	0.11	0.06
Retail	Heat_Pump	New	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$16.83	1	8.3%	0.000	0.10	0.11	0.06
Office	Heat_Pump	Existing	Heat Pump - Ground Source (Closed Loop), GSHP: COP=3.1, EER=13.4		per Ton	20	$2,162.19	$12.52	173	12.96%	0.027	0.11	0.12	0.06
Office	Heat_Pump	New	Heat Pump - Ground Source (Closed Loop), GSHP: COP=3.1, EER=13.4		per Ton	20	$2,162.18	$9.86	219	12.96%	0.035	0.14	0.15	0.08
Restaurant	Heat_Pump	Existing	Heat Pump - Ground Source (Closed Loop), GSHP: COP=3.1, EER=13.4		per Ton	20	$2,162.19	$24.83	87	6.3%	0.014	0.06	0.06	0.03
Restaurant	Heat_Pump	New	Heat Pump - Ground Source (Closed Loop), GSHP: COP=3.1, EER=13.4		per Ton	20	$2,162.19	$20.02	108	6.3%	0.017	0.07	0.08	0.04
Retail	Heat_Pump	Existing	Heat Pump - Ground Source (Closed Loop), GSHP: COP=3.1, EER=13.4		per Ton	20	$2,162.20	$105.51	20	1.4%	0.003	0.01	0.01	0.01
Retail	Heat_Pump	New	Heat Pump - Ground Source (Closed Loop), GSHP: COP=3.1, EER=13.4		per Ton	20	$2,162.20	$85.07	25	1.4%	0.004	0.02	0.02	0.01
Office	Heat_Pump	Existing	Heat Pump - Ground Source (Closed Loop), GSHP: COP=4.0, EER=20		per Ton	20	$2,162.19	$4.37	495	37.15%	0.079	0.28	0.34	0.17
Office	Heat_Pump	New	Heat Pump - Ground Source (Closed Loop), GSHP: COP=4.0, EER=20		per Ton	20	$2,162.18	$3.44	628	37.15%	0.100	0.33	0.43	0.22
Restaurant	Heat_Pump	Existing	Heat Pump - Ground Source (Closed Loop), GSHP: COP=4.0, EER=20		per Ton	20	$2,162.19	$5.22	414	30.1%	0.066	0.24	0.29	0.15
Restaurant	Heat_Pump	New	Heat Pump - Ground Source (Closed Loop), GSHP: COP=4.0, EER=20		per Ton	20	$2,162.19	$4.21	514	30.1%	0.082	0.28	0.36	0.18
Retail	Heat_Pump	Existing	Heat Pump - Ground Source (Closed Loop), GSHP: COP=4.0, EER=20		per Ton	20	$2,162.20	$5.97	362	24.9%	0.058	0.21	0.25	0.13
Retail	Heat_Pump	New	Heat Pump - Ground Source (Closed Loop), GSHP: COP=4.0, EER=20		per Ton	20	$2,162.20	$4.81	450	24.9%	0.072	0.26	0.31	0.16
Office	Heat_Pump	Existing	Heat Pump - Water Source (Closed Loop), WSHP: COP=4.2, EER=12.0		per Ton	20	$434.94	$1.70	255	19.17%	0.041	0.53	0.85	0.44
Office	Heat_Pump	New	Heat Pump - Water Source (Closed Loop), WSHP: COP=4.2, EER=12.0		per Ton	20	$574.43	$1.77	324	19.17%	0.052	0.52	0.82	0.42
Restaurant	Heat_Pump	Existing	Heat Pump - Water Source (Closed Loop), WSHP: COP=4.2, EER=12.0		per Ton	20	$434.94	$1.50	290	21.1%	0.046	0.57	0.96	0.50
Restaurant	Heat_Pump	New	Heat Pump - Water Source (Closed Loop), WSHP: COP=4.2, EER=12.0		per Ton	20	$574.44	$1.60	359	21.1%	0.057	0.55	0.90	0.47
Retail	Heat_Pump	Existing	Heat Pump - Water Source (Closed Loop), WSHP: COP=4.2, EER=12.0		per Ton	20	$434.94	$1.33	327	22.5%	0.052	0.61	1.07	0.56
Retail	Heat_Pump	New	Heat Pump - Water Source (Closed Loop), WSHP: COP=4.2, EER=12.0		per Ton	20	$574.45	$1.42	406	22.5%	0.065	0.59	1.01	0.52
Office	Heat_Pump	Existing	Heat Pump - Water Source (Closed Loop), WSHP: COP=4.8, EER=14.5		per Ton	20	$434.94	$1.03	421	31.60%	0.067	0.69	1.36	0.71
Office	Heat_Pump	New	Heat Pump - Water Source (Closed Loop), WSHP: COP=4.8, EER=14.5		per Ton	20	$574.43	$1.08	534	31.60%	0.085	0.67	1.31	0.68
Restaurant	Heat_Pump	Existing	Heat Pump - Water Source (Closed Loop), WSHP: COP=4.8, EER=14.5		per Ton	20	$434.94	$0.98	444	32.3%	0.071	0.70	1.42	0.75
Restaurant	Heat_Pump	New	Heat Pump - Water Source (Closed Loop), WSHP: COP=4.8, EER=14.5		per Ton	20	$574.44	$1.04	551	32.3%	0.088	0.68	1.34	0.70
Retail	Heat_Pump	Existing	Heat Pump - Water Source (Closed Loop), WSHP: COP=4.8, EER=14.5		per Ton	20	$434.94	$0.91	478	32.8%	0.076	0.72	1.52	0.80

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Retail	Heat_Pump	New	Heat Pump - Water Source (Closed Loop), WSHP: COP=4.8, EER=14.5		per Ton	20	$574.45	$0.97	593	32.8%	0.094	0.71	1.44	0.75
Office	Heat_Pump	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$0.05	4	8.25%	0.001	1.02	6.13	4.54
Restaurant	Heat_Pump	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$0.04	6	8.3%	0.001	1.04	6.88	5.41
Retail	Heat_Pump	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$0.03	7	8.3%	0.001	1.04	7.14	5.74
Office	Heat_Pump	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$3.96	0	2.25%	0.000	0.33	0.43	0.22
Restaurant	Heat_Pump	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$1.89	0	3.0%	0.000	0.55	0.87	0.45
Retail	Heat_Pump	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$2.38	0	3.0%	0.000	0.47	0.70	0.36
Office	Heat_Pump	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$6.17	0	0.75%	0.000	0.23	0.28	0.14
Office	Heat_Pump	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$6.23	0	0.75%	0.000	0.23	0.27	0.14
Restaurant	Heat_Pump	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$2.94	0	1.0%	0.000	0.41	0.57	0.29
Restaurant	Heat_Pump	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$2.97	0	1.0%	0.000	0.41	0.57	0.29
Retail	Heat_Pump	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$3.71	0	1.0%	0.000	0.35	0.46	0.23
Retail	Heat_Pump	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$3.74	0	1.0%	0.000	0.35	0.45	0.23
Office	Heat_Pump	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$2.57	0	1.80%	0.000	0.45	0.65	0.33
Office	Heat_Pump	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$2.44	0	4.50%	0.000	0.47	0.69	0.35
Restaurant	Heat_Pump	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$1.23	0	2.4%	0.000	0.69	1.31	0.68
Restaurant	Heat_Pump	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$1.16	1	6.0%	0.000	0.71	1.38	0.72
Retail	Heat_Pump	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$1.55	0	2.4%	0.000	0.61	1.06	0.54
Retail	Heat_Pump	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$1.47	0	6.0%	0.000	0.63	1.11	0.57
Office	Heat_Pump	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$5.60	0	1.50%	0.000	0.25	0.31	0.15
Office	Heat_Pump	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$5.65	0	1.50%	0.000	0.25	0.30	0.15
Restaurant	Heat_Pump	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$2.67	0	2.0%	0.000	0.44	0.63	0.32
Restaurant	Heat_Pump	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$2.69	0	2.0%	0.000	0.44	0.62	0.32
Retail	Heat_Pump	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$3.37	0	2.0%	0.000	0.37	0.50	0.25

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Retail	Heat_Pump	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$3.39	0	2.0%	0.000	0.37	0.50	0.25
Office	Heat_Pump	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$0.78	3	3.00%	0.000	0.84	1.98	1.049
Restaurant	Heat_Pump	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$0.37	6	3.0%	0.001	1.04	3.73	2.09
Retail	Heat_Pump	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$0.46	4	3.0%	0.001	0.99	3.09	1.70
Office	Heat_Pump	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$0.85	4	4.40%	0.001	0.81	1.83	0.966
Office	Heat_Pump	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$0.90	$0.32	3	3.30%	0.000	1.08	4.15	2.35
Restaurant	Heat_Pump	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$0.40	8	4.4%	0.001	1.02	3.48	1.93
Restaurant	Heat_Pump	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$0.90	$0.15	6	3.3%	0.001	1.20	6.95	4.34
Retail	Heat_Pump	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$0.50	6	4.4%	0.001	0.96	2.88	1.57
Retail	Heat_Pump	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$0.90	$0.19	5	3.3%	0.001	1.17	6.01	3.63
Office	Heat_Pump	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.31	2	19.75%	0.000	1.08	4.29	2.44
Office	Heat_Pump	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.60	1	10.00%	0.000	0.91	2.47	1.33
Restaurant	Heat_Pump	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.24	3	19.8%	0.000	1.13	5.06	2.96
Restaurant	Heat_Pump	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.48	1	10.0%	0.000	0.98	2.99	1.64
Retail	Heat_Pump	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.22	3	19.8%	0.000	1.14	5.36	3.17
Retail	Heat_Pump	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.44	1	10.0%	0.000	1.00	3.20	1.76
Office	Heat_Pump	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.05	6	7.50%	0.001	1.29	11.86	8.99
Restaurant	Heat_Pump	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.02	14	7.5%	0.002	1.32	14.26	12.08
Retail	Heat_Pump	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.03	11	7.5%	0.002	1.31	13.62	11.19
Office	Heat_Pump	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$138.81	$0.08	1675	3.00%	0.266	1.10	6.98	4.80
Restaurant	Heat_Pump	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$138.60	$0.13	1059	3.0%	0.168	1.06	5.53	3.53
Retail	Heat_Pump	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$138.56	$0.06	2345	3.0%	0.373	1.13	8.02	5.85
Office	Heat_Pump	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$8.72	2	4.06%	0.000	0.21	0.24	0.12

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Office	Heat_Pump	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$11.70	2	3.56%	0.000	0.16	0.18	0.09
Restaurant	Heat_Pump	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$6.63	3	3.7%	0.000	0.26	0.32	0.16
Restaurant	Heat_Pump	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$6.68	3	3.7%	0.000	0.26	0.31	0.16
Retail	Heat_Pump	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$6.10	3	3.5%	0.000	0.28	0.34	0.17
Retail	Heat_Pump	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$6.14	3	3.5%	0.000	0.28	0.34	0.17
Office	Heat_Pump	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$16.71	3	5.63%	0.000	0.12	0.13	0.06
Restaurant	Heat_Pump	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$12.69	4	5.1%	0.001	0.15	0.17	0.08
Retail	Heat_Pump	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$11.67	4	4.8%	0.001	0.16	0.18	0.09
Education	Heating	Existing	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$750.00	$0.72	1047	10.0%	0.012	0.59	1.11	0.59
Education	Heating	New	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$399.90	$0.38	1047	10.0%	0.012	0.75	1.87	1.046
Healthcare	Heating	Existing	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$750.00	$0.43	1762	10.00%	0.020	0.73	1.72	0.950
Healthcare	Heating	New	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$399.90	$0.23	1762	10.00%	0.020	0.87	2.76	1.63
Lodging	Heating	Existing	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$750.00	$1.60	469	2.0%	0.005	0.37	0.53	0.27
Lodging	Heating	New	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$399.90	$0.85	469	2.0%	0.005	0.54	0.95	0.50
Miscellaneous	Heating	Existing	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$750.00	$0.49	1523	10.0%	0.018	0.69	1.52	0.83
Miscellaneous	Heating	New	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$399.90	$0.26	1523	10.0%	0.018	0.84	2.49	1.44
Office	Heating	Existing	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$750.00	$0.37	2023	10.00%	0.023	0.76	1.92	1.07

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Office	Heating	New	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$399.90	$0.20	2023	10.00%	0.023	0.89	3.03	1.82
Education	Heating	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$1.67	0	12.5%	0.000	0.11	0.13	0.07
Grocery	Heating	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$0.61	1	12.5%	0.000	0.24	0.32	0.17
Healthcare	Heating	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$0.99	1	12.50%	0.000	0.17	0.20	0.11
Lodging	Heating	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$0.75	1	12.5%	0.000	0.21	0.26	0.14
Miscellaneous	Heating	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$1.15	1	12.5%	0.000	0.15	0.18	0.09
Office	Heating	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$0.87	1	12.50%	0.000	0.19	0.23	0.12
Restaurant	Heating	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$0.63	1	12.5%	0.000	0.24	0.31	0.16
Retail	Heating	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$0.69	1	12.5%	0.000	0.22	0.28	0.15
Warehouse	Heating	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$0.67	1	12.5%	0.000	0.23	0.29	0.16
Education	Heating	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$0.45	0	12.5%	0.000	0.29	0.41	0.22
Grocery	Heating	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$0.16	1	12.5%	0.000	0.46	0.85	0.52
Healthcare	Heating	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$0.27	1	12.50%	0.000	0.38	0.61	0.35
Lodging	Heating	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$0.20	1	12.5%	0.000	0.43	0.74	0.45
Miscellaneous	Heating	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$0.31	1	12.5%	0.000	0.36	0.55	0.31
Office	Heating	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$0.23	1	12.50%	0.000	0.40	0.67	0.39
Restaurant	Heating	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$0.17	1	12.5%	0.000	0.46	0.83	0.51

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Retail	Heating	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$0.19	1	12.5%	0.000	0.44	0.78	0.48
Warehouse	Heating	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$0.18	1	12.5%	0.000	0.45	0.80	0.48
Education	Heating	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$0.60	524	15.0%	0.006	0.35	0.52	0.28
Grocery	Heating	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$0.22	1435	15.0%	0.017	0.55	1.14	0.68
Healthcare	Heating	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$0.35	881	15.00%	0.010	0.46	0.80	0.45
Lodging	Heating	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$0.27	1174	15.0%	0.014	0.51	0.99	0.57
Miscellaneous	Heating	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$0.41	761	15.0%	0.009	0.43	0.71	0.39
Office	Heating	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$0.31	1012	15.00%	0.012	0.48	0.89	0.51
Restaurant	Heating	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$0.23	1388	15.0%	0.016	0.55	1.12	0.66
Retail	Heating	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$0.25	1273	15.0%	0.015	0.53	1.05	0.61
Warehouse	Heating	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$0.24	1304	15.0%	0.015	0.53	1.07	0.63
Education	Heating	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.50	349	10.0%	0.004	0.39	0.60	0.33
Education	Heating	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.50	349	10.0%	0.004	0.39	0.60	0.33
Grocery	Heating	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.18	956	10.0%	0.011	0.58	1.28	0.78
Grocery	Heating	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.18	956	10.0%	0.011	0.58	1.28	0.78
Healthcare	Heating	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.30	587	10.00%	0.007	0.49	0.91	0.52
Healthcare	Heating	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.30	587	10.00%	0.007	0.49	0.91	0.52

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Lodging	Heating	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.22	782	10.0%	0.009	0.55	1.12	0.66
Lodging	Heating	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.22	782	10.0%	0.009	0.55	1.12	0.66
Miscellaneous	Heating	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.34	508	10.0%	0.006	0.46	0.82	0.46
Miscellaneous	Heating	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.34	508	10.0%	0.006	0.46	0.82	0.46
Office	Heating	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.26	674	10.00%	0.008	0.52	1.01	0.59
Office	Heating	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.26	674	10.00%	0.008	0.52	1.01	0.59
Restaurant	Heating	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.19	925	10.0%	0.011	0.58	1.25	0.76
Restaurant	Heating	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.19	925	10.0%	0.011	0.58	1.25	0.76
Retail	Heating	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.21	849	10.0%	0.010	0.56	1.18	0.71
Retail	Heating	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.21	849	10.0%	0.010	0.56	1.18	0.71
Warehouse	Heating	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.20	870	10.0%	0.010	0.57	1.20	0.72
Warehouse	Heating	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.20	870	10.0%	0.010	0.57	1.20	0.72
Education	Heating	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$0.24	524	15.0%	0.006	0.53	1.06	0.62
Grocery	Heating	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$0.09	1435	15.0%	0.017	0.69	1.93	1.31
Healthcare	Heating	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$0.14	881	15.00%	0.010	0.62	1.49	0.94
Lodging	Heating	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$0.11	1174	15.0%	0.014	0.66	1.75	1.15

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Miscellaneous	Heating	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$0.17	761	15.0%	0.009	0.60	1.36	0.84
Office	Heating	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$0.12	1012	15.00%	0.012	0.64	1.61	1.037
Restaurant	Heating	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$0.09	1388	15.0%	0.016	0.68	1.90	1.29
Retail	Heating	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$0.10	1273	15.0%	0.015	0.67	1.82	1.22
Warehouse	Heating	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$0.10	1304	15.0%	0.015	0.68	1.84	1.24
Education	Heating	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$2.75	0	2.5%	0.000	0.28	0.36	0.18
Education	Heating	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$2.75	0	2.5%	0.000	0.28	0.36	0.18
Grocery	Heating	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$1.00	0	2.5%	0.000	0.54	0.93	0.49
Grocery	Heating	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$1.00	0	2.5%	0.000	0.54	0.93	0.49
Healthcare	Heating	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$1.63	0	2.50%	0.000	0.41	0.59	0.30
Healthcare	Heating	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$1.63	0	2.50%	0.000	0.41	0.59	0.30
Lodging	Heating	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$1.23	0	2.5%	0.000	0.49	0.77	0.40
Lodging	Heating	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$1.23	0	2.5%	0.000	0.49	0.77	0.40
Miscellaneous	Heating	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$1.89	0	2.5%	0.000	0.37	0.51	0.26
Miscellaneous	Heating	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$1.89	0	2.5%	0.000	0.37	0.51	0.26
Office	Heating	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$1.42	0	2.50%	0.000	0.44	0.67	0.35

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Office	Heating	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$1.42	0	2.50%	0.000	0.44	0.67	0.35
Restaurant	Heating	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$1.04	0	2.5%	0.000	0.53	0.90	0.47
Restaurant	Heating	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$1.04	0	2.5%	0.000	0.53	0.90	0.47
Retail	Heating	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$1.13	0	2.5%	0.000	0.51	0.83	0.43
Retail	Heating	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$1.13	0	2.5%	0.000	0.51	0.83	0.43
Warehouse	Heating	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$1.10	0	2.5%	0.000	0.52	0.85	0.44
Warehouse	Heating	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$1.10	0	2.5%	0.000	0.52	0.85	0.44
Education	Heating	Existing	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$0.91	$1.73	1	15.0%	0.000	0.28	0.36	0.19
Education	Heating	New	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$0.91	$1.73	1	15.0%	0.000	0.28	0.36	0.19
Grocery	Heating	Existing	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$1.72	$1.20	1	15.0%	0.000	0.36	0.51	0.27
Grocery	Heating	New	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$1.72	$1.20	1	15.0%	0.000	0.36	0.51	0.27
Healthcare	Heating	Existing	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$0.91	$1.03	1	15.00%	0.000	0.39	0.59	0.31
Healthcare	Heating	New	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$0.91	$1.03	1	15.00%	0.000	0.39	0.59	0.31
Lodging	Heating	Existing	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$0.91	$0.77	1	15.0%	0.000	0.46	0.76	0.40
Lodging	Heating	New	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$0.91	$0.77	1	15.0%	0.000	0.46	0.76	0.40
Miscellaneous	Heating	Existing	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$1.72	$2.26	1	15.0%	0.000	0.23	0.28	0.14
Miscellaneous	Heating	New	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$1.72	$2.26	1	15.0%	0.000	0.23	0.28	0.14

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Office	Heating	Existing	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$1.31	$1.30	1	15.00%	0.000	0.34	0.47	0.25
Office	Heating	New	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$1.31	$1.30	1	15.00%	0.000	0.34	0.47	0.25
Restaurant	Heating	Existing	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$1.72	$1.24	1	15.0%	0.000	0.35	0.49	0.26
Restaurant	Heating	New	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$1.72	$1.24	1	15.0%	0.000	0.35	0.49	0.26
Retail	Heating	Existing	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$0.91	$0.71	1	15.0%	0.000	0.48	0.82	0.43
Retail	Heating	New	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$0.91	$0.71	1	15.0%	0.000	0.48	0.82	0.43
Warehouse	Heating	Existing	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$0.91	$0.70	1	15.0%	0.000	0.49	0.83	0.44
Warehouse	Heating	New	Exhaust Air to Ventilation Air Heat Recovery, Exhaust Air Heat Recovery		per Building Sq Ft	10	$0.91	$0.70	1	15.0%	0.000	0.49	0.83	0.44
Education	Heating	Existing	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,450.29	$1.01	5399	4.5%	0.063	0.40	0.60	0.31
Education	Heating	New	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,450.29	$1.01	5399	4.5%	0.063	0.40	0.60	0.31
Grocery	Heating	Existing	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,449.72	$1.56	3496	4.5%	0.040	0.30	0.40	0.21
Grocery	Heating	New	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,449.72	$1.56	3496	4.5%	0.040	0.30	0.40	0.21
Healthcare	Heating	Existing	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,452.00	$0.08	69230	4.50%	0.802	0.89	3.71	2.57
Healthcare	Heating	New	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,452.00	$0.08	69230	4.50%	0.802	0.89	3.71	2.57
Lodging	Heating	Existing	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,449.66	$0.55	9902	4.5%	0.115	0.54	1.02	0.55
Lodging	Heating	New	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,449.66	$0.55	9902	4.5%	0.115	0.54	1.02	0.55
Restaurant	Heating	Existing	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,450.06	$3.40	1603	4.5%	0.019	0.16	0.19	0.10

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Restaurant	Heating	New	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,450.06	$3.40	1603	4.5%	0.019	0.16	0.19	0.10
Retail	Heating	Existing	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,449.98	$1.33	4102	4.5%	0.048	0.33	0.46	0.24
Retail	Heating	New	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,449.98	$1.33	4102	4.5%	0.048	0.33	0.46	0.24
Lodging	Heating	Existing	Hotel Key Card Room Energy Control System, Key card system to control room HVAC and lighting during non-occupied periods		per room	15	$200.00	$0.26	782	25.0%	0.009	0.84	2.54	1.48
Lodging	Heating	New	Hotel Key Card Room Energy Control System, Key card system to control room HVAC and lighting during non-occupied periods		per room	15	$200.00	$0.26	782	25.0%	0.009	0.84	2.54	1.48
Education	Heating	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$0.05	5	10.0%	0.000	0.92	4.36	3.25
Grocery	Heating	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$0.01	16	10.0%	0.000	0.97	5.80	5.15
Healthcare	Heating	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$0.03	9	10.00%	0.000	0.96	5.23	4.32
Lodging	Heating	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$0.05	5	10.0%	0.000	0.93	4.51	3.42
Miscellaneous	Heating	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$0.02	12	10.0%	0.000	0.97	5.57	4.81
Office	Heating	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$0.03	8	10.00%	0.000	0.95	5.10	4.14
Restaurant	Heating	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$0.03	8	10.0%	0.000	0.95	5.08	4.12
Retail	Heating	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$0.02	10	10.0%	0.000	0.96	5.40	4.55
Warehouse	Heating	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$0.06	4	1.0%	0.000	0.92	4.27	3.15
Education	Heating	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$4.96	0	3.0%	0.000	0.21	0.25	0.12
Grocery	Heating	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$1.81	0	3.0%	0.000	0.45	0.65	0.33
Healthcare	Heating	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$1.52	0	1.80%	0.000	0.50	0.77	0.39
Lodging	Heating	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$2.22	0	1.5%	0.000	0.39	0.54	0.27

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Miscellaneous	Heating	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$3.41	0	3.0%	0.000	0.28	0.35	0.18
Office	Heating	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$2.14	0	2.25%	0.000	0.40	0.55	0.28
Restaurant	Heating	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$1.87	0	3.0%	0.000	0.44	0.63	0.32
Retail	Heating	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$2.04	0	3.0%	0.000	0.41	0.58	0.30
Warehouse	Heating	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$1.99	0	3.0%	0.000	0.42	0.59	0.30
Education	Heating	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$7.73	0	1.0%	0.000	0.14	0.16	0.08
Education	Heating	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$7.73	0	1.0%	0.000	0.14	0.16	0.08
Grocery	Heating	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$2.82	0	1.0%	0.000	0.33	0.43	0.22
Grocery	Heating	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$2.82	0	1.0%	0.000	0.33	0.43	0.22
Healthcare	Heating	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$2.37	0	0.60%	0.000	0.37	0.50	0.26
Healthcare	Heating	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$2.37	0	0.60%	0.000	0.37	0.50	0.26
Lodging	Heating	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$3.45	0	0.5%	0.000	0.28	0.35	0.18
Lodging	Heating	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$3.45	0	0.5%	0.000	0.28	0.35	0.18
Miscellaneous	Heating	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$5.32	0	1.0%	0.000	0.20	0.23	0.12
Miscellaneous	Heating	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$5.32	0	1.0%	0.000	0.20	0.23	0.12
Office	Heating	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$3.34	0	0.75%	0.000	0.29	0.36	0.18
Office	Heating	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$3.34	0	0.75%	0.000	0.29	0.36	0.18
Restaurant	Heating	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$2.92	0	1.0%	0.000	0.32	0.41	0.21
Restaurant	Heating	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$2.92	0	1.0%	0.000	0.32	0.41	0.21
Retail	Heating	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$3.18	0	1.0%	0.000	0.30	0.38	0.19
Retail	Heating	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$3.18	0	1.0%	0.000	0.30	0.38	0.19
Warehouse	Heating	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$3.10	0	1.0%	0.000	0.30	0.39	0.20
Warehouse	Heating	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$3.10	0	1.0%	0.000	0.30	0.39	0.20
Education	Heating	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$3.22	0	2.4%	0.000	0.30	0.37	0.19

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Education	Heating	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$3.06	0	6.0%	0.000	0.31	0.39	0.20
Grocery	Heating	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$1.18	0	2.4%	0.000	0.58	0.97	0.51
Grocery	Heating	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$1.12	1	6.0%	0.000	0.59	1.02	0.53
Healthcare	Heating	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$0.99	0	1.44%	0.000	0.63	1.14	0.60
Healthcare	Heating	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$0.94	1	3.60%	0.000	0.65	1.20	0.63
Lodging	Heating	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$1.44	0	1.2%	0.000	0.51	0.81	0.42
Lodging	Heating	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$1.36	0	3.0%	0.000	0.53	0.85	0.44
Miscellaneous	Heating	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$2.22	0	2.4%	0.000	0.39	0.54	0.27
Miscellaneous	Heating	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$2.10	0	6.0%	0.000	0.40	0.56	0.29
Office	Heating	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$1.39	0	1.80%	0.000	0.52	0.83	0.43
Office	Heating	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$1.32	0	4.50%	0.000	0.54	0.88	0.45
Restaurant	Heating	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$1.22	0	2.4%	0.000	0.57	0.94	0.49
Restaurant	Heating	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$1.15	1	6.0%	0.000	0.58	0.99	0.52
Retail	Heating	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$1.33	0	2.4%	0.000	0.54	0.87	0.45
Retail	Heating	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$1.26	1	6.0%	0.000	0.56	0.92	0.48
Warehouse	Heating	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$1.29	0	2.4%	0.000	0.55	0.89	0.46
Warehouse	Heating	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$1.23	1	6.0%	0.000	0.56	0.94	0.49
Education	Heating	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$7.02	0	2.0%	0.000	0.16	0.17	0.09
Education	Heating	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$7.02	0	2.0%	0.000	0.16	0.17	0.09
Grocery	Heating	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$2.56	0	2.0%	0.000	0.35	0.47	0.24
Grocery	Heating	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$2.56	0	2.0%	0.000	0.35	0.47	0.24
Healthcare	Heating	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$2.15	0	1.20%	0.000	0.40	0.55	0.28
Healthcare	Heating	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$2.15	0	1.20%	0.000	0.40	0.55	0.28
Lodging	Heating	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$3.13	0	1.0%	0.000	0.30	0.38	0.20
Lodging	Heating	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$3.13	0	1.0%	0.000	0.30	0.38	0.20

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Miscellaneous	Heating	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$4.83	0	2.0%	0.000	0.21	0.25	0.13
Miscellaneous	Heating	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$4.83	0	2.0%	0.000	0.21	0.25	0.13
Office	Heating	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$3.03	0	1.50%	0.000	0.31	0.40	0.20
Office	Heating	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$3.03	0	1.50%	0.000	0.31	0.40	0.20
Restaurant	Heating	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$2.65	0	2.0%	0.000	0.34	0.45	0.23
Restaurant	Heating	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$2.65	0	2.0%	0.000	0.34	0.45	0.23
Retail	Heating	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$2.89	0	2.0%	0.000	0.32	0.42	0.21
Retail	Heating	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$2.89	0	2.0%	0.000	0.32	0.42	0.21
Warehouse	Heating	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$2.82	0	2.0%	0.000	0.33	0.43	0.22
Warehouse	Heating	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$2.82	0	2.0%	0.000	0.33	0.43	0.22
Education	Heating	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$0.96	2	3.0%	0.000	0.64	1.17	0.61
Grocery	Heating	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$0.35	6	3.0%	0.000	0.93	2.75	1.55
Healthcare	Heating	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$0.57	4	3.00%	0.000	0.80	1.85	0.998
Lodging	Heating	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$0.43	5	3.0%	0.000	0.88	2.35	1.29
Miscellaneous	Heating	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$0.66	3	3.0%	0.000	0.76	1.63	0.87
Office	Heating	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$0.50	4	3.00%	0.000	0.84	2.08	1.13
Restaurant	Heating	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$0.36	6	3.0%	0.000	0.93	2.68	1.50
Retail	Heating	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$0.40	5	3.0%	0.000	0.90	2.50	1.39
Warehouse	Heating	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$0.39	5	3.0%	0.000	0.91	2.55	1.42
Education	Heating	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$1.05	3	4.4%	0.000	0.61	1.08	0.56
Education	Heating	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$0.90	$0.39	2	3.3%	0.000	0.91	2.53	1.41
Grocery	Heating	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$0.38	8	4.4%	0.000	0.91	2.57	1.43
Grocery	Heating	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$0.90	$0.14	6	3.3%	0.000	1.11	5.12	3.22
Healthcare	Heating	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$0.62	5	4.40%	0.000	0.77	1.71	0.92

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Healthcare	Heating	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$0.90	$0.23	4	3.30%	0.000	1.02	3.73	2.20
Lodging	Heating	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$0.47	7	4.4%	0.000	0.86	2.18	1.20
Lodging	Heating	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$0.90	$0.17	5	3.3%	0.000	1.08	4.52	2.77
Miscellaneous	Heating	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$0.72	4	4.4%	0.000	0.73	1.51	0.80
Miscellaneous	Heating	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$0.90	$0.27	3	3.3%	0.000	0.99	3.36	1.95
Office	Heating	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$0.54	6	4.40%	0.000	0.82	1.93	1.045
Office	Heating	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$0.90	$0.20	4	3.30%	0.000	1.05	4.11	2.46
Restaurant	Heating	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$0.40	8	4.4%	0.000	0.90	2.50	1.39
Restaurant	Heating	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$0.90	$0.15	6	3.3%	0.000	1.10	5.02	3.14
Retail	Heating	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$0.43	7	4.4%	0.000	0.88	2.33	1.29
Retail	Heating	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$0.90	$0.16	6	3.3%	0.000	1.09	4.76	2.94
Warehouse	Heating	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$0.42	8	4.4%	0.000	0.89	2.38	1.32
Warehouse	Heating	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$0.90	$0.16	6	3.3%	0.000	1.09	4.83	3.00
Education	Heating	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.15	4	25.0%	0.000	1.10	4.99	3.12
Education	Heating	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.30	2	12.5%	0.000	0.97	3.12	1.79
Grocery	Heating	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.12	5	25.0%	0.000	1.13	5.59	3.61
Grocery	Heating	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.24	2	12.5%	0.000	1.02	3.61	2.11
Healthcare	Heating	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.17	4	25.00%	0.000	1.08	4.59	2.81
Healthcare	Heating	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.34	2	12.50%	0.000	0.94	2.81	1.58
Lodging	Heating	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.18	3	25.0%	0.000	1.07	4.50	2.75
Lodging	Heating	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.35	2	12.5%	0.000	0.93	2.75	1.54
Miscellaneous	Heating	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.19	3	25.0%	0.000	1.06	4.24	2.56
Miscellaneous	Heating	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.39	2	12.5%	0.000	0.91	2.56	1.42
Office	Heating	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.17	4	25.00%	0.000	1.08	4.55	2.78

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Office	Heating	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.35	2	12.50%	0.000	0.94	2.78	1.57
Restaurant	Heating	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.19	3	25.0%	0.000	1.06	4.27	2.58
Restaurant	Heating	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.38	2	12.5%	0.000	0.91	2.58	1.44
Retail	Heating	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.15	4	25.0%	0.000	1.10	4.93	3.08
Retail	Heating	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.30	2	12.5%	0.000	0.97	3.08	1.76
Warehouse	Heating	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.12	5	25.0%	0.000	1.13	5.75	3.74
Warehouse	Heating	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$0.23	3	12.5%	0.000	1.03	3.74	2.20
Education	Heating	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.06	5	7.5%	0.000	1.20	7.90	5.79
Grocery	Heating	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.02	14	7.5%	0.000	1.24	10.28	8.76
Healthcare	Heating	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.03	9	7.50%	0.000	1.23	9.27	7.39
Lodging	Heating	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.03	12	7.5%	0.000	1.24	9.90	8.22
Miscellaneous	Heating	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.04	8	7.5%	0.000	1.22	8.91	6.95
Office	Heating	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.03	10	7.50%	0.000	1.23	9.58	7.80
Restaurant	Heating	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.02	14	7.5%	0.000	1.24	10.22	8.68
Retail	Heating	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.02	13	7.5%	0.000	1.24	10.06	8.44
Warehouse	Heating	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.02	13	7.5%	0.000	1.24	10.10	8.51
Education	Heating	Existing	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$2.11	$2.42	1	25.0%	0.000	0.21	0.26	0.13
Education	Heating	New	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$2.11	$2.42	1	25.0%	0.000	0.21	0.26	0.13

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Grocery	Heating	Existing	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$2.11	$0.88	2	25.0%	0.000	0.43	0.67	0.36
Grocery	Heating	New	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$2.11	$0.88	2	25.0%	0.000	0.43	0.67	0.36
Healthcare	Heating	Existing	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$2.11	$1.93	1	25.00%	0.000	0.26	0.33	0.17
Healthcare	Heating	New	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$3.36	$0.01	471	12.89%	0.005	0.98	6.18	5.80
Lodging	Heating	Existing	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$2.11	$1.08	2	25.0%	0.000	0.38	0.56	0.29
Lodging	Heating	New	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$2.11	$1.08	2	25.0%	0.000	0.38	0.56	0.29
Miscellaneous	Heating	Existing	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$2.11	$1.66	1	25.0%	0.000	0.28	0.38	0.19
Miscellaneous	Heating	New	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$2.11	$1.66	1	25.0%	0.000	0.28	0.38	0.19
Office	Heating	Existing	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$2.11	$1.25	2	25.00%	0.000	0.35	0.49	0.25
Office	Heating	New	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$2.11	$1.25	2	25.00%	0.000	0.35	0.49	0.25
Restaurant	Heating	Existing	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$2.11	$0.91	2	25.0%	0.000	0.42	0.65	0.34
Restaurant	Heating	New	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$2.11	$0.91	2	25.0%	0.000	0.42	0.65	0.34
Retail	Heating	Existing	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$2.11	$0.99	2	25.0%	0.000	0.40	0.61	0.32

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Retail	Heating	New	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$2.11	$0.99	2	25.0%	0.000	0.40	0.61	0.32
Warehouse	Heating	Existing	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$2.11	$0.97	2	25.0%	0.000	0.40	0.62	0.32
Warehouse	Heating	New	Sensible And Total Heat Recovery Devices, Install Heat Recovery Devices - rotary air-to-air enthalpy heat recovery- 50% sensible and latent recovery effectiveness		per Building Sq Ft	10	$2.11	$0.97	2	25.0%	0.000	0.40	0.62	0.32
Education	Heating	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$137.46	$0.04	3599	3.0%	0.042	1.06	6.54	5.12
Grocery	Heating	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$138.90	$0.06	2331	3.0%	0.027	1.03	5.66	4.12
Healthcare	Heating	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$137.39	$0.02	5508	3.00%	0.064	1.08	7.23	6.03
Lodging	Heating	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$139.19	$0.04	3301	3.0%	0.038	1.05	6.35	4.90
Miscellaneous	Heating	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$138.69	$0.09	1519	3.0%	0.018	1.00	4.72	3.20
Office	Heating	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$138.81	$0.04	3855	3.00%	0.045	1.06	6.64	5.25
Restaurant	Heating	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$138.60	$0.13	1069	3.0%	0.012	0.96	3.93	2.51
Retail	Heating	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$138.56	$0.05	2735	3.0%	0.032	1.04	6.00	4.49
Warehouse	Heating	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$138.65	$0.03	4358	3.0%	0.050	1.07	6.85	5.52
Education	Heating	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$5.12	4	8.1%	0.000	0.25	0.29	0.15
Education	Heating	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$5.12	4	8.1%	0.000	0.25	0.29	0.15
Grocery	Heating	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$4.20	4	2.7%	0.000	0.29	0.36	0.18
Grocery	Heating	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$4.20	4	2.7%	0.000	0.29	0.36	0.18
Healthcare	Heating	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$5.86	3	3.64%	0.000	0.22	0.26	0.13
Healthcare	Heating	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$5.29	4	4.57%	0.000	0.24	0.28	0.14

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Lodging	Heating	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$6.07	3	6.2%	0.000	0.21	0.25	0.12
Lodging	Heating	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$6.07	3	6.2%	0.000	0.21	0.25	0.12
Miscellaneous	Heating	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$6.64	3	2.3%	0.000	0.20	0.23	0.11
Miscellaneous	Heating	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$6.64	3	2.3%	0.000	0.20	0.23	0.11
Office	Heating	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$5.90	3	4.06%	0.000	0.22	0.25	0.13
Office	Heating	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$7.42	3	3.56%	0.000	0.18	0.20	0.10
Restaurant	Heating	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$6.57	3	3.7%	0.000	0.20	0.23	0.12
Restaurant	Heating	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$6.57	3	3.7%	0.000	0.20	0.23	0.12
Retail	Heating	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$5.23	4	3.5%	0.000	0.24	0.29	0.14
Retail	Heating	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$5.23	4	3.5%	0.000	0.24	0.29	0.14
Warehouse	Heating	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$4.00	5	1.1%	0.000	0.30	0.37	0.19
Warehouse	Heating	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$4.00	5	1.1%	0.000	0.30	0.37	0.19
Education	Heating	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$9.81	5	11.2%	0.000	0.14	0.15	0.08
Grocery	Heating	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$8.05	6	3.8%	0.000	0.17	0.19	0.09
Healthcare	Heating	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$11.22	4	5.04%	0.000	0.12	0.13	0.07
Lodging	Heating	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$11.62	4	8.5%	0.000	0.12	0.13	0.07
Miscellaneous	Heating	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$12.72	4	3.1%	0.000	0.11	0.12	0.06
Office	Heating	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$11.30	4	5.63%	0.000	0.12	0.13	0.07
Restaurant	Heating	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$12.58	4	5.1%	0.000	0.11	0.12	0.06
Retail	Heating	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$10.01	5	4.8%	0.000	0.14	0.15	0.08
Warehouse	Heating	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$7.66	6	1.5%	0.000	0.17	0.20	0.10
Education	HID	Early	4′ T5 HO fixture - 54 W - 4 lamp	Replace HID Fixture drawing 250 W	Fixture	10	$235.00	$0.89	263	36%	0.035	0.52	0.90	0.47
Education	HID	Turnover	4′ T5 HO fixture - 54 W - 4 lamp	Replace HID Fixture drawing 250 W	Fixture	10	$145.00	$0.55	263	36%	0.035	0.64	1.37	0.74
Grocery	HID	Early	4′ T5 HO fixture - 54 W - 4 lamp	Replace HID Fixture drawing 250 W	Fixture	10	$235.00	$0.31	761	36%	0.100	0.78	2.18	1.24

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Grocery	HID	Turnover	4′ T5 HO fixture - 54 W - 4 lamp	Replace HID Fixture drawing 250 W	Fixture	10	$145.00	$0.19	761	36%	0.100	0.87	3.06	1.85
Healthcare	HID	Early	4′ T5 HO fixture - 54 W - 4 lamp	Replace HID Fixture drawing 250 W	Fixture	10	$235.00	$0.47	503	36%	0.066	0.68	1.57	0.86
Healthcare	HID	Turnover	4′ T5 HO fixture - 54 W - 4 lamp	Replace HID Fixture drawing 250 W	Fixture	10	$145.00	$0.29	503	36%	0.066	0.79	2.29	1.32
Lodging	HID	Early	4′ T5 HO fixture - 54 W - 4 lamp	Replace HID Fixture drawing 250 W	Fixture	10	$235.00	$0.67	351	36%	0.046	0.59	1.16	0.62
Lodging	HID	Turnover	4′ T5 HO fixture - 54 W - 4 lamp	Replace HID Fixture drawing 250 W	Fixture	10	$145.00	$0.41	351	36%	0.046	0.71	1.73	0.961
Misc	HID	Early	4′ T5 HO fixture - 54 W - 4 lamp	Replace HID Fixture drawing 250 W	Fixture	10	$235.00	$0.60	389	36%	0.051	0.62	1.26	0.68
Misc	HID	Turnover	4′ T5 HO fixture - 54 W - 4 lamp	Replace HID Fixture drawing 250 W	Fixture	10	$145.00	$0.37	389	36%	0.051	0.74	1.88	1.053
Office	HID	Early	4′ T5 HO fixture - 54 W - 4 lamp	Replace HID Fixture drawing 250 W	Fixture	10	$235.00	$0.65	363	36%	0.048	0.60	1.19	0.64
Office	HID	Turnover	4′ T5 HO fixture - 54 W - 4 lamp	Replace HID Fixture drawing 250 W	Fixture	10	$145.00	$0.40	363	36%	0.048	0.72	1.78	0.989
Restaurant	HID	Early	4′ T5 HO fixture - 54 W - 4 lamp	Replace HID Fixture drawing 250 W	Fixture	10	$235.00	$0.42	562	36%	0.074	0.71	1.72	0.950
Restaurant	HID	Turnover	4′ T5 HO fixture - 54 W - 4 lamp	Replace HID Fixture drawing 250 W	Fixture	10	$145.00	$0.26	562	36%	0.074	0.82	2.48	1.44
Retail	HID	Early	4′ T5 HO fixture - 54 W - 4 lamp	Replace HID Fixture drawing 250 W	Fixture	10	$235.00	$0.44	529	36%	0.070	0.70	1.63	0.90
Retail	HID	Turnover	4′ T5 HO fixture - 54 W - 4 lamp	Replace HID Fixture drawing 250 W	Fixture	10	$145.00	$0.27	529	36%	0.070	0.80	2.38	1.37
Warehouse	HID	Early	4′ T5 HO fixture - 54 W - 4 lamp	Replace HID Fixture drawing 250 W	Fixture	10	$235.00	$0.67	351	36%	0.046	0.59	1.16	0.62
Warehouse	HID	Turnover	4′ T5 HO fixture - 54 W - 4 lamp	Replace HID Fixture drawing 250 W	Fixture	10	$145.00	$0.41	351	36%	0.046	0.71	1.73	0.961
Education	HID	Early	4′ T5 HO fixture - 54 W - 6 lamp	Replace HID Fixture drawing 400 W	Fixture	10	$325.00	$0.88	369	34%	0.049	0.52	0.91	0.48
Education	HID	Turnover	4′ T5 HO fixture - 54 W - 6 lamp	Replace HID Fixture drawing 400 W	Fixture	10	$260.00	$0.70	369	34%	0.049	0.58	1.11	0.59
Grocery	HID	Early	4′ T5 HO fixture - 54 W - 6 lamp	Replace HID Fixture drawing 400 W	Fixture	10	$325.00	$0.30	1,066	34%	0.141	0.78	2.20	1.25
Grocery	HID	Turnover	4′ T5 HO fixture - 54 W - 6 lamp	Replace HID Fixture drawing 400 W	Fixture	10	$260.00	$0.24	1,066	34%	0.141	0.83	2.59	1.51
Healthcare	HID	Early	4′ T5 HO fixture - 54 W - 6 lamp	Replace HID Fixture drawing 400 W	Fixture	10	$325.00	$0.46	705	34%	0.093	0.69	1.59	0.87
Healthcare	HID	Turnover	4′ T5 HO fixture - 54 W - 6 lamp	Replace HID Fixture drawing 400 W	Fixture	10	$260.00	$0.37	705	34%	0.093	0.74	1.90	1.06
Lodging	HID	Early	4′ T5 HO fixture - 54 W - 6 lamp	Replace HID Fixture drawing 400 W	Fixture	10	$325.00	$0.66	492	34%	0.065	0.60	1.17	0.63
Lodging	HID	Turnover	4′ T5 HO fixture - 54 W - 6 lamp	Replace HID Fixture drawing 400 W	Fixture	10	$260.00	$0.53	492	34%	0.065	0.65	1.42	0.77
Misc	HID	Early	4′ T5 HO fixture - 54 W - 6 lamp	Replace HID Fixture drawing 400 W	Fixture	10	$325.00	$0.60	545	34%	0.072	0.62	1.28	0.69
Misc	HID	Turnover	4′ T5 HO fixture - 54 W - 6 lamp	Replace HID Fixture drawing 400 W	Fixture	10	$260.00	$0.48	545	34%	0.072	0.68	1.54	0.84
Office	HID	Early	4′ T5 HO fixture - 54 W - 6 lamp	Replace HID Fixture drawing 400 W	Fixture	10	$325.00	$0.64	508	34%	0.067	0.60	1.20	0.65

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Office	HID	Turnover	4′ T5 HO fixture - 54 W - 6 lamp	Replace HID Fixture drawing 400 W	Fixture	10	$260.00	$0.51	508	34%	0.067	0.66	1.46	0.79
Restaurant	HID	Early	4′ T5 HO fixture - 54 W - 6 lamp	Replace HID Fixture drawing 400 W	Fixture	10	$325.00	$0.41	787	34%	0.104	0.71	1.74	0.961
Restaurant	HID	Turnover	4′ T5 HO fixture - 54 W - 6 lamp	Replace HID Fixture drawing 400 W	Fixture	10	$260.00	$0.33	787	34%	0.104	0.77	2.07	1.17
Retail	HID	Early	4′ T5 HO fixture - 54 W - 6 lamp	Replace HID Fixture drawing 400 W	Fixture	10	$325.00	$0.44	741	34%	0.098	0.70	1.65	0.91
Retail	HID	Turnover	4′ T5 HO fixture - 54 W - 6 lamp	Replace HID Fixture drawing 400 W	Fixture	10	$260.00	$0.35	741	34%	0.098	0.75	1.97	1.11
Warehouse	HID	Early	4′ T5 HO fixture - 54 W - 6 lamp	Replace HID Fixture drawing 400 W	Fixture	10	$325.00	$0.66	492	34%	0.065	0.60	1.17	0.63
Warehouse	HID	Turnover	4′ T5 HO fixture - 54 W - 6 lamp	Replace HID Fixture drawing 400 W	Fixture	10	$260.00	$0.53	492	34%	0.065	0.65	1.42	0.77
Education	HID	Early	4′ T8 High Bay fixture - 32 W - 6 lamps HPF	Replace HID fixture drawing 250W	Fixture	10	$214.50	$0.98	218	30%	0.029	0.49	0.82	0.43
Education	HID	Turnover	4′ T8 High Bay fixture - 32 W - 6 lamps HPF	Replace HID fixture drawing 250W	Fixture	10	$110.50	$0.51	218	30%	0.029	0.66	1.47	0.80
Grocery	HID	Early	4′ T8 High Bay fixture - 32 W - 6 lamps HPF	Replace HID fixture drawing 250W	Fixture	10	$214.50	$0.34	631	30%	0.083	0.76	2.02	1.14
Grocery	HID	Turnover	4′ T8 High Bay fixture - 32 W - 6 lamps HPF	Replace HID fixture drawing 250W	Fixture	10	$110.50	$0.18	631	30%	0.083	0.88	3.23	1.98
Healthcare	HID	Early	4′ T8 High Bay fixture - 32 W - 6 lamps HPF	Replace HID fixture drawing 250W	Fixture	10	$214.50	$0.51	417	30%	0.055	0.66	1.45	0.79
Healthcare	HID	Turnover	4′ T8 High Bay fixture - 32 W - 6 lamps HPF	Replace HID fixture drawing 250W	Fixture	10	$110.50	$0.26	417	30%	0.055	0.81	2.44	1.41
Lodging	HID	Early	4′ T8 High Bay fixture - 32 W - 6 lamps HPF	Replace HID fixture drawing 250W	Fixture	10	$214.50	$0.74	291	30%	0.038	0.57	1.06	0.57
Lodging	HID	Turnover	4′ T8 High Bay fixture - 32 W - 6 lamps HPF	Replace HID fixture drawing 250W	Fixture	10	$110.50	$0.38	291	30%	0.038	0.73	1.86	1.036
Misc	HID	Early	4′ T8 High Bay fixture - 32 W - 6 lamps HPF	Replace HID fixture drawing 250W	Fixture	10	$214.50	$0.66	323	30%	0.043	0.59	1.16	0.62
Misc	HID	Turnover	4′ T8 High Bay fixture - 32 W - 6 lamps HPF	Replace HID fixture drawing 250W	Fixture	10	$110.50	$0.34	323	30%	0.043	0.76	2.01	1.13
Office	HID	Early	4′ T8 High Bay fixture - 32 W - 6 lamps HPF	Replace HID fixture drawing 250W	Fixture	10	$214.50	$0.71	301	30%	0.040	0.58	1.09	0.58
Office	HID	Turnover	4′ T8 High Bay fixture - 32 W - 6 lamps HPF	Replace HID fixture drawing 250W	Fixture	10	$110.50	$0.37	301	30%	0.040	0.74	1.90	1.07
Restaurant	HID	Early	4′ T8 High Bay fixture - 32 W - 6 lamps HPF	Replace HID fixture drawing 250W	Fixture	10	$214.50	$0.46	466	30%	0.061	0.69	1.59	0.87
Restaurant	HID	Turnover	4′ T8 High Bay fixture - 32 W - 6 lamps HPF	Replace HID fixture drawing 250W	Fixture	10	$110.50	$0.24	466	30%	0.061	0.83	2.64	1.55
Retail	HID	Early	4′ T8 High Bay fixture - 32 W - 6 lamps HPF	Replace HID fixture drawing 250W	Fixture	10	$214.50	$0.49	438	30%	0.058	0.67	1.51	0.83
Retail	HID	Turnover	4′ T8 High Bay fixture - 32 W - 6 lamps HPF	Replace HID fixture drawing 250W	Fixture	10	$110.50	$0.25	438	30%	0.058	0.82	2.53	1.47
Warehouse	HID	Early	4′ T8 High Bay fixture - 32 W - 6 lamps HPF	Replace HID fixture drawing 250W	Fixture	10	$214.50	$0.74	291	30%	0.038	0.57	1.06	0.57
Warehouse	HID	Turnover	4′ T8 High Bay fixture - 32 W - 6 lamps HPF	Replace HID fixture drawing 250W	Fixture	10	$110.50	$0.38	291	30%	0.038	0.73	1.86	1.036
Education	HID	Early	4′ T8 High Bay fixture - 32 W - 8 lamps HPF	Replace HID fixture drawing 400 W	Fixture	10	$300.00	$0.78	387	36%	0.051	0.55	1.02	0.54

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Education	HID	Turnover	4′ T8 High Bay fixture - 32 W - 8 lamps HPF	Replace HID fixture drawing 400 W	Fixture	10	$225.00	$0.58	387	36%	0.051	0.63	1.31	0.70
Grocery	HID	Early	4′ T8 High Bay fixture - 32 W - 8 lamps HPF	Replace HID fixture drawing 400 W	Fixture	10	$300.00	$0.27	1,118	36%	0.147	0.81	2.42	1.40
Grocery	HID	Turnover	4′ T8 High Bay fixture - 32 W - 8 lamps HPF	Replace HID fixture drawing 400 W	Fixture	10	$225.00	$0.20	1,118	36%	0.147	0.86	2.95	1.77
Healthcare	HID	Early	4′ T8 High Bay fixture - 32 W - 8 lamps HPF	Replace HID fixture drawing 400 W	Fixture	10	$300.00	$0.41	740	36%	0.098	0.72	1.76	0.977
Healthcare	HID	Turnover	4′ T8 High Bay fixture - 32 W - 8 lamps HPF	Replace HID fixture drawing 400 W	Fixture	10	$225.00	$0.30	740	36%	0.098	0.78	2.20	1.26
Lodging	HID	Early	4′ T8 High Bay fixture - 32 W - 8 lamps HPF	Replace HID fixture drawing 400 W	Fixture	10	$300.00	$0.58	516	36%	0.068	0.63	1.31	0.70
Lodging	HID	Turnover	4′ T8 High Bay fixture - 32 W - 8 lamps HPF	Replace HID fixture drawing 400 W	Fixture	10	$225.00	$0.44	516	36%	0.068	0.70	1.66	0.92
Misc	HID	Early	4′ T8 High Bay fixture - 32 W - 8 lamps HPF	Replace HID fixture drawing 400 W	Fixture	10	$300.00	$0.52	572	36%	0.075	0.66	1.43	0.77
Misc	HID	Turnover	4′ T8 High Bay fixture - 32 W - 8 lamps HPF	Replace HID fixture drawing 400 W	Fixture	10	$225.00	$0.39	572	36%	0.075	0.73	1.80	1.004
Office	HID	Early	4′ T8 High Bay fixture - 32 W - 8 lamps HPF	Replace HID fixture drawing 400 W	Fixture	10	$300.00	$0.56	533	36%	0.070	0.64	1.34	0.73
Office	HID	Turnover	4′ T8 High Bay fixture - 32 W - 8 lamps HPF	Replace HID fixture drawing 400 W	Fixture	10	$225.00	$0.42	533	36%	0.070	0.71	1.71	0.94
Restaurant	HID	Early	4′ T8 High Bay fixture - 32 W - 8 lamps HPF	Replace HID fixture drawing 400 W	Fixture	10	$300.00	$0.36	826	36%	0.109	0.74	1.92	1.08
Restaurant	HID	Turnover	4′ T8 High Bay fixture - 32 W - 8 lamps HPF	Replace HID fixture drawing 400 W	Fixture	10	$225.00	$0.27	826	36%	0.109	0.81	2.39	1.38
Retail	HID	Early	4′ T8 High Bay fixture - 32 W - 8 lamps HPF	Replace HID fixture drawing 400 W	Fixture	10	$300.00	$0.39	777	36%	0.103	0.73	1.83	1.021
Retail	HID	Turnover	4′ T8 High Bay fixture - 32 W - 8 lamps HPF	Replace HID fixture drawing 400 W	Fixture	10	$225.00	$0.29	777	36%	0.103	0.79	2.29	1.31
Warehouse	HID	Early	4′ T8 High Bay fixture - 32 W - 8 lamps HPF	Replace HID fixture drawing 400 W	Fixture	10	$300.00	$0.58	516	36%	0.068	0.63	1.31	0.70
Warehouse	HID	Turnover	4′ T8 High Bay fixture - 32 W - 8 lamps HPF	Replace HID fixture drawing 400 W	Fixture	10	$225.00	$0.44	516	36%	0.068	0.70	1.66	0.92
Education	HID	Early	Central lighting control system	Replace manual switches or no control	Control Point	10	$100.00	$0.34	293	10%	0.039	0.76	2.01	1.14
Education	HID	Turnover	Central lighting control system	Replace manual switches or no control	Control Point	10	$75.00	$0.26	293	10%	0.039	0.82	2.50	1.45
Education	HID	New	Central lighting control system	Replace manual switches or no control	Control Point	10	$65.00	$0.24	270	10%	0.036	0.83	2.61	1.53
Grocery	HID	Early	Central lighting control system	Replace manual switches or no control	Control Point	10	$100.00	$0.12	845	10%	0.111	0.94	4.08	2.64
Grocery	HID	Turnover	Central lighting control system	Replace manual switches or no control	Control Point	10	$75.00	$0.09	845	10%	0.111	0.97	4.72	3.21
Grocery	HID	New	Central lighting control system	Replace manual switches or no control	Control Point	10	$65.00	$0.08	780	10%	0.103	0.97	4.85	3.34
Healthcare	HID	Early	Central lighting control system	Replace manual switches or no control	Control Point	10	$100.00	$0.18	559	10%	0.074	0.88	3.19	1.94
Healthcare	HID	Turnover	Central lighting control system	Replace manual switches or no control	Control Point	10	$75.00	$0.13	559	10%	0.074	0.92	3.80	2.42
Healthcare	HID	New	Central lighting control system	Replace manual switches or no control	Control Point	10	$65.00	$0.13	516	10%	0.068	0.93	3.94	2.53

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Lodging	HID	Early	Central lighting control system	Replace manual switches or no control	Control Point	10	$100.00	$0.26	390	10%	0.051	0.82	2.50	1.45
Lodging	HID	Turnover	Central lighting control system	Replace manual switches or no control	Control Point	10	$75.00	$0.19	390	10%	0.051	0.87	3.04	1.84
Lodging	HID	New	Central lighting control system	Replace manual switches or no control	Control Point	10	$65.00	$0.18	360	10%	0.047	0.88	3.17	1.93
Misc	HID	Early	Central lighting control system	Replace manual switches or no control	Control Point	10	$100.00	$0.23	432	10%	0.057	0.84	2.69	1.58
Misc	HID	Turnover	Central lighting control system	Replace manual switches or no control	Control Point	10	$75.00	$0.17	432	10%	0.057	0.88	3.25	1.99
Misc	HID	New	Central lighting control system	Replace manual switches or no control	Control Point	10	$65.00	$0.16	399	10%	0.053	0.89	3.39	2.09
Office	HID	Early	Central lighting control system	Replace manual switches or no control	Control Point	10	$100.00	$0.25	403	10%	0.053	0.82	2.56	1.49
Office	HID	Turnover	Central lighting control system	Replace manual switches or no control	Control Point	10	$75.00	$0.19	403	10%	0.053	0.87	3.11	1.88
Office	HID	New	Central lighting control system	Replace manual switches or no control	Control Point	10	$65.00	$0.17	372	10%	0.049	0.88	3.24	1.98
Restaurant	HID	Early	Central lighting control system	Replace manual switches or no control	Control Point	10	$100.00	$0.16	624	10%	0.082	0.90	3.42	2.12
Restaurant	HID	Turnover	Central lighting control system	Replace manual switches or no control	Control Point	10	$75.00	$0.12	624	10%	0.082	0.93	4.04	2.61
Restaurant	HID	New	Central lighting control system	Replace manual switches or no control	Control Point	10	$65.00	$0.11	576	10%	0.076	0.94	4.18	2.73
Retail	HID	Early	Central lighting control system	Replace manual switches or no control	Control Point	10	$100.00	$0.17	588	10%	0.078	0.89	3.29	2.02
Retail	HID	Turnover	Central lighting control system	Replace manual switches or no control	Control Point	10	$75.00	$0.13	588	10%	0.078	0.93	3.91	2.51
Retail	HID	New	Central lighting control system	Replace manual switches or no control	Control Point	10	$65.00	$0.12	542	10%	0.072	0.93	4.05	2.62
Warehouse	HID	Early	Central lighting control system	Replace manual switches or no control	Control Point	10	$100.00	$0.26	390	10%	0.051	0.82	2.50	1.45
Warehouse	HID	Turnover	Central lighting control system	Replace manual switches or no control	Control Point	10	$75.00	$0.19	390	10%	0.051	0.87	3.04	1.84
Warehouse	HID	New	Central lighting control system	Replace manual switches or no control	Control Point	10	$65.00	$0.18	360	10%	0.047	0.88	3.17	1.93
Education	HID	Turnover	Ceramic Metal Halide lamp	Replace non-ceramic lamp lamp 400 W	Lamp	7	$35.00	$0.22	158	18%	0.021	0.74	2.05	1.21
Grocery	HID	Turnover	Ceramic Metal Halide lamp	Replace non-ceramic lamp lamp 400 W	Lamp	2	$35.00	$0.08	455	18%	0.060	0.54	1.15	0.80
Healthcare	HID	Turnover	Ceramic Metal Halide lamp	Replace non-ceramic lamp lamp 400 W	Lamp	3	$35.00	$0.12	301	18%	0.040	0.61	1.42	0.92
Lodging	HID	Turnover	Ceramic Metal Halide lamp	Replace non-ceramic lamp lamp 400 W	Lamp	5	$35.00	$0.17	210	18%	0.028	0.69	1.84	1.13
Misc	HID	Turnover	Ceramic Metal Halide lamp	Replace non-ceramic lamp lamp 400 W	Lamp	5	$35.00	$0.15	233	18%	0.031	0.71	1.96	1.23
Office	HID	Turnover	Ceramic Metal Halide lamp	Replace non-ceramic lamp lamp 400 W	Lamp	5	$35.00	$0.16	217	18%	0.029	0.70	1.88	1.16
Restaurant	HID	Turnover	Ceramic Metal Halide lamp	Replace non-ceramic lamp lamp 400 W	Lamp	3	$35.00	$0.10	336	18%	0.044	0.63	1.50	0.994
Retail	HID	Turnover	Ceramic Metal Halide lamp	Replace non-ceramic lamp lamp 400 W	Lamp	3	$35.00	$0.11	316	18%	0.042	0.62	1.45	0.954

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Warehouse	HID	Turnover	Ceramic Metal Halide lamp	Replace non-ceramic lamp lamp 400 W	Lamp	5	$35.00	$0.17	210	18%	0.028	0.69	1.84	1.13
Education	HID	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$75.17	$0.17	432	10%	0.057	1.00	4.40	2.69
Grocery	HID	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$12.00	$0.05	254	10%	0.034	1.12	8.19	6.20
Healthcare	HID	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$269.55	$0.08	3,378	10%	0.446	1.09	6.70	4.64
Lodging	HID	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$23.43	$0.20	120	10%	0.016	0.99	4.08	2.46
Misc	HID	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$8.32	$0.18	45	10%	0.006	1.00	4.26	2.59
Office	HID	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$2.90	$0.23	13	10%	0.002	0.96	3.65	2.15
Restaurant	HID	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$0.00	#DIV/0!	0	10%	0.000	#DIV/0!	#DIV/0!	#DIV/0!
Retail	HID	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$140.98	$0.12	1,192	10%	0.157	1.05	5.52	3.58
Warehouse	HID	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$219.25	$0.42	526	10%	0.069	0.84	2.33	1.29
Education	HID	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$375.87	$0.35	1,081	25%	0.143	0.88	2.69	1.52
Grocery	HID	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$60.00	$0.09	635	25%	0.084	1.08	6.20	4.17
Healthcare	HID	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$1,347.74	$0.16	8,445	25%	1.114	1.02	4.64	2.88
Lodging	HID	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$117.17	$0.39	300	25%	0.040	0.85	2.46	1.37
Misc	HID	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$41.58	$0.37	114	25%	0.015	0.87	2.59	1.45
Office	HID	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$14.49	$0.46	32	25%	0.004	0.81	2.15	1.18
Restaurant	HID	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$0.00	#DIV/0!	0	25%	0.000	#DIV/0!	#DIV/0!	#DIV/0!
Retail	HID	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$704.88	$0.24	2,980	25%	0.393	0.95	3.58	2.10
Warehouse	HID	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$1,096.27	$0.83	1,316	25%	0.174	0.65	1.29	0.68
Education	HID	Early	Induction High Bay Lighting	Base High Bay HID, 250W	Fixture	15	$688.00	$2.11	326	45%	0.043	0.38	0.55	0.28
Education	HID	Turnover	Induction High Bay Lighting	Base High Bay HID, 250W	Fixture	15	$375.00	$1.15	326	45%	0.043	0.55	0.96	0.50
Grocery	HID	Early	Induction High Bay Lighting	Base High Bay HID, 250W	Fixture	15	$688.00	$0.73	943	45%	0.124	0.69	1.45	0.77
Grocery	HID	Turnover	Induction High Bay Lighting	Base High Bay HID, 250W	Fixture	15	$375.00	$0.40	943	45%	0.124	0.85	2.42	1.35
Healthcare	HID	Early	Induction High Bay Lighting	Base High Bay HID, 250W	Fixture	15	$688.00	$1.10	624	45%	0.082	0.57	1.00	0.52
Healthcare	HID	Turnover	Induction High Bay Lighting	Base High Bay HID, 250W	Fixture	15	$375.00	$0.60	624	45%	0.082	0.74	1.72	0.93
Lodging	HID	Early	Induction High Bay Lighting	Base High Bay HID, 250W	Fixture	15	$688.00	$1.58	435	45%	0.057	0.46	0.72	0.37

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Lodging	HID	Turnover	Induction High Bay Lighting	Base High Bay HID, 250W	Fixture	15	$375.00	$0.86	435	45%	0.057	0.64	1.25	0.66
Misc	HID	Early	Induction High Bay Lighting	Base High Bay HID, 250W	Fixture	15	$688.00	$1.43	482	45%	0.064	0.49	0.79	0.41
Misc	HID	Turnover	Induction High Bay Lighting	Base High Bay HID, 250W	Fixture	15	$375.00	$0.78	482	45%	0.064	0.67	1.37	0.73
Office	HID	Early	Induction High Bay Lighting	Base High Bay HID, 250W	Fixture	15	$688.00	$1.53	450	45%	0.059	0.47	0.74	0.38
Office	HID	Turnover	Induction High Bay Lighting	Base High Bay HID, 250W	Fixture	15	$375.00	$0.83	450	45%	0.059	0.65	1.29	0.68
Restaurant	HID	Early	Induction High Bay Lighting	Base High Bay HID, 250W	Fixture	15	$688.00	$0.99	696	45%	0.092	0.60	1.11	0.58
Restaurant	HID	Turnover	Induction High Bay Lighting	Base High Bay HID, 250W	Fixture	15	$375.00	$0.54	696	45%	0.092	0.77	1.89	1.024
Retail	HID	Early	Induction High Bay Lighting	Base High Bay HID, 250W	Fixture	15	$688.00	$1.05	655	45%	0.086	0.58	1.05	0.55
Retail	HID	Turnover	Induction High Bay Lighting	Base High Bay HID, 250W	Fixture	15	$375.00	$0.57	655	45%	0.086	0.75	1.79	0.969
Warehouse	HID	Early	Induction High Bay Lighting	Base High Bay HID, 250W	Fixture	15	$688.00	$1.58	435	45%	0.057	0.46	0.72	0.37
Warehouse	HID	Turnover	Induction High Bay Lighting	Base High Bay HID, 250W	Fixture	15	$375.00	$0.86	435	45%	0.057	0.64	1.25	0.66
Education	HID	Turnover	Multi Lamp Hard Wired CFL	Replace HID Fixure Drawing 400 W	Fixture	10	$425.00	$0.89	477	45%	0.063	0.52	0.90	0.47
Grocery	HID	Turnover	Multi Lamp Hard Wired CFL	Replace HID Fixure Drawing 400 W	Fixture	10	$425.00	$0.31	1,378	45%	0.182	0.78	2.18	1.24
Healthcare	HID	Turnover	Multi Lamp Hard Wired CFL	Replace HID Fixure Drawing 400 W	Fixture	10	$425.00	$0.47	912	45%	0.120	0.69	1.57	0.86
Lodging	HID	Turnover	Multi Lamp Hard Wired CFL	Replace HID Fixure Drawing 400 W	Fixture	10	$425.00	$0.67	636	45%	0.084	0.59	1.16	0.62
Misc	HID	Turnover	Multi Lamp Hard Wired CFL	Replace HID Fixure Drawing 400 W	Fixture	10	$425.00	$0.60	705	45%	0.093	0.62	1.27	0.68
Office	HID	Turnover	Multi Lamp Hard Wired CFL	Replace HID Fixure Drawing 400 W	Fixture	10	$425.00	$0.65	657	45%	0.087	0.60	1.19	0.64
Restaurant	HID	Turnover	Multi Lamp Hard Wired CFL	Replace HID Fixure Drawing 400 W	Fixture	10	$425.00	$0.42	1,018	45%	0.134	0.71	1.72	0.952
Retail	HID	Turnover	Multi Lamp Hard Wired CFL	Replace HID Fixure Drawing 400 W	Fixture	10	$425.00	$0.44	958	45%	0.126	0.70	1.64	0.90
Warehouse	HID	Turnover	Multi Lamp Hard Wired CFL	Replace HID Fixure Drawing 400 W	Fixture	10	$425.00	$0.67	636	45%	0.084	0.59	1.16	0.62
Education	HID	Early	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$375.00	$0.43	878	30%	0.116	0.71	1.69	0.93
Education	HID	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$275.00	$0.31	878	30%	0.116	0.78	2.15	1.22
Education	HID	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$250.00	$0.31	810	30%	0.107	0.78	2.18	1.24
Grocery	HID	Early	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$375.00	$0.15	2,535	30%	0.334	0.91	3.59	2.25
Grocery	HID	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$275.00	$0.11	2,535	30%	0.334	0.95	4.27	2.81
Grocery	HID	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$250.00	$0.11	2,340	30%	0.309	0.95	4.30	2.84

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Healthcare	HID	Early	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$375.00	$0.22	1,677	30%	0.221	0.84	2.75	1.63
Healthcare	HID	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$275.00	$0.16	1,677	30%	0.221	0.89	3.37	2.08
Healthcare	HID	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$250.00	$0.16	1,548	30%	0.204	0.90	3.40	2.10
Lodging	HID	Early	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$375.00	$0.32	1,170	30%	0.154	0.77	2.12	1.20
Lodging	HID	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$275.00	$0.24	1,170	30%	0.154	0.83	2.66	1.56
Lodging	HID	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$250.00	$0.23	1,080	30%	0.142	0.84	2.69	1.58
Misc	HID	Early	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$375.00	$0.29	1,297	30%	0.171	0.79	2.29	1.31
Misc	HID	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$275.00	$0.21	1,297	30%	0.171	0.85	2.85	1.70
misc	HID	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$250.00	$0.21	1,197	30%	0.158	0.85	2.88	1.72
Office	HID	Early	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$375.00	$0.31	1,209	30%	0.159	0.78	2.17	1.24
Office	HID	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$275.00	$0.23	1,209	30%	0.159	0.84	2.72	1.60
Office	HID	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$250.00	$0.22	1,116	30%	0.147	0.84	2.75	1.62
Restaurant	HID	Early	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$375.00	$0.20	1,872	30%	0.247	0.86	2.96	1.78
Restaurant	HID	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$275.00	$0.15	1,872	30%	0.247	0.91	3.60	2.26
Restaurant	HID	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$250.00	$0.14	1,728	30%	0.228	0.91	3.64	2.29
Retail	HID	Early	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$375.00	$0.21	1,763	30%	0.233	0.85	2.85	1.69
Retail	HID	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$275.00	$0.16	1,763	30%	0.233	0.90	3.48	2.16
Retail	HID	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$250.00	$0.15	1,627	30%	0.215	0.90	3.51	2.19
Warehouse	HID	Early	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$375.00	$0.32	1,170	30%	0.154	0.77	2.12	1.20
Warehouse	HID	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$275.00	$0.24	1,170	30%	0.154	0.83	2.66	1.56
Warehouse	HID	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	10	$250.00	$0.23	1,080	30%	0.142	0.84	2.69	1.58
Education	HID	Early	Photocell dimming control	No prior dimming control	Photocell	10	$550.00	$0.38	1,463	50%	0.193	0.74	1.87	1.044
Education	HID	Turnover	Photocell dimming control	No prior dimming control	Photocell	10	$550.00	$0.38	1,463	50%	0.193	0.74	1.87	1.044
Education	HID	New	Photocell dimming control	No prior dimming control	Photocell	10	$450.00	$0.33	1,350	50%	0.178	0.76	2.05	1.16
Grocery	HID	Early	Photocell dimming control	No prior dimming control	Photocell	10	$550.00	$0.13	4,225	50%	0.557	0.92	3.87	2.47
Grocery	HID	Turnover	Photocell dimming control	No prior dimming control	Photocell	10	$550.00	$0.13	4,225	50%	0.557	0.92	3.87	2.47

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Grocery	HID	New	Photocell dimming control	No prior dimming control	Photocell	10	$450.00	$0.12	3,900	50%	0.514	0.94	4.13	2.69
Healthcare	HID	Early	Photocell dimming control	No prior dimming control	Photocell	10	$550.00	$0.20	2,795	50%	0.369	0.86	3.00	1.80
Healthcare	HID	Turnover	Photocell dimming control	No prior dimming control	Photocell	10	$550.00	$0.20	2,795	50%	0.369	0.86	3.00	1.80
Healthcare	HID	New	Photocell dimming control	No prior dimming control	Photocell	10	$450.00	$0.17	2,580	50%	0.340	0.88	3.24	1.98
Lodging	HID	Early	Photocell dimming control	No prior dimming control	Photocell	10	$550.00	$0.28	1,950	50%	0.257	0.80	2.33	1.34
Lodging	HID	Turnover	Photocell dimming control	No prior dimming control	Photocell	10	$550.00	$0.28	1,950	50%	0.257	0.80	2.33	1.34
Lodging	HID	New	Photocell dimming control	No prior dimming control	Photocell	10	$450.00	$0.25	1,800	50%	0.237	0.82	2.54	1.48
Misc	HID	Early	Photocell dimming control	No prior dimming control	Photocell	10	$550.00	$0.25	2,162	50%	0.285	0.82	2.51	1.46
Misc	HID	Turnover	Photocell dimming control	No prior dimming control	Photocell	10	$550.00	$0.25	2,162	50%	0.285	0.82	2.51	1.46
Misc	HID	New	Photocell dimming control	No prior dimming control	Photocell	10	$450.00	$0.23	1,995	50%	0.263	0.84	2.73	1.62
Office	HID	Early	Photocell dimming control	No prior dimming control	Photocell	10	$550.00	$0.27	2,015	50%	0.266	0.80	2.39	1.38
Office	HID	Turnover	Photocell dimming control	No prior dimming control	Photocell	10	$550.00	$0.27	2,015	50%	0.266	0.80	2.39	1.38
Office	HID	New	Photocell dimming control	No prior dimming control	Photocell	10	$450.00	$0.24	1,860	50%	0.245	0.83	2.60	1.52
Restaurant	HID	Early	Photocell dimming control	No prior dimming control	Photocell	10	$550.00	$0.18	3,120	50%	0.412	0.88	3.22	1.97
Restaurant	HID	Turnover	Photocell dimming control	No prior dimming control	Photocell	10	$550.00	$0.18	3,120	50%	0.412	0.88	3.22	1.97
Restaurant	HID	New	Photocell dimming control	No prior dimming control	Photocell	10	$450.00	$0.16	2,880	50%	0.380	0.90	3.47	2.16
Retail	HID	Early	Photocell dimming control	No prior dimming control	Photocell	10	$550.00	$0.19	2,938	50%	0.388	0.87	3.10	1.88
Retail	HID	Turnover	Photocell dimming control	No prior dimming control	Photocell	10	$550.00	$0.19	2,938	50%	0.388	0.87	3.10	1.88
Retail	HID	New	Photocell dimming control	No prior dimming control	Photocell	10	$450.00	$0.17	2,712	50%	0.358	0.89	3.35	2.06
Warehouse	HID	Early	Photocell dimming control	No prior dimming control	Photocell	10	$550.00	$0.28	1,950	50%	0.257	0.80	2.33	1.34
Warehouse	HID	Turnover	Photocell dimming control	No prior dimming control	Photocell	10	$550.00	$0.28	1,950	50%	0.257	0.80	2.33	1.34
Warehouse	HID	New	Photocell dimming control	No prior dimming control	Photocell	10	$450.00	$0.25	1,800	50%	0.237	0.82	2.54	1.48
Education	Incandescent	Turnover	CFL Lamp - 21 Watt	EISA - 75 Watt equivalent - 53W	Lamp	5	$3.00	$0.04	72	60%	0.009	0.84	3.47	2.68
Grocery	Incandescent	Turnover	CFL Lamp - 21 Watt	EISA - 75 Watt equivalent - 53W	Lamp	5	$3.00	$0.01	208	60%	0.027	0.88	4.29	3.81
Healthcare	Incandescent	Turnover	CFL Lamp - 21 Watt	EISA - 75 Watt equivalent - 53W	Lamp	5	$3.00	$0.02	138	60%	0.018	0.87	4.03	3.42
Lodging	Incandescent	Turnover	CFL Lamp - 21 Watt	EISA - 75 Watt equivalent - 53W	Lamp	5	$3.00	$0.03	96	60%	0.013	0.86	3.74	3.02

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
misc	Incandescent	Turnover	CFL Lamp - 21 Watt	EISA - 75 Watt equivalent - 53W	Lamp	5	$3.00	$0.03	106	60%	0.014	0.86	3.83	3.14
Office	Incandescent	Turnover	CFL Lamp - 21 Watt	EISA - 75 Watt equivalent - 53W	Lamp	5	$3.00	$0.03	99	60%	0.013	0.86	3.77	3.06
Restaurant	Incandescent	Turnover	CFL Lamp - 21 Watt	EISA - 75 Watt equivalent - 53W	Lamp	5	$3.00	$0.02	154	60%	0.020	0.88	4.11	3.53
Retail	Incandescent	Turnover	CFL Lamp - 21 Watt	EISA - 75 Watt equivalent - 53W	Lamp	5	$3.00	$0.02	145	60%	0.019	0.87	4.07	3.47
Warehouse	Incandescent	Turnover	CFL Lamp - 21 Watt	EISA - 75 Watt equivalent - 53W	Lamp	5	$3.00	$0.03	96	60%	0.013	0.86	3.74	3.02
Education	Incandescent	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$240.56	$0.17	1,384	10%	0.183	1.00	4.40	2.69
Grocery	Incandescent	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$24.00	$0.05	508	10%	0.067	1.12	8.19	6.20
Healthcare	Incandescent	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$862.55	$0.08	10,809	10%	1.426	1.09	6.70	4.64
Lodging	Incandescent	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$146.46	$0.20	750	10%	0.099	0.99	4.08	2.46
Misc	Incandescent	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$51.97	$0.18	284	10%	0.037	1.00	4.26	2.59
Office	Incandescent	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$161.95	$0.23	705	10%	0.093	0.96	3.65	2.15
Restaurant	Incandescent	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$6.42	$0.08	79	10%	0.010	1.09	6.65	4.59
Retail	Incandescent	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$31.73	$0.12	268	10%	0.035	1.05	5.52	3.58
Warehouse	Incandescent	New	HE Lighting Fixtures/Design 15% better than code	Code Baseline	per Building	15	$0.00	#DIV/0!	0	10%	0.000	#DIV/0!	#DIV/0!	#DIV/0!
Education	Incandescent	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$1,202.78	$0.35	3,460	25%	0.456	0.88	2.69	1.52
Grocery	Incandescent	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$120.00	$0.09	1,271	25%	0.168	1.08	6.20	4.17
Healthcare	Incandescent	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$4,312.77	$0.16	27,023	25%	3.564	1.02	4.64	2.88
Lodging	Incandescent	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$732.29	$0.39	1,875	25%	0.247	0.85	2.46	1.37
Misc	Incandescent	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$259.84	$0.37	710	25%	0.094	0.87	2.59	1.45
Office	Incandescent	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$809.74	$0.46	1,762	25%	0.232	0.81	2.15	1.18
Restaurant	Incandescent	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$32.08	$0.16	197	25%	0.026	1.01	4.59	2.83
Retail	Incandescent	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$158.67	$0.24	671	25%	0.088	0.95	3.58	2.10
Warehouse	Incandescent	New	HE Lighting Fixtures/Design 25% better than code	Code Baseline	per Building	15	$0.00	#DIV/0!	0	25%	0.000	#DIV/0!	#DIV/0!	#DIV/0!
Lodging	Incandescent	Early	Hotel Occupancy Sensors	No prior control	Per Room	10	$125.00	$0.74	168	70%	0.022	0.56	1.05	0.56
Lodging	Incandescent	New	Hotel Occupancy Sensors	No prior control	Per Room	10	$75.00	$0.45	168	70%	0.022	0.70	1.63	0.90
Lodging	Incandescent	Turnover	Hotel Occupancy Sensors	No prior control	Per Room	10	$100.00	$0.60	168	70%	0.022	0.62	1.28	0.69

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Education	Incandescent	Turnover	LED Lamp - 12 Watt	EISA - 60 Watt equivalent - 43W	Lamp	5	$23.99	$0.34	70	72%	0.009	0.56	1.11	0.62
Grocery	Incandescent	Turnover	LED Lamp - 12 Watt	EISA - 60 Watt equivalent - 43W	Lamp	5	$23.99	$0.12	202	72%	0.027	0.74	2.24	1.45
Healthcare	Incandescent	Turnover	LED Lamp - 12 Watt	EISA - 60 Watt equivalent - 43W	Lamp	5	$23.99	$0.18	133	72%	0.018	0.68	1.75	1.07
Lodging	Incandescent	Turnover	LED Lamp - 12 Watt	EISA - 60 Watt equivalent - 43W	Lamp	5	$23.99	$0.26	93	72%	0.012	0.61	1.37	0.80
misc	Incandescent	Turnover	LED Lamp - 12 Watt	EISA - 60 Watt equivalent - 43W	Lamp	5	$23.99	$0.23	103	72%	0.014	0.63	1.48	0.87
Office	Incandescent	Turnover	LED Lamp - 12 Watt	EISA - 60 Watt equivalent - 43W	Lamp	5	$23.99	$0.25	96	72%	0.013	0.62	1.40	0.82
Restaurant	Incandescent	Turnover	LED Lamp - 12 Watt	EISA - 60 Watt equivalent - 43W	Lamp	5	$23.99	$0.16	149	72%	0.020	0.70	1.88	1.16
Retail	Incandescent	Turnover	LED Lamp - 12 Watt	EISA - 60 Watt equivalent - 43W	Lamp	5	$23.99	$0.17	140	72%	0.018	0.69	1.81	1.11
Warehouse	Incandescent	Turnover	LED Lamp - 12 Watt	EISA - 60 Watt equivalent - 43W	Lamp	5	$23.99	$0.26	93	72%	0.012	0.61	1.37	0.80
Education	Incandescent	Turnover	LED Lamp PAR - 12 Watt	Halogen PAR - 45 W	Lamp	5	$34.45	$0.49	70	69%	0.009	0.47	0.83	0.45
Grocery	Incandescent	Turnover	LED Lamp PAR - 12 Watt	Halogen PAR - 45 W	Lamp	5	$34.45	$0.17	202	69%	0.027	0.69	1.81	1.11
Healthcare	Incandescent	Turnover	LED Lamp PAR - 12 Watt	Halogen PAR - 45 W	Lamp	5	$34.45	$0.26	133	69%	0.018	0.61	1.37	0.80
Lodging	Incandescent	Turnover	LED Lamp PAR - 12 Watt	Halogen PAR - 45 W	Lamp	5	$34.45	$0.37	93	69%	0.012	0.54	1.04	0.58
misc	Incandescent	Turnover	LED Lamp PAR - 12 Watt	Halogen PAR - 45 W	Lamp	5	$34.45	$0.33	103	69%	0.014	0.56	1.13	0.64
Office	Incandescent	Turnover	LED Lamp PAR - 12 Watt	Halogen PAR - 45 W	Lamp	5	$34.45	$0.36	96	69%	0.013	0.55	1.07	0.60
Restaurant	Incandescent	Turnover	LED Lamp PAR - 12 Watt	Halogen PAR - 45 W	Lamp	5	$34.45	$0.23	149	69%	0.020	0.64	1.48	0.87
Retail	Incandescent	Turnover	LED Lamp PAR - 12 Watt	Halogen PAR - 45 W	Lamp	5	$34.45	$0.25	140	69%	0.018	0.62	1.42	0.83
Warehouse	Incandescent	Turnover	LED Lamp PAR - 12 Watt	Halogen PAR - 45 W	Lamp	5	$34.45	$0.37	93	69%	0.012	0.54	1.04	0.58
Education	Incandescent	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.06	864	30%	0.114	1.09	7.27	5.32
Education	Incandescent	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$125.00	$0.14	864	30%	0.114	1.01	4.69	2.95
Grocery	Incandescent	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.02	2,496	30%	0.329	1.13	9.57	8.20
Grocery	Incandescent	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$125.00	$0.05	2,496	30%	0.329	1.10	7.65	5.74
Healthcare	Incandescent	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$125.00	$0.08	1,651	30%	0.218	1.07	6.54	4.57
Healthcare	Incandescent	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.03	1,651	30%	0.218	1.12	8.81	7.15
Lodging	Incandescent	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.04	1,152	30%	0.152	1.11	8.01	6.15
Lodging	Incandescent	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$125.00	$0.11	1,152	30%	0.152	1.04	5.51	3.62

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Misc	Incandescent	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.04	1,277	30%	0.168	1.11	8.25	6.44
Misc	Incandescent	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$125.00	$0.10	1,277	30%	0.168	1.05	5.80	3.88
Office	Incandescent	Early	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$125.00	$0.11	1,190	30%	0.157	1.04	5.60	3.70
Office	Incandescent	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.04	1,190	30%	0.157	1.11	8.09	6.24
Office	Incandescent	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$125.00	$0.11	1,190	30%	0.157	1.04	5.60	3.70
Restaurant	Incandescent	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.03	1,843	30%	0.243	1.12	9.03	7.44
Restaurant	Incandescent	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$125.00	$0.07	1,843	30%	0.243	1.08	6.84	4.87
Retail	Incandescent	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.03	1,736	30%	0.229	1.12	8.92	7.29
Retail	Incandescent	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$125.00	$0.07	1,736	30%	0.229	1.08	6.68	4.71
Warehouse	Incandescent	New	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$50.00	$0.04	1,152	30%	0.152	1.11	8.01	6.15
Warehouse	Incandescent	Turnover	Occupancy sensor, wall or ceiling mounted	Manual Wall Switch	Sensor	14	$125.00	$0.11	1,152	30%	0.152	1.04	5.51	3.62
Education	Incandescent	New	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.10	1,440	50%	0.190	0.92	4.00	2.65
Education	Incandescent	Turnover	Photocell dimming control	No prior dimming control	Photocell	9	$225.00	$0.16	1,440	50%	0.190	0.87	3.19	1.98
Grocery	Incandescent	New	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.04	4,160	50%	0.549	1.00	6.01	4.75
Grocery	Incandescent	Turnover	Photocell dimming control	No prior dimming control	Photocell	9	$225.00	$0.05	4,160	50%	0.549	0.98	5.30	3.93
Healthcare	Incandescent	Turnover	Photocell dimming control	No prior dimming control	Photocell	9	$225.00	$0.08	2,752	50%	0.363	0.94	4.50	3.10
Healthcare	Incandescent	New	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.05	2,752	50%	0.363	0.97	5.29	3.91
Lodging	Incandescent	New	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.08	1,920	50%	0.253	0.95	4.59	3.19
Lodging	Incandescent	Turnover	Photocell dimming control	No prior dimming control	Photocell	9	$225.00	$0.12	1,920	50%	0.253	0.91	3.76	2.44
Misc	Incandescent	New	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.07	2,128	50%	0.281	0.96	4.79	3.39
Misc	Incandescent	Turnover	Photocell dimming control	No prior dimming control	Photocell	9	$225.00	$0.11	2,128	50%	0.281	0.92	3.97	2.62
Office	Incandescent	Early	Photocell dimming control	No prior dimming control	Photocell	9	$225.00	$0.11	1,984	50%	0.262	0.91	3.83	2.50
Office	Incandescent	New	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.08	1,984	50%	0.262	0.95	4.65	3.25
Office	Incandescent	Turnover	Photocell dimming control	No prior dimming control	Photocell	9	$225.00	$0.11	1,984	50%	0.262	0.91	3.83	2.50
Restaurant	Incandescent	New	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.05	3,072	50%	0.405	0.98	5.49	4.13
Restaurant	Incandescent	Turnover	Photocell dimming control	No prior dimming control	Photocell	9	$225.00	$0.07	3,072	50%	0.405	0.95	4.72	3.32

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Retail	Incandescent	New	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.05	2,893	50%	0.382	0.98	5.38	4.01
Retail	Incandescent	Turnover	Photocell dimming control	No prior dimming control	Photocell	9	$225.00	$0.08	2,893	50%	0.382	0.95	4.60	3.20
Warehouse	Incandescent	New	Photocell dimming control	No prior dimming control	Photocell	9	$150.00	$0.08	1,920	50%	0.253	0.95	4.59	3.19
Warehouse	Incandescent	Turnover	Photocell dimming control	No prior dimming control	Photocell	9	$225.00	$0.12	1,920	50%	0.253	0.91	3.76	2.44
All	Large Appliances	New	Beverage machine control	Vending machine with no sensor	machine	5	$170.00	$0.10	1,665	46%	0.265	0.78	2.58	1.71
All	Large Appliances	Turnover	Beverage machine control	Vending machine with no sensor	machine	5	$170.00	$0.10	1,665	46%	0.265	0.78	2.58	1.71
All	Large Appliances	New	EnergyStar dishwasher	Std Dishwasher	dishwasher	12	$55.00	$0.40	137	55%	0.022	0.80	2.17	1.20
All	Large Appliances	Turnover	EnergyStar dishwasher	Std Dishwasher	dishwasher	12	$55.00	$0.40	137	55%	0.022	0.80	2.17	1.20
All	Large Appliances	New	EnergyStar refrigerator	Std Refrigerator	refrigerator	12	$30.00	$0.30	100	13%	0.016	0.86	2.72	1.55
All	Large Appliances	Turnover	EnergyStar refrigerator	Std Refrigerator	refrigerator	12	$30.00	$0.30	100	13%	0.016	0.86	2.72	1.55
All	Large Appliances	New	EnergyStar vending machine	Standard vending machine	machine	15	$350.00	$0.27	1,310	36%	0.208	0.95	3.47	2.01
All	Large Appliances	Turnover	EnergyStar vending machine	Standard vending machine	machine	15	$350.00	$0.27	1,310	36%	0.208	0.95	3.47	2.01
All	Large Appliances	New	High-efficiency coin-op washer w/ Electric water heat	Coin-op wash, electric hot water	washer	10	$420.00	$0.44	959	42%	0.153	0.72	1.75	0.966
All	Large Appliances	Turnover	High-efficiency coin-op washer w/ Electric water heat	Coin-op wash, electric hot water	washer	10	$420.00	$0.44	959	42%	0.153	0.72	1.75	0.966
All	Large Appliances	New	High-efficiency coin-op washer w/o Electric Water Heat	Coin-op wash, w/out electric hot water	washer	10	$420.00	$1.79	235	20%	0.037	0.35	0.50	0.26
All	Large Appliances	Turnover	High-efficiency coin-op washer w/o Electric Water Heat	Coin-op wash, w/out electric hot water	washer	10	$420.00	$1.79	235	20%	0.037	0.35	0.50	0.26
All	Large Appliances	New	High-efficiency washer	Standard washer, electric hot water	washer	10	$420.00	$0.44	959	42%	0.153	0.72	1.75	0.966
All	Large Appliances	Turnover	High-efficiency washer	Standard washer, electric hot water	washer	10	$420.00	$0.44	959	42%	0.153	0.72	1.75	0.966

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
All	Large Appliances	New	Low-temperature dish machine	High temp dish machine with booster heater	removed kW	15	$530.00	$0.06	8,362	48%	1.330	1.12	7.81	5.63
All	Large Appliances	Turnover	Low-temperature dish machine	High temp dish machine with booster heater	removed kW	15	$530.00	$0.06	8,362	48%	1.330	1.12	7.81	5.63
All	Large Appliances	New	Non-cooled snack control	Vending machine with no sensor	machine	5	$160.00	$0.47	343	46%	0.054	0.51	0.92	0.50
All	Large Appliances	Turnover	Non-cooled snack control	Vending machine with no sensor	machine	5	$160.00	$0.47	343	46%	0.054	0.51	0.92	0.50
All	Large Appliances	New	Other cold product control	Vending machine with no sensor	machine	5	$179.00	$0.11	1,612	46%	0.256	0.77	2.47	1.62
All	Large Appliances	Turnover	Other cold product control	Vending machine with no sensor	machine	5	$179.00	$0.11	1,612	46%	0.256	0.77	2.47	1.62
Education	Motors	Turnover	Air Comp Improvements	n/a	each	15	$990.00	$0.11	8,928	16%	1.178	1.06	5.72	3.75
Grocery	Motors	Turnover	Air Comp Improvements	n/a	each	15	$990.00	$0.11	8,928	16%	1.178	1.06	5.72	3.75
Healthcare	Motors	Turnover	Air Comp Improvements	n/a	each	15	$990.00	$0.11	8,928	16%	1.178	1.06	5.72	3.75
Lodging	Motors	Turnover	Air Comp Improvements	n/a	each	15	$990.00	$0.11	8,928	16%	1.178	1.06	5.72	3.75
misc	Motors	Turnover	Air Comp Improvements	n/a	each	15	$990.00	$0.11	8,928	16%	1.178	1.06	5.72	3.75
Office	Motors	Turnover	Air Comp Improvements	n/a	each	15	$990.00	$0.11	8,928	16%	1.178	1.06	5.72	3.75
Restaurant	Motors	Turnover	Air Comp Improvements	n/a	each	15	$990.00	$0.11	8,928	16%	1.178	1.06	5.72	3.75
Retail	Motors	Turnover	Air Comp Improvements	n/a	each	15	$990.00	$0.11	8,928	16%	1.178	1.06	5.72	3.75
Warehouse	Motors	Turnover	Air Comp Improvements	n/a	each	15	$990.00	$0.11	8,928	16%	1.178	1.06	5.72	3.75
Education	Motors	Early	Air Compressor Optimization	n/a	each	15	$2,750.00	$0.16	16,901	30%	2.229	1.01	4.59	2.83
Grocery	Motors	Early	Air Compressor Optimization	n/a	each	15	$2,750.00	$0.16	16,901	30%	2.229	1.01	4.59	2.83
Healthcare	Motors	Early	Air Compressor Optimization	n/a	each	15	$2,750.00	$0.16	16,901	30%	2.229	1.01	4.59	2.83
Lodging	Motors	Early	Air Compressor Optimization	n/a	each	15	$2,750.00	$0.16	16,901	30%	2.229	1.01	4.59	2.83
misc	Motors	Early	Air Compressor Optimization	n/a	each	15	$2,750.00	$0.16	16,901	30%	2.229	1.01	4.59	2.83
Office	Motors	Early	Air Compressor Optimization	n/a	each	15	$2,750.00	$0.16	16,901	30%	2.229	1.01	4.59	2.83
Restaurant	Motors	Early	Air Compressor Optimization	n/a	each	15	$2,750.00	$0.16	16,901	30%	2.229	1.01	4.59	2.83
Retail	Motors	Early	Air Compressor Optimization	n/a	each	15	$2,750.00	$0.16	16,901	30%	2.229	1.01	4.59	2.83

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Warehouse	Motors	Early	Air Compressor Optimization	n/a	each	15	$2,750.00	$0.16	16,901	30%	2.229	1.01	4.59	2.83
Education	Motors	Existing	Automated Exhaust VFD Control - Parking Garage CO sensor, CO Sensors		per HP	10	$939.78	$0.88	1062	20.0%	0.140	0.52	0.90	0.48
Education	Motors	New	Automated Exhaust VFD Control - Parking Garage CO sensor, CO Sensors		per HP	10	$939.78	$0.88	1062	20.0%	0.140	0.52	0.90	0.48
Grocery	Motors	Existing	Automated Exhaust VFD Control - Parking Garage CO sensor, CO Sensors		per HP	10	$939.78	$0.49	1934	20.0%	0.255	0.67	1.52	0.83
Grocery	Motors	New	Automated Exhaust VFD Control - Parking Garage CO sensor, CO Sensors		per HP	10	$939.78	$0.49	1934	20.0%	0.255	0.67	1.52	0.83
Healthcare	Motors	Existing	Automated Exhaust VFD Control - Parking Garage CO sensor, CO Sensors		per HP	10	$939.78	$0.20	4656	20.00%	0.614	0.86	2.95	1.77
Healthcare	Motors	New	Automated Exhaust VFD Control - Parking Garage CO sensor, CO Sensors		per HP	10	$939.78	$0.20	4656	20.00%	0.614	0.86	2.95	1.77
Lodging	Motors	Existing	Automated Exhaust VFD Control - Parking Garage CO sensor, CO Sensors		per HP	10	$939.78	$0.47	1987	20.0%	0.262	0.68	1.55	0.85
Lodging	Motors	New	Automated Exhaust VFD Control - Parking Garage CO sensor, CO Sensors		per HP	10	$939.78	$0.47	1987	20.0%	0.262	0.68	1.55	0.85
Miscellaneous	Motors	Existing	Automated Exhaust VFD Control - Parking Garage CO sensor, CO Sensors		per HP	10	$939.78	$1.03	914	20.0%	0.121	0.48	0.79	0.41
Miscellaneous	Motors	New	Automated Exhaust VFD Control - Parking Garage CO sensor, CO Sensors		per HP	10	$939.78	$1.03	914	20.0%	0.121	0.48	0.79	0.41
Office	Motors	Existing	Automated Exhaust VFD Control - Parking Garage CO sensor, CO Sensors		per HP	10	$0.20	$0.00	2170	20.00%	0.286	1.07	8.89	8.88
Office	Motors	New	Automated Exhaust VFD Control - Parking Garage CO sensor, CO Sensors		per HP	10	$0.20	$0.00	2170	20.00%	0.286	1.07	8.89	8.88
Retail	Motors	Existing	Automated Exhaust VFD Control - Parking Garage CO sensor, CO Sensors		per HP	10	$939.78	$1.12	839	20.0%	0.111	0.46	0.73	0.38
Retail	Motors	New	Automated Exhaust VFD Control - Parking Garage CO sensor, CO Sensors		per HP	10	$939.78	$1.12	839	20.0%	0.111	0.46	0.73	0.38
Education	Motors	Existing	Cooking Hood Controls, Demand Controlled Ventilation - Cooking Hood Controls, with Sensors, Variable Speed Control, And Direct Make-up Air		per Measure Installed	18	$4,319.68	$1.37	3157	15.9%	0.416	0.55	0.93	0.48
Education	Motors	New	Cooking Hood Controls, Demand Controlled Ventilation - Cooking Hood Controls, with Sensors, Variable Speed Control, And Direct Make-up Air		per Measure Installed	18	$4,319.68	$1.37	3157	15.9%	0.416	0.55	0.93	0.48
Grocery	Motors	Existing	Cooking Hood Controls, Demand Controlled Ventilation - Cooking Hood Controls, with Sensors, Variable Speed Control, And Direct Make-up Air		per Measure Installed	18	$3,839.95	$5.65	680	15.9%	0.090	0.20	0.24	0.12
Grocery	Motors	New	Cooking Hood Controls, Demand Controlled Ventilation - Cooking Hood Controls, with Sensors, Variable Speed Control, And Direct Make-up Air		per Measure Installed	18	$3,839.95	$5.65	680	15.9%	0.090	0.20	0.24	0.12
Healthcare	Motors	Existing	Cooking Hood Controls, Demand Controlled Ventilation - Cooking Hood Controls, with Sensors, Variable Speed Control, And Direct Make-up Air		per Measure Installed	18	$4,077.25	$0.04	94643	15.92%	12.484	1.18	9.51	7.31

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Healthcare	Motors	New	Cooking Hood Controls, Demand Controlled Ventilation - Cooking Hood Controls, with Sensors, Variable Speed Control, And Direct Make-up Air		per Measure Installed	18	$4,324.00	$0.05	94643	15.92%	12.484	1.18	9.34	7.11
Lodging	Motors	Existing	Cooking Hood Controls, Demand Controlled Ventilation - Cooking Hood Controls, with Sensors, Variable Speed Control, And Direct Make-up Air		per Measure Installed	18	$8,399.44	$0.87	9666	15.9%	1.275	0.69	1.40	0.74
Lodging	Motors	New	Cooking Hood Controls, Demand Controlled Ventilation - Cooking Hood Controls, with Sensors, Variable Speed Control, And Direct Make-up Air		per Measure Installed	18	$8,399.44	$0.87	9666	15.9%	1.275	0.69	1.40	0.74
Office	Motors	New	Cooking Hood Controls, Demand Controlled Ventilation - Cooking Hood Controls, with Sensors, Variable Speed Control, And Direct Make-up Air		per Measure Installed	18	$4,319.57	$0.77	5643	15.92%	0.744	0.73	1.57	0.83
Restaurant	Motors	Existing	Cooking Hood Controls, Demand Controlled Ventilation - Cooking Hood Controls, with Sensors, Variable Speed Control, And Direct Make-up Air		per Measure Installed	18	$5,999.84	$5.08	1181	15.9%	0.156	0.22	0.26	0.13
Restaurant	Motors	New	Cooking Hood Controls, Demand Controlled Ventilation - Cooking Hood Controls, with Sensors, Variable Speed Control, And Direct Make-up Air		per Measure Installed	18	$5,999.84	$5.08	1181	15.9%	0.156	0.22	0.26	0.13
Retail	Motors	Existing	Cooking Hood Controls, Demand Controlled Ventilation - Cooking Hood Controls, with Sensors, Variable Speed Control, And Direct Make-up Air		per Measure Installed	18	$4,320.03	$5.54	779	15.9%	0.103	0.20	0.24	0.12
Retail	Motors	New	Cooking Hood Controls, Demand Controlled Ventilation - Cooking Hood Controls, with Sensors, Variable Speed Control, And Direct Make-up Air		per Measure Installed	18	$4,320.03	$5.54	779	15.9%	0.103	0.20	0.24	0.12
Education	Motors	New	Demand Control Ventilation (DCV)	Base Standard Ventilation	system	10	$257.83	$0.19	1,357	8%	0.179	0.87	3.07	1.85
Education	Motors	Turnover	Demand Control Ventilation (DCV)	Base Standard Ventilation	system	10	$257.83	$0.19	1,357	8%	0.179	0.87	3.07	1.85
Grocery	Motors	New	Demand Control Ventilation (DCV)	Base Standard Ventilation	system	10	$257.83	$0.19	1,357	8%	0.179	0.87	3.07	1.85
Grocery	Motors	Turnover	Demand Control Ventilation (DCV)	Base Standard Ventilation	system	10	$257.83	$0.19	1,357	8%	0.179	0.87	3.07	1.85
Healthcare	Motors	New	Demand Control Ventilation (DCV)	Base Standard Ventilation	system	10	$257.83	$0.19	1,357	8%	0.179	0.87	3.07	1.85
Healthcare	Motors	Turnover	Demand Control Ventilation (DCV)	Base Standard Ventilation	system	10	$257.83	$0.19	1,357	8%	0.179	0.87	3.07	1.85
Lodging	Motors	New	Demand Control Ventilation (DCV)	Base Standard Ventilation	system	10	$257.83	$0.19	1,357	8%	0.179	0.87	3.07	1.85
Lodging	Motors	Turnover	Demand Control Ventilation (DCV)	Base Standard Ventilation	system	10	$257.83	$0.19	1,357	8%	0.179	0.87	3.07	1.85
misc	Motors	New	Demand Control Ventilation (DCV)	Base Standard Ventilation	system	10	$257.83	$0.19	1,357	8%	0.179	0.87	3.07	1.85
misc	Motors	Turnover	Demand Control Ventilation (DCV)	Base Standard Ventilation	system	10	$257.83	$0.19	1,357	8%	0.179	0.87	3.07	1.85

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Office	Motors	New	Demand Control Ventilation (DCV)	Base Standard Ventilation	system	10	$257.83	$0.19	1,357	8%	0.179	0.87	3.07	1.85
Office	Motors	Turnover	Demand Control Ventilation (DCV)	Base Standard Ventilation	system	10	$257.83	$0.19	1,357	8%	0.179	0.87	3.07	1.85
Restaurant	Motors	New	Demand Control Ventilation (DCV)	Base Standard Ventilation	system	10	$257.83	$0.19	1,357	8%	0.179	0.87	3.07	1.85
Restaurant	Motors	Turnover	Demand Control Ventilation (DCV)	Base Standard Ventilation	system	10	$257.83	$0.19	1,357	8%	0.179	0.87	3.07	1.85
Retail	Motors	New	Demand Control Ventilation (DCV)	Base Standard Ventilation	system	10	$257.83	$0.19	1,357	8%	0.179	0.87	3.07	1.85
Retail	Motors	Turnover	Demand Control Ventilation (DCV)	Base Standard Ventilation	system	10	$257.83	$0.19	1,357	8%	0.179	0.87	3.07	1.85
Warehouse	Motors	New	Demand Control Ventilation (DCV)	Base Standard Ventilation	system	10	$257.83	$0.19	1,357	8%	0.179	0.87	3.07	1.85
Warehouse	Motors	Turnover	Demand Control Ventilation (DCV)	Base Standard Ventilation	system	10	$257.83	$0.19	1,357	8%	0.179	0.87	3.07	1.85
Education	Motors	New	Exhaust Hood Demand Controlled Ventilation	Base Exhaust Hood	per installed measure	10	$6,500.21	$16.21	401	8%	0.053	0.05	0.05	0.03
Education	Motors	Turnover	Exhaust Hood Demand Controlled Ventilation	Base Exhaust Hood	per installed measure	10	$6,500.21	$16.21	401	8%	0.053	0.05	0.05	0.03
Grocery	Motors	New	Exhaust Hood Demand Controlled Ventilation	Base Exhaust Hood	per installed measure	10	$6,500.21	$16.21	401	8%	0.053	0.05	0.05	0.03
Grocery	Motors	Turnover	Exhaust Hood Demand Controlled Ventilation	Base Exhaust Hood	per installed measure	10	$6,500.21	$16.21	401	8%	0.053	0.05	0.05	0.03
Healthcare	Motors	New	Exhaust Hood Demand Controlled Ventilation	Base Exhaust Hood	per installed measure	10	$6,500.21	$16.21	401	8%	0.053	0.05	0.05	0.03
Healthcare	Motors	Turnover	Exhaust Hood Demand Controlled Ventilation	Base Exhaust Hood	per installed measure	10	$6,500.21	$16.21	401	8%	0.053	0.05	0.05	0.03
Lodging	Motors	New	Exhaust Hood Demand Controlled Ventilation	Base Exhaust Hood	per installed measure	10	$6,500.21	$16.21	401	8%	0.053	0.05	0.05	0.03
Lodging	Motors	Turnover	Exhaust Hood Demand Controlled Ventilation	Base Exhaust Hood	per installed measure	10	$6,500.21	$16.21	401	8%	0.053	0.05	0.05	0.03
misc	Motors	New	Exhaust Hood Demand Controlled Ventilation	Base Exhaust Hood	per installed measure	10	$6,500.21	$16.21	401	8%	0.053	0.05	0.05	0.03
misc	Motors	Turnover	Exhaust Hood Demand Controlled Ventilation	Base Exhaust Hood	per installed measure	10	$6,500.21	$16.21	401	8%	0.053	0.05	0.05	0.03
Office	Motors	New	Exhaust Hood Demand Controlled Ventilation	Base Exhaust Hood	per installed measure	10	$6,500.21	$16.21	401	8%	0.053	0.05	0.05	0.03
Office	Motors	Turnover	Exhaust Hood Demand Controlled Ventilation	Base Exhaust Hood	per installed measure	10	$6,500.21	$16.21	401	8%	0.053	0.05	0.05	0.03

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Restaurant	Motors	New	Exhaust Hood Demand Controlled Ventilation	Base Exhaust Hood	per installed measure	10	$6,500.21	$16.21	401	8%	0.053	0.05	0.05	0.03
Restaurant	Motors	Turnover	Exhaust Hood Demand Controlled Ventilation	Base Exhaust Hood	per installed measure	10	$6,500.21	$16.21	401	8%	0.053	0.05	0.05	0.03
Retail	Motors	New	Exhaust Hood Demand Controlled Ventilation	Base Exhaust Hood	per installed measure	10	$6,500.21	$16.21	401	8%	0.053	0.05	0.05	0.03
Retail	Motors	Turnover	Exhaust Hood Demand Controlled Ventilation	Base Exhaust Hood	per installed measure	10	$6,500.21	$16.21	401	8%	0.053	0.05	0.05	0.03
Warehouse	Motors	New	Exhaust Hood Demand Controlled Ventilation	Base Exhaust Hood	per installed measure	10	$6,500.21	$16.21	401	8%	0.053	0.05	0.05	0.03
Warehouse	Motors	Turnover	Exhaust Hood Demand Controlled Ventilation	Base Exhaust Hood	per installed measure	10	$6,500.21	$16.21	401	8%	0.053	0.05	0.05	0.03
Education	Motors	Existing	Motor - CEE Premium-Efficiency, CEE PE Motors for HVAC Applications		per HP	10	$7.11	$0.71	10	0.9%	0.001	0.58	1.10	0.58
Education	Motors	New	Motor - CEE Premium-Efficiency, CEE PE Motors for HVAC Applications		per HP	10	$7.11	$0.71	10	0.9%	0.001	0.58	1.10	0.58
Grocery	Motors	Existing	Motor - CEE Premium-Efficiency, CEE PE Motors for HVAC Applications		per HP	10	$7.11	$0.39	18	0.9%	0.002	0.73	1.81	1.009
Grocery	Motors	New	Motor - CEE Premium-Efficiency, CEE PE Motors for HVAC Applications		per HP	10	$7.11	$0.39	18	0.9%	0.002	0.73	1.81	1.009
Healthcare	Motors	Existing	Motor - CEE Premium-Efficiency, CEE PE Motors for HVAC Applications		per HP	10	$7.11	$0.28	25	0.90%	0.003	0.80	2.34	1.35
Healthcare	Motors	New	Motor - CEE Premium-Efficiency, CEE PE Motors for HVAC Applications		per HP	10	$7.11	$0.28	25	0.90%	0.003	0.80	2.34	1.35
Lodging	Motors	Existing	Motor - CEE Premium-Efficiency, CEE PE Motors for HVAC Applications		per HP	10	$7.11	$0.38	19	0.9%	0.002	0.73	1.85	1.033
Lodging	Motors	New	Motor - CEE Premium-Efficiency, CEE PE Motors for HVAC Applications		per HP	10	$7.11	$0.38	19	0.9%	0.002	0.73	1.85	1.033
Miscellaneous	Motors	Existing	Motor - CEE Premium-Efficiency, CEE PE Motors for HVAC Applications		per HP	10	$7.11	$0.83	9	0.9%	0.001	0.54	0.96	0.51
Miscellaneous	Motors	New	Motor - CEE Premium-Efficiency, CEE PE Motors for HVAC Applications		per HP	10	$7.11	$0.83	9	0.9%	0.001	0.54	0.96	0.51
Office	Motors	Existing	Motor - CEE Premium-Efficiency, CEE PE Motors for HVAC Applications		per HP	10	$7.11	$0.46	15	0.90%	0.002	0.69	1.59	0.87
Office	Motors	New	Motor - CEE Premium-Efficiency, CEE PE Motors for HVAC Applications		per HP	10	$7.11	$0.46	15	0.90%	0.002	0.69	1.59	0.87
Restaurant	Motors	Existing	Motor - CEE Premium-Efficiency, CEE PE Motors for HVAC Applications		per HP	10	$7.11	$0.43	17	0.9%	0.002	0.71	1.69	0.93
Restaurant	Motors	New	Motor - CEE Premium-Efficiency, CEE PE Motors for HVAC Applications		per HP	10	$7.11	$0.43	17	0.9%	0.002	0.71	1.69	0.93
Retail	Motors	Existing	Motor - CEE Premium-Efficiency, CEE PE Motors for HVAC Applications		per HP	10	$7.11	$0.90	8	0.9%	0.001	0.51	0.89	0.47
Retail	Motors	New	Motor - CEE Premium-Efficiency, CEE PE Motors for HVAC Applications		per HP	10	$7.11	$0.90	8	0.9%	0.001	0.51	0.89	0.47

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Warehouse	Motors	Existing	Motor - CEE Premium-Efficiency, CEE PE Motors for HVAC Applications		per HP	10	$7.11	$1.11	6	0.9%	0.001	0.46	0.73	0.38
Warehouse	Motors	New	Motor - CEE Premium-Efficiency, CEE PE Motors for HVAC Applications		per HP	10	$7.11	$1.11	6	0.9%	0.001	0.46	0.73	0.38
Education	Motors	Existing	Motor - Fan System - Variable Speed Control, Fan System Optimization w/ VSD		per HP	20	$194.93	$0.83	234	21.1%	0.031	0.73	1.56	0.82
Education	Motors	New	Motor - Fan System - Variable Speed Control, Fan System Optimization w/ VSD		per HP	20	$194.93	$0.83	234	21.1%	0.031	0.73	1.56	0.82
Grocery	Motors	Existing	Motor - Fan System - Variable Speed Control, Fan System Optimization w/ VSD		per HP	20	$194.93	$0.46	427	21.1%	0.056	0.90	2.61	1.43
Grocery	Motors	New	Motor - Fan System - Variable Speed Control, Fan System Optimization w/ VSD		per HP	20	$194.93	$0.46	427	21.1%	0.056	0.90	2.61	1.43
Healthcare	Motors	Existing	Motor - Fan System - Variable Speed Control, Fan System Optimization w/ VSD		per HP	20	$194.93	$0.33	596	21.14%	0.079	0.98	3.40	1.93
Healthcare	Motors	New	Motor - Fan System - Variable Speed Control, Fan System Optimization w/ VSD		per HP	20	$194.93	$0.33	596	21.14%	0.079	0.98	3.40	1.93
Lodging	Motors	Existing	Motor - Fan System - Variable Speed Control, Fan System Optimization w/ VSD		per HP	20	$194.93	$0.44	439	21.1%	0.058	0.91	2.67	1.47
Lodging	Motors	New	Motor - Fan System - Variable Speed Control, Fan System Optimization w/ VSD		per HP	20	$194.93	$0.44	439	21.1%	0.058	0.91	2.67	1.47
Miscellaneous	Motors	Existing	Motor - Fan System - Variable Speed Control, Fan System Optimization w/ VSD		per HP	20	$194.93	$0.97	202	21.1%	0.027	0.68	1.36	0.71
Miscellaneous	Motors	New	Motor - Fan System - Variable Speed Control, Fan System Optimization w/ VSD		per HP	20	$194.93	$0.97	202	21.1%	0.027	0.68	1.36	0.71
Office	Motors	Existing	Motor - Fan System - Variable Speed Control, Fan System Optimization w/ VSD		per HP	20	$194.93	$0.54	363	21.14%	0.048	0.86	2.28	1.24
Office	Motors	New	Motor - Fan System - Variable Speed Control, Fan System Optimization w/ VSD		per HP	20	$194.93	$0.54	363	21.14%	0.048	0.86	2.28	1.24
Restaurant	Motors	Existing	Motor - Fan System - Variable Speed Control, Fan System Optimization w/ VSD		per HP	20	$194.93	$0.50	392	21.1%	0.052	0.88	2.43	1.33
Restaurant	Motors	New	Motor - Fan System - Variable Speed Control, Fan System Optimization w/ VSD		per HP	20	$194.93	$0.50	392	21.1%	0.052	0.88	2.43	1.33
Retail	Motors	Existing	Motor - Fan System - Variable Speed Control, Fan System Optimization w/ VSD		per HP	20	$194.93	$1.05	185	21.1%	0.024	0.66	1.26	0.66
Retail	Motors	New	Motor - Fan System - Variable Speed Control, Fan System Optimization w/ VSD		per HP	20	$194.93	$1.05	185	21.1%	0.024	0.66	1.26	0.66
Warehouse	Motors	Existing	Motor - Fan System - Variable Speed Control, Fan System Optimization w/ VSD		per HP	20	$194.93	$1.30	150	21.1%	0.020	0.59	1.04	0.54
Warehouse	Motors	New	Motor - Fan System - Variable Speed Control, Fan System Optimization w/ VSD		per HP	20	$194.93	$1.30	150	21.1%	0.020	0.59	1.04	0.54
Education	Motors	Existing	Motor - Pump System - Variable Speed Control, Pump System Optimization w/ VSD		per HP	20	$194.88	$1.87	104	6.3%	0.014	0.48	0.74	0.38
Education	Motors	New	Motor - Pump System - Variable Speed Control, Pump System Optimization w/ VSD		per HP	20	$194.88	$1.87	104	6.3%	0.014	0.48	0.74	0.38
Grocery	Motors	Existing	Motor - Pump System - Variable Speed Control, Pump System Optimization w/ VSD		per HP	20	$194.88	$1.03	190	6.3%	0.025	0.67	1.29	0.67
Grocery	Motors	New	Motor - Pump System - Variable Speed Control, Pump System Optimization w/ VSD		per HP	20	$194.88	$1.03	190	6.3%	0.025	0.67	1.29	0.67
Healthcare	Motors	Existing	Motor - Pump System - Variable Speed Control, Pump System Optimization w/ VSD		per HP	20	$194.88	$0.74	265	6.25%	0.035	0.77	1.74	0.92

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Healthcare	Motors	New	Motor - Pump System - Variable Speed Control, Pump System Optimization w/ VSD		per HP	20	$194.88	$0.74	265	6.25%	0.035	0.77	1.74	0.92
Lodging	Motors	Existing	Motor - Pump System - Variable Speed Control, Pump System Optimization w/ VSD		per HP	20	$194.88	$1.00	195	6.3%	0.026	0.67	1.32	0.69
Lodging	Motors	New	Motor - Pump System - Variable Speed Control, Pump System Optimization w/ VSD		per HP	20	$194.88	$1.00	195	6.3%	0.026	0.67	1.32	0.69
Miscellaneous	Motors	Existing	Motor - Pump System - Variable Speed Control, Pump System Optimization w/ VSD		per HP	20	$194.88	$2.18	90	6.3%	0.012	0.44	0.64	0.33
Miscellaneous	Motors	New	Motor - Pump System - Variable Speed Control, Pump System Optimization w/ VSD		per HP	20	$194.88	$2.18	90	6.3%	0.012	0.44	0.64	0.33
Office	Motors	Existing	Motor - Pump System - Variable Speed Control, Pump System Optimization w/ VSD		per HP	20	$194.88	$1.21	161	6.25%	0.021	0.61	1.11	0.58
Office	Motors	New	Motor - Pump System - Variable Speed Control, Pump System Optimization w/ VSD		per HP	20	$194.88	$1.21	161	6.25%	0.021	0.61	1.11	0.58
Restaurant	Motors	Existing	Motor - Pump System - Variable Speed Control, Pump System Optimization w/ VSD		per HP	20	$194.88	$1.12	174	6.3%	0.023	0.64	1.19	0.62
Restaurant	Motors	New	Motor - Pump System - Variable Speed Control, Pump System Optimization w/ VSD		per HP	20	$194.88	$1.12	174	6.3%	0.023	0.64	1.19	0.62
Retail	Motors	Existing	Motor - Pump System - Variable Speed Control, Pump System Optimization w/ VSD		per HP	20	$194.88	$2.37	82	6.3%	0.011	0.41	0.59	0.30
Retail	Motors	New	Motor - Pump System - Variable Speed Control, Pump System Optimization w/ VSD		per HP	20	$194.88	$2.37	82	6.3%	0.011	0.41	0.59	0.30
Warehouse	Motors	Existing	Motor - Pump System - Variable Speed Control, Pump System Optimization w/ VSD		per HP	20	$194.88	$2.93	66	6.3%	0.009	0.36	0.48	0.24
Warehouse	Motors	New	Motor - Pump System - Variable Speed Control, Pump System Optimization w/ VSD		per HP	20	$194.88	$2.93	66	6.3%	0.009	0.36	0.48	0.24
Education	Motors	Existing	Motor - VAV Box High-Efficiency, ECM Motors		per Measure Installed	10	$173.47	$3.62	48	8.8%	0.006	0.20	0.24	0.12
Education	Motors	New	Motor - VAV Box High-Efficiency, ECM Motors		per Measure Installed	10	$173.47	$3.62	48	8.8%	0.006	0.20	0.24	0.12
Grocery	Motors	Existing	Motor - VAV Box High-Efficiency, ECM Motors		per Measure Installed	10	$173.47	$1.99	87	8.8%	0.012	0.32	0.43	0.22
Grocery	Motors	New	Motor - VAV Box High-Efficiency, ECM Motors		per Measure Installed	10	$173.47	$1.99	87	8.8%	0.012	0.32	0.43	0.22
Healthcare	Motors	Existing	Motor - VAV Box High-Efficiency, ECM Motors		per Measure Installed	10	$173.47	$1.42	122	8.75%	0.016	0.39	0.59	0.30
Healthcare	Motors	New	Motor - VAV Box High-Efficiency, ECM Motors		per Measure Installed	10	$173.47	$1.42	122	8.75%	0.016	0.39	0.59	0.30
Miscellaneous	Motors	Existing	Motor - VAV Box High-Efficiency, ECM Motors		per Measure Installed	10	$173.47	$4.20	41	8.8%	0.005	0.18	0.21	0.10
Miscellaneous	Motors	New	Motor - VAV Box High-Efficiency, ECM Motors		per Measure Installed	10	$173.47	$4.20	41	8.8%	0.005	0.18	0.21	0.10

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Office	Motors	Existing	Motor - VAV Box High-Efficiency, ECM Motors		per Measure Installed	10	$173.47	$2.34	74	8.75%	0.010	0.28	0.37	0.19
Office	Motors	New	Motor - VAV Box High-Efficiency, ECM Motors		per Measure Installed	10	$173.47	$2.34	74	8.75%	0.010	0.28	0.37	0.19
Retail	Motors	Existing	Motor - VAV Box High-Efficiency, ECM Motors		per Measure Installed	10	$173.47	$4.58	38	8.8%	0.005	0.16	0.19	0.10
Retail	Motors	New	Motor - VAV Box High-Efficiency, ECM Motors		per Measure Installed	10	$173.47	$4.58	38	8.8%	0.005	0.16	0.19	0.10
Education	Motors	Early	Motor Retrocommissiong		Motor	7	$2,450.00	$0.27	8,984	16%	1.185	0.70	1.77	1.023
Education	Motors	Turnover	Motor Retrocommissiong		Motor	7	$2,450.00	$0.27	8,984	16%	1.185	0.70	1.77	1.023
Grocery	Motors	Early	Motor Retrocommissiong		Motor	7	$2,450.00	$0.27	8,984	16%	1.185	0.70	1.77	1.023
Grocery	Motors	Turnover	Motor Retrocommissiong		Motor	7	$2,450.00	$0.27	8,984	16%	1.185	0.70	1.77	1.023
Healthcare	Motors	Early	Motor Retrocommissiong		Motor	7	$2,450.00	$0.27	8,984	16%	1.185	0.70	1.77	1.023
Healthcare	Motors	Turnover	Motor Retrocommissiong		Motor	7	$2,450.00	$0.27	8,984	16%	1.185	0.70	1.77	1.023
Lodging	Motors	Early	Motor Retrocommissiong		Motor	7	$2,450.00	$0.27	8,984	16%	1.185	0.70	1.77	1.023
Lodging	Motors	Turnover	Motor Retrocommissiong		Motor	7	$2,450.00	$0.27	8,984	16%	1.185	0.70	1.77	1.023
misc	Motors	Early	Motor Retrocommissiong		Motor	7	$2,450.00	$0.27	8,984	16%	1.185	0.70	1.77	1.023
Misc	Motors	Turnover	Motor Retrocommissiong		Motor	7	$2,450.00	$0.27	8,984	16%	1.185	0.70	1.77	1.023
Office	Motors	Early	Motor Retrocommissiong		Motor	7	$2,450.00	$0.27	8,984	16%	1.185	0.70	1.77	1.023
Office	Motors	Turnover	Motor Retrocommissiong		Motor	7	$2,450.00	$0.27	8,984	16%	1.185	0.70	1.77	1.023
Restaurant	Motors	Early	Motor Retrocommissiong		Motor	7	$2,450.00	$0.27	8,984	16%	1.185	0.70	1.77	1.023
Restaurant	Motors	Turnover	Motor Retrocommissiong		Motor	7	$2,450.00	$0.27	8,984	16%	1.185	0.70	1.77	1.023
Retail	Motors	Early	Motor Retrocommissiong		Motor	7	$2,450.00	$0.27	8,984	16%	1.185	0.70	1.77	1.023
Retail	Motors	Turnover	Motor Retrocommissiong		Motor	7	$2,450.00	$0.27	8,984	16%	1.185	0.70	1.77	1.023
Warehouse	Motors	Early	Motor Retrocommissiong		Motor	7	$2,450.00	$0.27	8,984	16%	1.185	0.70	1.77	1.023
Warehouse	Motors	Turnover	Motor Retrocommissiong		Motor	7	$2,450.00	$0.27	8,984	16%	1.185	0.70	1.77	1.023
Education	Motors	Existing	Motors Rewind, Motor Rewind NEMA Premium, Epact and Standard Motor a&B Design		per HP	15	$4.62	$0.36	13	0.8%	0.002	0.87	2.64	1.48

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Grocery	Motors	Existing	Motors Rewind, Motor Rewind NEMA Premium, Epact and Standard Motor a&B Design		per HP	15	$4.62	$0.20	24	0.8%	0.003	0.99	4.08	2.46
Healthcare	Motors	Existing	Motors Rewind, Motor Rewind NEMA Premium, Epact and Standard Motor a&B Design		per HP	15	$860.06	$0.12	7115	1.19%	0.939	1.05	5.46	3.53
Lodging	Motors	Existing	Motors Rewind, Motor Rewind NEMA Premium, Epact and Standard Motor a&B Design		per HP	15	$4.62	$0.19	24	0.8%	0.003	0.99	4.15	2.51
Miscellaneous	Motors	Existing	Motors Rewind, Motor Rewind NEMA Premium, Epact and Standard Motor a&B Design		per HP	15	$4.62	$0.41	11	0.8%	0.001	0.84	2.35	1.30
Office	Motors	Existing	Motors Rewind, Motor Rewind NEMA Premium, Epact and Standard Motor a&B Design		per HP	15	$4.62	$0.23	20	0.78%	0.003	0.96	3.65	2.15
Restaurant	Motors	Existing	Motors Rewind, Motor Rewind NEMA Premium, Epact and Standard Motor a&B Design		per HP	15	$4.62	$0.21	22	0.8%	0.003	0.97	3.85	2.29
Retail	Motors	Existing	Motors Rewind, Motor Rewind NEMA Premium, Epact and Standard Motor a&B Design		per HP	15	$4.62	$0.45	10	0.8%	0.001	0.82	2.19	1.20
Warehouse	Motors	Existing	Motors Rewind, Motor Rewind NEMA Premium, Epact and Standard Motor a&B Design		per HP	15	$4.62	$0.56	8	0.8%	0.001	0.76	1.83	0.993
Education	Motors	Turnover	Motors: Rewind 125-200 HP	(E) Motor	Motor	15	$750.00	$0.61	1226.7	0.5%	0.162	0.74	1.69	0.91
Grocery	Motors	Turnover	Motors: Rewind 125-200 HP	(E) Motor	Motor	15	$750.00	$0.51	1471.4	0.5%	0.194	0.78	1.98	1.08
Healthcare	Motors	Turnover	Motors: Rewind 125-200 HP	(E) Motor	Motor	15	$750.00	$0.40	1889.7	0.5%	0.249	0.85	2.43	1.35
Lodging	Motors	Turnover	Motors: Rewind 125-200 HP	(E) Motor	Motor	15	$750.00	$0.52	1451.0	0.5%	0.191	0.78	1.95	1.06
misc	Motors	Turnover	Motors: Rewind 125-200 HP	(E) Motor	Motor	15	$750.00	$0.52	1451.0	0.5%	0.191	0.78	1.95	1.06
Office	Motors	Turnover	Motors: Rewind 125-200 HP	(E) Motor	Motor	15	$750.00	$0.61	1235.7	0.5%	0.163	0.74	1.71	0.92
Restaurant	Motors	Turnover	Motors: Rewind 125-200 HP	(E) Motor	Motor	15	$750.00	$0.53	1410.9	0.5%	0.186	0.77	1.91	1.036
Retail	Motors	Turnover	Motors: Rewind 125-200 HP	(E) Motor	Motor	15	$750.00	$0.51	1471.4	0.5%	0.194	0.78	1.98	1.08
Warehouse	Motors	Turnover	Motors: Rewind 125-200 HP	(E) Motor	Motor	15	$750.00	$0.52	1451.0	0.5%	0.191	0.78	1.95	1.06
Education	Motors	Turnover	Motors: Rewind 201-500 HP	(E) Motor	Motor	15	$2,000.00	$0.75	2657.9	0.5%	0.351	0.68	1.41	0.75
Grocery	Motors	Turnover	Motors: Rewind 201-500 HP	(E) Motor	Motor	15	$2,000.00	$0.63	3187.9	0.5%	0.420	0.73	1.66	0.89
Healthcare	Motors	Turnover	Motors: Rewind 201-500 HP	(E) Motor	Motor	15	$2,000.00	$0.49	4094.4	0.5%	0.540	0.80	2.05	1.12
Lodging	Motors	Turnover	Motors: Rewind 201-500 HP	(E) Motor	Motor	15	$2,000.00	$0.64	3143.8	0.5%	0.415	0.72	1.64	0.88
misc	Motors	Turnover	Motors: Rewind 201-500 HP	(E) Motor	Motor	15	$2,000.00	$0.64	3143.8	0.5%	0.415	0.72	1.64	0.88

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Office	Motors	Turnover	Motors: Rewind 201-500 HP	(E) Motor	Motor	15	$2,000.00	$0.75	2677.4	0.5%	0.353	0.68	1.42	0.76
Restaurant	Motors	Turnover	Motors: Rewind 201-500 HP	(E) Motor	Motor	15	$2,000.00	$0.65	3057.1	0.5%	0.403	0.72	1.60	0.86
Retail	Motors	Turnover	Motors: Rewind 201-500 HP	(E) Motor	Motor	15	$2,000.00	$0.63	3187.9	0.5%	0.420	0.73	1.66	0.89
Warehouse	Motors	Turnover	Motors: Rewind 201-500 HP	(E) Motor	Motor	15	$2,000.00	$0.64	3143.8	0.5%	0.415	0.72	1.64	0.88
Education	Motors	Turnover	Motors: Rewind 20-50 HP	(E) Motor	Motor	15	$250.00	$0.56	443.1	0.9%	0.058	0.76	1.81	0.981
Grocery	Motors	Turnover	Motors: Rewind 20-50 HP	(E) Motor	Motor	15	$250.00	$0.47	531.4	0.9%	0.070	0.81	2.11	1.16
Healthcare	Motors	Turnover	Motors: Rewind 20-50 HP	(E) Motor	Motor	15	$250.00	$0.37	682.5	0.9%	0.090	0.87	2.59	1.45
Lodging	Motors	Turnover	Motors: Rewind 20-50 HP	(E) Motor	Motor	15	$250.00	$0.48	524.1	0.9%	0.069	0.80	2.09	1.14
misc	Motors	Turnover	Motors: Rewind 20-50 HP	(E) Motor	Motor	15	$250.00	$0.48	524.1	0.9%	0.069	0.80	2.09	1.14
Office	Motors	Turnover	Motors: Rewind 20-50 HP	(E) Motor	Motor	15	$250.00	$0.56	446.3	0.9%	0.059	0.76	1.83	0.988
Restaurant	Motors	Turnover	Motors: Rewind 20-50 HP	(E) Motor	Motor	15	$250.00	$0.49	509.6	0.9%	0.067	0.79	2.04	1.11
Retail	Motors	Turnover	Motors: Rewind 20-50 HP	(E) Motor	Motor	15	$250.00	$0.47	531.4	0.9%	0.070	0.81	2.11	1.16
Warehouse	Motors	Turnover	Motors: Rewind 20-50 HP	(E) Motor	Motor	15	$250.00	$0.48	524.1	0.9%	0.069	0.80	2.09	1.14
Education	Motors	Turnover	Motors: Rewind 500+ HP	(E) Motor	Motor	15	$4,000.00	$0.65	6133.7	0.5%	0.809	0.72	1.60	0.86
Grocery	Motors	Turnover	Motors: Rewind 500+ HP	(E) Motor	Motor	15	$4,000.00	$0.54	7356.8	0.5%	0.970	0.77	1.87	1.015
Healthcare	Motors	Turnover	Motors: Rewind 500+ HP	(E) Motor	Motor	15	$4,000.00	$0.42	9448.6	0.5%	1.246	0.83	2.30	1.27
Lodging	Motors	Turnover	Motors: Rewind 500+ HP	(E) Motor	Motor	15	$4,000.00	$0.55	7254.9	0.5%	0.957	0.76	1.85	1.002
misc	Motors	Turnover	Motors: Rewind 500+ HP	(E) Motor	Motor	15	$4,000.00	$0.55	7254.9	0.5%	0.957	0.76	1.85	1.002
Office	Motors	Turnover	Motors: Rewind 500+ HP	(E) Motor	Motor	15	$4,000.00	$0.65	6178.6	0.5%	0.815	0.72	1.61	0.86
Restaurant	Motors	Turnover	Motors: Rewind 500+ HP	(E) Motor	Motor	15	$4,000.00	$0.57	7054.7	0.5%	0.931	0.76	1.81	0.977
Retail	Motors	Turnover	Motors: Rewind 500+ HP	(E) Motor	Motor	15	$4,000.00	$0.54	7356.8	0.5%	0.970	0.77	1.87	1.015
Warehouse	Motors	Turnover	Motors: Rewind 500+ HP	(E) Motor	Motor	15	$4,000.00	$0.55	7254.9	0.5%	0.957	0.76	1.85	1.002
Education	Motors	Turnover	Motors: Rewind 51-100 HP	(E) Motor	Motor	15	$500.00	$0.70	713.7	0.6%	0.094	0.70	1.51	0.80
Grocery	Motors	Turnover	Motors: Rewind 51-100 HP	(E) Motor	Motor	15	$500.00	$0.58	856.0	0.6%	0.113	0.75	1.76	0.950
Healthcare	Motors	Turnover	Motors: Rewind 51-100 HP	(E) Motor	Motor	15	$500.00	$0.45	1099.4	0.6%	0.145	0.81	2.17	1.19
Lodging	Motors	Turnover	Motors: Rewind 51-100 HP	(E) Motor	Motor	15	$500.00	$0.59	844.1	0.6%	0.111	0.74	1.74	0.94

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
misc	Motors	Turnover	Motors: Rewind 51-100 HP	(E) Motor	Motor	15	$500.00	$0.59	844.1	0.6%	0.111	0.74	1.74	0.94
Office	Motors	Turnover	Motors: Rewind 51-100 HP	(E) Motor	Motor	15	$500.00	$0.70	718.9	0.6%	0.095	0.70	1.52	0.81
Restaurant	Motors	Turnover	Motors: Rewind 51-100 HP	(E) Motor	Motor	15	$500.00	$0.61	820.8	0.6%	0.108	0.74	1.70	0.91
Retail	Motors	Turnover	Motors: Rewind 51-100 HP	(E) Motor	Motor	15	$500.00	$0.58	856.0	0.6%	0.113	0.75	1.76	0.950
Warehouse	Motors	Turnover	Motors: Rewind 51-100 HP	(E) Motor	Motor	15	$500.00	$0.59	844.1	0.6%	0.111	0.74	1.74	0.94
Education	Motors	Existing	Optimized Variable Volume Lab Hood Design, Optimized Variable Volume Lab Hood Design		per Measure Installed	10	$1,704.50	$2.69	635	1.6%	0.084	0.25	0.32	0.16
Education	Motors	New	Optimized Variable Volume Lab Hood Design, Optimized Variable Volume Lab Hood Design		per Measure Installed	10	$1,704.50	$2.69	635	1.6%	0.084	0.25	0.32	0.16
Healthcare	Motors	Existing	Optimized Variable Volume Lab Hood Design, Optimized Variable Volume Lab Hood Design		per Measure Installed	10	$1,715.50	$0.09	19028	1.60%	2.510	0.96	4.68	3.18
Healthcare	Motors	New	Optimized Variable Volume Lab Hood Design, Optimized Variable Volume Lab Hood Design		per Measure Installed	10	$904.25	$0.04	24595	4.13%	3.244	1.02	6.51	5.13
Miscellaneous	Motors	Existing	Optimized Variable Volume Lab Hood Design, Optimized Variable Volume Lab Hood Design		per Measure Installed	10	$1,705.24	$10.75	159	1.6%	0.021	0.08	0.08	0.04
Miscellaneous	Motors	New	Optimized Variable Volume Lab Hood Design, Optimized Variable Volume Lab Hood Design		per Measure Installed	10	$1,705.24	$10.75	159	1.6%	0.021	0.08	0.08	0.04
Retail	Motors	Existing	Optimized Variable Volume Lab Hood Design, Optimized Variable Volume Lab Hood Design		per Measure Installed	10	$1,704.60	$10.88	157	1.6%	0.021	0.08	0.08	0.04
Retail	Motors	New	Optimized Variable Volume Lab Hood Design, Optimized Variable Volume Lab Hood Design		per Measure Installed	10	$1,704.60	$10.88	157	1.6%	0.021	0.08	0.08	0.04
Education	Motors	New	Variable Speed Drives on Process Equipment (1 hp - 100hp)	Constant speed control	Motor	15	$11,000.00	$0.68	16,275	20%	2.147	0.71	1.55	0.83
Education	Motors	Turnover	Variable Speed Drives on Process Equipment (1 hp - 100hp)	Constant speed control	Motor	15	$11,000.00	$0.68	16,275	20%	2.147	0.71	1.55	0.83
Grocery	Motors	New	Variable Speed Drives on Process Equipment (1 hp - 100hp)	Constant speed control	Motor	15	$11,000.00	$0.56	19,520	20%	2.575	0.76	1.82	0.982
Grocery	Motors	Turnover	Variable Speed Drives on Process Equipment (1 hp - 100hp)	Constant speed control	Motor	15	$11,000.00	$0.56	19,520	20%	2.575	0.76	1.82	0.982
Healthcare	Motors	New	Variable Speed Drives on Process Equipment (1 hp - 100hp)	Constant speed control	Motor	15	$11,000.00	$0.44	25,070	20%	3.307	0.82	2.24	1.23
Healthcare	Motors	Turnover	Variable Speed Drives on Process Equipment (1 hp - 100hp)	Constant speed control	Motor	15	$11,000.00	$0.44	25,070	20%	3.307	0.82	2.24	1.23
Lodging	Motors	New	Variable Speed Drives on Process Equipment (1 hp - 100hp)	Constant speed control	Motor	15	$11,000.00	$0.57	19,250	20%	2.539	0.75	1.80	0.970
Lodging	Motors	Turnover	Variable Speed Drives on Process Equipment (1 hp - 100hp)	Constant speed control	Motor	15	$11,000.00	$0.57	19,250	20%	2.539	0.75	1.80	0.970
misc	Motors	New	Variable Speed Drives on Process Equipment (1 hp - 100hp)	Constant speed control	Motor	15	$11,000.00	$0.57	19,250	20%	2.539	0.75	1.80	0.970

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
misc	Motors	Turnover	Variable Speed Drives on Process Equipment (1 hp - 100hp)	Constant speed control	Motor	15	$11,000.00	$0.57	19,250	20%	2.539	0.75	1.80	0.970
Office	Motors	New	Variable Speed Drives on Process Equipment (1 hp - 100hp)	Constant speed control	Motor	15	$11,000.00	$0.67	16,394	20%	2.162	0.71	1.56	0.84
Office	Motors	Turnover	Variable Speed Drives on Process Equipment (1 hp - 100hp)	Constant speed control	Motor	15	$11,000.00	$0.67	16,394	20%	2.162	0.71	1.56	0.84
Restaurant	Motors	New	Variable Speed Drives on Process Equipment (1 hp - 100hp)	Constant speed control	Motor	15	$11,000.00	$0.59	18,719	20%	2.469	0.75	1.75	0.945
Restaurant	Motors	Turnover	Variable Speed Drives on Process Equipment (1 hp - 100hp)	Constant speed control	Motor	15	$11,000.00	$0.59	18,719	20%	2.469	0.75	1.75	0.945
Retail	Motors	New	Variable Speed Drives on Process Equipment (1 hp - 100hp)	Constant speed control	Motor	15	$11,000.00	$0.56	19,520	20%	2.575	0.76	1.82	0.982
Retail	Motors	Turnover	Variable Speed Drives on Process Equipment (1 hp - 100hp)	Constant speed control	Motor	15	$11,000.00	$0.56	19,520	20%	2.575	0.76	1.82	0.982
Warehouse	Motors	New	Variable Speed Drives on Process Equipment (1 hp - 100hp)	Constant speed control	Motor	15	$11,000.00	$0.57	19,250	20%	2.539	0.75	1.80	0.970
Warehouse	Motors	Turnover	Variable Speed Drives on Process Equipment (1 hp - 100hp)	Constant speed control	Motor	15	$11,000.00	$0.57	19,250	20%	2.539	0.75	1.80	0.970
Education	Motors	Existing	VAV Boxes, Variable Air Volume		per Building Sq Ft	10	$1.19	$8.59	0	12.0%	0.000	0.09	0.10	0.05
Education	Motors	New	VAV Boxes, Variable Air Volume		per Building Sq Ft	10	$1.19	$8.59	0	12.0%	0.000	0.09	0.10	0.05
Grocery	Motors	Existing	VAV Boxes, Variable Air Volume		per Building Sq Ft	10	$1.19	$4.72	0	12.0%	0.000	0.16	0.18	0.09
Grocery	Motors	New	VAV Boxes, Variable Air Volume		per Building Sq Ft	10	$1.19	$4.72	0	12.0%	0.000	0.16	0.18	0.09
Healthcare	Motors	Existing	VAV Boxes, Variable Air Volume		per Building Sq Ft	10	$1.19	$3.38	0	12.00%	0.000	0.21	0.26	0.13
Healthcare	Motors	New	VAV Boxes, Variable Air Volume		per Building Sq Ft	10	$1.19	$3.38	0	12.00%	0.000	0.21	0.26	0.13
Lodging	Motors	Existing	VAV Boxes, Variable Air Volume		per Building Sq Ft	10	$1.19	$4.59	0	12.0%	0.000	0.16	0.19	0.10
Lodging	Motors	New	VAV Boxes, Variable Air Volume		per Building Sq Ft	10	$1.19	$4.59	0	12.0%	0.000	0.16	0.19	0.10
Miscellaneous	Motors	Existing	VAV Boxes, Variable Air Volume		per Building Sq Ft	10	$1.19	$9.98	0	12.0%	0.000	0.08	0.09	0.04
Miscellaneous	Motors	New	VAV Boxes, Variable Air Volume		per Building Sq Ft	10	$1.19	$9.98	0	12.0%	0.000	0.08	0.09	0.04
Office	Motors	Existing	VAV Boxes, Variable Air Volume		per Building Sq Ft	10	$1.19	$5.55	0	12.00%	0.000	0.14	0.16	0.08

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Office	Motors	New	VAV Boxes, Variable Air Volume		per Building Sq Ft	10	$1.19	$5.55	0	12.00%	0.000	0.14	0.16	0.08
Restaurant	Motors	Existing	VAV Boxes, Variable Air Volume		per Building Sq Ft	10	$1.19	$5.14	0	12.0%	0.000	0.15	0.17	0.09
Restaurant	Motors	New	VAV Boxes, Variable Air Volume		per Building Sq Ft	10	$1.19	$5.14	0	12.0%	0.000	0.15	0.17	0.09
Retail	Motors	Existing	VAV Boxes, Variable Air Volume		per Building Sq Ft	10	$1.19	$10.88	0	12.0%	0.000	0.08	0.08	0.04
Retail	Motors	New	VAV Boxes, Variable Air Volume		per Building Sq Ft	10	$1.19	$10.88	0	12.0%	0.000	0.08	0.08	0.04
Warehouse	Motors	Existing	VAV Boxes, Variable Air Volume		per Building Sq Ft	10	$1.19	$13.44	0	12.0%	0.000	0.06	0.07	0.03
Warehouse	Motors	New	VAV Boxes, Variable Air Volume		per Building Sq Ft	10	$1.19	$13.44	0	12.0%	0.000	0.06	0.07	0.03
All	Office Equipment	New	80 Plus® PC-desktop	Standard personal computer, desktop	PC	5	$25.00	$0.19	130	31.71%	0.021	0.69	1.78	1.08
All	Office Equipment	Turnover	80 Plus® PC-desktop	Standard personal computer, desktop	PC	5	$25.00	$0.19	130	31.71%	0.021	0.69	1.78	1.08
All	Office Equipment	New	Data Center - Server/Storage Virtualization	No Virtualization	unit	5	$7,434.05	$1.76	4,227	87.73%	0.672	0.22	0.28	0.14
All	Office Equipment	Turnover	Data Center - Server/Storage Virtualization	No Virtualization	unit	5	$7,434.05	$1.76	4,227	87.73%	0.672	0.22	0.28	0.14
All	Office Equipment	New	Energy Star - Water Cooler	Std Water Cooler	unit	5	$215.67	$1.06	204	45.08%	0.032	0.32	0.45	0.24
All	Office Equipment	Turnover	Energy Star - Water Cooler	Std Water Cooler	unit	5	$215.67	$1.06	204	45.08%	0.032	0.32	0.45	0.24
All	Office Equipment	New	ENERGY STAR® Office Equipment	Std Office Equipment	PC	5	$218.00	$1.09	200	5.00%	0.032	0.32	0.44	0.23
All	Office Equipment	Turnover	ENERGY STAR® Office Equipment	Std Office Equipment	PC	5	$218.00	$1.09	200	5.00%	0.032	0.32	0.44	0.23
All	Office Equipment	Early	Occupancy sensor controls/Smart Strip	Computers, other plug loads	sensor	5	$75.00	$0.60	124	30.02%	0.020	0.45	0.74	0.40
All	Office Equipment	Early	PC network power management	No central control	PC	5	$30.00	$0.14	215	52.44%	0.034	0.74	2.18	1.37

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
All	Other	Turnover	EE Transformer - CSL 3	NEMA Transformer - 75W	Motor	15	$950.00	$0.60	1,595	23%	0.254	0.76	1.83	0.988
All	Other	New	EE Transformer - CSL 3	NEMA Transformer - 75W	Motor	15	$950.00	$0.60	1,595	23%	0.254	0.76	1.83	0.988
All	Other	Turnover	Motor Improvements Bundle - Industrial Model	No Motor Improvements	Motor	14	$522.00	$0.48	1,092	11%	0.174	0.80	2.10	1.15
Education	Packaged DX	Existing	(DX) Packaged Air Conditioner System, Advanced-Efficiency 12.5 EER Rooftop Unit Tier 3		per Ton	15	$168.01	$7.45	23	10.4%	0.006	0.17	0.20	0.10
Education	Packaged DX	New	(DX) Packaged Air Conditioner System, Advanced-Efficiency 12.5 EER Rooftop Unit Tier 3		per Ton	15	$167.99	$5.96	28	10.4%	0.007	0.21	0.25	0.13
Grocery	Packaged DX	Existing	(DX) Packaged Air Conditioner System, Advanced-Efficiency 12.5 EER Rooftop Unit Tier 3		per Ton	15	$168.00	$1.88	89	10.4%	0.023	0.48	0.76	0.39
Grocery	Packaged DX	New	(DX) Packaged Air Conditioner System, Advanced-Efficiency 12.5 EER Rooftop Unit Tier 3		per Ton	15	$168.00	$1.50	112	10.4%	0.029	0.55	0.94	0.49
Healthcare	Packaged DX	Existing	(DX) Packaged Air Conditioner System, Advanced-Efficiency 12.5 EER Rooftop Unit Tier 3		per Ton	15	$168.00	$2.45	69	10.40%	0.018	0.41	0.59	0.30
Healthcare	Packaged DX	New	(DX) Packaged Air Conditioner System, Advanced-Efficiency 12.5 EER Rooftop Unit Tier 3		per Ton	15	$168.00	$1.96	86	10.40%	0.022	0.47	0.73	0.38
Lodging	Packaged DX	Existing	(DX) Packaged Air Conditioner System, Advanced-Efficiency 12.5 EER Rooftop Unit Tier 3		per Ton	15	$168.00	$1.91	88	10.4%	0.023	0.48	0.75	0.39
Lodging	Packaged DX	New	(DX) Packaged Air Conditioner System, Advanced-Efficiency 12.5 EER Rooftop Unit Tier 3		per Ton	15	$168.00	$1.53	110	10.4%	0.028	0.54	0.93	0.48
Miscellaneous	Packaged DX	Existing	(DX) Packaged Air Conditioner System, Advanced-Efficiency 12.5 EER Rooftop Unit Tier 3		per Ton	15	$167.99	$2.91	58	10.4%	0.015	0.36	0.50	0.26
Miscellaneous	Packaged DX	New	(DX) Packaged Air Conditioner System, Advanced-Efficiency 12.5 EER Rooftop Unit Tier 3		per Ton	15	$168.00	$2.33	72	10.4%	0.019	0.42	0.62	0.32
Office	Packaged DX	Existing	(DX) Packaged Air Conditioner System, Advanced-Efficiency 12.5 EER Rooftop Unit Tier 3		per Ton	15	$168.00	$2.38	71	10.40%	0.018	0.42	0.61	0.31
Office	Packaged DX	New	(DX) Packaged Air Conditioner System, Advanced-Efficiency 12.5 EER Rooftop Unit Tier 3		per Ton	15	$167.99	$1.93	87	10.40%	0.022	0.48	0.74	0.38
Restaurant	Packaged DX	Existing	(DX) Packaged Air Conditioner System, Advanced-Efficiency 12.5 EER Rooftop Unit Tier 3		per Ton	15	$168.00	$3.42	49	10.4%	0.013	0.32	0.43	0.22
Restaurant	Packaged DX	New	(DX) Packaged Air Conditioner System, Advanced-Efficiency 12.5 EER Rooftop Unit Tier 3		per Ton	15	$168.00	$2.74	61	10.4%	0.016	0.38	0.53	0.27
Retail	Packaged DX	Existing	(DX) Packaged Air Conditioner System, Advanced-Efficiency 12.5 EER Rooftop Unit Tier 3		per Ton	15	$168.00	$6.67	25	10.4%	0.007	0.19	0.22	0.11

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Retail	Packaged DX	New	(DX) Packaged Air Conditioner System, Advanced-Efficiency 12.5 EER Rooftop Unit Tier 3		per Ton	15	$168.00	$5.33	31	10.4%	0.008	0.23	0.28	0.14
Warehouse	Packaged DX	Existing	(DX) Packaged Air Conditioner System, Advanced-Efficiency 12.5 EER Rooftop Unit Tier 3		per Ton	15	$168.00	$19.16	9	10.4%	0.002	0.07	0.08	0.04
Warehouse	Packaged DX	New	(DX) Packaged Air Conditioner System, Advanced-Efficiency 12.5 EER Rooftop Unit Tier 3		per Ton	15	$168.00	$15.33	11	10.4%	0.003	0.09	0.10	0.05
Education	Packaged DX	Existing	(DX) Packaged Air Conditioner System, High-Efficiency 11.5 EER Rooftop Unit (CEE Tier 1)		per Ton	15	$47.00	$8.31	6	2.6%	0.001	0.16	0.18	0.09
Education	Packaged DX	New	(DX) Packaged Air Conditioner System, High-Efficiency 11.5 EER Rooftop Unit (CEE Tier 1)		per Ton	15	$47.00	$6.65	7	2.6%	0.002	0.19	0.22	0.11
Grocery	Packaged DX	Existing	(DX) Packaged Air Conditioner System, High-Efficiency 11.5 EER Rooftop Unit (CEE Tier 1)		per Ton	15	$47.01	$2.10	22	2.6%	0.006	0.45	0.69	0.35
Grocery	Packaged DX	New	(DX) Packaged Air Conditioner System, High-Efficiency 11.5 EER Rooftop Unit (CEE Tier 1)		per Ton	15	$46.99	$1.68	28	2.6%	0.007	0.52	0.85	0.44
Healthcare	Packaged DX	Existing	(DX) Packaged Air Conditioner System, High-Efficiency 11.5 EER Rooftop Unit (CEE Tier 1)		per Ton	15	$47.01	$2.73	17	2.61%	0.004	0.38	0.53	0.27
Healthcare	Packaged DX	New	(DX) Packaged Air Conditioner System, High-Efficiency 11.5 EER Rooftop Unit (CEE Tier 1)		per Ton	15	$46.99	$2.19	21	2.61%	0.006	0.44	0.66	0.34
Lodging	Packaged DX	Existing	(DX) Packaged Air Conditioner System, High-Efficiency 11.5 EER Rooftop Unit (CEE Tier 1)		per Ton	15	$47.01	$2.13	22	2.6%	0.006	0.45	0.68	0.35
Lodging	Packaged DX	New	(DX) Packaged Air Conditioner System, High-Efficiency 11.5 EER Rooftop Unit (CEE Tier 1)		per Ton	15	$46.99	$1.71	28	2.6%	0.007	0.51	0.84	0.43
Miscellaneous	Packaged DX	Existing	(DX) Packaged Air Conditioner System, High-Efficiency 11.5 EER Rooftop Unit (CEE Tier 1)		per Ton	15	$47.01	$3.25	14	2.6%	0.004	0.34	0.45	0.23
Miscellaneous	Packaged DX	New	(DX) Packaged Air Conditioner System, High-Efficiency 11.5 EER Rooftop Unit (CEE Tier 1)		per Ton	15	$46.99	$2.60	18	2.6%	0.005	0.39	0.56	0.29
Office	Packaged DX	Existing	(DX) Packaged Air Conditioner System, High-Efficiency 11.5 EER Rooftop Unit (CEE Tier 1)		per Ton	15	$47.00	$2.65	18	2.61%	0.005	0.39	0.55	0.28
Office	Packaged DX	New	(DX) Packaged Air Conditioner System, High-Efficiency 11.5 EER Rooftop Unit (CEE Tier 1)		per Ton	15	$47.00	$2.16	22	2.61%	0.006	0.44	0.67	0.34
Restaurant	Packaged DX	Existing	(DX) Packaged Air Conditioner System, High-Efficiency 11.5 EER Rooftop Unit (CEE Tier 1)		per Ton	15	$47.00	$3.81	12	2.6%	0.003	0.30	0.39	0.20
Restaurant	Packaged DX	New	(DX) Packaged Air Conditioner System, High-Efficiency 11.5 EER Rooftop Unit (CEE Tier 1)		per Ton	15	$47.01	$3.05	15	2.6%	0.004	0.35	0.48	0.24

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Retail	Packaged DX	Existing	(DX) Packaged Air Conditioner System, High-Efficiency 11.5 EER Rooftop Unit (CEE Tier 1)		per Ton	15	$47.00	$7.44	6	2.6%	0.002	0.17	0.20	0.10
Retail	Packaged DX	New	(DX) Packaged Air Conditioner System, High-Efficiency 11.5 EER Rooftop Unit (CEE Tier 1)		per Ton	15	$47.00	$5.95	8	2.6%	0.002	0.21	0.25	0.13
Warehouse	Packaged DX	Existing	(DX) Packaged Air Conditioner System, High-Efficiency 11.5 EER Rooftop Unit (CEE Tier 1)		per Ton	15	$47.00	$21.37	2	2.6%	0.001	0.07	0.07	0.04
Warehouse	Packaged DX	New	(DX) Packaged Air Conditioner System, High-Efficiency 11.5 EER Rooftop Unit (CEE Tier 1)		per Ton	15	$47.00	$17.10	3	2.6%	0.001	0.08	0.09	0.04
Education	Packaged DX	Existing	(DX) Packaged Air Conditioner System, Premium-Efficiency 12.0 EER Rooftop Unit (CEE Tier 2)		per Ton	15	$92.99	$6.43	14	6.7%	0.004	0.20	0.23	0.12
Education	Packaged DX	New	(DX) Packaged Air Conditioner System, Premium-Efficiency 12.0 EER Rooftop Unit (CEE Tier 2)		per Ton	15	$93.01	$5.15	18	6.7%	0.005	0.24	0.29	0.15
Grocery	Packaged DX	Existing	(DX) Packaged Air Conditioner System, Premium-Efficiency 12.0 EER Rooftop Unit (CEE Tier 2)		per Ton	15	$93.00	$1.62	57	6.7%	0.015	0.53	0.88	0.45
Grocery	Packaged DX	New	(DX) Packaged Air Conditioner System, Premium-Efficiency 12.0 EER Rooftop Unit (CEE Tier 2)		per Ton	15	$93.00	$1.30	72	6.7%	0.019	0.59	1.08	0.56
Healthcare	Packaged DX	Existing	(DX) Packaged Air Conditioner System, Premium-Efficiency 12.0 EER Rooftop Unit (CEE Tier 2)		per Ton	15	$93.00	$1.43	65	6.67%	0.017	0.56	0.99	0.51
Healthcare	Packaged DX	New	(DX) Packaged Air Conditioner System, Premium-Efficiency 12.0 EER Rooftop Unit (CEE Tier 2)		per Ton	15	$112.75	$0.85	133	4.69%	0.035	0.72	1.60	0.84
Lodging	Packaged DX	Existing	(DX) Packaged Air Conditioner System, Premium-Efficiency 12.0 EER Rooftop Unit (CEE Tier 2)		per Ton	15	$93.00	$1.65	56	6.7%	0.015	0.52	0.86	0.44
Lodging	Packaged DX	New	(DX) Packaged Air Conditioner System, Premium-Efficiency 12.0 EER Rooftop Unit (CEE Tier 2)		per Ton	15	$93.00	$1.32	70	6.7%	0.018	0.59	1.06	0.55
Miscellaneous	Packaged DX	Existing	(DX) Packaged Air Conditioner System, Premium-Efficiency 12.0 EER Rooftop Unit (CEE Tier 2)		per Ton	15	$93.00	$2.52	37	6.7%	0.010	0.40	0.58	0.29
Miscellaneous	Packaged DX	New	(DX) Packaged Air Conditioner System, Premium-Efficiency 12.0 EER Rooftop Unit (CEE Tier 2)		per Ton	15	$93.00	$2.01	46	6.7%	0.012	0.46	0.72	0.37
Office	Packaged DX	Existing	(DX) Packaged Air Conditioner System, Premium-Efficiency 12.0 EER Rooftop Unit (CEE Tier 2)		per Ton	15	$93.01	$2.05	45	6.67%	0.012	0.46	0.70	0.36
Office	Packaged DX	New	(DX) Packaged Air Conditioner System, Premium-Efficiency 12.0 EER Rooftop Unit (CEE Tier 2)		per Ton	15	$93.00	$1.67	56	6.67%	0.014	0.52	0.86	0.44
Restaurant	Packaged DX	Existing	(DX) Packaged Air Conditioner System, Premium-Efficiency 12.0 EER Rooftop Unit (CEE Tier 2)		per Ton	15	$93.00	$2.95	31	6.7%	0.008	0.36	0.50	0.25

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Restaurant	Packaged DX	New	(DX) Packaged Air Conditioner System, Premium-Efficiency 12.0 EER Rooftop Unit (CEE Tier 2)		per Ton	15	$93.00	$2.36	39	6.7%	0.010	0.42	0.61	0.31
Retail	Packaged DX	Existing	(DX) Packaged Air Conditioner System, Premium-Efficiency 12.0 EER Rooftop Unit (CEE Tier 2)		per Ton	15	$93.00	$5.76	16	6.7%	0.004	0.22	0.26	0.13
Retail	Packaged DX	New	(DX) Packaged Air Conditioner System, Premium-Efficiency 12.0 EER Rooftop Unit (CEE Tier 2)		per Ton	15	$93.00	$4.61	20	6.7%	0.005	0.26	0.32	0.16
Warehouse	Packaged DX	Existing	(DX) Packaged Air Conditioner System, Premium-Efficiency 12.0 EER Rooftop Unit (CEE Tier 2)		per Ton	15	$93.00	$16.55	6	6.7%	0.001	0.09	0.09	0.05
Warehouse	Packaged DX	New	(DX) Packaged Air Conditioner System, Premium-Efficiency 12.0 EER Rooftop Unit (CEE Tier 2)		per Ton	15	$93.00	$13.24	7	6.7%	0.002	0.10	0.11	0.06
Education	Packaged DX	Existing	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$750.00	$2.60	288	10.0%	0.075	0.39	0.56	0.29
Education	Packaged DX	New	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$399.90	$1.42	282	10.0%	0.073	0.57	1.00	0.52
Healthcare	Packaged DX	Existing	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$750.00	$1.14	657	10.00%	0.170	0.63	1.22	0.64
Healthcare	Packaged DX	New	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$399.90	$0.62	645	10.00%	0.167	0.81	2.10	1.13
Lodging	Packaged DX	Existing	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$750.00	$4.45	168	2.0%	0.044	0.27	0.33	0.17
Lodging	Packaged DX	New	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$399.90	$2.42	166	2.0%	0.043	0.41	0.60	0.31
Miscellaneous	Packaged DX	Existing	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$750.00	$1.27	589	10.0%	0.152	0.60	1.10	0.57
Miscellaneous	Packaged DX	New	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$399.90	$0.69	578	10.0%	0.150	0.78	1.91	1.021
Office	Packaged DX	Existing	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$750.00	$1.16	646	10.00%	0.167	0.63	1.20	0.62

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Office	Packaged DX	New	Automated Ventilation VFD Control (Occupancy Sensors / CO2 Sensors), Demand Controlled Ventilation (CO2 sensors)		0.33 units per 1,000 Sq Ft	15	$399.90	$0.63	634	10.00%	0.164	0.80	2.07	1.11
Education	Packaged DX	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$6.22	0	12.5%	0.000	0.06	0.06	0.03
Grocery	Packaged DX	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$2.08	0	12.5%	0.000	0.15	0.18	0.09
Healthcare	Packaged DX	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$2.71	0	12.50%	0.000	0.12	0.14	0.07
Lodging	Packaged DX	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$2.12	0	12.5%	0.000	0.15	0.18	0.09
Miscellaneous	Packaged DX	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$3.03	0	12.5%	0.000	0.11	0.12	0.06
Office	Packaged DX	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$2.76	0	12.50%	0.000	0.12	0.14	0.07
Restaurant	Packaged DX	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$1.88	0	12.5%	0.000	0.17	0.20	0.10
Retail	Packaged DX	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$4.92	0	12.5%	0.000	0.07	0.08	0.04
Warehouse	Packaged DX	New	Commissioning - New Building Commissioning, Commissioning - New Building Commissioning		per Building Sq Ft	3	$0.73	$28.13	0	12.5%	0.000	0.01	0.01	0.01
Education	Packaged DX	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$1.64	0	12.5%	0.000	0.19	0.22	0.12
Grocery	Packaged DX	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$0.55	0	12.5%	0.000	0.39	0.60	0.32
Healthcare	Packaged DX	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$0.72	0	12.50%	0.000	0.33	0.48	0.25
Lodging	Packaged DX	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$0.56	0	12.5%	0.000	0.38	0.59	0.32
Miscellaneous	Packaged DX	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$0.80	0	12.5%	0.000	0.31	0.43	0.23
Office	Packaged DX	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$0.73	0	12.50%	0.000	0.33	0.47	0.25
Restaurant	Packaged DX	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$0.50	0	12.5%	0.000	0.41	0.65	0.35

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Retail	Packaged DX	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$1.30	0	12.5%	0.000	0.22	0.28	0.14
Warehouse	Packaged DX	Existing	Commissioning - Retro Building Commissioning, Commissioning - Retro Building Commissioning		per Building Sq Ft	3	$0.20	$7.49	0	12.5%	0.000	0.05	0.05	0.03
Education	Packaged DX	Existing	Cooling DX Package-Air Side Economizer, Air-Side Economizer		per Ton	15	$170.10	$5.25	32	15.0%	0.008	0.23	0.28	0.14
Grocery	Packaged DX	Existing	Cooling DX Package-Air Side Economizer, Air-Side Economizer		per Ton	15	$170.10	$1.32	129	15.0%	0.033	0.59	1.06	0.55
Healthcare	Packaged DX	Existing	Cooling DX Package-Air Side Economizer, Air-Side Economizer		per Ton	15	$170.10	$1.73	99	15.00%	0.026	0.51	0.83	0.43
Lodging	Packaged DX	Existing	Cooling DX Package-Air Side Economizer, Air-Side Economizer		per Ton	15	$170.10	$1.35	126	15.0%	0.033	0.58	1.05	0.54
Miscellaneous	Packaged DX	Existing	Cooling DX Package-Air Side Economizer, Air-Side Economizer		per Ton	15	$170.11	$2.05	83	15.0%	0.021	0.46	0.70	0.36
Office	Packaged DX	Existing	Cooling DX Package-Air Side Economizer, Air-Side Economizer		per Ton	15	$170.10	$1.67	102	15.00%	0.026	0.52	0.85	0.44
Restaurant	Packaged DX	Existing	Cooling DX Package-Air Side Economizer, Air-Side Economizer		per Ton	15	$170.10	$2.40	71	15.0%	0.018	0.41	0.60	0.31
Retail	Packaged DX	Existing	Cooling DX Package-Air Side Economizer, Air-Side Economizer		per Ton	15	$170.10	$4.69	36	15.0%	0.009	0.25	0.32	0.16
Warehouse	Packaged DX	Existing	Cooling DX Package-Air Side Economizer, Air-Side Economizer		per Ton	15	$170.12	$13.47	13	15.0%	0.003	0.10	0.11	0.06
Education	Packaged DX	Existing	Direct / Indirect Evaporative Cooling, Pre-Cooling, Direct / Indirect Evaporative Cooling, Pre-Cooling		per Building Sq Ft	15	$2.08	$8.68	0	25.0%	0.000	0.15	0.17	0.09
Education	Packaged DX	New	Direct / Indirect Evaporative Cooling, Pre-Cooling, Direct / Indirect Evaporative Cooling, Pre-Cooling		per Building Sq Ft	15	$2.08	$8.87	0	25.0%	0.000	0.15	0.17	0.08
Grocery	Packaged DX	Existing	Direct / Indirect Evaporative Cooling, Pre-Cooling, Direct / Indirect Evaporative Cooling, Pre-Cooling		per Building Sq Ft	15	$2.08	$2.92	1	25.0%	0.000	0.36	0.50	0.25
Grocery	Packaged DX	New	Direct / Indirect Evaporative Cooling, Pre-Cooling, Direct / Indirect Evaporative Cooling, Pre-Cooling		per Building Sq Ft	15	$2.08	$2.97	1	25.0%	0.000	0.36	0.49	0.25
Healthcare	Packaged DX	Existing	Direct / Indirect Evaporative Cooling, Pre-Cooling, Direct / Indirect Evaporative Cooling, Pre-Cooling		per Building Sq Ft	15	$2.08	$3.81	1	25.00%	0.000	0.30	0.39	0.20
Healthcare	Packaged DX	New	Direct / Indirect Evaporative Cooling, Pre-Cooling, Direct / Indirect Evaporative Cooling, Pre-Cooling		per Building Sq Ft	15	$2.08	$3.87	1	25.00%	0.000	0.30	0.38	0.19
Lodging	Packaged DX	Existing	Direct / Indirect Evaporative Cooling, Pre-Cooling, Direct / Indirect Evaporative Cooling, Pre-Cooling		per Building Sq Ft	15	$2.08	$2.97	1	25.0%	0.000	0.36	0.49	0.25
Lodging	Packaged DX	New	Direct / Indirect Evaporative Cooling, Pre-Cooling, Direct / Indirect Evaporative Cooling, Pre-Cooling		per Building Sq Ft	15	$2.08	$3.02	1	25.0%	0.000	0.35	0.48	0.25
Miscellaneous	Packaged DX	Existing	Direct / Indirect Evaporative Cooling, Pre-Cooling, Direct / Indirect Evaporative Cooling, Pre-Cooling		per Building Sq Ft	15	$2.08	$4.25	0	25.0%	0.000	0.28	0.35	0.18

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Miscellaneous	Packaged DX	New	Direct / Indirect Evaporative Cooling, Pre-Cooling, Direct / Indirect Evaporative Cooling, Pre-Cooling		per Building Sq Ft	15	$2.08	$4.32	0	25.0%	0.000	0.27	0.34	0.17
Office	Packaged DX	Existing	Direct / Indirect Evaporative Cooling, Pre-Cooling, Direct / Indirect Evaporative Cooling, Pre-Cooling		per Building Sq Ft	15	$2.08	$3.87	1	25.00%	0.000	0.30	0.38	0.19
Office	Packaged DX	New	Direct / Indirect Evaporative Cooling, Pre-Cooling, Direct / Indirect Evaporative Cooling, Pre-Cooling		per Building Sq Ft	15	$2.08	$3.94	1	25.00%	0.000	0.29	0.37	0.19
Restaurant	Packaged DX	Existing	Direct / Indirect Evaporative Cooling, Pre-Cooling, Direct / Indirect Evaporative Cooling, Pre-Cooling		per Building Sq Ft	15	$2.08	$2.65	1	25.0%	0.000	0.39	0.55	0.28
Restaurant	Packaged DX	New	Direct / Indirect Evaporative Cooling, Pre-Cooling, Direct / Indirect Evaporative Cooling, Pre-Cooling		per Building Sq Ft	15	$2.08	$2.69	1	25.0%	0.000	0.38	0.54	0.28
Retail	Packaged DX	Existing	Direct / Indirect Evaporative Cooling, Pre-Cooling, Direct / Indirect Evaporative Cooling, Pre-Cooling		per Building Sq Ft	15	$2.08	$6.90	0	25.0%	0.000	0.19	0.22	0.11
Retail	Packaged DX	New	Direct / Indirect Evaporative Cooling, Pre-Cooling, Direct / Indirect Evaporative Cooling, Pre-Cooling		per Building Sq Ft	15	$2.08	$7.03	0	25.0%	0.000	0.18	0.21	0.11
Warehouse	Packaged DX	Existing	Direct / Indirect Evaporative Cooling, Pre-Cooling, Direct / Indirect Evaporative Cooling, Pre-Cooling		per Building Sq Ft	15	$2.08	$39.58	0	25.0%	0.000	0.04	0.04	0.02
Warehouse	Packaged DX	New	Direct / Indirect Evaporative Cooling, Pre-Cooling, Direct / Indirect Evaporative Cooling, Pre-Cooling		per Building Sq Ft	15	$2.08	$40.15	0	25.0%	0.000	0.04	0.04	0.02
Education	Packaged DX	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$2.17	144	15.0%	0.037	0.22	0.27	0.14
Grocery	Packaged DX	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$0.73	428	15.0%	0.111	0.45	0.75	0.40
Healthcare	Packaged DX	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$0.95	329	15.00%	0.085	0.39	0.59	0.31
Lodging	Packaged DX	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$0.74	421	15.0%	0.109	0.45	0.74	0.39
Miscellaneous	Packaged DX	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$1.06	294	15.0%	0.076	0.36	0.54	0.28
Office	Packaged DX	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$0.97	323	15.00%	0.084	0.38	0.58	0.31
Restaurant	Packaged DX	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$0.66	472	15.0%	0.122	0.47	0.81	0.44
Retail	Packaged DX	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$1.72	181	15.0%	0.047	0.26	0.34	0.18

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Warehouse	Packaged DX	Existing	Direct Digital Control System-Installation, DDC Retrofit		per control zone	5	$312.60	$9.90	32	15.0%	0.008	0.06	0.06	0.03
Education	Packaged DX	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$1.82	96	10.0%	0.025	0.25	0.32	0.17
Education	Packaged DX	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$1.86	94	10.0%	0.024	0.25	0.32	0.16
Grocery	Packaged DX	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.61	286	10.0%	0.074	0.49	0.87	0.47
Grocery	Packaged DX	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.62	280	10.0%	0.073	0.49	0.86	0.46
Healthcare	Packaged DX	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.80	219	10.00%	0.057	0.43	0.69	0.37
Healthcare	Packaged DX	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.81	215	10.00%	0.056	0.43	0.68	0.36
Lodging	Packaged DX	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.62	281	10.0%	0.073	0.49	0.86	0.46
Lodging	Packaged DX	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.63	276	10.0%	0.071	0.49	0.85	0.45
Miscellaneous	Packaged DX	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.89	196	10.0%	0.051	0.40	0.63	0.33
Miscellaneous	Packaged DX	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.91	193	10.0%	0.050	0.40	0.62	0.32
Office	Packaged DX	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.81	215	10.00%	0.056	0.43	0.68	0.36
Office	Packaged DX	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.83	211	10.00%	0.055	0.42	0.67	0.35
Restaurant	Packaged DX	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.56	314	10.0%	0.081	0.52	0.95	0.51
Restaurant	Packaged DX	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$0.56	310	10.0%	0.080	0.51	0.94	0.51
Retail	Packaged DX	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$1.45	121	10.0%	0.031	0.30	0.40	0.21
Retail	Packaged DX	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$1.48	119	10.0%	0.031	0.29	0.39	0.20

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Warehouse	Packaged DX	Existing	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$8.31	21	10.0%	0.005	0.07	0.07	0.04
Warehouse	Packaged DX	New	Direct Digital Control System-Optimization, DDC System (Optimized)		per control zone	5	$175.00	$8.43	21	10.0%	0.005	0.07	0.07	0.04
Education	Packaged DX	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$0.88	144	15.0%	0.037	0.41	0.64	0.34
Grocery	Packaged DX	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$0.29	428	15.0%	0.111	0.66	1.57	0.90
Healthcare	Packaged DX	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$0.38	329	15.00%	0.085	0.60	1.28	0.72
Lodging	Packaged DX	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$0.30	421	15.0%	0.109	0.66	1.55	0.89
Miscellaneous	Packaged DX	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$0.43	294	15.0%	0.076	0.58	1.18	0.65
Office	Packaged DX	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$0.39	323	15.00%	0.084	0.60	1.27	0.70
Restaurant	Packaged DX	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$0.27	472	15.0%	0.122	0.68	1.69	0.978
Retail	Packaged DX	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$0.70	181	15.0%	0.047	0.46	0.78	0.42
Warehouse	Packaged DX	Existing	Direct Digital Control System-Wireless Performance Monitoring, DDC Retrofit - Wireless Performance Monitoring, Diagnostics And Control		per control zone	5	$126.30	$4.00	32	15.0%	0.008	0.13	0.15	0.08
Education	Packaged DX	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$9.99	0	2.5%	0.000	0.15	0.17	0.08
Education	Packaged DX	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$10.22	0	2.5%	0.000	0.15	0.17	0.08
Grocery	Packaged DX	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$3.36	0	2.5%	0.000	0.36	0.49	0.25

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Grocery	Packaged DX	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$3.43	0	2.5%	0.000	0.36	0.48	0.25
Healthcare	Packaged DX	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$4.38	0	2.50%	0.000	0.30	0.38	0.19
Healthcare	Packaged DX	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$4.46	0	2.50%	0.000	0.29	0.37	0.19
Lodging	Packaged DX	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$3.42	0	2.5%	0.000	0.36	0.48	0.25
Lodging	Packaged DX	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$3.48	0	2.5%	0.000	0.35	0.48	0.24
Miscellaneous	Packaged DX	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$4.89	0	2.5%	0.000	0.27	0.34	0.17
Miscellaneous	Packaged DX	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$4.98	0	2.5%	0.000	0.27	0.34	0.17
Office	Packaged DX	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$4.46	0	2.50%	0.000	0.29	0.37	0.19
Office	Packaged DX	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$4.54	0	2.50%	0.000	0.29	0.37	0.19
Restaurant	Packaged DX	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$3.05	0	2.5%	0.000	0.39	0.54	0.27
Restaurant	Packaged DX	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$3.09	0	2.5%	0.000	0.38	0.53	0.27
Retail	Packaged DX	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$7.94	0	2.5%	0.000	0.18	0.21	0.11
Retail	Packaged DX	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$8.09	0	2.5%	0.000	0.18	0.21	0.10
Warehouse	Packaged DX	Existing	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$45.59	0	2.5%	0.000	0.04	0.04	0.02
Warehouse	Packaged DX	New	Duct Repair And Sealing, Reduction In Duct Losses to 5%		per Building Sq Ft	18	$0.24	$46.24	0	2.5%	0.000	0.04	0.04	0.02
Education	Packaged DX	Existing	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,450.29	$3.67	1486	4.5%	0.384	0.24	0.30	0.15
Education	Packaged DX	New	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,450.29	$3.75	1453	4.5%	0.376	0.24	0.29	0.15

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Grocery	Packaged DX	Existing	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,449.72	$5.22	1044	4.5%	0.270	0.18	0.21	0.11
Grocery	Packaged DX	New	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,449.72	$5.32	1024	4.5%	0.265	0.18	0.21	0.10
Healthcare	Packaged DX	Existing	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,452.00	$0.18	30435	4.50%	7.874	0.94	4.02	2.45
Healthcare	Packaged DX	New	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,452.00	$0.18	29840	4.50%	7.720	0.94	3.97	2.41
Lodging	Packaged DX	Existing	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,449.66	$1.53	3552	4.5%	0.919	0.44	0.69	0.35
Lodging	Packaged DX	New	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,449.66	$1.56	3492	4.5%	0.903	0.44	0.68	0.35
Restaurant	Packaged DX	Existing	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,450.06	$10.01	545	4.5%	0.141	0.10	0.11	0.06
Restaurant	Packaged DX	New	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,450.06	$10.14	538	4.5%	0.139	0.10	0.11	0.06
Retail	Packaged DX	Existing	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,449.98	$9.33	584	4.5%	0.151	0.11	0.12	0.06
Retail	Packaged DX	New	Exhaust Hood Makeup Air, Provide Makeup Air Directly at Exhaust Hood Instead of Pulling Conditioned Air		per Measure Installed	10	$5,449.98	$9.51	573	4.5%	0.148	0.11	0.12	0.06
Education	Packaged DX	Existing	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$105.43	0	10.0%	0.000	0.02	0.02	0.01
Education	Packaged DX	New	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$107.82	0	10.0%	0.000	0.02	0.02	0.01
Grocery	Packaged DX	Existing	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$35.47	0	10.0%	0.000	0.06	0.06	0.03
Grocery	Packaged DX	New	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$36.15	0	10.0%	0.000	0.06	0.06	0.03
Healthcare	Packaged DX	Existing	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$21.25	0	6.00%	0.000	0.10	0.10	0.05
Healthcare	Packaged DX	New	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$21.66	0	6.00%	0.000	0.10	0.10	0.05
Lodging	Packaged DX	Existing	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$36.08	0	5.0%	0.000	0.06	0.06	0.03
Lodging	Packaged DX	New	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$36.71	0	5.0%	0.000	0.06	0.06	0.03
Miscellaneous	Packaged DX	Existing	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$51.61	0	10.0%	0.000	0.04	0.04	0.02
Miscellaneous	Packaged DX	New	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$52.53	0	10.0%	0.000	0.04	0.04	0.02

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Office	Packaged DX	Existing	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$39.12	0	7.50%	0.000	0.05	0.06	0.03
Office	Packaged DX	New	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$39.85	0	7.50%	0.000	0.05	0.06	0.03
Restaurant	Packaged DX	Existing	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$32.22	0	10.0%	0.000	0.07	0.07	0.03
Restaurant	Packaged DX	New	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$32.64	0	10.0%	0.000	0.07	0.07	0.03
Retail	Packaged DX	Existing	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$83.81	0	10.0%	0.000	0.03	0.03	0.01
Retail	Packaged DX	New	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$85.39	0	10.0%	0.000	0.03	0.03	0.01
Warehouse	Packaged DX	Existing	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$481.08	0	10.0%	0.000	0.00	0.00	0.00
Warehouse	Packaged DX	New	Green Roof, Vegetation on Roof		Roof Sq Ft	30	$10.13	$487.97	0	10.0%	0.000	0.00	0.00	0.00
Lodging	Packaged DX	Existing	Hotel Key Card Room Energy Control System, Key card system to control room HVAC and lighting during non-occupied periods		per room	15	$200.00	$0.71	281	25.0%	0.073	0.77	1.86	0.992
Lodging	Packaged DX	New	Hotel Key Card Room Energy Control System, Key card system to control room HVAC and lighting during non-occupied periods		per room	15	$200.00	$0.72	276	25.0%	0.071	0.77	1.83	0.976
Education	Packaged DX	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$0.38	1	5.0%	0.000	0.81	2.35	1.31
Grocery	Packaged DX	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$0.10	2	5.0%	0.001	1.02	5.73	3.84
Healthcare	Packaged DX	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$0.15	2	5.00%	0.000	0.97	4.54	2.84
Lodging	Packaged DX	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$0.26	1	5.0%	0.000	0.88	3.10	1.80
Miscellaneous	Packaged DX	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$0.10	2	5.0%	0.001	1.01	5.67	3.80
Office	Packaged DX	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$0.19	1	5.00%	0.000	0.94	3.89	2.35
Restaurant	Packaged DX	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$0.18	1	5.0%	0.000	0.94	4.03	2.45
Retail	Packaged DX	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$0.32	1	5.0%	0.000	0.84	2.68	1.52
Warehouse	Packaged DX	Existing	Infiltration Control (Caulking, Weather Stripping, etc.), Install Caulking And Weatherstripping (ACH 0.65)		Window Sq Ft	10	$0.23	$4.56	0	0.5%	0.000	0.20	0.24	0.12

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Education	Packaged DX	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$18.04	0	3.0%	0.000	0.11	0.11	0.06
Grocery	Packaged DX	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$6.07	0	3.0%	0.000	0.27	0.33	0.17
Healthcare	Packaged DX	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$3.64	0	1.80%	0.000	0.40	0.55	0.28
Lodging	Packaged DX	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$6.17	0	1.5%	0.000	0.27	0.33	0.16
Miscellaneous	Packaged DX	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$8.83	0	3.0%	0.000	0.20	0.23	0.12
Office	Packaged DX	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$6.69	0	2.25%	0.000	0.25	0.30	0.15
Restaurant	Packaged DX	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$5.51	0	3.0%	0.000	0.29	0.37	0.18
Retail	Packaged DX	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$14.34	0	3.0%	0.000	0.13	0.14	0.07
Warehouse	Packaged DX	Existing	Insulation - Floor (Non-Slab) - Existing to Code, R-10 (Code)		Floor Sq Ft	25	$0.52	$82.32	0	3.0%	0.000	0.02	0.02	0.01
Education	Packaged DX	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$28.10	0	1.0%	0.000	0.07	0.07	0.04
Education	Packaged DX	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$28.74	0	1.0%	0.000	0.07	0.07	0.04
Grocery	Packaged DX	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$9.45	0	1.0%	0.000	0.19	0.21	0.11
Grocery	Packaged DX	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$9.64	0	1.0%	0.000	0.18	0.21	0.11
Healthcare	Packaged DX	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$5.66	0	0.60%	0.000	0.29	0.36	0.18
Healthcare	Packaged DX	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$5.77	0	0.60%	0.000	0.28	0.35	0.18
Lodging	Packaged DX	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$9.62	0	0.5%	0.000	0.18	0.21	0.11
Lodging	Packaged DX	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$9.78	0	0.5%	0.000	0.18	0.21	0.10
Miscellaneous	Packaged DX	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$13.76	0	1.0%	0.000	0.13	0.15	0.07
Miscellaneous	Packaged DX	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$14.00	0	1.0%	0.000	0.13	0.15	0.07
Office	Packaged DX	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$10.43	0	0.75%	0.000	0.17	0.20	0.10
Office	Packaged DX	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$10.62	0	0.75%	0.000	0.17	0.19	0.10
Restaurant	Packaged DX	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$8.59	0	1.0%	0.000	0.20	0.24	0.12
Restaurant	Packaged DX	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$8.70	0	1.0%	0.000	0.20	0.23	0.12
Retail	Packaged DX	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$22.34	0	1.0%	0.000	0.09	0.09	0.05

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Retail	Packaged DX	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$22.76	0	1.0%	0.000	0.08	0.09	0.05
Warehouse	Packaged DX	Existing	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$128.22	0	1.0%	0.000	0.02	0.02	0.01
Warehouse	Packaged DX	New	Insulation - Floor (Non-Slab), R-19		Floor Sq Ft	25	$0.27	$130.06	0	1.0%	0.000	0.02	0.02	0.01
Education	Packaged DX	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$11.71	0	2.4%	0.000	0.16	0.17	0.09
Education	Packaged DX	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$11.10	0	6.0%	0.000	0.16	0.18	0.09
Grocery	Packaged DX	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$3.94	0	2.4%	0.000	0.38	0.51	0.26
Grocery	Packaged DX	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$3.74	0	6.0%	0.000	0.39	0.54	0.27
Healthcare	Packaged DX	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$2.36	0	1.44%	0.000	0.53	0.84	0.43
Healthcare	Packaged DX	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$2.24	0	3.60%	0.000	0.55	0.88	0.45
Lodging	Packaged DX	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$4.01	0	1.2%	0.000	0.37	0.50	0.25
Lodging	Packaged DX	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$3.80	0	3.0%	0.000	0.39	0.53	0.27
Miscellaneous	Packaged DX	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$5.73	0	2.4%	0.000	0.28	0.35	0.18
Miscellaneous	Packaged DX	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$5.43	0	6.0%	0.000	0.30	0.37	0.19
Office	Packaged DX	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$4.34	0	1.80%	0.000	0.35	0.46	0.23
Office	Packaged DX	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$4.12	0	4.50%	0.000	0.36	0.49	0.25
Restaurant	Packaged DX	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$3.58	0	2.4%	0.000	0.40	0.56	0.28
Restaurant	Packaged DX	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$3.39	0	6.0%	0.000	0.42	0.59	0.30
Retail	Packaged DX	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$9.31	0	2.4%	0.000	0.19	0.22	0.11
Retail	Packaged DX	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$8.83	0	6.0%	0.000	0.20	0.23	0.12
Warehouse	Packaged DX	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.27	$53.43	0	2.4%	0.000	0.04	0.04	0.02
Warehouse	Packaged DX	Existing	Insulation (Ceiling), R-20 (Code)		Ceiling Sq Ft	25	$0.64	$50.66	0	6.0%	0.000	0.04	0.04	0.02
Education	Packaged DX	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$25.50	0	2.0%	0.000	0.08	0.08	0.04
Education	Packaged DX	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$26.08	0	2.0%	0.000	0.07	0.08	0.04
Grocery	Packaged DX	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$8.58	0	2.0%	0.000	0.20	0.24	0.12
Grocery	Packaged DX	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$8.74	0	2.0%	0.000	0.20	0.23	0.12

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Healthcare	Packaged DX	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$5.14	0	1.20%	0.000	0.31	0.39	0.20
Healthcare	Packaged DX	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$5.24	0	1.20%	0.000	0.30	0.38	0.19
Lodging	Packaged DX	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$8.73	0	1.0%	0.000	0.20	0.23	0.12
Lodging	Packaged DX	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$8.88	0	1.0%	0.000	0.20	0.23	0.12
Miscellaneous	Packaged DX	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$12.48	0	2.0%	0.000	0.15	0.16	0.08
Miscellaneous	Packaged DX	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$12.71	0	2.0%	0.000	0.14	0.16	0.08
Office	Packaged DX	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$9.46	0	1.50%	0.000	0.19	0.21	0.11
Office	Packaged DX	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$9.64	0	1.50%	0.000	0.18	0.21	0.11
Restaurant	Packaged DX	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$7.79	0	2.0%	0.000	0.22	0.26	0.13
Restaurant	Packaged DX	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$7.90	0	2.0%	0.000	0.22	0.26	0.13
Retail	Packaged DX	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$20.27	0	2.0%	0.000	0.09	0.10	0.05
Retail	Packaged DX	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$20.65	0	2.0%	0.000	0.09	0.10	0.05
Warehouse	Packaged DX	Existing	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$116.35	0	2.0%	0.000	0.02	0.02	0.01
Warehouse	Packaged DX	New	Insulation (Ceiling), R-38		Ceiling Sq Ft	25	$0.49	$118.02	0	2.0%	0.000	0.02	0.02	0.01
Education	Packaged DX	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$3.50	1	3.0%	0.000	0.41	0.57	0.29
Grocery	Packaged DX	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$1.18	2	3.0%	0.000	0.76	1.61	0.84
Healthcare	Packaged DX	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$1.54	1	3.00%	0.000	0.67	1.26	0.65
Lodging	Packaged DX	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$1.20	2	3.0%	0.000	0.76	1.58	0.82
Miscellaneous	Packaged DX	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$1.71	1	3.0%	0.000	0.64	1.13	0.58
Office	Packaged DX	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$1.56	1	3.00%	0.000	0.67	1.24	0.64
Restaurant	Packaged DX	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$1.07	2	3.0%	0.000	0.79	1.76	0.92
Retail	Packaged DX	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$2.78	1	3.0%	0.000	0.48	0.71	0.36
Warehouse	Packaged DX	Existing	Insulation (Duct) (Unconditioned Spaces), R-5		Linear Foot	25	$2.02	$15.97	0	3.0%	0.000	0.12	0.13	0.06
Education	Packaged DX	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$3.82	1	4.4%	0.000	0.39	0.52	0.27

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Education	Packaged DX	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$0.90	$1.45	1	3.3%	0.000	0.69	1.32	0.68
Grocery	Packaged DX	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$1.29	3	4.4%	0.001	0.73	1.48	0.77
Grocery	Packaged DX	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$0.90	$0.49	2	3.3%	0.000	1.03	3.49	1.91
Healthcare	Packaged DX	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$1.68	2	4.40%	0.000	0.64	1.16	0.60
Healthcare	Packaged DX	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$17.83	$0.82	22	3.08%	0.006	0.88	2.23	1.18
Lodging	Packaged DX	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$1.31	2	4.4%	0.001	0.73	1.46	0.76
Lodging	Packaged DX	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$0.90	$0.50	2	3.3%	0.000	1.02	3.45	1.88
Miscellaneous	Packaged DX	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$1.87	2	4.4%	0.000	0.61	1.04	0.53
Miscellaneous	Packaged DX	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$0.90	$0.71	1	3.3%	0.000	0.92	2.54	1.35
Office	Packaged DX	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$1.71	2	4.40%	0.000	0.64	1.14	0.58
Office	Packaged DX	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$0.90	$0.65	1	3.30%	0.000	0.95	2.75	1.47
Restaurant	Packaged DX	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$1.17	3	4.4%	0.001	0.77	1.62	0.84
Restaurant	Packaged DX	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$0.90	$0.44	2	3.3%	0.001	1.05	3.80	2.09
Retail	Packaged DX	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$3.04	1	4.4%	0.000	0.45	0.65	0.33
Retail	Packaged DX	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$0.90	$1.15	1	3.3%	0.000	0.77	1.64	0.85
Warehouse	Packaged DX	Existing	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$3.23	$17.43	0	4.4%	0.000	0.11	0.12	0.06
Warehouse	Packaged DX	New	Insulation (Duct) (Unconditioned Spaces), R-8		Linear Foot	25	$0.90	$6.58	0	3.3%	0.000	0.25	0.31	0.15
Education	Packaged DX	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$1.35	0	10.0%	0.000	0.72	1.41	0.73
Education	Packaged DX	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$2.71	0	5.0%	0.000	0.49	0.73	0.37
Grocery	Packaged DX	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$1.02	1	10.0%	0.000	0.81	1.83	0.958
Grocery	Packaged DX	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$2.05	0	5.0%	0.000	0.58	0.96	0.49
Healthcare	Packaged DX	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$1.12	1	10.00%	0.000	0.78	1.69	0.88
Healthcare	Packaged DX	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$2.24	0	5.00%	0.000	0.55	0.88	0.45
Lodging	Packaged DX	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$1.23	0	10.0%	0.000	0.75	1.55	0.80
Lodging	Packaged DX	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$2.46	0	5.0%	0.000	0.52	0.80	0.41

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Miscellaneous	Packaged DX	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$1.25	0	10.0%	0.000	0.74	1.52	0.79
Miscellaneous	Packaged DX	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$2.50	0	5.0%	0.000	0.51	0.79	0.40
Office	Packaged DX	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$1.36	0	10.00%	0.000	0.71	1.41	0.73
Office	Packaged DX	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$2.72	0	5.00%	0.000	0.48	0.73	0.37
Restaurant	Packaged DX	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$1.40	0	10.0%	0.000	0.70	1.37	0.71
Restaurant	Packaged DX	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$2.81	0	5.0%	0.000	0.48	0.71	0.36
Retail	Packaged DX	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$2.67	0	10.0%	0.000	0.49	0.74	0.38
Retail	Packaged DX	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$5.33	0	5.0%	0.000	0.30	0.38	0.19
Warehouse	Packaged DX	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$12.00	0	10.0%	0.000	0.15	0.17	0.09
Warehouse	Packaged DX	Existing	Insulation (Wall), R-13 + R-7.5 (Code)		Wall Sq Ft	25	$0.61	$24.00	0	5.0%	0.000	0.08	0.09	0.04
Education	Packaged DX	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.21	1	7.5%	0.000	1.19	6.56	3.91
Grocery	Packaged DX	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.07	4	7.5%	0.001	1.30	11.99	8.46
Healthcare	Packaged DX	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.09	3	7.50%	0.001	1.28	10.64	7.18
Lodging	Packaged DX	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.07	4	7.5%	0.001	1.29	11.91	8.38
Miscellaneous	Packaged DX	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.10	3	7.5%	0.001	1.27	10.08	6.68
Office	Packaged DX	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.09	3	7.50%	0.001	1.28	10.56	7.10
Restaurant	Packaged DX	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.06	5	7.5%	0.001	1.30	12.49	8.97
Retail	Packaged DX	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.17	2	7.5%	0.000	1.22	7.65	4.70
Warehouse	Packaged DX	New	Leak Proof Duct Fittings, Quick connect fittings that do not require mastic or drawbands		Linear Foot	25	$0.30	$0.96	0	7.5%	0.000	0.83	1.93	1.013
Education	Packaged DX	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$137.46	$0.14	991	3.0%	0.256	1.09	6.34	4.01

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Grocery	Packaged DX	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$138.90	$0.20	696	3.0%	0.180	1.04	5.05	3.03
Healthcare	Packaged DX	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$137.39	$0.06	2287	3.00%	0.592	1.16	9.45	6.87
Lodging	Packaged DX	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$139.19	$0.12	1184	3.0%	0.306	1.11	6.95	4.52
Miscellaneous	Packaged DX	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$138.69	$0.24	587	3.0%	0.152	1.02	4.50	2.64
Office	Packaged DX	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$138.81	$0.11	1239	3.00%	0.320	1.11	7.13	4.67
Restaurant	Packaged DX	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$138.60	$0.38	363	3.0%	0.094	0.93	3.14	1.75
Retail	Packaged DX	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$138.56	$0.36	389	3.0%	0.101	0.94	3.32	1.86
Warehouse	Packaged DX	Existing	Thermostat - Programmable, Energy Star Programmable Thermostat		per Measure Installed	15	$138.65	$1.31	106	3.0%	0.027	0.59	1.07	0.55
Education	Packaged DX	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$18.62	1	8.1%	0.000	0.12	0.13	0.07
Education	Packaged DX	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$19.04	1	8.1%	0.000	0.12	0.13	0.07
Grocery	Packaged DX	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$14.07	1	2.7%	0.000	0.16	0.18	0.09
Grocery	Packaged DX	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$14.34	1	2.7%	0.000	0.16	0.17	0.09
Healthcare	Packaged DX	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$16.14	1	3.64%	0.000	0.14	0.15	0.08
Healthcare	Packaged DX	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$14.45	1	4.57%	0.000	0.15	0.17	0.09
Lodging	Packaged DX	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$16.91	1	6.2%	0.000	0.13	0.15	0.07
Lodging	Packaged DX	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$17.20	1	6.2%	0.000	0.13	0.14	0.07
Miscellaneous	Packaged DX	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$17.18	1	2.3%	0.000	0.13	0.14	0.07
Miscellaneous	Packaged DX	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$17.49	1	2.3%	0.000	0.13	0.14	0.07
Office	Packaged DX	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$18.51	1	4.06%	0.000	0.12	0.13	0.07
Office	Packaged DX	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$23.67	1	3.56%	0.000	0.10	0.10	0.05
Restaurant	Packaged DX	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$19.33	1	3.7%	0.000	0.12	0.13	0.06

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
Restaurant	Packaged DX	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$19.58	1	3.7%	0.000	0.12	0.13	0.06
Retail	Packaged DX	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$36.70	1	3.5%	0.000	0.07	0.07	0.03
Retail	Packaged DX	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$37.39	0	3.5%	0.000	0.06	0.07	0.03
Warehouse	Packaged DX	Existing	Windows, U = 0.35		Window Sq Ft	40	$18.66	$165.19	0	1.1%	0.000	0.01	0.02	0.01
Warehouse	Packaged DX	New	Windows, U = 0.35		Window Sq Ft	40	$18.66	$167.56	0	1.1%	0.000	0.01	0.01	0.01
Education	Packaged DX	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$35.65	1	11.2%	0.000	0.07	0.07	0.03
Grocery	Packaged DX	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$26.95	2	3.8%	0.000	0.09	0.09	0.05
Healthcare	Packaged DX	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$30.90	2	5.04%	0.000	0.08	0.08	0.04
Lodging	Packaged DX	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$32.38	2	8.5%	0.000	0.07	0.08	0.04
Miscellaneous	Packaged DX	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$32.90	2	3.1%	0.000	0.07	0.08	0.04
Office	Packaged DX	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$35.44	1	5.63%	0.000	0.07	0.07	0.04
Restaurant	Packaged DX	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$37.02	1	5.1%	0.000	0.06	0.07	0.03
Retail	Packaged DX	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$70.28	1	4.8%	0.000	0.03	0.04	0.02
Warehouse	Packaged DX	Existing	Windows, U = 0.45 (Code)		Window Sq Ft	40	$49.47	$316.33	0	1.5%	0.000	0.01	0.01	0.00
All	Refrigeration	New	Reach-in Cooler: PSC to ECM: 1-37 Watt		per installed measure	15	$91.25	$0.54	169	36%	0.020	0.76	1.83	0.991
All	Refrigeration	Turnover	Reach-in Cooler: PSC to ECM: 1-37 Watt		per installed measure	15	$91.25	$0.54	169	36%	0.020	0.76	1.83	0.991
All	Refrigeration	New	Reach-in Cooler: Shaded Pole to ECM: 1-37 Watt		per installed measure	15	$306.25	$0.59	521	63%	0.062	0.74	1.70	0.92
All	Refrigeration	Turnover	Reach-in Cooler: Shaded Pole to ECM: 1-37 Watt		per installed measure	15	$306.25	$0.59	521	63%	0.062	0.74	1.70	0.92
All	Refrigeration	New	Reach-in Cooler: Shaded Pole to PSC: 1-37 Watt		per installed measure	15	$212.50	$0.60	352	42%	0.042	0.73	1.66	0.89
All	Refrigeration	Turnover	Reach-in Cooler: Shaded Pole to PSC: 1-37 Watt		per installed measure	15	$212.50	$0.60	352	42%	0.042	0.73	1.66	0.89
All	Refrigeration	New	Reach-in Freezer: Shaded Pole to ECM: 1-14 Watt		per installed measure	15	$306.25	$0.49	622	75%	0.074	0.78	1.97	1.08

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
All	Refrigeration	Turnover	Reach-in Freezer: Shaded Pole to ECM: 1-14 Watt		per installed measure	15	$306.25	$0.49	622	75%	0.074	0.78	1.97	1.08
All	Refrigeration	New	Reach-in PSC to ECM Evaporator Fan Motor		per installed measure	15	$91.25	$0.49	185	40%	0.022	0.78	1.97	1.08
All	Refrigeration	Turnover	Reach-in PSC to ECM Evaporator Fan Motor		per installed measure	15	$91.25	$0.49	185	40%	0.022	0.78	1.97	1.08
All	Refrigeration	New	Reach-in Shaded Pole to ECM Evaporator Fan Motor		per installed measure	15	$306.25	$0.54	571	69%	0.068	0.76	1.84	0.997
All	Refrigeration	Turnover	Reach-in Shaded Pole to ECM Evaporator Fan Motor		per installed measure	15	$306.25	$0.54	571	69%	0.068	0.76	1.84	0.997
All	Refrigeration	New	Reach-in Shaded Pole to PSC Evaporator Fan Motor		per installed measure	15	$212.50	$0.55	386	46%	0.046	0.75	1.80	0.974
All	Refrigeration	Turnover	Reach-in Shaded Pole to PSC Evaporator Fan Motor		per installed measure	15	$212.50	$0.55	386	46%	0.046	0.75	1.80	0.974
All	Refrigeration	Turnover	Anti-sweat heat (ASH) controls - Cooler	ASH without controls	Per Door	12	$300.00	$0.29	1,023	63%	0.121	0.83	2.53	1.45
All	Refrigeration	New	Anti-sweat heat (ASH) controls - Cooler	ASH without controls	Per Door	12	$300.00	$0.29	1,023	63%	0.121	0.83	2.53	1.45
All	Refrigeration	Turnover	Anti-sweat heat (ASH) controls - Freezer	ASH without controls	Per Door	12	$300.00	$0.16	1,882	63%	0.223	0.94	3.83	2.37
All	Refrigeration	New	Anti-sweat heat (ASH) controls - Freezer	ASH without controls	Per Door	12	$300.00	$0.16	1,882	63%	0.223	0.94	3.83	2.37
All	Refrigeration	New	Compressor VSD	Base Refrigeration System - Grocery	system	13	$267.00	$0.35	761	14%	0.090	0.82	2.34	1.32
All	Refrigeration	Turnover	Compressor VSD retrofit	Base Refrigeration System - Grocery	system	13	$267.00	$0.35	761	14%	0.090	0.82	2.34	1.32
All	Refrigeration	New	Demand Defrost Electric	Base Refrigeration System - Grocery	system	15	$0.05	$0.91	0	1%	0.000	0.61	1.16	0.61
All	Refrigeration	Turnover	Demand Defrost Electric	Base Refrigeration System - Grocery	system	15	$0.05	$0.91	0	1%	0.000	0.61	1.16	0.61
All	Refrigeration	New	Demand Hot Gas Defrost	Base Refrigeration System - Grocery	system	15	$0.05	$0.35	0	3%	0.000	0.86	2.58	1.45
All	Refrigeration	Turnover	Demand Hot Gas Defrost	Base Refrigeration System - Grocery	system	15	$0.05	$0.35	0	3%	0.000	0.86	2.58	1.45
All	Refrigeration	Turnover	eCube	No eCube	unit	9	$399.00	$0.33	1,222	22.50%	0.145	0.72	1.86	1.052
All	Refrigeration	New	Efficient compressor motor - scroll	Base Refrigeration System - Grocery	system	15	$60.00	$0.09	633	4%	0.075	1.07	6.00	4.04
All	Refrigeration	Turnover	Efficient compressor motor - scroll	Base Refrigeration System - Grocery	system	15	$60.00	$0.09	633	4%	0.075	1.07	6.00	4.04
All	Refrigeration	New	Efficient, low-temp reach-in	Standard low-temp reach-in	unit	12	$123.33	$0.07	1,671	30.77%	0.198	1.02	5.72	4.02
All	Refrigeration	Turnover	Efficient, low-temp reach-in	Standard low-temp reach-in	unit	12	$123.33	$0.07	1,671	30.77%	0.198	1.02	5.72	4.02

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
All	Refrigeration	Turnover	Floating head pressure controller	Standard head pressure control	ton	14	$296.00	$0.46	641	4%	0.076	0.78	1.98	1.09
All	Refrigeration	Turnover	Fluorescent walk-in light fixture	Incandescent walk-in light fixture	fixture	15	$206.00	$0.42	491	62.00%	0.058	0.82	2.25	1.24
All	Refrigeration	New	High Efficiency Ice Machine Self Contained	Standard Ice Machine Self Contained	per installed measure	10	$100.00	$0.31	318	7%	0.038	0.76	2.08	1.18
All	Refrigeration	New	High Efficiency Ice Makers	Standard Ice Maker	Each	10	$50.00	$0.16	318	3%	0.038	0.89	3.35	2.08
All	Refrigeration	Turnover	High Efficiency Ice Makers	Standard Ice Making	per installed measure	10	$140.00	$0.12	1,197	10%	0.142	0.93	3.98	2.58
All	Refrigeration	Turnover	High R-Value Glass Doors		door	10	$537.50	$0.67	797	20.00%	0.094	0.58	1.11	0.60
All	Refrigeration	New	High R-Value Glass Doors	Base Refrigeration System - Grocery	Door	10	$537.50	$0.67	797	20.00%	0.094	0.58	1.11	0.60
All	Refrigeration	Turnover	LED Case Lighting	T12 or T10 fluorescent lighting	Light Bar	15	$225.00	$0.43	526	77.78%	0.062	0.82	2.22	1.22
All	Refrigeration	Turnover	LED Case Lighting - Occupancy Sensor	No Occupancy Sensor	Light Bar	8	$3.00	$0.15	20	3.00%	0.002	0.83	2.87	1.79
All	Refrigeration	New	No-heat glass doors	Standard low-temp reach-in	door	10	$537.50	$0.67	797	20.00%	0.094	0.58	1.11	0.60
All	Refrigeration	Turnover	Quick acting freezer doors	standard doors	freezer door	10	$20,966.00	$0.62	33,637	87%	3.982	0.60	1.19	0.64
All	Refrigeration	New	Refrigeration Commissioning	Base Refrigeration System - Grocery	Per refigerator	7	$440.00	$0.31	1,408	16%	0.167	0.66	1.55	0.88
All	Refrigeration	Early	Refrigeration Commissioning	Base Refrigeration System - Grocery	Per refigerator	7	$220.00	$0.25	880	10%	0.104	0.71	1.83	1.07
All	Refrigeration	New	Strip curtains for walk-ins	Base Refrigeration System - Grocery	system	15	$300.00	$0.50	598	2%	0.071	0.78	1.94	1.06
All	Refrigeration	Turnover	Strip curtains for walk-ins	Base Refrigeration System - Grocery	system	15	$300.00	$0.50	598	2%	0.071	0.78	1.94	1.06
All	Refrigeration	Turnover	Vertical night covers	No covers present	linear ft	5	$15.00	$0.34	44	1.00%	0.005	0.55	1.08	0.61
All	Refrigeration	New	VFD on cooling tower fans	Base single-speed fan	fan	15	$1,507.40	$0.29	5,132	72%	0.607	0.90	2.97	1.70
All	Refrigeration	Turnover	VFD on cooling tower fans	Base single-speed fan	fan	15	$1,507.40	$0.29	5,132	72%	0.607	0.90	2.97	1.70
All	Refrigeration	New	Walk-in Cooler: PSC to ECM: 16-49 Watt		per installed measure	15	$91.25	$0.35	258	36%	0.031	0.86	2.58	1.45
All	Refrigeration	Turnover	Walk-in Cooler: PSC to ECM: 16-49 Watt		per installed measure	15	$91.25	$0.35	258	36%	0.031	0.86	2.58	1.45
All	Refrigeration	New	Walk-in Cooler: Shaded Pole to ECM: 16-49 Watt		per installed measure	15	$306.25	$0.44	704	60%	0.083	0.81	2.19	1.21
All	Refrigeration	Turnover	Walk-in Cooler: Shaded Pole to ECM: 16-49 Watt		per installed measure	15	$306.25	$0.44	704	60%	0.083	0.81	2.19	1.21

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
All	Refrigeration	New	Walk-in Freezer: PSC to ECM: 16-49 Watt		per installed measure	15	$91.25	$0.30	309	43%	0.037	0.90	2.96	1.69
All	Refrigeration	Turnover	Walk-in Freezer: PSC to ECM: 16-49 Watt		per installed measure	15	$91.25	$0.30	309	43%	0.037	0.90	2.96	1.69
All	Refrigeration	New	Walk-in Freezer: Shaded Pole to ECM: 16-49 Watt		per installed measure	15	$306.25	$0.36	842	72%	0.100	0.86	2.52	1.41
All	Refrigeration	Turnover	Walk-in Freezer: Shaded Pole to ECM: 16-49 Watt		per installed measure	15	$306.25	$0.36	842	72%	0.100	0.86	2.52	1.41
All	Refrigeration	New	Walk-in PSC to ECM		per installed measure	15	$91.25	$0.32	283	40%	0.034	0.88	2.77	1.57
All	Refrigeration	Turnover	Walk-in PSC to ECM		per installed measure	15	$91.25	$0.32	283	40%	0.034	0.88	2.77	1.57
All	Refrigeration	New	Walk-in Shaded Pole to ECM		per installed measure	15	$306.25	$0.40	773	66%	0.092	0.84	2.36	1.31
All	Refrigeration	Turnover	Walk-in Shaded Pole to ECM		per installed measure	15	$306.25	$0.40	773	66%	0.092	0.84	2.36	1.31
All	Signage	Early	Dusk to Dawn	Time Clock Control	Pole	15	$200.00	$0.17	1,209	40%	0.031	0.92	3.50	2.15
All	Signage	Turnover	Green LED Traffic Light	Green Standard Traffic Light	Lamp	10	$174.00	$0.77	226	87%	0.006	0.47	0.78	0.42
All	Signage	Turnover	Hand/Man LED	Pedestrian Standard	Lamp	10	$182.00	$0.19	946	93%	0.024	0.78	2.33	1.41
All	Signage	Turnover	Induction Street Lighting	Base HID Streetlighting	Fixture	15	$925.00	$0.57	1,619	59%	0.041	0.66	1.38	0.75
All	Signage	New	Induction Street Lighting	Base HID Streetlighting	Fixture	15	$875.00	$0.54	1,619	59%	0.041	0.67	1.45	0.79
All	Signage	Turnover	LED exit sign - 1 sided	Incandescent exit sign	Exit Sign	15	$23.50	$0.15	158	90%	0.004	0.94	3.73	2.33
All	Signage	Turnover	LED exit sign -2 sided	Incandescent exit sign	Exit Sign	15	$37.50	$0.16	228	65%	0.006	0.92	3.51	2.16
All	Signage	New	LED or equivalent sign lighting	Replace fluorescent sign lighting	Exit Sign	15	$17.36	$0.58	30	58%	0.001	0.65	1.36	0.73
All	Signage	Turnover	LED or equivalent sign lighting -1 sided	Replace fluorescent sign lighting	Exit Sign	15	$17.36	$0.28	61	78%	0.002	0.83	2.42	1.39
All	Signage	Turnover	LED or equivalent sign lighting -2 sided	Replace fluorescent sign lighting	Exit Sign	15	$17.36	$0.12	140	80%	0.004	0.96	4.14	2.67
All	Signage	Turnover	LED Street Lighting	Std HID Street Lighting	Pole	15	$475.00	$0.63	756	27%	0.019	0.63	1.27	0.68
All	Signage	New	LED Street Lighting	Std HID Street Lighting	Pole	15	$425.00	$0.56	756	25%	0.019	0.66	1.40	0.76
All	Signage	Turnover	Photoluminescent Exit Sign	Incandescent exit sign	Exit Sign	15	$30.00	$0.17	175	100%	0.004	0.92	3.42	2.10
All	Signage	Turnover	Red LED Traffic Light	Red Traffic Light	Signal	10	$112.00	$0.37	299	90%	0.008	0.64	1.44	0.80

Segment	End Use	Vintage	Commercial Measure Name	Commercial Baseline Description	Unit	Life (years)	Incremental Cost ($/unit)	$/kWh Saved	Energy Savings (kWh/unit)	Energy Savings %	Summer Peak Savings at Meter (kW/unit)	RIM Test	PAC Test	TRC Test
All	Signage	Turnover	Yellow LED Traffic Light	Yellow Standard Traffic Light	Lamp	10	$121.00	$12.10	10	83%	0.000	0.05	0.06	0.03
All	Water Heating	Turnover	Faucet Aerators	Std Flow faucet	unit	12	$15.00	$0.25	61	6%	0.005	0.84	2.65	1.55
All	Water Heating	New	Faucet Aerators	Std Flow faucet	unit	12	$5.00	$0.08	61	6%	0.005	0.99	5.04	3.47
All	Water Heating	New	Heat Pump Water Heater (air source)	Base Water Heating	unit	14	$988.00	$0.52	1,914.00	46%	0.155	0.72	1.67	0.91
All	Water Heating	Turnover	Heat Pump Water Heater (air source)	Base Water Heating	unit	14	$988.00	$0.52	1,914.00	46%	0.155	0.72	1.67	0.91
All	Water Heating	New	Heat Recovery Unit	Base Water Heating	unit	14	$750.00	$0.36	2,073	50.3%	0.168	0.81	2.23	1.25
All	Water Heating	Turnover	Heat Recovery Unit	Base Water Heating	unit	14	$950.00	$0.46	2,073	50.3%	0.168	0.75	1.84	1.011
All	Water Heating	New	High Efficiency Water Heater (Electric) EF .93, 28-50 Gal	Std Efficiency water heater	unit	14	$72.00	$0.54	133	3%	0.011	0.71	1.60	0.87
All	Water Heating	Turnover	High Efficiency Water Heater (Electric) EF .93, 28-50 Gal	Std Efficiency water heater	unit	14	$72.00	$0.54	133	8.0%	0.011	0.71	1.60	0.87
All	Water Heating	Turnover	Hot Water (DHW) Pipe Insulation	No insulation present	10 ln ft	14	$36.23	$0.29	124.00	3%	0.010	0.86	2.62	1.50
All	Water Heating	New	Hot Water (DHW) Pipe Insulation	No insulation present	10 ln ft	14	$36.23	$0.29	124.00	3%	0.010	0.86	2.62	1.50
All	Water Heating	Turnover	Low-Flow Showerheads	Std Flow showerhead	unit	9	$50.00	$0.11	461	11%	0.037	0.88	3.50	2.30
All	Water Heating	New	Low-Flow Showerheads	Std Flow showerhead	unit	9	$50.00	$0.11	461	11%	0.037	0.88	3.50	2.30
All	Water Heating	New	Solar Water Heater	Base Water Heating	unit	14	$2,540.00	$1.21	2,106	82.0%	0.171	0.49	0.79	0.41
All	Water Heating	Turnover	Solar Water Heater	Base Water Heating	unit	14	$2,950.00	$1.40	2,106	82.0%	0.171	0.45	0.68	0.35
All	Water Heating	Turnover	Ultrasonic Faucet Control	Manual Faucet Control	unit	10	$125.00	$1.00	125	7%	0.010	0.45	0.72	0.38
All	Water Heating	New	Ultrasonic Faucet Control	Manual Faucet Control	unit	10	$50.00	$0.40	125	3%	0.010	0.68	1.59	0.88
All	Water Heating	Turnover	Water Heater Thermostat Setback	Constant setpoint	unit	2	$17.00	$0.03	577.09	14%	0.047	0.58	1.39	1.13
All	Water Heating	New	Water Heater Thermostat Setback	Constant setpoint	unit	2	$17.00	$0.03	577.09	14%	0.047	0.58	1.39	1.13

F.3 Industrial Measures

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Agriculture	Fans	Circulating Fans	10	$1.41	5.00%	0.01	0.53	0.89	0.305
Lumber_Wood_Products	Fans	Efficient Centrifugal Fan	10	$0.18	20.00%	0.03	0.47	0.89	1.920
Paper_Mfg	Fans	Efficient Centrifugal Fan	10	$0.18	20.00%	0.03	0.80	0.89	1.920
Wastewater	Fans	Efficient Centrifugal Fan	10	$0.18	20.00%	0.03	0.74	0.89	1.920
Water	Fans	Efficient Centrifugal Fan	10	$0.18	20.00%	0.03	0.88	0.89	1.920
Chemical_Mfg	Fans	Facility Energy Management	2	$0.02	1.84%	0.00	0.17	0.20	1.434
Electronic_Equipment_Mfg	Fans	Facility Energy Management	2	$0.02	1.84%	0.00	0.14	0.20	1.434
Food_Mfg	Fans	Facility Energy Management	2	$0.02	1.84%	0.00	0.09	0.20	1.434
Industrial_Machinery	Fans	Facility Energy Management	2	$0.02	1.84%	0.00	0.07	0.20	1.434
Lumber_Wood_Products	Fans	Facility Energy Management	2	$0.02	1.84%	0.00	0.02	0.20	1.434
Miscellaneous_Mfg	Fans	Facility Energy Management	2	$0.02	1.84%	0.00	0.02	0.20	1.434
Paper_Mfg	Fans	Facility Energy Management	2	$0.02	1.84%	0.00	0.09	0.20	1.434
Petroleum_Refining	Fans	Facility Energy Management	2	$0.02	1.84%	0.00	0.17	0.20	1.434
Primary_Metal_Mfg	Fans	Facility Energy Management	2	$0.02	1.84%	0.00	0.17	0.20	1.434
Stone_Clay_Glass_Products	Fans	Facility Energy Management	2	$0.02	1.84%	0.00	0.14	0.20	1.434
Transportation_Equipment_Mfg	Fans	Facility Energy Management	2	$0.02	1.84%	0.00	0.12	0.20	1.434
Wastewater	Fans	Facility Energy Management	2	$0.02	1.84%	0.00	0.17	0.20	1.434
Water	Fans	Facility Energy Management	2	$0.02	1.84%	0.00	0.12	0.20	1.434
Industrial_Machinery	Fans	Fan Equipment Upgrade	10	$0.09	35.00%	0.05	0.81	0.89	3.279
Lumber_Wood_Products	Fans	Fan Equipment Upgrade	10	$0.09	35.00%	0.05	0.59	0.89	3.279
Miscellaneous_Mfg	Fans	Fan Equipment Upgrade	10	$0.09	35.00%	0.05	0.57	0.89	3.279
Paper_Mfg	Fans	Fan Equipment Upgrade	10	$0.09	35.00%	0.05	0.83	0.89	3.279
Stone_Clay_Glass_Products	Fans	Fan Equipment Upgrade	10	$0.09	35.00%	0.05	0.87	0.89	3.279
Wastewater	Fans	Fan Equipment Upgrade	10	$0.09	35.00%	0.05	0.88	0.89	3.279
Water	Fans	Fan Equipment Upgrade	10	$0.09	35.00%	0.05	0.86	0.89	3.279

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Food_Mfg	Fans	Fan System Optimization	10	$0.20	7.69%	0.01	0.27	0.89	1.751
Industrial_Machinery	Fans	Fan System Optimization	10	$0.20	7.69%	0.01	0.62	0.89	1.751
Lumber_Wood_Products	Fans	Fan System Optimization	10	$0.20	7.69%	0.01	0.27	0.89	1.751
Miscellaneous_Mfg	Fans	Fan System Optimization	10	$0.20	7.69%	0.01	0.25	0.89	1.751
Paper_Mfg	Fans	Fan System Optimization	10	$0.20	7.69%	0.01	0.68	0.89	1.751
Petroleum_Refining	Fans	Fan System Optimization	10	$0.20	7.69%	0.01	0.85	0.89	1.751
Transportation_Equipment_Mfg	Fans	Fan System Optimization	10	$0.20	7.69%	0.01	0.77	0.89	1.751
Wastewater	Fans	Fan System Optimization	10	$0.20	7.69%	0.01	0.85	0.89	1.751
Water	Fans	Fan System Optimization	10	$0.20	7.69%	0.01	0.77	0.89	1.751
Chemical_Mfg	Fans	High Efficiency Motors	15	$0.44	1.48%	0.00	0.98	1.20	1.242
Electronic_Equipment_Mfg	Fans	High Efficiency Motors	15	$0.44	1.48%	0.00	0.80	1.20	1.242
Food_Mfg	Fans	High Efficiency Motors	15	$0.44	1.48%	0.00	0.09	1.20	1.242
Industrial_Machinery	Fans	High Efficiency Motors	15	$0.44	1.48%	0.00	0.37	1.20	1.242
Lumber_Wood_Products	Fans	High Efficiency Motors	15	$0.44	1.48%	0.00	0.13	1.20	1.242
Miscellaneous_Mfg	Fans	High Efficiency Motors	15	$0.44	1.48%	0.00	0.09	1.20	1.242
Paper_Mfg	Fans	High Efficiency Motors	15	$0.44	1.48%	0.00	0.47	1.20	1.242
Petroleum_Refining	Fans	High Efficiency Motors	15	$0.44	1.48%	0.00	0.99	1.20	1.242
Primary_Metal_Mfg	Fans	High Efficiency Motors	15	$0.44	1.48%	0.00	0.98	1.20	1.242
Stone_Clay_Glass_Products	Fans	High Efficiency Motors	15	$0.44	1.48%	0.00	0.74	1.20	1.242
Transportation_Equipment_Mfg	Fans	High Efficiency Motors	15	$0.44	1.48%	0.00	0.66	1.20	1.242
Wastewater	Fans	High Efficiency Motors	15	$0.44	1.48%	0.00	0.98	1.20	1.242
Water	Fans	High Efficiency Motors	15	$0.44	1.48%	0.00	0.98	1.20	1.242
Agriculture	Fans	High-efficiency Ventilation Systems	10	$1.92	5.66%	0.01	0.26	0.89	0.226
Chemical_Mfg	Fans	Improved Controls - Fans	10	$0.09	6.14%	0.01	0.84	0.89	3.170
Electronic_Equipment_Mfg	Fans	Improved Controls - Fans	10	$0.09	6.14%	0.01	0.79	0.89	3.170
Food_Mfg	Fans	Improved Controls - Fans	10	$0.09	6.14%	0.01	0.23	0.89	3.170

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Industrial_Machinery	Fans	Improved Controls - Fans	10	$0.09	6.14%	0.01	0.58	0.89	3.170
Lumber_Wood_Products	Fans	Improved Controls - Fans	10	$0.09	6.14%	0.01	0.23	0.89	3.170
Miscellaneous_Mfg	Fans	Improved Controls - Fans	10	$0.09	6.14%	0.01	0.21	0.89	3.170
Paper_Mfg	Fans	Improved Controls - Fans	10	$0.09	6.14%	0.01	0.65	0.89	3.170
Petroleum_Refining	Fans	Improved Controls - Fans	10	$0.09	6.14%	0.01	0.85	0.89	3.170
Primary_Metal_Mfg	Fans	Improved Controls - Fans	10	$0.09	6.14%	0.01	0.84	0.89	3.170
Stone_Clay_Glass_Products	Fans	Improved Controls - Fans	10	$0.09	6.14%	0.01	0.29	0.89	3.170
Transportation_Equipment_Mfg	Fans	Improved Controls - Fans	10	$0.09	6.14%	0.01	0.74	0.89	3.170
Wastewater	Fans	Improved Controls - Fans	10	$0.09	6.14%	0.01	0.84	0.89	3.170
Water	Fans	Improved Controls - Fans	10	$0.09	6.14%	0.01	0.74	0.89	3.170
Agriculture	Fans	Programmable Ventilation Controllers	10	$0.11	0.10%	0.00	0.01	0.88	2.734
Chemical_Mfg	Fans	Properly Sized Fans	10	$0.16	10.42%	0.01	0.86	0.89	2.128
Electronic_Equipment_Mfg	Fans	Properly Sized Fans	10	$0.16	10.42%	0.01	0.83	0.89	2.128
Food_Mfg	Fans	Properly Sized Fans	10	$0.16	10.42%	0.01	0.33	0.89	2.128
Industrial_Machinery	Fans	Properly Sized Fans	10	$0.16	10.42%	0.01	0.67	0.89	2.128
Lumber_Wood_Products	Fans	Properly Sized Fans	10	$0.16	10.42%	0.01	0.33	0.89	2.128
Miscellaneous_Mfg	Fans	Properly Sized Fans	10	$0.16	10.42%	0.01	0.31	0.89	2.128
Paper_Mfg	Fans	Properly Sized Fans	10	$0.16	10.42%	0.01	0.73	0.89	2.128
Petroleum_Refining	Fans	Properly Sized Fans	10	$0.16	10.42%	0.01	0.86	0.89	2.128
Primary_Metal_Mfg	Fans	Properly Sized Fans	10	$0.16	10.42%	0.01	0.86	0.89	2.128
Stone_Clay_Glass_Products	Fans	Properly Sized Fans	10	$0.16	10.42%	0.01	0.41	0.89	2.128
Transportation_Equipment_Mfg	Fans	Properly Sized Fans	10	$0.16	10.42%	0.01	0.80	0.89	2.128
Wastewater	Fans	Properly Sized Fans	10	$0.16	10.42%	0.01	0.86	0.89	2.128
Water	Fans	Properly Sized Fans	10	$0.16	10.42%	0.01	0.79	0.89	2.128
Chemical_Mfg	Fans	Synchronous Belts	10	$0.21	1.12%	0.00	0.69	0.89	1.686
Food_Mfg	Fans	Synchronous Belts	10	$0.21	1.12%	0.00	0.05	0.89	1.686

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Industrial_Machinery	Fans	Synchronous Belts	10	$0.21	1.12%	0.00	0.22	0.89	1.686
Lumber_Wood_Products	Fans	Synchronous Belts	10	$0.21	1.12%	0.00	0.05	0.89	1.686
Miscellaneous_Mfg	Fans	Synchronous Belts	10	$0.21	1.12%	0.00	0.05	0.89	1.686
Paper_Mfg	Fans	Synchronous Belts	10	$0.21	1.12%	0.00	0.29	0.89	1.686
Petroleum_Refining	Fans	Synchronous Belts	10	$0.21	1.12%	0.00	0.69	0.89	1.686
Primary_Metal_Mfg	Fans	Synchronous Belts	10	$0.21	1.12%	0.00	0.69	0.89	1.686
Stone_Clay_Glass_Products	Fans	Synchronous Belts	10	$0.21	1.12%	0.00	0.07	0.89	1.686
Transportation_Equipment_Mfg	Fans	Synchronous Belts	10	$0.21	1.12%	0.00	0.42	0.89	1.686
Wastewater	Fans	Synchronous Belts	10	$0.21	1.12%	0.00	0.69	0.89	1.686
Water	Fans	Synchronous Belts	10	$0.21	1.12%	0.00	0.42	0.89	1.686
Chemical_Mfg	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - High Efficiency	15	$0.15	3.51%	0.00	0.49	1.20	3.059
Electronic_Equipment_Mfg	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - High Efficiency	15	$0.15	3.51%	0.00	0.65	1.20	3.059
Food_Mfg	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - High Efficiency	15	$0.15	3.51%	0.00	0.74	1.20	3.059
Industrial_Machinery	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - High Efficiency	15	$0.15	3.51%	0.00	0.24	1.20	3.059
Lumber_Wood_Products	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - High Efficiency	15	$0.15	3.51%	0.00	0.32	1.20	3.059
Miscellaneous_Mfg	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - High Efficiency	15	$0.15	3.51%	0.00	0.22	1.20	3.059
Paper_Mfg	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - High Efficiency	15	$0.15	3.51%	0.00	1.01	1.20	3.059
Petroleum_Refining	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - High Efficiency	15	$0.15	3.51%	0.00	1.09	1.20	3.059
Primary_Metal_Mfg	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - High Efficiency	15	$0.15	3.51%	0.00	0.81	1.20	3.059
Stone_Clay_Glass_Products	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - High Efficiency	15	$0.15	3.51%	0.00	0.27	1.20	3.059
Transportation_Equipment_Mfg	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - High Efficiency	15	$0.15	3.51%	0.00	0.20	1.20	3.059
Wastewater	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - High Efficiency	15	$0.15	3.51%	0.00	0.37	1.20	3.059
Water	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - High Efficiency	15	$0.15	3.51%	0.00	1.09	1.20	3.059
Chemical_Mfg	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - Premium Efficiency	15	$0.09	11.20%	0.01	0.83	1.21	4.191
Electronic_Equipment_Mfg	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - Premium Efficiency	15	$0.09	11.20%	0.01	0.95	1.21	4.191
Food_Mfg	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - Premium Efficiency	15	$0.09	11.20%	0.01	1.01	1.21	4.191

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Industrial_Machinery	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - Premium Efficiency	15	$0.09	11.20%	0.01	0.53	1.21	4.191
Lumber_Wood_Products	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - Premium Efficiency	15	$0.09	11.20%	0.01	0.64	1.21	4.191
Miscellaneous_Mfg	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - Premium Efficiency	15	$0.09	11.20%	0.01	0.51	1.21	4.191
Paper_Mfg	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - Premium Efficiency	15	$0.09	11.20%	0.01	1.14	1.21	4.191
Petroleum_Refining	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - Premium Efficiency	15	$0.09	11.20%	0.01	1.17	1.21	4.191
Primary_Metal_Mfg	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - Premium Efficiency	15	$0.09	11.20%	0.01	1.04	1.21	4.191
Stone_Clay_Glass_Products	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - Premium Efficiency	15	$0.09	11.20%	0.01	1.09	1.21	4.191
Transportation_Equipment_Mfg	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - Premium Efficiency	15	$0.09	11.20%	0.01	0.48	1.21	4.191
Wastewater	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - Premium Efficiency	15	$0.09	11.20%	0.01	0.71	1.21	4.191
Water	HVAC	Air Source Heat Pump 65 to 135 kBTU/hr - Premium Efficiency	15	$0.09	11.20%	0.01	1.17	1.21	4.191
Chemical_Mfg	HVAC	Chillers <150 tons (screw) - Advanced Efficiency	20	$0.13	25.16%	0.03	0.75	1.45	3.939
Electronic_Equipment_Mfg	HVAC	Chillers <150 tons (screw) - Advanced Efficiency	20	$0.13	25.16%	0.03	1.30	1.45	3.939
Food_Mfg	HVAC	Chillers <150 tons (screw) - Advanced Efficiency	20	$0.13	25.16%	0.03	1.34	1.45	3.939
Industrial_Machinery	HVAC	Chillers <150 tons (screw) - Advanced Efficiency	20	$0.13	25.16%	0.03	0.93	1.45	3.939
Lumber_Wood_Products	HVAC	Chillers <150 tons (screw) - Advanced Efficiency	20	$0.13	25.16%	0.03	0.85	1.45	3.939
Miscellaneous_Mfg	HVAC	Chillers <150 tons (screw) - Advanced Efficiency	20	$0.13	25.16%	0.03	0.82	1.45	3.939
Paper_Mfg	HVAC	Chillers <150 tons (screw) - Advanced Efficiency	20	$0.13	25.16%	0.03	0.97	1.45	3.939
Petroleum_Refining	HVAC	Chillers <150 tons (screw) - Advanced Efficiency	20	$0.13	25.16%	0.03	1.43	1.45	3.939
Primary_Metal_Mfg	HVAC	Chillers <150 tons (screw) - Advanced Efficiency	20	$0.13	25.16%	0.03	1.36	1.45	3.939
Stone_Clay_Glass_Products	HVAC	Chillers <150 tons (screw) - Advanced Efficiency	20	$0.13	25.16%	0.03	0.97	1.45	3.939
Transportation_Equipment_Mfg	HVAC	Chillers <150 tons (screw) - Advanced Efficiency	20	$0.13	25.16%	0.03	0.86	1.45	3.939
Wastewater	HVAC	Chillers <150 tons (screw) - Advanced Efficiency	20	$0.13	25.16%	0.03	1.43	1.45	3.939
Water	HVAC	Chillers <150 tons (screw) - Advanced Efficiency	20	$0.13	25.16%	0.03	1.38	1.45	3.939
Chemical_Mfg	HVAC	Chillers <150 tons (screw) - High Efficiency	20	$0.13	8.39%	0.01	0.38	1.45	3.939
Electronic_Equipment_Mfg	HVAC	Chillers <150 tons (screw) - High Efficiency	20	$0.13	8.39%	0.01	1.07	1.45	3.939
Food_Mfg	HVAC	Chillers <150 tons (screw) - High Efficiency	20	$0.13	8.39%	0.01	1.15	1.45	3.939

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Industrial_Machinery	HVAC	Chillers <150 tons (screw) - High Efficiency	20	$0.13	8.39%	0.01	1.05	1.45	3.939
Lumber_Wood_Products	HVAC	Chillers <150 tons (screw) - High Efficiency	20	$0.13	8.39%	0.01	0.47	1.45	3.939
Miscellaneous_Mfg	HVAC	Chillers <150 tons (screw) - High Efficiency	20	$0.13	8.39%	0.01	0.44	1.45	3.939
Paper_Mfg	HVAC	Chillers <150 tons (screw) - High Efficiency	20	$0.13	8.39%	0.01	1.04	1.45	3.939
Petroleum_Refining	HVAC	Chillers <150 tons (screw) - High Efficiency	20	$0.13	8.39%	0.01	1.39	1.45	3.939
Primary_Metal_Mfg	HVAC	Chillers <150 tons (screw) - High Efficiency	20	$0.13	8.39%	0.01	1.20	1.45	3.939
Stone_Clay_Glass_Products	HVAC	Chillers <150 tons (screw) - High Efficiency	20	$0.13	8.39%	0.01	0.58	1.45	3.939
Transportation_Equipment_Mfg	HVAC	Chillers <150 tons (screw) - High Efficiency	20	$0.13	8.39%	0.01	1.27	1.45	3.939
Wastewater	HVAC	Chillers <150 tons (screw) - High Efficiency	20	$0.13	8.39%	0.01	1.40	1.45	3.939
Water	HVAC	Chillers <150 tons (screw) - High Efficiency	20	$0.13	8.39%	0.01	1.26	1.45	3.939
Chemical_Mfg	HVAC	Chillers <150 tons (screw) - Premium Efficiency	20	$0.13	18.71%	0.02	0.65	1.45	3.939
Electronic_Equipment_Mfg	HVAC	Chillers <150 tons (screw) - Premium Efficiency	20	$0.13	18.71%	0.02	1.25	1.45	3.939
Food_Mfg	HVAC	Chillers <150 tons (screw) - Premium Efficiency	20	$0.13	18.71%	0.02	1.30	1.45	3.939
Industrial_Machinery	HVAC	Chillers <150 tons (screw) - Premium Efficiency	20	$0.13	18.71%	0.02	1.20	1.45	3.939
Lumber_Wood_Products	HVAC	Chillers <150 tons (screw) - Premium Efficiency	20	$0.13	18.71%	0.02	0.75	1.45	3.939
Miscellaneous_Mfg	HVAC	Chillers <150 tons (screw) - Premium Efficiency	20	$0.13	18.71%	0.02	0.71	1.45	3.939
Paper_Mfg	HVAC	Chillers <150 tons (screw) - Premium Efficiency	20	$0.13	18.71%	0.02	1.23	1.45	3.939
Petroleum_Refining	HVAC	Chillers <150 tons (screw) - Premium Efficiency	20	$0.13	18.71%	0.02	1.42	1.45	3.939
Primary_Metal_Mfg	HVAC	Chillers <150 tons (screw) - Premium Efficiency	20	$0.13	18.71%	0.02	1.33	1.45	3.939
Stone_Clay_Glass_Products	HVAC	Chillers <150 tons (screw) - Premium Efficiency	20	$0.13	18.71%	0.02	0.87	1.45	3.939
Transportation_Equipment_Mfg	HVAC	Chillers <150 tons (screw) - Premium Efficiency	20	$0.13	18.71%	0.02	0.76	1.45	3.939
Wastewater	HVAC	Chillers <150 tons (screw) - Premium Efficiency	20	$0.13	18.71%	0.02	1.43	1.45	3.939
Water	HVAC	Chillers <150 tons (screw) - Premium Efficiency	20	$0.13	18.71%	0.02	1.36	1.45	3.939
Chemical_Mfg	HVAC	DX Package 65 to 135 kBTU/hr - High Efficiency	15	$0.14	2.61%	0.00	0.12	1.20	3.097
Electronic_Equipment_Mfg	HVAC	DX Package 65 to 135 kBTU/hr - High Efficiency	15	$0.14	2.61%	0.00	0.56	1.20	3.097
Food_Mfg	HVAC	DX Package 65 to 135 kBTU/hr - High Efficiency	15	$0.14	2.61%	0.00	0.65	1.20	3.097

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Industrial_Machinery	HVAC	DX Package 65 to 135 kBTU/hr - High Efficiency	15	$0.14	2.61%	0.00	0.19	1.20	3.097
Lumber_Wood_Products	HVAC	DX Package 65 to 135 kBTU/hr - High Efficiency	15	$0.14	2.61%	0.00	0.16	1.20	3.097
Miscellaneous_Mfg	HVAC	DX Package 65 to 135 kBTU/hr - High Efficiency	15	$0.14	2.61%	0.00	0.14	1.20	3.097
Paper_Mfg	HVAC	DX Package 65 to 135 kBTU/hr - High Efficiency	15	$0.14	2.61%	0.00	1.20	1.20	3.097
Petroleum_Refining	HVAC	DX Package 65 to 135 kBTU/hr - High Efficiency	15	$0.14	2.61%	0.00	1.05	1.20	3.097
Primary_Metal_Mfg	HVAC	DX Package 65 to 135 kBTU/hr - High Efficiency	15	$0.14	2.61%	0.00	0.72	1.20	3.097
Stone_Clay_Glass_Products	HVAC	DX Package 65 to 135 kBTU/hr - High Efficiency	15	$0.14	2.61%	0.00	0.21	1.20	3.097
Transportation_Equipment_Mfg	HVAC	DX Package 65 to 135 kBTU/hr - High Efficiency	15	$0.14	2.61%	0.00	0.16	1.20	3.097
Wastewater	HVAC	DX Package 65 to 135 kBTU/hr - High Efficiency	15	$0.14	2.61%	0.00	1.07	1.20	3.097
Water	HVAC	DX Package 65 to 135 kBTU/hr - High Efficiency	15	$0.14	2.61%	0.00	0.81	1.20	3.097
Chemical_Mfg	HVAC	DX Package 65 to 135 kBTU/hr - Premium Efficiency	15	$0.11	6.67%	0.01	0.27	1.21	3.679
Electronic_Equipment_Mfg	HVAC	DX Package 65 to 135 kBTU/hr - Premium Efficiency	15	$0.11	6.67%	0.01	0.83	1.21	3.679
Food_Mfg	HVAC	DX Package 65 to 135 kBTU/hr - Premium Efficiency	15	$0.11	6.67%	0.01	0.91	1.21	3.679
Industrial_Machinery	HVAC	DX Package 65 to 135 kBTU/hr - Premium Efficiency	15	$0.11	6.67%	0.01	0.39	1.21	3.679
Lumber_Wood_Products	HVAC	DX Package 65 to 135 kBTU/hr - Premium Efficiency	15	$0.11	6.67%	0.01	0.49	1.21	3.679
Miscellaneous_Mfg	HVAC	DX Package 65 to 135 kBTU/hr - Premium Efficiency	15	$0.11	6.67%	0.01	0.31	1.21	3.679
Paper_Mfg	HVAC	DX Package 65 to 135 kBTU/hr - Premium Efficiency	15	$0.11	6.67%	0.01	0.42	1.21	3.679
Petroleum_Refining	HVAC	DX Package 65 to 135 kBTU/hr - Premium Efficiency	15	$0.11	6.67%	0.01	1.14	1.21	3.679
Primary_Metal_Mfg	HVAC	DX Package 65 to 135 kBTU/hr - Premium Efficiency	15	$0.11	6.67%	0.01	0.96	1.21	3.679
Stone_Clay_Glass_Products	HVAC	DX Package 65 to 135 kBTU/hr - Premium Efficiency	15	$0.11	6.67%	0.01	0.42	1.21	3.679
Transportation_Equipment_Mfg	HVAC	DX Package 65 to 135 kBTU/hr - Premium Efficiency	15	$0.11	6.67%	0.01	0.34	1.21	3.679
Wastewater	HVAC	DX Package 65 to 135 kBTU/hr - Premium Efficiency	15	$0.11	6.67%	0.01	0.56	1.21	3.679
Water	HVAC	DX Package 65 to 135 kBTU/hr - Premium Efficiency	15	$0.11	6.67%	0.01	1.01	1.21	3.679
Chemical_Mfg	HVAC	Evaporative Cooler replaces DX Package 65 to 135 kBTU/hr - Advanced Efficiency	15	$0.00	55.20%	0.07	1.10	1.21	11.817
Electronic_Equipment_Mfg	HVAC	Evaporative Cooler replaces DX Package 65 to 135 kBTU/hr - Advanced Efficiency	15	$0.00	55.20%	0.07	1.14	1.21	11.817
Food_Mfg	HVAC	Evaporative Cooler replaces DX Package 65 to 135 kBTU/hr - Advanced Efficiency	15	$0.00	55.20%	0.07	1.16	1.21	11.817

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Industrial_Machinery	HVAC	Evaporative Cooler replaces DX Package 65 to 135 kBTU/hr - Advanced Efficiency	15	$0.00	55.20%	0.07	0.96	1.21	11.817
Lumber_Wood_Products	HVAC	Evaporative Cooler replaces DX Package 65 to 135 kBTU/hr - Advanced Efficiency	15	$0.00	55.20%	0.07	1.02	1.21	11.817
Miscellaneous_Mfg	HVAC	Evaporative Cooler replaces DX Package 65 to 135 kBTU/hr - Advanced Efficiency	15	$0.00	55.20%	0.07	0.94	1.21	11.817
Paper_Mfg	HVAC	Evaporative Cooler replaces DX Package 65 to 135 kBTU/hr - Advanced Efficiency	15	$0.00	55.20%	0.07	1.19	1.21	11.817
Petroleum_Refining	HVAC	Evaporative Cooler replaces DX Package 65 to 135 kBTU/hr - Advanced Efficiency	15	$0.00	55.20%	0.07	1.20	1.21	11.817
Primary_Metal_Mfg	HVAC	Evaporative Cooler replaces DX Package 65 to 135 kBTU/hr - Advanced Efficiency	15	$0.00	55.20%	0.07	1.17	1.21	11.817
Stone_Clay_Glass_Products	HVAC	Evaporative Cooler replaces DX Package 65 to 135 kBTU/hr - Advanced Efficiency	15	$0.00	55.20%	0.07	0.98	1.21	11.817
Transportation_Equipment_Mfg	HVAC	Evaporative Cooler replaces DX Package 65 to 135 kBTU/hr - Advanced Efficiency	15	$0.00	55.20%	0.07	0.92	1.21	11.817
Wastewater	HVAC	Evaporative Cooler replaces DX Package 65 to 135 kBTU/hr - Advanced Efficiency	15	$0.00	55.20%	0.07	1.06	1.21	11.817
Water	HVAC	Evaporative Cooler replaces DX Package 65 to 135 kBTU/hr - Advanced Efficiency	15	$0.00	55.20%	0.07	1.20	1.21	11.817
Chemical_Mfg	HVAC	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBTU/hr - Advanced Efficiency	30	$0.09	23.41%	0.03	1.47	1.80	6.246
Electronic_Equipment_Mfg	HVAC	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBTU/hr - Advanced Efficiency	30	$0.09	23.41%	0.03	1.59	1.80	6.246
Food_Mfg	HVAC	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBTU/hr - Advanced Efficiency	30	$0.09	23.41%	0.03	1.64	1.80	6.246
Industrial_Machinery	HVAC	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBTU/hr - Advanced Efficiency	30	$0.09	23.41%	0.03	1.12	1.80	6.246
Lumber_Wood_Products	HVAC	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBTU/hr - Advanced Efficiency	30	$0.09	23.41%	0.03	1.26	1.80	6.246
Miscellaneous_Mfg	HVAC	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBTU/hr - Advanced Efficiency	30	$0.09	23.41%	0.03	1.08	1.80	6.246
Paper_Mfg	HVAC	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBTU/hr - Advanced Efficiency	30	$0.09	23.41%	0.03	1.75	1.80	6.246
Petroleum_Refining	HVAC	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBTU/hr - Advanced Efficiency	30	$0.09	23.41%	0.03	1.77	1.80	6.246
Primary_Metal_Mfg	HVAC	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBTU/hr - Advanced Efficiency	30	$0.09	23.41%	0.03	1.67	1.80	6.246
Stone_Clay_Glass_Products	HVAC	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBTU/hr - Advanced Efficiency	30	$0.09	23.41%	0.03	1.71	1.80	6.246
Transportation_Equipment_Mfg	HVAC	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBTU/hr - Advanced Efficiency	30	$0.09	23.41%	0.03	1.04	1.80	6.246
Wastewater	HVAC	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBTU/hr - Advanced Efficiency	30	$0.09	23.41%	0.03	1.35	1.80	6.246
Water	HVAC	Ground Source Heat Pump Replacing Air Source Heat Pump 65 to 135 kBTU/hr - Advanced Efficiency	30	$0.09	23.41%	0.03	1.77	1.80	6.246
Chemical_Mfg	HVAC	Improved Controls - HVAC	10	$0.05	20.89%	0.03	0.42	0.89	4.435
Electronic_Equipment_Mfg	HVAC	Improved Controls - HVAC	10	$0.05	20.89%	0.03	0.78	0.89	4.435
Food_Mfg	HVAC	Improved Controls - HVAC	10	$0.05	20.89%	0.03	0.81	0.89	4.435

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Industrial_Machinery	HVAC	Improved Controls - HVAC	10	$0.05	20.89%	0.03	0.77	0.89	4.435
Lumber_Wood_Products	HVAC	Improved Controls - HVAC	10	$0.05	20.89%	0.03	0.48	0.89	4.435
Miscellaneous_Mfg	HVAC	Improved Controls - HVAC	10	$0.05	20.89%	0.03	0.46	0.89	4.435
Paper_Mfg	HVAC	Improved Controls - HVAC	10	$0.05	20.89%	0.03	0.80	0.89	4.435
Petroleum_Refining	HVAC	Improved Controls - HVAC	10	$0.05	20.89%	0.03	0.88	0.89	4.435
Primary_Metal_Mfg	HVAC	Improved Controls - HVAC	10	$0.05	20.89%	0.03	0.82	0.89	4.435
Stone_Clay_Glass_Products	HVAC	Improved Controls - HVAC	10	$0.05	20.89%	0.03	0.56	0.89	4.435
Transportation_Equipment_Mfg	HVAC	Improved Controls - HVAC	10	$0.05	20.89%	0.03	0.84	0.89	4.435
Wastewater	HVAC	Improved Controls - HVAC	10	$0.05	20.89%	0.03	0.88	0.89	4.435
Water	HVAC	Improved Controls - HVAC	10	$0.05	20.89%	0.03	0.84	0.89	4.435
Chemical_Mfg	HVAC	Recommissioning / Facility Energy Management	10	$0.03	5.00%	0.01	0.16	0.89	5.748
Electronic_Equipment_Mfg	HVAC	Recommissioning / Facility Energy Management	10	$0.03	5.00%	0.01	0.56	0.89	5.748
Food_Mfg	HVAC	Recommissioning / Facility Energy Management	10	$0.03	5.00%	0.01	0.62	0.89	5.748
Industrial_Machinery	HVAC	Recommissioning / Facility Energy Management	10	$0.03	5.00%	0.01	0.71	0.89	5.748
Lumber_Wood_Products	HVAC	Recommissioning / Facility Energy Management	10	$0.03	5.00%	0.01	0.20	0.89	5.748
Miscellaneous_Mfg	HVAC	Recommissioning / Facility Energy Management	10	$0.03	5.00%	0.01	0.18	0.89	5.748
Paper_Mfg	HVAC	Recommissioning / Facility Energy Management	10	$0.03	5.00%	0.01	0.53	0.89	5.748
Petroleum_Refining	HVAC	Recommissioning / Facility Energy Management	10	$0.03	5.00%	0.01	0.84	0.89	5.748
Primary_Metal_Mfg	HVAC	Recommissioning / Facility Energy Management	10	$0.03	5.00%	0.01	0.66	0.89	5.748
Stone_Clay_Glass_Products	HVAC	Recommissioning / Facility Energy Management	10	$0.03	5.00%	0.01	0.26	0.89	5.748
Transportation_Equipment_Mfg	HVAC	Recommissioning / Facility Energy Management	10	$0.03	5.00%	0.01	0.71	0.89	5.748
Wastewater	HVAC	Recommissioning / Facility Energy Management	10	$0.03	5.00%	0.01	0.83	0.89	5.748
Water	HVAC	Recommissioning / Facility Energy Management	10	$0.03	5.00%	0.01	0.71	0.89	5.748
Irrigation	Irrigation	High Efficiency Motors	15	$0.44	1.48%	0.00	0.13	1.20	1.242
Irrigation	Irrigation	Irrigation System Improvements	5	$0.33	8.00%	0.01	0.19	0.49	0.642
Irrigation	Irrigation	SIS	7	$0.84	7.50%	0.01	0.25	0.66	0.371

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Chemical_Mfg	Lighting	Efficient Metal Halide (High Bay)	15	$1.99	16.67%	0.02	0.92	1.20	0.295
Electronic_Equipment_Mfg	Lighting	Efficient Metal Halide (High Bay)	15	$1.99	16.67%	0.02	0.77	1.20	0.295
Food_Mfg	Lighting	Efficient Metal Halide (High Bay)	15	$1.99	16.67%	0.02	0.90	1.20	0.295
Industrial_Machinery	Lighting	Efficient Metal Halide (High Bay)	15	$1.99	16.67%	0.02	0.65	1.20	0.295
Lumber_Wood_Products	Lighting	Efficient Metal Halide (High Bay)	15	$1.99	16.67%	0.02	0.76	1.20	0.295
Miscellaneous_Mfg	Lighting	Efficient Metal Halide (High Bay)	15	$1.99	16.67%	0.02	0.62	1.20	0.295
Paper_Mfg	Lighting	Efficient Metal Halide (High Bay)	15	$1.99	16.67%	0.02	1.16	1.20	0.295
Petroleum_Refining	Lighting	Efficient Metal Halide (High Bay)	15	$1.99	16.67%	0.02	1.18	1.20	0.295
Primary_Metal_Mfg	Lighting	Efficient Metal Halide (High Bay)	15	$1.99	16.67%	0.02	0.74	1.20	0.295
Stone_Clay_Glass_Products	Lighting	Efficient Metal Halide (High Bay)	15	$1.99	16.67%	0.02	1.12	1.20	0.295
Transportation_Equipment_Mfg	Lighting	Efficient Metal Halide (High Bay)	15	$1.99	16.67%	0.02	1.18	1.20	0.295
Wastewater	Lighting	Efficient Metal Halide (High Bay)	15	$1.99	16.67%	0.02	0.82	1.20	0.295
Water	Lighting	Efficient Metal Halide (High Bay)	15	$1.99	16.67%	0.02	1.18	1.20	0.295
Chemical_Mfg	Lighting	Facility Energy Management	2	$0.02	1.84%	0.00	0.05	0.20	1.434
Electronic_Equipment_Mfg	Lighting	Facility Energy Management	2	$0.02	1.84%	0.00	0.08	0.20	1.434
Food_Mfg	Lighting	Facility Energy Management	2	$0.02	1.84%	0.00	0.05	0.20	1.434
Industrial_Machinery	Lighting	Facility Energy Management	2	$0.02	1.84%	0.00	0.02	0.20	1.434
Lumber_Wood_Products	Lighting	Facility Energy Management	2	$0.02	1.84%	0.00	0.03	0.20	1.434
Miscellaneous_Mfg	Lighting	Facility Energy Management	2	$0.02	1.84%	0.00	0.02	0.20	1.434
Paper_Mfg	Lighting	Facility Energy Management	2	$0.02	1.84%	0.00	0.15	0.20	1.434
Petroleum_Refining	Lighting	Facility Energy Management	2	$0.02	1.84%	0.00	0.17	0.20	1.434
Primary_Metal_Mfg	Lighting	Facility Energy Management	2	$0.02	1.84%	0.00	0.10	0.20	1.434
Stone_Clay_Glass_Products	Lighting	Facility Energy Management	2	$0.02	1.84%	0.00	0.12	0.20	1.434
Transportation_Equipment_Mfg	Lighting	Facility Energy Management	2	$0.02	1.84%	0.00	0.02	0.20	1.434
Wastewater	Lighting	Facility Energy Management	2	$0.02	1.84%	0.00	0.04	0.20	1.434
Water	Lighting	Facility Energy Management	2	$0.02	1.84%	0.00	0.17	0.20	1.434

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Chemical_Mfg	Lighting	Induction (High Bay)	20	$35.20	5.64%	0.01	0.74	1.37	0.021
Electronic_Equipment_Mfg	Lighting	Induction (High Bay)	20	$35.20	5.64%	0.01	0.53	1.37	0.021
Food_Mfg	Lighting	Induction (High Bay)	20	$35.20	5.64%	0.01	0.71	1.37	0.021
Industrial_Machinery	Lighting	Induction (High Bay)	20	$35.20	5.64%	0.01	0.41	1.37	0.021
Lumber_Wood_Products	Lighting	Induction (High Bay)	20	$35.20	5.64%	0.01	0.52	1.37	0.021
Miscellaneous_Mfg	Lighting	Induction (High Bay)	20	$35.20	5.64%	0.01	0.38	1.37	0.021
Paper_Mfg	Lighting	Induction (High Bay)	20	$35.20	5.64%	0.01	1.23	1.37	0.021
Petroleum_Refining	Lighting	Induction (High Bay)	20	$35.20	5.64%	0.01	1.29	1.37	0.021
Primary_Metal_Mfg	Lighting	Induction (High Bay)	20	$35.20	5.64%	0.01	0.49	1.37	0.021
Stone_Clay_Glass_Products	Lighting	Induction (High Bay)	20	$35.20	5.64%	0.01	1.13	1.37	0.021
Transportation_Equipment_Mfg	Lighting	Induction (High Bay)	20	$35.20	5.64%	0.01	1.30	1.37	0.021
Wastewater	Lighting	Induction (High Bay)	20	$35.20	5.64%	0.01	0.59	1.37	0.021
Water	Lighting	Induction (High Bay)	20	$35.20	5.64%	0.01	1.29	1.37	0.021
Chemical_Mfg	Lighting	LED (High Bay)	20	$16.19	18.51%	0.02	1.35	1.44	0.045
Electronic_Equipment_Mfg	Lighting	LED (High Bay)	20	$16.19	18.51%	0.02	0.96	1.44	0.045
Food_Mfg	Lighting	LED (High Bay)	20	$16.19	18.51%	0.02	1.11	1.44	0.045
Industrial_Machinery	Lighting	LED (High Bay)	20	$16.19	18.51%	0.02	0.82	1.44	0.045
Lumber_Wood_Products	Lighting	LED (High Bay)	20	$16.19	18.51%	0.02	0.94	1.44	0.045
Miscellaneous_Mfg	Lighting	LED (High Bay)	20	$16.19	18.51%	0.02	0.79	1.44	0.045
Paper_Mfg	Lighting	LED (High Bay)	20	$16.19	18.51%	0.02	1.39	1.44	0.045
Petroleum_Refining	Lighting	LED (High Bay)	20	$16.19	18.51%	0.02	0.72	1.44	0.045
Primary_Metal_Mfg	Lighting	LED (High Bay)	20	$16.19	18.51%	0.02	0.92	1.44	0.045
Stone_Clay_Glass_Products	Lighting	LED (High Bay)	20	$16.19	18.51%	0.02	1.35	1.44	0.045
Transportation_Equipment_Mfg	Lighting	LED (High Bay)	20	$16.19	18.51%	0.02	1.41	1.44	0.045
Wastewater	Lighting	LED (High Bay)	20	$16.19	18.51%	0.02	1.02	1.44	0.045
Water	Lighting	LED (High Bay)	20	$16.19	18.51%	0.02	1.41	1.44	0.045

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Chemical_Mfg	Lighting	Lighting Controls	10	$0.13	18.42%	0.02	0.70	0.89	2.498
Electronic_Equipment_Mfg	Lighting	Lighting Controls	10	$0.13	18.42%	0.02	0.77	0.89	2.498
Food_Mfg	Lighting	Lighting Controls	10	$0.13	18.42%	0.02	0.79	0.89	2.498
Industrial_Machinery	Lighting	Lighting Controls	10	$0.13	18.42%	0.02	0.50	0.89	2.498
Lumber_Wood_Products	Lighting	Lighting Controls	10	$0.13	18.42%	0.02	0.58	0.89	2.498
Miscellaneous_Mfg	Lighting	Lighting Controls	10	$0.13	18.42%	0.02	0.48	0.89	2.498
Paper_Mfg	Lighting	Lighting Controls	10	$0.13	18.42%	0.02	0.86	0.89	2.498
Petroleum_Refining	Lighting	Lighting Controls	10	$0.13	18.42%	0.02	0.87	0.89	2.498
Primary_Metal_Mfg	Lighting	Lighting Controls	10	$0.13	18.42%	0.02	0.81	0.89	2.498
Stone_Clay_Glass_Products	Lighting	Lighting Controls	10	$0.13	18.42%	0.02	0.83	0.89	2.498
Transportation_Equipment_Mfg	Lighting	Lighting Controls	10	$0.13	18.42%	0.02	0.46	0.89	2.498
Wastewater	Lighting	Lighting Controls	10	$0.13	18.42%	0.02	0.63	0.89	2.498
Water	Lighting	Lighting Controls	10	$0.13	18.42%	0.02	0.87	0.89	2.498
Chemical_Mfg	Lighting	Linear Fluorescent (High Bay)	15	$2.97	20.87%	0.03	1.14	1.20	0.199
Electronic_Equipment_Mfg	Lighting	Linear Fluorescent (High Bay)	15	$2.97	20.87%	0.03	0.83	1.20	0.199
Food_Mfg	Lighting	Linear Fluorescent (High Bay)	15	$2.97	20.87%	0.03	0.95	1.20	0.199
Industrial_Machinery	Lighting	Linear Fluorescent (High Bay)	15	$2.97	20.87%	0.03	1.18	1.20	0.199
Lumber_Wood_Products	Lighting	Linear Fluorescent (High Bay)	15	$2.97	20.87%	0.03	0.82	1.20	0.199
Miscellaneous_Mfg	Lighting	Linear Fluorescent (High Bay)	15	$2.97	20.87%	0.03	0.69	1.20	0.199
Paper_Mfg	Lighting	Linear Fluorescent (High Bay)	15	$2.97	20.87%	0.03	1.17	1.20	0.199
Petroleum_Refining	Lighting	Linear Fluorescent (High Bay)	15	$2.97	20.87%	0.03	0.95	1.20	0.199
Primary_Metal_Mfg	Lighting	Linear Fluorescent (High Bay)	15	$2.97	20.87%	0.03	0.80	1.20	0.199
Stone_Clay_Glass_Products	Lighting	Linear Fluorescent (High Bay)	15	$2.97	20.87%	0.03	1.14	1.20	0.199
Transportation_Equipment_Mfg	Lighting	Linear Fluorescent (High Bay)	15	$2.97	20.87%	0.03	1.18	1.20	0.199
Wastewater	Lighting	Linear Fluorescent (High Bay)	15	$2.97	20.87%	0.03	0.79	1.20	0.199
Water	Lighting	Linear Fluorescent (High Bay)	15	$2.97	20.87%	0.03	1.18	1.20	0.199

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Chemical_Mfg	Lighting	Metal Halide (High Bay)	15	$2.08	11.66%	0.02	0.84	1.20	0.283
Electronic_Equipment_Mfg	Lighting	Metal Halide (High Bay)	15	$2.08	11.66%	0.02	0.66	1.20	0.283
Food_Mfg	Lighting	Metal Halide (High Bay)	15	$2.08	11.66%	0.02	0.81	1.20	0.283
Industrial_Machinery	Lighting	Metal Halide (High Bay)	15	$2.08	11.66%	0.02	0.55	1.20	0.283
Lumber_Wood_Products	Lighting	Metal Halide (High Bay)	15	$2.08	11.66%	0.02	0.65	1.20	0.283
Miscellaneous_Mfg	Lighting	Metal Halide (High Bay)	15	$2.08	11.66%	0.02	0.52	1.20	0.283
Paper_Mfg	Lighting	Metal Halide (High Bay)	15	$2.08	11.66%	0.02	1.14	1.20	0.283
Petroleum_Refining	Lighting	Metal Halide (High Bay)	15	$2.08	11.66%	0.02	1.17	1.20	0.283
Primary_Metal_Mfg	Lighting	Metal Halide (High Bay)	15	$2.08	11.66%	0.02	0.63	1.20	0.283
Stone_Clay_Glass_Products	Lighting	Metal Halide (High Bay)	15	$2.08	11.66%	0.02	1.09	1.20	0.283
Transportation_Equipment_Mfg	Lighting	Metal Halide (High Bay)	15	$2.08	11.66%	0.02	0.49	1.20	0.283
Wastewater	Lighting	Metal Halide (High Bay)	15	$2.08	11.66%	0.02	0.72	1.20	0.283
Water	Lighting	Metal Halide (High Bay)	15	$2.08	11.66%	0.02	1.17	1.20	0.283
Chemical_Mfg	Lighting	Screw Base CFL	4	$0.02	80.19%	0.11	0.39	0.40	2.823
Electronic_Equipment_Mfg	Lighting	Screw Base CFL	4	$0.02	80.19%	0.11	0.36	0.40	2.823
Food_Mfg	Lighting	Screw Base CFL	4	$0.02	80.19%	0.11	0.37	0.40	2.823
Industrial_Machinery	Lighting	Screw Base CFL	4	$0.02	80.19%	0.11	0.40	0.40	2.823
Lumber_Wood_Products	Lighting	Screw Base CFL	4	$0.02	80.19%	0.11	0.30	0.40	2.823
Miscellaneous_Mfg	Lighting	Screw Base CFL	4	$0.02	80.19%	0.11	0.32	0.40	2.823
Paper_Mfg	Lighting	Screw Base CFL	4	$0.02	80.19%	0.11	0.40	0.40	2.823
Petroleum_Refining	Lighting	Screw Base CFL	4	$0.02	80.19%	0.11	0.37	0.40	2.823
Primary_Metal_Mfg	Lighting	Screw Base CFL	4	$0.02	80.19%	0.11	0.35	0.40	2.823
Stone_Clay_Glass_Products	Lighting	Screw Base CFL	4	$0.02	80.19%	0.11	0.39	0.40	2.823
Transportation_Equipment_Mfg	Lighting	Screw Base CFL	4	$0.02	80.19%	0.11	0.40	0.40	2.823
Wastewater	Lighting	Screw Base CFL	4	$0.02	80.19%	0.11	0.38	0.40	2.823
Water	Lighting	Screw Base CFL	4	$0.02	80.19%	0.11	0.34	0.40	2.823

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Chemical_Mfg	Lighting	Screw Base EISA Backstop Incandescent	1	$0.02	70.17%	0.09	0.10	0.10	0.752
Electronic_Equipment_Mfg	Lighting	Screw Base EISA Backstop Incandescent	1	$0.02	70.17%	0.09	0.09	0.10	0.752
Food_Mfg	Lighting	Screw Base EISA Backstop Incandescent	1	$0.02	70.17%	0.09	0.10	0.10	0.752
Industrial_Machinery	Lighting	Screw Base EISA Backstop Incandescent	1	$0.02	70.17%	0.09	0.10	0.10	0.752
Lumber_Wood_Products	Lighting	Screw Base EISA Backstop Incandescent	1	$0.02	70.17%	0.09	0.07	0.10	0.752
Miscellaneous_Mfg	Lighting	Screw Base EISA Backstop Incandescent	1	$0.02	70.17%	0.09	0.08	0.10	0.752
Paper_Mfg	Lighting	Screw Base EISA Backstop Incandescent	1	$0.02	70.17%	0.09	0.10	0.10	0.752
Petroleum_Refining	Lighting	Screw Base EISA Backstop Incandescent	1	$0.02	70.17%	0.09	0.10	0.10	0.752
Primary_Metal_Mfg	Lighting	Screw Base EISA Backstop Incandescent	1	$0.02	70.17%	0.09	0.09	0.10	0.752
Stone_Clay_Glass_Products	Lighting	Screw Base EISA Backstop Incandescent	1	$0.02	70.17%	0.09	0.10	0.10	0.752
Transportation_Equipment_Mfg	Lighting	Screw Base EISA Backstop Incandescent	1	$0.02	70.17%	0.09	0.10	0.10	0.752
Wastewater	Lighting	Screw Base EISA Backstop Incandescent	1	$0.02	70.17%	0.09	0.10	0.10	0.752
Water	Lighting	Screw Base EISA Backstop Incandescent	1	$0.02	70.17%	0.09	0.09	0.10	0.752
Chemical_Mfg	Lighting	Screw Base EISA Compliant Incandescent	1	$0.06	19.35%	0.03	0.10	0.10	0.472
Electronic_Equipment_Mfg	Lighting	Screw Base EISA Compliant Incandescent	1	$0.06	19.35%	0.03	0.07	0.10	0.472
Food_Mfg	Lighting	Screw Base EISA Compliant Incandescent	1	$0.06	19.35%	0.03	0.08	0.10	0.472
Industrial_Machinery	Lighting	Screw Base EISA Compliant Incandescent	1	$0.06	19.35%	0.03	0.10	0.10	0.472
Lumber_Wood_Products	Lighting	Screw Base EISA Compliant Incandescent	1	$0.06	19.35%	0.03	0.04	0.10	0.472
Miscellaneous_Mfg	Lighting	Screw Base EISA Compliant Incandescent	1	$0.06	19.35%	0.03	0.05	0.10	0.472
Paper_Mfg	Lighting	Screw Base EISA Compliant Incandescent	1	$0.06	19.35%	0.03	0.10	0.10	0.472
Petroleum_Refining	Lighting	Screw Base EISA Compliant Incandescent	1	$0.06	19.35%	0.03	0.08	0.10	0.472
Primary_Metal_Mfg	Lighting	Screw Base EISA Compliant Incandescent	1	$0.06	19.35%	0.03	0.07	0.10	0.472
Stone_Clay_Glass_Products	Lighting	Screw Base EISA Compliant Incandescent	1	$0.06	19.35%	0.03	0.10	0.10	0.472
Transportation_Equipment_Mfg	Lighting	Screw Base EISA Compliant Incandescent	1	$0.06	19.35%	0.03	0.10	0.10	0.472
Wastewater	Lighting	Screw Base EISA Compliant Incandescent	1	$0.06	19.35%	0.03	0.09	0.10	0.472
Water	Lighting	Screw Base EISA Compliant Incandescent	1	$0.06	19.35%	0.03	0.06	0.10	0.472

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Chemical_Mfg	Lighting	Screw Base LED	12	$0.17	80.85%	0.11	1.01	1.03	2.353
Electronic_Equipment_Mfg	Lighting	Screw Base LED	12	$0.17	80.85%	0.11	0.92	1.03	2.353
Food_Mfg	Lighting	Screw Base LED	12	$0.17	80.85%	0.11	0.65	1.03	2.353
Industrial_Machinery	Lighting	Screw Base LED	12	$0.17	80.85%	0.11	1.02	1.03	2.353
Lumber_Wood_Products	Lighting	Screw Base LED	12	$0.17	80.85%	0.11	0.77	1.03	2.353
Miscellaneous_Mfg	Lighting	Screw Base LED	12	$0.17	80.85%	0.11	0.83	1.03	2.353
Paper_Mfg	Lighting	Screw Base LED	12	$0.17	80.85%	0.11	1.02	1.03	2.353
Petroleum_Refining	Lighting	Screw Base LED	12	$0.17	80.85%	0.11	0.96	1.03	2.353
Primary_Metal_Mfg	Lighting	Screw Base LED	12	$0.17	80.85%	0.11	0.88	1.03	2.353
Stone_Clay_Glass_Products	Lighting	Screw Base LED	12	$0.17	80.85%	0.11	1.01	1.03	2.353
Transportation_Equipment_Mfg	Lighting	Screw Base LED	12	$0.17	80.85%	0.11	1.02	1.03	2.353
Wastewater	Lighting	Screw Base LED	12	$0.17	80.85%	0.11	0.98	1.03	2.353
Water	Lighting	Screw Base LED	12	$0.17	80.85%	0.11	0.87	1.03	2.353
Chemical_Mfg	Lighting	T5 Linear Florescent	13	$1.87	23.58%	0.03	1.03	1.09	0.283
Electronic_Equipment_Mfg	Lighting	T5 Linear Florescent	13	$1.87	23.58%	0.03	0.78	1.09	0.283
Food_Mfg	Lighting	T5 Linear Florescent	13	$1.87	23.58%	0.03	0.88	1.09	0.283
Industrial_Machinery	Lighting	T5 Linear Florescent	13	$1.87	23.58%	0.03	1.07	1.09	0.283
Lumber_Wood_Products	Lighting	T5 Linear Florescent	13	$1.87	23.58%	0.03	0.51	1.09	0.283
Miscellaneous_Mfg	Lighting	T5 Linear Florescent	13	$1.87	23.58%	0.03	0.66	1.09	0.283
Paper_Mfg	Lighting	T5 Linear Florescent	13	$1.87	23.58%	0.03	1.06	1.09	0.283
Petroleum_Refining	Lighting	T5 Linear Florescent	13	$1.87	23.58%	0.03	0.88	1.09	0.283
Primary_Metal_Mfg	Lighting	T5 Linear Florescent	13	$1.87	23.58%	0.03	0.75	1.09	0.283
Stone_Clay_Glass_Products	Lighting	T5 Linear Florescent	13	$1.87	23.58%	0.03	1.03	1.09	0.283
Transportation_Equipment_Mfg	Lighting	T5 Linear Florescent	13	$1.87	23.58%	0.03	1.07	1.09	0.283
Wastewater	Lighting	T5 Linear Florescent	13	$1.87	23.58%	0.03	1.07	1.09	0.283
Water	Lighting	T5 Linear Florescent	13	$1.87	23.58%	0.03	1.07	1.09	0.283

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Chemical_Mfg	Lighting	T8 High Performance Linear Florescent	13	$0.64	24.66%	0.03	1.04	1.09	0.787
Electronic_Equipment_Mfg	Lighting	T8 High Performance Linear Florescent	13	$0.64	24.66%	0.03	0.79	1.09	0.787
Food_Mfg	Lighting	T8 High Performance Linear Florescent	13	$0.64	24.66%	0.03	0.89	1.09	0.787
Industrial_Machinery	Lighting	T8 High Performance Linear Florescent	13	$0.64	24.66%	0.03	1.07	1.09	0.787
Lumber_Wood_Products	Lighting	T8 High Performance Linear Florescent	13	$0.64	24.66%	0.03	0.78	1.09	0.787
Miscellaneous_Mfg	Lighting	T8 High Performance Linear Florescent	13	$0.64	24.66%	0.03	0.67	1.09	0.787
Paper_Mfg	Lighting	T8 High Performance Linear Florescent	13	$0.64	24.66%	0.03	1.06	1.09	0.787
Petroleum_Refining	Lighting	T8 High Performance Linear Florescent	13	$0.64	24.66%	0.03	0.89	1.09	0.787
Primary_Metal_Mfg	Lighting	T8 High Performance Linear Florescent	13	$0.64	24.66%	0.03	0.76	1.09	0.787
Stone_Clay_Glass_Products	Lighting	T8 High Performance Linear Florescent	13	$0.64	24.66%	0.03	1.04	1.09	0.787
Transportation_Equipment_Mfg	Lighting	T8 High Performance Linear Florescent	13	$0.64	24.66%	0.03	1.07	1.09	0.787
Wastewater	Lighting	T8 High Performance Linear Florescent	13	$0.64	24.66%	0.03	0.93	1.09	0.787
Water	Lighting	T8 High Performance Linear Florescent	13	$0.64	24.66%	0.03	1.07	1.09	0.787
Chemical_Mfg	Lighting	T8 Linear Florescent	13	$0.78	19.83%	0.03	1.02	1.09	0.657
Electronic_Equipment_Mfg	Lighting	T8 Linear Florescent	13	$0.78	19.83%	0.03	0.74	1.09	0.657
Food_Mfg	Lighting	T8 Linear Florescent	13	$0.78	19.83%	0.03	0.85	1.09	0.657
Industrial_Machinery	Lighting	T8 Linear Florescent	13	$0.78	19.83%	0.03	1.07	1.09	0.657
Lumber_Wood_Products	Lighting	T8 Linear Florescent	13	$0.78	19.83%	0.03	0.46	1.09	0.657
Miscellaneous_Mfg	Lighting	T8 Linear Florescent	13	$0.78	19.83%	0.03	0.55	1.09	0.657
Paper_Mfg	Lighting	T8 Linear Florescent	13	$0.78	19.83%	0.03	1.07	1.09	0.657
Petroleum_Refining	Lighting	T8 Linear Florescent	13	$0.78	19.83%	0.03	0.85	1.09	0.657
Primary_Metal_Mfg	Lighting	T8 Linear Florescent	13	$0.78	19.83%	0.03	0.71	1.09	0.657
Stone_Clay_Glass_Products	Lighting	T8 Linear Florescent	13	$0.78	19.83%	0.03	1.04	1.09	0.657
Transportation_Equipment_Mfg	Lighting	T8 Linear Florescent	13	$0.78	19.83%	0.03	1.07	1.09	0.657
Wastewater	Lighting	T8 Linear Florescent	13	$0.78	19.83%	0.03	0.72	1.09	0.657
Water	Lighting	T8 Linear Florescent	13	$0.78	19.83%	0.03	0.62	1.09	0.657

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Chemical_Mfg	Lighting	T8 Reduced Wattage Linear Florescent	13	$0.86	24.41%	0.03	1.03	1.09	0.598
Electronic_Equipment_Mfg	Lighting	T8 Reduced Wattage Linear Florescent	13	$0.86	24.41%	0.03	0.78	1.09	0.598
Food_Mfg	Lighting	T8 Reduced Wattage Linear Florescent	13	$0.86	24.41%	0.03	0.88	1.09	0.598
Industrial_Machinery	Lighting	T8 Reduced Wattage Linear Florescent	13	$0.86	24.41%	0.03	1.07	1.09	0.598
Lumber_Wood_Products	Lighting	T8 Reduced Wattage Linear Florescent	13	$0.86	24.41%	0.03	0.52	1.09	0.598
Miscellaneous_Mfg	Lighting	T8 Reduced Wattage Linear Florescent	13	$0.86	24.41%	0.03	0.61	1.09	0.598
Paper_Mfg	Lighting	T8 Reduced Wattage Linear Florescent	13	$0.86	24.41%	0.03	1.06	1.09	0.598
Petroleum_Refining	Lighting	T8 Reduced Wattage Linear Florescent	13	$0.86	24.41%	0.03	0.88	1.09	0.598
Primary_Metal_Mfg	Lighting	T8 Reduced Wattage Linear Florescent	13	$0.86	24.41%	0.03	0.76	1.09	0.598
Stone_Clay_Glass_Products	Lighting	T8 Reduced Wattage Linear Florescent	13	$0.86	24.41%	0.03	1.05	1.09	0.598
Transportation_Equipment_Mfg	Lighting	T8 Reduced Wattage Linear Florescent	13	$0.86	24.41%	0.03	1.07	1.09	0.598
Wastewater	Lighting	T8 Reduced Wattage Linear Florescent	13	$0.86	24.41%	0.03	1.07	1.09	0.598
Water	Lighting	T8 Reduced Wattage Linear Florescent	13	$0.86	24.41%	0.03	0.67	1.09	0.598
Chemical_Mfg	Motors_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.06	0.20	1.434
Electronic_Equipment_Mfg	Motors_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.01	0.20	1.434
Food_Mfg	Motors_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.01	0.20	1.434
Industrial_Machinery	Motors_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.17	0.20	1.434
Lumber_Wood_Products	Motors_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.04	0.20	1.434
Miscellaneous_Mfg	Motors_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.17	0.20	1.434
Paper_Mfg	Motors_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.17	0.20	1.434
Petroleum_Refining	Motors_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.14	0.20	1.434
Primary_Metal_Mfg	Motors_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.02	0.20	1.434
Stone_Clay_Glass_Products	Motors_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.13	0.20	1.434
Transportation_Equipment_Mfg	Motors_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.17	0.20	1.434
Wastewater	Motors_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.14	0.20	1.434
Water	Motors_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.03	0.20	1.434

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Chemical_Mfg	Motors_Other	High Efficiency Motors	15	$0.44	1.48%	0.00	0.65	1.20	1.242
Electronic_Equipment_Mfg	Motors_Other	High Efficiency Motors	15	$0.44	1.48%	0.00	0.07	1.20	1.242
Food_Mfg	Motors_Other	High Efficiency Motors	15	$0.44	1.48%	0.00	0.04	1.20	1.242
Industrial_Machinery	Motors_Other	High Efficiency Motors	15	$0.44	1.48%	0.00	0.98	1.20	1.242
Lumber_Wood_Products	Motors_Other	High Efficiency Motors	15	$0.44	1.48%	0.00	0.06	1.20	1.242
Mining	Motors_Other	High Efficiency Motors	15	$0.44	1.48%	0.00	0.03	1.20	1.242
Miscellaneous_Mfg	Motors_Other	High Efficiency Motors	15	$0.44	1.48%	0.00	0.09	1.20	1.242
Paper_Mfg	Motors_Other	High Efficiency Motors	15	$0.44	1.48%	0.00	0.96	1.20	1.242
Petroleum_Refining	Motors_Other	High Efficiency Motors	15	$0.44	1.48%	0.00	0.25	1.20	1.242
Primary_Metal_Mfg	Motors_Other	High Efficiency Motors	15	$0.44	1.48%	0.00	0.12	1.20	1.242
Stone_Clay_Glass_Products	Motors_Other	High Efficiency Motors	15	$0.44	1.48%	0.00	0.73	1.20	1.242
Transportation_Equipment_Mfg	Motors_Other	High Efficiency Motors	15	$0.44	1.48%	0.00	0.33	1.20	1.242
Wastewater	Motors_Other	High Efficiency Motors	15	$0.44	1.48%	0.00	0.37	1.20	1.242
Water	Motors_Other	High Efficiency Motors	15	$0.44	1.48%	0.00	0.11	1.20	1.242
Chemical_Mfg	Motors_Other	Improved Controls - Motors	10	$0.10	3.47%	0.00	0.65	0.89	2.898
Electronic_Equipment_Mfg	Motors_Other	Improved Controls - Motors	10	$0.10	3.47%	0.00	0.11	0.89	2.898
Food_Mfg	Motors_Other	Improved Controls - Motors	10	$0.10	3.47%	0.00	0.06	0.89	2.898
Industrial_Machinery	Motors_Other	Improved Controls - Motors	10	$0.10	3.47%	0.00	0.81	0.89	2.898
Lumber_Wood_Products	Motors_Other	Improved Controls - Motors	10	$0.10	3.47%	0.00	0.10	0.89	2.898
Mining	Motors_Other	Improved Controls - Motors	10	$0.10	3.47%	0.00	0.14	0.89	2.898
Miscellaneous_Mfg	Motors_Other	Improved Controls - Motors	10	$0.10	3.47%	0.00	0.14	0.89	2.898
Paper_Mfg	Motors_Other	Improved Controls - Motors	10	$0.10	3.47%	0.00	0.80	0.89	2.898
Petroleum_Refining	Motors_Other	Improved Controls - Motors	10	$0.10	3.47%	0.00	0.34	0.89	2.898
Primary_Metal_Mfg	Motors_Other	Improved Controls - Motors	10	$0.10	3.47%	0.00	0.18	0.89	2.898
Stone_Clay_Glass_Products	Motors_Other	Improved Controls - Motors	10	$0.10	3.47%	0.00	0.70	0.89	2.898
Transportation_Equipment_Mfg	Motors_Other	Improved Controls - Motors	10	$0.10	3.47%	0.00	0.41	0.89	2.898

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Wastewater	Motors_Other	Improved Controls - Motors	10	$0.10	3.47%	0.00	0.45	0.89	2.898
Water	Motors_Other	Improved Controls - Motors	10	$0.10	3.47%	0.00	0.17	0.89	2.898
Lumber_Wood_Products	Motors_Other	Material Handling	10	$0.47	5.01%	0.01	0.14	0.89	0.860
Mining	Motors_Other	Material Handling	10	$0.47	5.01%	0.01	0.19	0.89	0.860
Paper_Mfg	Motors_Other	Material Handling	10	$0.47	5.01%	0.01	0.83	0.89	0.860
Lumber_Wood_Products	Motors_Other	Material Handling VFD	10	$0.30	18.73%	0.02	0.37	0.89	1.271
Mining	Motors_Other	Material Handling VFD	10	$0.30	0.00%	-	-	-	#####
Paper_Mfg	Motors_Other	Material Handling VFD	10	$0.30	18.73%	0.02	0.87	0.89	1.271
Chemical_Mfg	Motors_Other	Motors Other	15	$0.02	0.79%	0.00	0.47	1.21	8.832
Electronic_Equipment_Mfg	Motors_Other	Motors Other	15	$0.02	0.79%	0.00	0.04	1.21	8.832
Food_Mfg	Motors_Other	Motors Other	15	$0.02	0.79%	0.00	0.02	1.21	8.832
Industrial_Machinery	Motors_Other	Motors Other	15	$0.02	0.79%	0.00	0.85	1.21	8.832
Lumber_Wood_Products	Motors_Other	Motors Other	15	$0.02	0.79%	0.00	0.03	1.21	8.832
Mining	Motors_Other	Motors Other	15	$0.02	0.79%	0.00	0.05	1.21	8.832
Miscellaneous_Mfg	Motors_Other	Motors Other	15	$0.02	0.79%	0.00	0.05	1.21	8.832
Paper_Mfg	Motors_Other	Motors Other	15	$0.02	0.79%	0.00	0.82	1.21	8.832
Petroleum_Refining	Motors_Other	Motors Other	15	$0.02	0.79%	0.00	0.15	1.21	8.832
Primary_Metal_Mfg	Motors_Other	Motors Other	15	$0.02	0.79%	0.00	0.07	1.21	8.832
Stone_Clay_Glass_Products	Motors_Other	Motors Other	15	$0.02	0.79%	0.00	0.55	1.21	8.832
Transportation_Equipment_Mfg	Motors_Other	Motors Other	15	$0.02	0.79%	0.00	0.20	1.21	8.832
Wastewater	Motors_Other	Motors Other	15	$0.02	0.79%	0.00	0.23	1.21	8.832
Water	Motors_Other	Motors Other	15	$0.02	0.79%	0.00	0.06	1.21	8.832
Chemical_Mfg	Motors_Other	Motors: Rewind 101-200 HP	10	$0.23	0.55%	0.00	0.11	0.89	1.600
Electronic_Equipment_Mfg	Motors_Other	Motors: Rewind 101-200 HP	10	$0.23	0.55%	0.00	0.02	0.89	1.600
Food_Mfg	Motors_Other	Motors: Rewind 101-200 HP	10	$0.23	0.55%	0.00	0.01	0.89	1.600
Industrial_Machinery	Motors_Other	Motors: Rewind 101-200 HP	10	$0.23	0.55%	0.00	0.08	0.89	1.600

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Lumber_Wood_Products	Motors_Other	Motors: Rewind 101-200 HP	10	$0.23	0.55%	0.00	0.02	0.89	1.600
Mining	Motors_Other	Motors: Rewind 101-200 HP	10	$0.23	0.55%	0.00	0.03	0.89	1.600
Miscellaneous_Mfg	Motors_Other	Motors: Rewind 101-200 HP	10	$0.23	0.55%	0.00	0.03	0.89	1.600
Paper_Mfg	Motors_Other	Motors: Rewind 101-200 HP	10	$0.23	0.55%	0.00	0.53	0.89	1.600
Petroleum_Refining	Motors_Other	Motors: Rewind 101-200 HP	10	$0.23	0.55%	0.00	0.08	0.89	1.600
Primary_Metal_Mfg	Motors_Other	Motors: Rewind 101-200 HP	10	$0.23	0.55%	0.00	0.03	0.89	1.600
Stone_Clay_Glass_Products	Motors_Other	Motors: Rewind 101-200 HP	10	$0.23	0.55%	0.00	0.33	0.89	1.600
Transportation_Equipment_Mfg	Motors_Other	Motors: Rewind 101-200 HP	10	$0.23	0.55%	0.00	0.11	0.89	1.600
Wastewater	Motors_Other	Motors: Rewind 101-200 HP	10	$0.23	0.55%	0.00	0.12	0.89	1.600
Water	Motors_Other	Motors: Rewind 101-200 HP	10	$0.23	0.55%	0.00	0.05	0.89	1.600
Chemical_Mfg	Motors_Other	Motors: Rewind 201-500 HP	8	$0.15	0.55%	0.00	0.09	0.74	1.898
Electronic_Equipment_Mfg	Motors_Other	Motors: Rewind 201-500 HP	8	$0.15	0.55%	0.00	0.02	0.74	1.898
Food_Mfg	Motors_Other	Motors: Rewind 201-500 HP	8	$0.15	0.55%	0.00	0.01	0.74	1.898
Industrial_Machinery	Motors_Other	Motors: Rewind 201-500 HP	8	$0.15	0.55%	0.00	0.07	0.74	1.898
Lumber_Wood_Products	Motors_Other	Motors: Rewind 201-500 HP	8	$0.15	0.55%	0.00	0.06	0.74	1.898
Mining	Motors_Other	Motors: Rewind 201-500 HP	8	$0.15	0.55%	0.00	0.02	0.74	1.898
Miscellaneous_Mfg	Motors_Other	Motors: Rewind 201-500 HP	8	$0.15	0.55%	0.00	0.02	0.74	1.898
Paper_Mfg	Motors_Other	Motors: Rewind 201-500 HP	8	$0.15	0.55%	0.00	0.44	0.74	1.898
Petroleum_Refining	Motors_Other	Motors: Rewind 201-500 HP	8	$0.15	0.55%	0.00	0.07	0.74	1.898
Primary_Metal_Mfg	Motors_Other	Motors: Rewind 201-500 HP	8	$0.15	0.55%	0.00	0.03	0.74	1.898
Stone_Clay_Glass_Products	Motors_Other	Motors: Rewind 201-500 HP	8	$0.15	0.55%	0.00	0.09	0.74	1.898
Transportation_Equipment_Mfg	Motors_Other	Motors: Rewind 201-500 HP	8	$0.15	0.55%	0.00	0.09	0.74	1.898
Wastewater	Motors_Other	Motors: Rewind 201-500 HP	8	$0.15	0.55%	0.00	0.10	0.74	1.898
Water	Motors_Other	Motors: Rewind 201-500 HP	8	$0.15	0.55%	0.00	0.04	0.74	1.898
Chemical_Mfg	Motors_Other	Motors: Rewind 20-50 HP	11.2	$0.36	1.03%	0.00	0.19	0.96	1.169
Electronic_Equipment_Mfg	Motors_Other	Motors: Rewind 20-50 HP	11	$0.36	1.03%	0.00	0.04	0.96	1.169

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Food_Mfg	Motors_Other	Motors: Rewind 20-50 HP	11	$0.36	1.03%	0.00	0.02	0.96	1.169
Industrial_Machinery	Motors_Other	Motors: Rewind 20-50 HP	11	$0.36	1.03%	0.00	0.15	0.96	1.169
Lumber_Wood_Products	Motors_Other	Motors: Rewind 20-50 HP	11	$0.36	1.03%	0.00	0.13	0.96	1.169
Mining	Motors_Other	Motors: Rewind 20-50 HP	11	$0.36	1.03%	0.00	0.05	0.96	1.169
Miscellaneous_Mfg	Motors_Other	Motors: Rewind 20-50 HP	11	$0.36	1.03%	0.00	0.05	0.96	1.169
Paper_Mfg	Motors_Other	Motors: Rewind 20-50 HP	11	$0.36	1.03%	0.00	0.70	0.96	1.169
Petroleum_Refining	Motors_Other	Motors: Rewind 20-50 HP	11	$0.36	1.03%	0.00	0.55	0.96	1.169
Primary_Metal_Mfg	Motors_Other	Motors: Rewind 20-50 HP	11	$0.36	1.03%	0.00	0.07	0.96	1.169
Stone_Clay_Glass_Products	Motors_Other	Motors: Rewind 20-50 HP	11	$0.36	1.03%	0.00	0.20	0.96	1.169
Transportation_Equipment_Mfg	Motors_Other	Motors: Rewind 20-50 HP	11	$0.36	1.03%	0.00	0.20	0.96	1.169
Wastewater	Motors_Other	Motors: Rewind 20-50 HP	11	$0.36	1.03%	0.00	0.22	0.96	1.169
Water	Motors_Other	Motors: Rewind 20-50 HP	11	$0.36	1.03%	0.00	0.10	0.96	1.169
Chemical_Mfg	Motors_Other	Motors: Rewind 500+ HP	8	$0.10	0.56%	0.00	0.09	0.74	2.441
Electronic_Equipment_Mfg	Motors_Other	Motors: Rewind 500+ HP	8	$0.10	0.56%	0.00	0.02	0.74	2.441
Food_Mfg	Motors_Other	Motors: Rewind 500+ HP	8	$0.10	0.56%	0.00	0.01	0.74	2.441
Industrial_Machinery	Motors_Other	Motors: Rewind 500+ HP	8	$0.10	0.56%	0.00	0.07	0.74	2.441
Lumber_Wood_Products	Motors_Other	Motors: Rewind 500+ HP	8	$0.10	0.56%	0.00	0.06	0.74	2.441
Mining	Motors_Other	Motors: Rewind 500+ HP	8	$0.10	0.56%	0.00	0.02	0.74	2.441
Miscellaneous_Mfg	Motors_Other	Motors: Rewind 500+ HP	8	$0.10	0.56%	0.00	0.02	0.74	2.441
Paper_Mfg	Motors_Other	Motors: Rewind 500+ HP	8	$0.10	0.56%	0.00	0.44	0.74	2.441
Petroleum_Refining	Motors_Other	Motors: Rewind 500+ HP	8	$0.10	0.56%	0.00	0.32	0.74	2.441
Primary_Metal_Mfg	Motors_Other	Motors: Rewind 500+ HP	8	$0.10	0.56%	0.00	0.03	0.74	2.441
Stone_Clay_Glass_Products	Motors_Other	Motors: Rewind 500+ HP	8	$0.10	0.56%	0.00	0.09	0.74	2.441
Transportation_Equipment_Mfg	Motors_Other	Motors: Rewind 500+ HP	8	$0.10	0.56%	0.00	0.09	0.74	2.441
Wastewater	Motors_Other	Motors: Rewind 500+ HP	8	$0.10	0.56%	0.00	0.10	0.74	2.441
Water	Motors_Other	Motors: Rewind 500+ HP	8	$0.10	0.56%	0.00	0.04	0.74	2.441

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Chemical_Mfg	Motors_Other	Motors: Rewind 51-100 HP	9	$0.30	0.60%	0.00	0.10	0.81	1.151
Electronic_Equipment_Mfg	Motors_Other	Motors: Rewind 51-100 HP	9	$0.30	0.60%	0.00	0.02	0.81	1.151
Food_Mfg	Motors_Other	Motors: Rewind 51-100 HP	9	$0.30	0.60%	0.00	0.01	0.81	1.151
Industrial_Machinery	Motors_Other	Motors: Rewind 51-100 HP	9	$0.30	0.60%	0.00	0.08	0.81	1.151
Lumber_Wood_Products	Motors_Other	Motors: Rewind 51-100 HP	9	$0.30	0.60%	0.00	0.07	0.81	1.151
Mining	Motors_Other	Motors: Rewind 51-100 HP	9	$0.30	0.60%	0.00	0.03	0.81	1.151
Miscellaneous_Mfg	Motors_Other	Motors: Rewind 51-100 HP	9	$0.30	0.60%	0.00	0.52	0.81	1.151
Paper_Mfg	Motors_Other	Motors: Rewind 51-100 HP	9	$0.30	0.60%	0.00	0.53	0.81	1.151
Petroleum_Refining	Motors_Other	Motors: Rewind 51-100 HP	9	$0.30	0.60%	0.00	0.36	0.81	1.151
Primary_Metal_Mfg	Motors_Other	Motors: Rewind 51-100 HP	9	$0.30	0.60%	0.00	0.02	0.81	1.151
Stone_Clay_Glass_Products	Motors_Other	Motors: Rewind 51-100 HP	9	$0.30	0.60%	0.00	0.11	0.81	1.151
Transportation_Equipment_Mfg	Motors_Other	Motors: Rewind 51-100 HP	9	$0.30	0.60%	0.00	0.11	0.81	1.151
Wastewater	Motors_Other	Motors: Rewind 51-100 HP	9	$0.30	0.60%	0.00	0.36	0.81	1.151
Water	Motors_Other	Motors: Rewind 51-100 HP	9	$0.30	0.60%	0.00	0.05	0.81	1.151
Lumber_Wood_Products	Motors_Other	Panel: Hydraulic Press	10	$0.20	28.00%	0.04	0.72	0.89	1.776
Chemical_Mfg	Motors_Other	Switch from Belt drive to Direct Drive	12	$0.21	7.50%	0.01	0.66	1.03	1.943
Electronic_Equipment_Mfg	Motors_Other	Switch from Belt drive to Direct Drive	12	$0.21	7.50%	0.01	0.24	1.03	1.943
Food_Mfg	Motors_Other	Switch from Belt drive to Direct Drive	12	$0.21	7.50%	0.01	0.14	1.03	1.943
Industrial_Machinery	Motors_Other	Switch from Belt drive to Direct Drive	12	$0.21	7.50%	0.01	0.59	1.03	1.943
Lumber_Wood_Products	Motors_Other	Switch from Belt drive to Direct Drive	12	$0.21	7.50%	0.01	0.55	1.03	1.943
Mining	Motors_Other	Switch from Belt drive to Direct Drive	12	$0.21	7.50%	0.01	0.30	1.03	1.943
Miscellaneous_Mfg	Motors_Other	Switch from Belt drive to Direct Drive	12	$0.21	7.50%	0.01	0.98	1.03	1.943
Paper_Mfg	Motors_Other	Switch from Belt drive to Direct Drive	12	$0.21	7.50%	0.01	0.98	1.03	1.943
Petroleum_Refining	Motors_Other	Switch from Belt drive to Direct Drive	12	$0.21	7.50%	0.01	0.93	1.03	1.943
Primary_Metal_Mfg	Motors_Other	Switch from Belt drive to Direct Drive	12	$0.21	7.50%	0.01	0.28	1.03	1.943
Stone_Clay_Glass_Products	Motors_Other	Switch from Belt drive to Direct Drive	12	$0.21	7.50%	0.01	0.67	1.03	1.943

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Transportation_Equipment_Mfg	Motors_Other	Switch from Belt drive to Direct Drive	12	$0.21	7.50%	0.01	0.67	1.03	1.943
Wastewater	Motors_Other	Switch from Belt drive to Direct Drive	12	$0.21	7.50%	0.01	0.93	1.03	1.943
Water	Motors_Other	Switch from Belt drive to Direct Drive	12	$0.21	7.50%	0.01	0.46	1.03	1.943
Chemical_Mfg	Motors_Other	Synchronous Belts	10	$0.21	1.12%	0.00	0.19	0.89	1.686
Food_Mfg	Motors_Other	Synchronous Belts	10	$0.21	1.12%	0.00	0.02	0.89	1.686
Industrial_Machinery	Motors_Other	Synchronous Belts	10	$0.21	1.12%	0.00	0.15	0.89	1.686
Lumber_Wood_Products	Motors_Other	Synchronous Belts	10	$0.21	1.12%	0.00	0.13	0.89	1.686
Mining	Motors_Other	Synchronous Belts	10	$0.21	1.12%	0.00	0.05	0.89	1.686
Miscellaneous_Mfg	Motors_Other	Synchronous Belts	10	$0.21	1.12%	0.00	0.69	0.89	1.686
Paper_Mfg	Motors_Other	Synchronous Belts	10	$0.21	1.12%	0.00	0.69	0.89	1.686
Petroleum_Refining	Motors_Other	Synchronous Belts	10	$0.21	1.12%	0.00	0.53	0.89	1.686
Primary_Metal_Mfg	Motors_Other	Synchronous Belts	10	$0.21	1.12%	0.00	0.05	0.89	1.686
Stone_Clay_Glass_Products	Motors_Other	Synchronous Belts	10	$0.21	1.12%	0.00	0.20	0.89	1.686
Transportation_Equipment_Mfg	Motors_Other	Synchronous Belts	10	$0.21	1.12%	0.00	0.19	0.89	1.686
Wastewater	Motors_Other	Synchronous Belts	10	$0.21	1.12%	0.00	0.53	0.89	1.686
Water	Motors_Other	Synchronous Belts	10	$0.21	1.12%	0.00	0.10	0.89	1.686
Agriculture	Motors_Other	VFDs - Potato / Onion Shed	10	$0.31	32.07%	0.04	0.63	0.89	1.243
Agriculture	Other	Agricultural Engine Block Heater Timers	10	$0.06	2.50%	0.00	0.14	0.89	3.994
Chemical_Mfg	Other	Bldg Improvements	15	$0.13	20.40%	0.03	1.00	1.21	3.334
Electronic_Equipment_Mfg	Other	Bldg Improvements	15	$0.13	20.40%	0.03	0.55	1.21	3.334
Food_Mfg	Other	Bldg Improvements	15	$0.13	20.40%	0.03	0.37	1.21	3.334
Industrial_Machinery	Other	Bldg Improvements	15	$0.13	20.40%	0.03	0.95	1.21	3.334
Lumber_Wood_Products	Other	Bldg Improvements	15	$0.13	20.40%	0.03	0.91	1.21	3.334
Miscellaneous_Mfg	Other	Bldg Improvements	15	$0.13	20.40%	0.03	1.19	1.21	3.334
Paper_Mfg	Other	Bldg Improvements	15	$0.13	20.40%	0.03	1.19	1.21	3.334
Petroleum_Refining	Other	Bldg Improvements	15	$0.13	20.40%	0.03	1.16	1.21	3.334

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Primary_Metal_Mfg	Other	Bldg Improvements	15	$0.13	20.40%	0.03	0.61	1.21	3.334
Stone_Clay_Glass_Products	Other	Bldg Improvements	15	$0.13	20.40%	0.03	1.01	1.21	3.334
Transportation_Equipment_Mfg	Other	Bldg Improvements	15	$0.13	20.40%	0.03	1.01	1.21	3.334
Wastewater	Other	Bldg Improvements	15	$0.13	20.40%	0.03	1.16	1.21	3.334
Water	Other	Bldg Improvements	15	$0.13	20.40%	0.03	1.16	1.21	3.334
Chemical_Mfg	Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.06	0.20	1.434
Electronic_Equipment_Mfg	Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.01	0.20	1.434
Food_Mfg	Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.01	0.20	1.434
Industrial_Machinery	Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.05	0.20	1.434
Lumber_Wood_Products	Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.04	0.20	1.434
Miscellaneous_Mfg	Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.17	0.20	1.434
Paper_Mfg	Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.17	0.20	1.434
Petroleum_Refining	Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.14	0.20	1.434
Primary_Metal_Mfg	Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.02	0.20	1.434
Stone_Clay_Glass_Products	Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.06	0.20	1.434
Transportation_Equipment_Mfg	Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.08	0.20	1.434
Wastewater	Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.14	0.20	1.434
Water	Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.14	0.20	1.434
Chemical_Mfg	Other	Transformers	30	$0.20	1.60%	0.00	0.50	1.79	3.597
Electronic_Equipment_Mfg	Other	Transformers	30	$0.20	1.60%	0.00	0.11	1.79	3.597
Food_Mfg	Other	Transformers	30	$0.20	1.60%	0.00	0.11	1.79	3.597
Industrial_Machinery	Other	Transformers	30	$0.20	1.60%	0.00	0.41	1.79	3.597
Lumber_Wood_Products	Other	Transformers	30	$0.20	1.60%	0.00	0.35	1.79	3.597
Miscellaneous_Mfg	Other	Transformers	30	$0.20	1.60%	0.00	1.49	1.79	3.597
Paper_Mfg	Other	Transformers	30	$0.20	1.60%	0.00	1.50	1.79	3.597
Petroleum_Refining	Other	Transformers	30	$0.20	1.60%	0.00	1.22	1.79	3.597

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Primary_Metal_Mfg	Other	Transformers	30	$0.20	1.60%	0.00	0.13	1.79	3.597
Stone_Clay_Glass_Products	Other	Transformers	30	$0.20	1.60%	0.00	0.52	1.79	3.597
Transportation_Equipment_Mfg	Other	Transformers	30	$0.20	1.60%	0.00	1.45	1.79	3.597
Wastewater	Other	Transformers	30	$0.20	1.60%	0.00	1.22	1.79	3.597
Water	Other	Transformers	30	$0.20	1.60%	0.00	1.22	1.79	3.597
Chemical_Mfg	Process_AirComp	Air Compressor Demand Reduction	10	$0.05	15.94%	0.02	0.71	0.89	4.381
Electronic_Equipment_Mfg	Process_AirComp	Air Compressor Demand Reduction	10	$0.05	15.94%	0.02	0.59	0.89	4.381
Industrial_Machinery	Process_AirComp	Air Compressor Demand Reduction	10	$0.05	15.94%	0.02	0.66	0.89	4.381
Lumber_Wood_Products	Process_AirComp	Air Compressor Demand Reduction	10	$0.05	15.94%	0.02	0.63	0.89	4.381
Mining	Process_AirComp	Air Compressor Demand Reduction	10	$0.05	15.94%	0.02	0.41	0.89	4.381
Miscellaneous_Mfg	Process_AirComp	Air Compressor Demand Reduction	10	$0.05	15.94%	0.02	0.87	0.89	4.381
Paper_Mfg	Process_AirComp	Air Compressor Demand Reduction	10	$0.05	15.94%	0.02	0.87	0.89	4.381
Petroleum_Refining	Process_AirComp	Air Compressor Demand Reduction	10	$0.05	15.94%	0.02	0.85	0.89	4.381
Primary_Metal_Mfg	Process_AirComp	Air Compressor Demand Reduction	10	$0.05	15.94%	0.02	0.39	0.89	4.381
Stone_Clay_Glass_Products	Process_AirComp	Air Compressor Demand Reduction	10	$0.05	15.94%	0.02	0.71	0.89	4.381
Transportation_Equipment_Mfg	Process_AirComp	Air Compressor Demand Reduction	10	$0.05	15.94%	0.02	0.81	0.89	4.381
Wastewater	Process_AirComp	Air Compressor Demand Reduction	10	$0.05	15.94%	0.02	0.85	0.89	4.381
Food_Mfg	Process_AirComp	Air Compressor Equipment	10	$0.04	20.26%	0.03	0.39	0.89	4.985
Industrial_Machinery	Process_AirComp	Air Compressor Equipment	10	$0.04	20.26%	0.03	0.70	0.89	4.985
Lumber_Wood_Products	Process_AirComp	Air Compressor Equipment	10	$0.04	20.26%	0.03	0.67	0.89	4.985
Paper_Mfg	Process_AirComp	Air Compressor Equipment	10	$0.04	20.26%	0.03	0.88	0.89	4.985
Petroleum_Refining	Process_AirComp	Air Compressor Equipment	10	$0.04	20.26%	0.03	0.86	0.89	4.985
Primary_Metal_Mfg	Process_AirComp	Air Compressor Equipment	10	$0.04	20.26%	0.03	0.45	0.89	4.985
Stone_Clay_Glass_Products	Process_AirComp	Air Compressor Equipment	10	$0.04	20.26%	0.03	0.74	0.89	4.985
Transportation_Equipment_Mfg	Process_AirComp	Air Compressor Equipment	10	$0.04	20.26%	0.03	0.80	0.89	4.985
Wastewater	Process_AirComp	Air Compressor Equipment	10	$0.04	20.26%	0.03	0.86	0.89	4.985

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Food_Mfg	Process_AirComp	Air Compressor Optimization	10	$0.11	30.09%	0.04	0.48	0.89	2.816
Industrial_Machinery	Process_AirComp	Air Compressor Optimization	10	$0.11	30.09%	0.04	0.75	0.89	2.816
Lumber_Wood_Products	Process_AirComp	Air Compressor Optimization	10	$0.11	30.09%	0.04	0.84	0.89	2.816
Paper_Mfg	Process_AirComp	Air Compressor Optimization	10	$0.11	30.09%	0.04	0.88	0.89	2.816
Petroleum_Refining	Process_AirComp	Air Compressor Optimization	10	$0.11	30.09%	0.04	0.87	0.89	2.816
Primary_Metal_Mfg	Process_AirComp	Air Compressor Optimization	10	$0.11	30.09%	0.04	0.53	0.89	2.816
Stone_Clay_Glass_Products	Process_AirComp	Air Compressor Optimization	10	$0.11	30.09%	0.04	0.86	0.89	2.816
Transportation_Equipment_Mfg	Process_AirComp	Air Compressor Optimization	10	$0.11	30.09%	0.04	0.69	0.89	2.816
Wastewater	Process_AirComp	Air Compressor Optimization	10	$0.11	30.09%	0.04	0.87	0.89	2.816
Chemical_Mfg	Process_AirComp	Facility Energy Management	2	$0.02	1.84%	0.00	0.20	0.20	1.434
Electronic_Equipment_Mfg	Process_AirComp	Facility Energy Management	2	$0.02	1.84%	0.00	0.04	0.20	1.434
Food_Mfg	Process_AirComp	Facility Energy Management	2	$0.02	1.84%	0.00	0.01	0.20	1.434
Industrial_Machinery	Process_AirComp	Facility Energy Management	2	$0.02	1.84%	0.00	0.02	0.20	1.434
Lumber_Wood_Products	Process_AirComp	Facility Energy Management	2	$0.02	1.84%	0.00	0.10	0.20	1.434
Miscellaneous_Mfg	Process_AirComp	Facility Energy Management	2	$0.02	1.84%	0.00	0.17	0.20	1.434
Paper_Mfg	Process_AirComp	Facility Energy Management	2	$0.02	1.84%	0.00	0.15	0.20	1.434
Petroleum_Refining	Process_AirComp	Facility Energy Management	2	$0.02	1.84%	0.00	0.02	0.20	1.434
Primary_Metal_Mfg	Process_AirComp	Facility Energy Management	2	$0.02	1.84%	0.00	0.17	0.20	1.434
Stone_Clay_Glass_Products	Process_AirComp	Facility Energy Management	2	$0.02	1.84%	0.00	0.13	0.20	1.434
Transportation_Equipment_Mfg	Process_AirComp	Facility Energy Management	2	$0.02	1.84%	0.00	0.04	0.20	1.434
Wastewater	Process_AirComp	Facility Energy Management	2	$0.02	1.84%	0.00	0.17	0.20	1.434
Water	Process_AirComp	Facility Energy Management	2	$0.02	1.84%	0.00	0.14	0.20	1.434
Chemical_Mfg	Process_AirComp	High efficiency Compressor motors	15	$0.34	1.10%	0.00	0.25	1.20	1.532
Electronic_Equipment_Mfg	Process_AirComp	High efficiency Compressor motors	15	$0.34	1.10%	0.00	0.14	1.20	1.532
Food_Mfg	Process_AirComp	High efficiency Compressor motors	15	$0.34	1.10%	0.00	0.05	1.20	1.532
Industrial_Machinery	Process_AirComp	High efficiency Compressor motors	15	$0.34	1.10%	0.00	0.07	1.20	1.532

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Lumber_Wood_Products	Process_AirComp	High efficiency Compressor motors	15	$0.34	1.10%	0.00	0.45	1.20	1.532
Miscellaneous_Mfg	Process_AirComp	High efficiency Compressor motors	15	$0.34	1.10%	0.00	0.92	1.20	1.532
Paper_Mfg	Process_AirComp	High efficiency Compressor motors	15	$0.34	1.10%	0.00	0.93	1.20	1.532
Petroleum_Refining	Process_AirComp	High efficiency Compressor motors	15	$0.34	1.10%	0.00	0.06	1.20	1.532
Primary_Metal_Mfg	Process_AirComp	High efficiency Compressor motors	15	$0.34	1.10%	0.00	0.92	1.20	1.532
Stone_Clay_Glass_Products	Process_AirComp	High efficiency Compressor motors	15	$0.34	1.10%	0.00	0.60	1.20	1.532
Transportation_Equipment_Mfg	Process_AirComp	High efficiency Compressor motors	15	$0.34	1.10%	0.00	0.07	1.20	1.532
Wastewater	Process_AirComp	High efficiency Compressor motors	15	$0.34	1.10%	0.00	0.92	1.20	1.532
Chemical_Mfg	Process_AirComp	Improved Controls - Air Compressor	10	$0.03	18.61%	0.02	0.73	0.89	5.415
Electronic_Equipment_Mfg	Process_AirComp	Improved Controls - Air Compressor	10	$0.03	18.61%	0.02	0.62	0.89	5.415
Food_Mfg	Process_AirComp	Improved Controls - Air Compressor	10	$0.03	18.61%	0.02	0.38	0.89	5.415
Industrial_Machinery	Process_AirComp	Improved Controls - Air Compressor	10	$0.03	18.61%	0.02	0.46	0.89	5.415
Lumber_Wood_Products	Process_AirComp	Improved Controls - Air Compressor	10	$0.03	18.61%	0.02	0.81	0.89	5.415
Miscellaneous_Mfg	Process_AirComp	Improved Controls - Air Compressor	10	$0.03	18.61%	0.02	0.87	0.89	5.415
Paper_Mfg	Process_AirComp	Improved Controls - Air Compressor	10	$0.03	18.61%	0.02	0.88	0.89	5.415
Petroleum_Refining	Process_AirComp	Improved Controls - Air Compressor	10	$0.03	18.61%	0.02	0.86	0.89	5.415
Primary_Metal_Mfg	Process_AirComp	Improved Controls - Air Compressor	10	$0.03	18.61%	0.02	0.87	0.89	5.415
Stone_Clay_Glass_Products	Process_AirComp	Improved Controls - Air Compressor	10	$0.03	18.61%	0.02	0.84	0.89	5.415
Transportation_Equipment_Mfg	Process_AirComp	Improved Controls - Air Compressor	10	$0.03	18.61%	0.02	0.44	0.89	5.415
Wastewater	Process_AirComp	Improved Controls - Air Compressor	10	$0.03	18.61%	0.02	0.78	0.89	5.415
Chemical_Mfg	Process_AirComp	Low Pressure-drop Filters	10	$0.62	1.84%	0.00	0.19	0.89	0.667
Electronic_Equipment_Mfg	Process_AirComp	Low Pressure-drop Filters	10	$0.62	1.84%	0.00	0.17	0.89	0.667
Food_Mfg	Process_AirComp	Low Pressure-drop Filters	10	$0.62	1.84%	0.00	0.06	0.89	0.667
Industrial_Machinery	Process_AirComp	Low Pressure-drop Filters	10	$0.62	1.84%	0.00	0.08	0.89	0.667
Lumber_Wood_Products	Process_AirComp	Low Pressure-drop Filters	10	$0.62	1.84%	0.00	0.45	0.89	0.667
Miscellaneous_Mfg	Process_AirComp	Low Pressure-drop Filters	10	$0.62	1.84%	0.00	0.75	0.89	0.667

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Paper_Mfg	Process_AirComp	Low Pressure-drop Filters	10	$0.62	1.84%	0.00	0.76	0.89	0.667
Petroleum_Refining	Process_AirComp	Low Pressure-drop Filters	10	$0.62	1.84%	0.00	0.47	0.89	0.667
Primary_Metal_Mfg	Process_AirComp	Low Pressure-drop Filters	10	$0.62	1.84%	0.00	0.75	0.89	0.667
Stone_Clay_Glass_Products	Process_AirComp	Low Pressure-drop Filters	10	$0.62	1.84%	0.00	0.55	0.89	0.667
Transportation_Equipment_Mfg	Process_AirComp	Low Pressure-drop Filters	10	$0.62	1.84%	0.00	0.08	0.89	0.667
Chemical_Mfg	Process_AirComp	Outside Air Intake	10	$0.46	1.43%	0.00	0.15	0.89	0.873
Electronic_Equipment_Mfg	Process_AirComp	Outside Air Intake	10	$0.46	1.43%	0.00	0.13	0.89	0.873
Food_Mfg	Process_AirComp	Outside Air Intake	10	$0.46	1.43%	0.00	0.05	0.89	0.873
Industrial_Machinery	Process_AirComp	Outside Air Intake	10	$0.46	1.43%	0.00	0.07	0.89	0.873
Lumber_Wood_Products	Process_AirComp	Outside Air Intake	10	$0.46	1.43%	0.00	0.39	0.89	0.873
Miscellaneous_Mfg	Process_AirComp	Outside Air Intake	10	$0.46	1.43%	0.00	0.47	0.89	0.873
Paper_Mfg	Process_AirComp	Outside Air Intake	10	$0.46	1.43%	0.00	0.59	0.89	0.873
Petroleum_Refining	Process_AirComp	Outside Air Intake	10	$0.46	1.43%	0.00	0.07	0.89	0.873
Primary_Metal_Mfg	Process_AirComp	Outside Air Intake	10	$0.46	1.43%	0.00	0.72	0.89	0.873
Stone_Clay_Glass_Products	Process_AirComp	Outside Air Intake	10	$0.46	1.43%	0.00	0.50	0.89	0.873
Transportation_Equipment_Mfg	Process_AirComp	Outside Air Intake	10	$0.46	1.43%	0.00	0.06	0.89	0.873
Chemical_Mfg	Process_AirComp	Receiver Capacity Addition	10	$0.31	5.94%	0.01	0.41	0.89	1.226
Electronic_Equipment_Mfg	Process_AirComp	Receiver Capacity Addition	10	$0.31	5.94%	0.01	0.38	0.89	1.226
Food_Mfg	Process_AirComp	Receiver Capacity Addition	10	$0.31	5.94%	0.01	0.17	0.89	1.226
Industrial_Machinery	Process_AirComp	Receiver Capacity Addition	10	$0.31	5.94%	0.01	0.22	0.89	1.226
Lumber_Wood_Products	Process_AirComp	Receiver Capacity Addition	10	$0.31	5.94%	0.01	0.68	0.89	1.226
Miscellaneous_Mfg	Process_AirComp	Receiver Capacity Addition	10	$0.31	5.94%	0.01	0.84	0.89	1.226
Paper_Mfg	Process_AirComp	Receiver Capacity Addition	10	$0.31	5.94%	0.01	0.84	0.89	1.226
Petroleum_Refining	Process_AirComp	Receiver Capacity Addition	10	$0.31	5.94%	0.01	0.23	0.89	1.226
Primary_Metal_Mfg	Process_AirComp	Receiver Capacity Addition	10	$0.31	5.94%	0.01	0.84	0.89	1.226
Stone_Clay_Glass_Products	Process_AirComp	Receiver Capacity Addition	10	$0.31	5.94%	0.01	0.75	0.89	1.226

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Transportation_Equipment_Mfg	Process_AirComp	Receiver Capacity Addition	10	$0.31	5.94%	0.01	0.21	0.89	1.226
Chemical_Mfg	Process_AirComp	Refrigerated Cycling Dryers	10	$0.14	1.66%	0.00	0.17	0.89	2.367
Electronic_Equipment_Mfg	Process_AirComp	Refrigerated Cycling Dryers	10	$0.14	1.66%	0.00	0.15	0.89	2.367
Food_Mfg	Process_AirComp	Refrigerated Cycling Dryers	10	$0.14	1.66%	0.00	0.05	0.89	2.367
Industrial_Machinery	Process_AirComp	Refrigerated Cycling Dryers	10	$0.14	1.66%	0.00	0.08	0.89	2.367
Lumber_Wood_Products	Process_AirComp	Refrigerated Cycling Dryers	10	$0.14	1.66%	0.00	0.43	0.89	2.367
Miscellaneous_Mfg	Process_AirComp	Refrigerated Cycling Dryers	10	$0.14	1.66%	0.00	0.51	0.89	2.367
Paper_Mfg	Process_AirComp	Refrigerated Cycling Dryers	10	$0.14	1.66%	0.00	0.62	0.89	2.367
Petroleum_Refining	Process_AirComp	Refrigerated Cycling Dryers	10	$0.14	1.66%	0.00	0.08	0.89	2.367
Primary_Metal_Mfg	Process_AirComp	Refrigerated Cycling Dryers	10	$0.14	1.66%	0.00	0.74	0.89	2.367
Stone_Clay_Glass_Products	Process_AirComp	Refrigerated Cycling Dryers	10	$0.14	1.66%	0.00	0.53	0.89	2.367
Transportation_Equipment_Mfg	Process_AirComp	Refrigerated Cycling Dryers	10	$0.14	1.66%	0.00	0.07	0.89	2.367
Chemical_Mfg	Process_AirComp	VFD Controlled Compressor	10	$0.42	23.70%	0.03	0.69	0.89	0.956
Electronic_Equipment_Mfg	Process_AirComp	VFD Controlled Compressor	10	$0.42	23.70%	0.03	0.66	0.89	0.956
Food_Mfg	Process_AirComp	VFD Controlled Compressor	10	$0.42	23.70%	0.03	0.43	0.89	0.956
Industrial_Machinery	Process_AirComp	VFD Controlled Compressor	10	$0.42	23.70%	0.03	0.51	0.89	0.956
Lumber_Wood_Products	Process_AirComp	VFD Controlled Compressor	10	$0.42	23.70%	0.03	0.83	0.89	0.956
Miscellaneous_Mfg	Process_AirComp	VFD Controlled Compressor	10	$0.42	23.70%	0.03	0.85	0.89	0.956
Paper_Mfg	Process_AirComp	VFD Controlled Compressor	10	$0.42	23.70%	0.03	0.86	0.89	0.956
Petroleum_Refining	Process_AirComp	VFD Controlled Compressor	10	$0.42	23.70%	0.03	0.52	0.89	0.956
Primary_Metal_Mfg	Process_AirComp	VFD Controlled Compressor	10	$0.42	23.70%	0.03	0.88	0.89	0.956
Stone_Clay_Glass_Products	Process_AirComp	VFD Controlled Compressor	10	$0.42	23.70%	0.03	0.85	0.89	0.956
Transportation_Equipment_Mfg	Process_AirComp	VFD Controlled Compressor	10	$0.42	23.70%	0.03	0.49	0.89	0.956
Chemical_Mfg	Process_AirComp	Zero Loss Condensate Drain	10	$0.31	1.84%	0.00	0.19	0.89	1.232
Electronic_Equipment_Mfg	Process_AirComp	Zero Loss Condensate Drain	10	$0.31	1.84%	0.00	0.17	0.89	1.232
Food_Mfg	Process_AirComp	Zero Loss Condensate Drain	10	$0.31	1.84%	0.00	0.06	0.89	1.232

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Industrial_Machinery	Process_AirComp	Zero Loss Condensate Drain	10	$0.31	1.84%	0.00	0.08	0.89	1.232
Lumber_Wood_Products	Process_AirComp	Zero Loss Condensate Drain	10	$0.31	1.84%	0.00	0.45	0.89	1.232
Miscellaneous_Mfg	Process_AirComp	Zero Loss Condensate Drain	10	$0.31	1.84%	0.00	0.53	0.89	1.232
Paper_Mfg	Process_AirComp	Zero Loss Condensate Drain	10	$0.31	1.84%	0.00	0.63	0.89	1.232
Petroleum_Refining	Process_AirComp	Zero Loss Condensate Drain	10	$0.31	1.84%	0.00	0.09	0.89	1.232
Primary_Metal_Mfg	Process_AirComp	Zero Loss Condensate Drain	10	$0.31	1.84%	0.00	0.75	0.89	1.232
Stone_Clay_Glass_Products	Process_AirComp	Zero Loss Condensate Drain	10	$0.31	1.84%	0.00	0.55	0.89	1.232
Transportation_Equipment_Mfg	Process_AirComp	Zero Loss Condensate Drain	10	$0.31	1.84%	0.00	0.08	0.89	1.232
Chemical_Mfg	Process_Cool	Equipment: Chillers	20	$0.26	17.88%	0.02	1.05	1.45	2.324
Electronic_Equipment_Mfg	Process_Cool	Equipment: Chillers	20	$0.26	17.88%	0.02	1.00	1.45	2.324
Food_Mfg	Process_Cool	Equipment: Chillers	20	$0.26	17.88%	0.02	0.82	1.45	2.324
Industrial_Machinery	Process_Cool	Equipment: Chillers	20	$0.26	17.88%	0.02	0.73	1.45	2.324
Lumber_Wood_Products	Process_Cool	Equipment: Chillers	20	$0.26	17.88%	0.02	1.32	1.45	2.324
Miscellaneous_Mfg	Process_Cool	Equipment: Chillers	20	$0.26	17.88%	0.02	1.36	1.45	2.324
Paper_Mfg	Process_Cool	Equipment: Chillers	20	$0.26	17.88%	0.02	1.39	1.45	2.324
Petroleum_Refining	Process_Cool	Equipment: Chillers	20	$0.26	17.88%	0.02	0.74	1.45	2.324
Primary_Metal_Mfg	Process_Cool	Equipment: Chillers	20	$0.26	17.88%	0.02	1.43	1.45	2.324
Stone_Clay_Glass_Products	Process_Cool	Equipment: Chillers	20	$0.26	17.88%	0.02	1.37	1.45	2.324
Transportation_Equipment_Mfg	Process_Cool	Equipment: Chillers	20	$0.26	17.88%	0.02	0.70	1.45	2.324
Chemical_Mfg	Process_Cool	Facility Energy Management	2	$0.02	1.84%	0.00	0.04	0.20	1.434
Electronic_Equipment_Mfg	Process_Cool	Facility Energy Management	2	$0.02	1.84%	0.00	0.04	0.20	1.434
Food_Mfg	Process_Cool	Facility Energy Management	2	$0.02	1.84%	0.00	0.02	0.20	1.434
Industrial_Machinery	Process_Cool	Facility Energy Management	2	$0.02	1.84%	0.00	0.02	0.20	1.434
Lumber_Wood_Products	Process_Cool	Facility Energy Management	2	$0.02	1.84%	0.00	0.10	0.20	1.434
Miscellaneous_Mfg	Process_Cool	Facility Energy Management	2	$0.02	1.84%	0.00	0.12	0.20	1.434
Paper_Mfg	Process_Cool	Facility Energy Management	2	$0.02	1.84%	0.00	0.15	0.20	1.434

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Petroleum_Refining	Process_Cool	Facility Energy Management	2	$0.02	1.84%	0.00	0.02	0.20	1.434
Primary_Metal_Mfg	Process_Cool	Facility Energy Management	2	$0.02	1.84%	0.00	0.17	0.20	1.434
Stone_Clay_Glass_Products	Process_Cool	Facility Energy Management	2	$0.02	1.84%	0.00	0.02	0.20	1.434
Transportation_Equipment_Mfg	Process_Cool	Facility Energy Management	2	$0.02	1.84%	0.00	0.02	0.20	1.434
Wastewater	Process_Cool	Facility Energy Management	2	$0.02	1.84%	0.00	0.17	0.20	1.434
Water	Process_Cool	Facility Energy Management	2	$0.02	1.84%	0.00	0.14	0.20	1.434
Chemical_Mfg	Process_Cool	Improved Controls - Process Cooling	10	$0.88	6.00%	0.01	0.41	0.89	0.479
Electronic_Equipment_Mfg	Process_Cool	Improved Controls - Process Cooling	10	$0.88	6.00%	0.01	0.38	0.89	0.479
Food_Mfg	Process_Cool	Improved Controls - Process Cooling	10	$0.88	6.00%	0.01	0.27	0.89	0.479
Industrial_Machinery	Process_Cool	Improved Controls - Process Cooling	10	$0.88	6.00%	0.01	0.22	0.89	0.479
Lumber_Wood_Products	Process_Cool	Improved Controls - Process Cooling	10	$0.88	6.00%	0.01	0.68	0.89	0.479
Miscellaneous_Mfg	Process_Cool	Improved Controls - Process Cooling	10	$0.88	6.00%	0.01	0.74	0.89	0.479
Paper_Mfg	Process_Cool	Improved Controls - Process Cooling	10	$0.88	6.00%	0.01	0.79	0.89	0.479
Petroleum_Refining	Process_Cool	Improved Controls - Process Cooling	10	$0.88	6.00%	0.01	0.23	0.89	0.479
Primary_Metal_Mfg	Process_Cool	Improved Controls - Process Cooling	10	$0.88	6.00%	0.01	0.84	0.89	0.479
Stone_Clay_Glass_Products	Process_Cool	Improved Controls - Process Cooling	10	$0.88	6.00%	0.01	0.24	0.89	0.479
Transportation_Equipment_Mfg	Process_Cool	Improved Controls - Process Cooling	10	$0.88	6.00%	0.01	0.21	0.89	0.479
Agriculture	Process_Cool	Milk Precoolers	15	$0.52	3.24%	0.00	1.09	1.20	1.049
Agriculture	Process_Heat	Heat Lamp Setback (Microzone)	15	$0.17	0.45%	0.00	0.69	1.20	2.739
Agriculture	Process_Heat	Heat Lamp/Heating Pad Controller	15	$0.10	1.75%	0.00	1.01	1.20	3.900
Agriculture	Process_Heat	Heat Lamps	10	$0.02	3.38%	0.00	0.81	0.89	6.460
Agriculture	Process_Heat	Heat Reclaimers	15	$0.69	10.50%	0.01	1.17	1.20	0.814
Agriculture	Process_Heat	High-efficiency Livestock Waterers	10	$0.37	11.25%	0.01	0.86	0.89	1.054
Chemical_Mfg	Process_Heat	Improved Controls - Process Heating	10	$0.05	28.74%	0.04	0.72	0.89	4.433
Electronic_Equipment_Mfg	Process_Heat	Improved Controls - Process Heating	10	$0.05	28.74%	0.04	0.55	0.89	4.433
Food_Mfg	Process_Heat	Improved Controls - Process Heating	10	$0.05	28.74%	0.04	0.60	0.89	4.433

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Industrial_Machinery	Process_Heat	Improved Controls - Process Heating	10	$0.05	28.74%	0.04	0.55	0.89	4.433
Lumber_Wood_Products	Process_Heat	Improved Controls - Process Heating	10	$0.05	28.74%	0.04	0.29	0.89	4.433
Miscellaneous_Mfg	Process_Heat	Improved Controls - Process Heating	10	$0.05	28.74%	0.04	0.85	0.89	4.433
Paper_Mfg	Process_Heat	Improved Controls - Process Heating	10	$0.05	28.74%	0.04	0.87	0.89	4.433
Petroleum_Refining	Process_Heat	Improved Controls - Process Heating	10	$0.05	28.74%	0.04	0.56	0.89	4.433
Primary_Metal_Mfg	Process_Heat	Improved Controls - Process Heating	10	$0.05	28.74%	0.04	0.88	0.89	4.433
Stone_Clay_Glass_Products	Process_Heat	Improved Controls - Process Heating	10	$0.05	28.74%	0.04	0.57	0.89	4.433
Transportation_Equipment_Mfg	Process_Heat	Improved Controls - Process Heating	10	$0.05	28.74%	0.04	0.78	0.89	4.433
Chemical_Mfg	Process_Heat	Process Heat O&M	2	$0.03	22.05%	0.03	0.15	0.20	1.258
Electronic_Equipment_Mfg	Process_Heat	Process Heat O&M	2	$0.03	22.05%	0.03	0.11	0.20	1.258
Food_Mfg	Process_Heat	Process Heat O&M	2	$0.03	22.05%	0.03	0.12	0.20	1.258
Industrial_Machinery	Process_Heat	Process Heat O&M	2	$0.03	22.05%	0.03	0.13	0.20	1.258
Lumber_Wood_Products	Process_Heat	Process Heat O&M	2	$0.03	22.05%	0.03	0.05	0.20	1.258
Miscellaneous_Mfg	Process_Heat	Process Heat O&M	2	$0.03	22.05%	0.03	0.19	0.20	1.258
Paper_Mfg	Process_Heat	Process Heat O&M	2	$0.03	22.05%	0.03	0.20	0.20	1.258
Petroleum_Refining	Process_Heat	Process Heat O&M	2	$0.03	22.05%	0.03	0.11	0.20	1.258
Primary_Metal_Mfg	Process_Heat	Process Heat O&M	2	$0.03	22.05%	0.03	0.20	0.20	1.258
Stone_Clay_Glass_Products	Process_Heat	Process Heat O&M	2	$0.03	22.05%	0.03	0.12	0.20	1.258
Transportation_Equipment_Mfg	Process_Heat	Process Heat O&M	2	$0.03	22.05%	0.03	0.17	0.20	1.258
Chemical_Mfg	Process_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.04	0.20	1.434
Electronic_Equipment_Mfg	Process_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.02	0.20	1.434
Food_Mfg	Process_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.02	0.20	1.434
Industrial_Machinery	Process_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.03	0.20	1.434
Lumber_Wood_Products	Process_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.01	0.20	1.434
Miscellaneous_Mfg	Process_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.12	0.20	1.434
Paper_Mfg	Process_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.15	0.20	1.434

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Petroleum_Refining	Process_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.02	0.20	1.434
Primary_Metal_Mfg	Process_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.14	0.20	1.434
Stone_Clay_Glass_Products	Process_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.02	0.20	1.434
Transportation_Equipment_Mfg	Process_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.06	0.20	1.434
Wastewater	Process_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.17	0.20	1.434
Water	Process_Other	Facility Energy Management	2	$0.02	1.84%	0.00	0.14	0.20	1.434
Chemical_Mfg	Process_Refrig	Adjustable speed drive on compressors	10	$0.16	11.67%	0.02	0.56	0.89	2.134
Electronic_Equipment_Mfg	Process_Refrig	Adjustable speed drive on compressors	10	$0.16	11.67%	0.02	0.35	0.89	2.134
Food_Mfg	Process_Refrig	Adjustable speed drive on compressors	10	$0.16	11.67%	0.02	0.41	0.89	2.134
Industrial_Machinery	Process_Refrig	Adjustable speed drive on compressors	10	$0.16	11.67%	0.02	0.43	0.89	2.134
Lumber_Wood_Products	Process_Refrig	Adjustable speed drive on compressors	10	$0.16	11.67%	0.02	0.14	0.89	2.134
Miscellaneous_Mfg	Process_Refrig	Adjustable speed drive on compressors	10	$0.16	11.67%	0.02	0.80	0.89	2.134
Paper_Mfg	Process_Refrig	Adjustable speed drive on compressors	10	$0.16	11.67%	0.02	0.84	0.89	2.134
Petroleum_Refining	Process_Refrig	Adjustable speed drive on compressors	10	$0.16	11.67%	0.02	0.36	0.89	2.134
Primary_Metal_Mfg	Process_Refrig	Adjustable speed drive on compressors	10	$0.16	11.67%	0.02	0.82	0.89	2.134
Stone_Clay_Glass_Products	Process_Refrig	Adjustable speed drive on compressors	10	$0.16	11.67%	0.02	0.38	0.89	2.134
Transportation_Equipment_Mfg	Process_Refrig	Adjustable speed drive on compressors	10	$0.16	11.67%	0.02	0.66	0.89	2.134
Food_Mfg	Process_Refrig	Cold Storage Retrofit	10	$0.17	16.52%	0.02	0.48	0.89	2.041
Food_Mfg	Process_Refrig	Cold Storage Tuneup	3	$0.04	15.61%	0.02	0.16	0.31	1.639
Wastewater	Process_Refrig	Facility Energy Management	2	$0.02	1.84%	0.00	0.17	0.20	1.434
Water	Process_Refrig	Facility Energy Management	2	$0.02	1.84%	0.00	0.14	0.20	1.434
Food_Mfg	Process_Refrig	Food: Cooling and Storage	10	$0.30	15.00%	0.02	0.46	0.89	1.271
Chemical_Mfg	Process_Refrig	Optimization of operating parameters	3	$0.06	13.06%	0.02	0.29	0.31	1.370
Electronic_Equipment_Mfg	Process_Refrig	Optimization of operating parameters	3	$0.06	13.06%	0.02	0.13	0.31	1.370
Food_Mfg	Process_Refrig	Optimization of operating parameters	3	$0.06	13.06%	0.02	0.15	0.31	1.370
Industrial_Machinery	Process_Refrig	Optimization of operating parameters	3	$0.06	13.06%	0.02	0.16	0.31	1.370

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Lumber_Wood_Products	Process_Refrig	Optimization of operating parameters	3	$0.06	13.06%	0.02	0.05	0.31	1.370
Miscellaneous_Mfg	Process_Refrig	Optimization of operating parameters	3	$0.06	13.06%	0.02	0.28	0.31	1.370
Paper_Mfg	Process_Refrig	Optimization of operating parameters	3	$0.06	13.06%	0.02	0.29	0.31	1.370
Petroleum_Refining	Process_Refrig	Optimization of operating parameters	3	$0.06	13.06%	0.02	0.30	0.31	1.370
Primary_Metal_Mfg	Process_Refrig	Optimization of operating parameters	3	$0.06	13.06%	0.02	0.29	0.31	1.370
Stone_Clay_Glass_Products	Process_Refrig	Optimization of operating parameters	3	$0.06	13.06%	0.02	0.14	0.31	1.370
Transportation_Equipment_Mfg	Process_Refrig	Optimization of operating parameters	3	$0.06	13.06%	0.02	0.23	0.31	1.370
Chemical_Mfg	Process_Refrig	Synchronous Belts	10	$0.21	1.12%	0.00	0.53	0.89	1.686
Food_Mfg	Process_Refrig	Synchronous Belts	10	$0.21	1.12%	0.00	0.07	0.89	1.686
Industrial_Machinery	Process_Refrig	Synchronous Belts	10	$0.21	1.12%	0.00	0.07	0.89	1.686
Lumber_Wood_Products	Process_Refrig	Synchronous Belts	10	$0.21	1.12%	0.00	0.02	0.89	1.686
Miscellaneous_Mfg	Process_Refrig	Synchronous Belts	10	$0.21	1.12%	0.00	0.42	0.89	1.686
Paper_Mfg	Process_Refrig	Synchronous Belts	10	$0.21	1.12%	0.00	0.54	0.89	1.686
Petroleum_Refining	Process_Refrig	Synchronous Belts	10	$0.21	1.12%	0.00	0.69	0.89	1.686
Primary_Metal_Mfg	Process_Refrig	Synchronous Belts	10	$0.21	1.12%	0.00	0.49	0.89	1.686
Stone_Clay_Glass_Products	Process_Refrig	Synchronous Belts	10	$0.21	1.12%	0.00	0.06	0.89	1.686
Transportation_Equipment_Mfg	Process_Refrig	Synchronous Belts	10	$0.21	1.12%	0.00	0.20	0.89	1.686
Agriculture	Pumps	Automatic Milker Takeoffs	15	$0.61	3.00%	0.00	1.08	1.20	0.906
Chemical_Mfg	Pumps	Facility Energy Management	2	$0.02	1.84%	0.00	0.14	0.20	1.434
Electronic_Equipment_Mfg	Pumps	Facility Energy Management	2	$0.02	1.84%	0.00	0.02	0.20	1.434
Food_Mfg	Pumps	Facility Energy Management	2	$0.02	1.84%	0.00	0.07	0.20	1.434
Industrial_Machinery	Pumps	Facility Energy Management	2	$0.02	1.84%	0.00	0.03	0.20	1.434
Lumber_Wood_Products	Pumps	Facility Energy Management	2	$0.02	1.84%	0.00	0.01	0.20	1.434
Miscellaneous_Mfg	Pumps	Facility Energy Management	2	$0.02	1.84%	0.00	0.09	0.20	1.434
Paper_Mfg	Pumps	Facility Energy Management	2	$0.02	1.84%	0.00	0.17	0.20	1.434
Petroleum_Refining	Pumps	Facility Energy Management	2	$0.02	1.84%	0.00	0.17	0.20	1.434

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Primary_Metal_Mfg	Pumps	Facility Energy Management	2	$0.02	1.84%	0.00	0.14	0.20	1.434
Stone_Clay_Glass_Products	Pumps	Facility Energy Management	2	$0.02	1.84%	0.00	0.02	0.20	1.434
Transportation_Equipment_Mfg	Pumps	Facility Energy Management	2	$0.02	1.84%	0.00	0.06	0.20	1.434
Wastewater	Pumps	Facility Energy Management	2	$0.02	1.84%	0.00	0.17	0.20	1.434
Water	Pumps	Facility Energy Management	2	$0.02	1.84%	0.00	0.01	0.20	1.434
Chemical_Mfg	Pumps	High Efficiency Motors	15	$0.44	1.48%	0.00	0.80	1.20	1.242
Electronic_Equipment_Mfg	Pumps	High Efficiency Motors	15	$0.44	1.48%	0.00	0.09	1.20	1.242
Food_Mfg	Pumps	High Efficiency Motors	15	$0.44	1.48%	0.00	0.12	1.20	1.242
Industrial_Machinery	Pumps	High Efficiency Motors	15	$0.44	1.48%	0.00	0.13	1.20	1.242
Lumber_Wood_Products	Pumps	High Efficiency Motors	15	$0.44	1.48%	0.00	0.03	1.20	1.242
Miscellaneous_Mfg	Pumps	High Efficiency Motors	15	$0.44	1.48%	0.00	0.65	1.20	1.242
Paper_Mfg	Pumps	High Efficiency Motors	15	$0.44	1.48%	0.00	0.99	1.20	1.242
Petroleum_Refining	Pumps	High Efficiency Motors	15	$0.44	1.48%	0.00	0.98	1.20	1.242
Primary_Metal_Mfg	Pumps	High Efficiency Motors	15	$0.44	1.48%	0.00	0.74	1.20	1.242
Stone_Clay_Glass_Products	Pumps	High Efficiency Motors	15	$0.44	1.48%	0.00	0.10	1.20	1.242
Transportation_Equipment_Mfg	Pumps	High Efficiency Motors	15	$0.44	1.48%	0.00	0.33	1.20	1.242
Wastewater	Pumps	High Efficiency Motors	15	$0.44	1.48%	0.00	0.98	1.20	1.242
Water	Pumps	High Efficiency Motors	15	$0.44	1.48%	0.00	0.80	1.20	1.242
Chemical_Mfg	Pumps	Motor rewinds	9	$0.24	0.59%	0.00	0.36	0.81	1.413
Electronic_Equipment_Mfg	Pumps	Motor rewinds	9	$0.24	0.59%	0.00	0.03	0.81	1.413
Food_Mfg	Pumps	Motor rewinds	9	$0.24	0.59%	0.00	0.12	0.81	1.413
Industrial_Machinery	Pumps	Motor rewinds	9	$0.24	0.59%	0.00	0.04	0.81	1.413
Lumber_Wood_Products	Pumps	Motor rewinds	9	$0.24	0.59%	0.00	0.01	0.81	1.413
Miscellaneous_Mfg	Pumps	Motor rewinds	9	$0.24	0.59%	0.00	0.17	0.81	1.413
Paper_Mfg	Pumps	Motor rewinds	9	$0.24	0.59%	0.00	0.53	0.81	1.413
Petroleum_Refining	Pumps	Motor rewinds	9	$0.24	0.59%	0.00	0.52	0.81	1.413

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Primary_Metal_Mfg	Pumps	Motor rewinds	9	$0.24	0.59%	0.00	0.32	0.81	1.413
Stone_Clay_Glass_Products	Pumps	Motor rewinds	9	$0.24	0.59%	0.00	0.03	0.81	1.413
Transportation_Equipment_Mfg	Pumps	Motor rewinds	9	$0.24	0.59%	0.00	0.11	0.81	1.413
Wastewater	Pumps	Motor rewinds	9	$0.24	0.59%	0.00	0.52	0.81	1.413
Water	Pumps	Motor rewinds	9	$0.24	0.59%	0.00	0.36	0.81	1.413
Chemical_Mfg	Pumps	Pump Equipment Upgrade	12	$0.13	20.00%	0.03	0.99	1.03	2.930
Food_Mfg	Pumps	Pump Equipment Upgrade	12	$0.13	20.00%	0.03	0.88	1.03	2.930
Lumber_Wood_Products	Pumps	Pump Equipment Upgrade	12	$0.13	20.00%	0.03	0.26	1.03	2.930
Miscellaneous_Mfg	Pumps	Pump Equipment Upgrade	12	$0.13	20.00%	0.03	0.92	1.03	2.930
Paper_Mfg	Pumps	Pump Equipment Upgrade	12	$0.13	20.00%	0.03	1.01	1.03	2.930
Petroleum_Refining	Pumps	Pump Equipment Upgrade	12	$0.13	20.00%	0.03	1.01	1.03	2.930
Stone_Clay_Glass_Products	Pumps	Pump Equipment Upgrade	12	$0.13	20.00%	0.03	0.97	1.03	2.930
Wastewater	Pumps	Pump Equipment Upgrade	12	$0.13	20.00%	0.03	1.01	1.03	2.930
Water	Pumps	Pump Equipment Upgrade	12	$0.13	20.00%	0.03	0.99	1.03	2.930
Chemical_Mfg	Pumps	Pump System Optimization	12	$0.26	12.10%	0.02	0.97	1.03	1.670
Food_Mfg	Pumps	Pump System Optimization	12	$0.26	12.10%	0.02	0.80	1.03	1.670
Lumber_Wood_Products	Pumps	Pump System Optimization	12	$0.26	12.10%	0.02	0.17	1.03	1.670
Miscellaneous_Mfg	Pumps	Pump System Optimization	12	$0.26	12.10%	0.02	0.86	1.03	1.670
Paper_Mfg	Pumps	Pump System Optimization	12	$0.26	12.10%	0.02	1.00	1.03	1.670
Petroleum_Refining	Pumps	Pump System Optimization	12	$0.26	12.10%	0.02	1.00	1.03	1.670
Wastewater	Pumps	Pump System Optimization	12	$0.26	12.10%	0.02	1.00	1.03	1.670
Water	Pumps	Pump System Optimization	12	$0.26	12.10%	0.02	0.97	1.03	1.670
Chemical_Mfg	Pumps	Synchronous Belts	10	$0.21	1.12%	0.00	0.53	0.89	1.686
Food_Mfg	Pumps	Synchronous Belts	10	$0.21	1.12%	0.00	0.22	0.89	1.686
Industrial_Machinery	Pumps	Synchronous Belts	10	$0.21	1.12%	0.00	0.07	0.89	1.686
Lumber_Wood_Products	Pumps	Synchronous Belts	10	$0.21	1.12%	0.00	0.02	0.89	1.686

Industry	End-Use	Industrial Measure	Life (years)	Cost ($/kWh saved)	Energy Savings %	Summer Peak Demand Savings (kW)	RIM Test	PAC Test	TRC Test
Miscellaneous_Mfg	Pumps	Synchronous Belts	10	$0.21	1.12%	0.00	0.29	0.89	1.686
Paper_Mfg	Pumps	Synchronous Belts	10	$0.21	1.12%	0.00	0.69	0.89	1.686
Petroleum_Refining	Pumps	Synchronous Belts	10	$0.21	1.12%	0.00	0.69	0.89	1.686
Primary_Metal_Mfg	Pumps	Synchronous Belts	10	$0.21	1.12%	0.00	0.49	0.89	1.686
Stone_Clay_Glass_Products	Pumps	Synchronous Belts	10	$0.21	1.12%	0.00	0.42	0.89	1.686
Transportation_Equipment_Mfg	Pumps	Synchronous Belts	10	$0.21	1.12%	0.00	0.20	0.89	1.686
Wastewater	Pumps	Synchronous Belts	10	$0.21	1.12%	0.00	0.69	0.89	1.686
Water	Pumps	Synchronous Belts	10	$0.21	1.12%	0.00	0.53	0.89	1.686
Agriculture	Pumps	VFDs for Dairy Vacuum Pumps	15	$0.14	58.50%	0.08	1.20	1.21	3.245