



Austin Energy DSM Market Potential Assessment

Final Report



Prepared for
Austin Energy
Austin, Texas

Prepared by
DNV KEMA Energy & Sustainability
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Glossary

achievable potential: The amount of savings that would occur in response to specific program funding and measure incentive levels. Savings associated with program potential are savings that are projected beyond those that would occur naturally in the absence of any market intervention.

applicability factor: The percentage of the building stock that has a particular type of equipment or for which an efficiency measure applies. For example, the applicability factor for a tankless electric water heater (compared to a base standard electric water heater) is the percentage of homes with electric water heaters. The applicability factor for high-efficiency clothes washers as an electric water heating measure is the percentage of homes with electric water heating that also have a clothes washer. For base measures, this is sometimes referred to as the equipment saturation.

business-as-usual (BAU): Represents a continuation of current activities or trends. For utility programs, it denotes a scenario in which program marketing and administrative budgets are kept constant in real terms, and incentive levels are kept constant as a percentage of incremental costs.

baseline analysis: Characterizes how energy consumption breaks down by sector, building type, and end use.

base measure: The equipment against which an efficiency measure is compared.

C&I: commercial and industrial.

CFL: compact fluorescent lamp.

coincidence factor: Utility coincidence factors are the ratio of actual demand at utility peak to the average demand, as calculated from the load shape. These factors vary by market segment or building type, end use, and by time-of-use period.

cumulative annual: Savings occurring in a particular year that are due to cumulative program activities over time. For example, if a program installs one high-efficiency widget in year 1 of the program, two in year 2, and five in year 3, the cumulative annual savings in year three would be the savings accruing on all eight surviving units in place in year 3, regardless of what year they were installed. Cumulative annual savings does account for equipment retirement. In the

example above, widgets are assumed to have an effective useful life of more than three years. If the equipment in the above example were doohickeys, which only have a two-year effective useful life, the year 1 doohickey would have retired at the end of year 2, so only the units sold in years 2 and 3 would contribute to year 3 cumulative annual savings.

demand-side management (DSM): An electric system must balance the supply of electricity with the demand for electricity. Demand-side management (DSM) programs focus on managing the demand side of this balance through energy-efficiency and load management.

Energy Conservation Audit and Disclosure Ordinance (ECAD): The city of Austin requires owners of single-family homes to have an energy audit performed on their home prior to selling that home per this ordinance.

economic potential: The technical potential of those energy conservation measures that are cost effective when compared to supply-side alternatives.

effective useful life (EUL): A measure of the typical lifetime of an efficiency measure. Technically, it is the age at which half of the units have failed and half survive. In DNV KEMA's ASSYST™ model, all measures are assumed to remain in place until the end of their effective useful lives and then retire.

end-use energy intensity (EUI): Energy use per unit of building stock having a specific end use. For example, the EUI for commercial electric heating is the amount of electricity used for heating divided by the number of square feet of floor space that are electrically heated. EUI differs from EI in that it accounts for the equipment type's saturation. If the saturation of the equipment type is low, the EUI will be much higher than the EI.

energy intensity (EI): Energy use per unit of building stock. For example, the EI for commercial electric heating is the amount of electricity used for heating divided by the total square feet. EI differs from EUI in that it does not account for the saturation of the equipment. If the saturation for the equipment type is low, EI will be much lower than the EUI.

EUI adjustment factor: Because equipment efficiencies can change over time independent of program activities, due to either naturally occurring technological changes or external intervention, such as appliance standards, the efficiency of new equipment may differ from the typical efficiency of the equipment stock. The EUI adjustment factor is the ratio of new standard efficiency equipment's energy use to the average energy use of units in the equipment stock.

feasibility factor: The fraction of the applicable floor space, or households, that is technically feasible to convert to a DSM technology, from an engineering perspective.

free rider: A program participant who would have invested in an energy efficiency measure even without the intervention of the program. Free riders add to program costs but do not contribute to net energy savings.

free-rider energy savings: The subset of naturally occurring energy savings for which the utility pays incentives or provides other program benefits. These savings are included in gross program savings but not in net program savings.

gross program savings: The total savings for all measures installed under the program, including those that would have been installed even without program intervention (free riders). Gross program savings equals net program savings minus free ridership.

HP: horsepower. A metric for the power of a motor.

HVAC: heating, ventilation and air conditioning. These space-conditioning measures are often discussed as a group and are referred to by the abbreviation HVAC, usually pronounced H-vac.

incomplete factor: The fraction of the applicable floor space, or households, that has not yet been converted to the particular energy-efficiency technology.

incremental cost: The additional cost required to purchase an efficiency measure compared to base equipment.

kW: kilowatts, 1,000 watts. A measure of electric power or electricity demand.

kWh: kilowatt-hour. A measure of electrical energy.

LED: light-emitting diode. LEDs are semiconductor light sources. They have been in use for decades as indicator lights; they are increasingly being used for general-purpose lighting. They are highly efficient compared to incandescent lamps.

line losses: When electricity is transmitted over the transmission and distribution system, some of the electricity is dissipated as heat due to resistance in the transmission lines or inefficiencies in transformers in the distribution system. As a result, the amount of electricity delivered to consumers is less than the amount produced at the generator. These are referred to as line losses or transmission and distribution losses.

load management: Load management refers to methods that control the power demand within an electric system. Load management programs are designed to reduce the electrical demands during time of system peak energy use (in contrast to energy efficiency programs that focus on reducing overall energy use, and may or may not reduce energy use during peak hours). Examples of load management programs include air conditioner cycling and thermal energy storage.

MW: megawatt, one million watts. A measure of electric power or electricity demand.

MWh: megawatt-hour, equal to 1,000 kWh. A measure of electrical energy.

naturally occurring energy savings: The amount of savings estimated to occur as a result of normal market forces, that is, in the absence of any utility or governmental intervention.

net program savings: Program savings above and beyond naturally occurring levels. Net savings exclude free-rider energy savings.

net-to-gross: The ratio of net program savings to gross program savings.

program potential: This term is used interchangeably with achievable potential.

replace on burnout (ROB): A measure that is installed when the previous equipment reaches the end of its useful life. ROB measures penetrate the market gradually as the existing stock of equipment turns over due to equipment age and eventual failure.

retrofit: A measure that is installed to achieve energy savings independent of the condition of the existing equipment. This includes measures that affect the energy use of other equipment, such as insulation to reduce heating costs. It also includes replacing equipment with higher efficiency equipment before the end of existing equipment's useful life, for example replacing T12 fluorescent lighting in an office with higher efficiency T8s. Retrofits can be done at any time and therefore have the potential to penetrate the market more quickly than ROB measures.

spinning reserves: Operating reserve is the generating capacity available to an electricity network operator within a short interval of time to meet demand in case of a disruption to electricity supply. Spinning reserve is the share of operating reserve that is available by increasing the power output of generators already connected to the power system. Spinning reserves help ensure stability of the electricity network in case of an unexpected event, such as a generator going down or unforeseen load swings.

technical potential: The savings that would result from complete penetration of all analyzed measures in applications where they were deemed technically feasible, from an engineering perspective.

technology saturation: A factor that relates the cost units used in the model for a measure to its savings units. For example, the cost of a chiller may be expressed in dollars per ton, though the savings are in kWh per square foot. The technology saturation then represents the number of tons of cooling per square foot.

time-of-use (TOU) period: The Assyst model can analyze energy use by up to six time-of-use periods. These periods are used to characterize the relationship between energy and peak demand, which varies over both season and time of day, and to capture differences in avoided costs and rates over different time periods. TOU periods usually capture differences between summer/winter and peak/off-peak but can also capture shoulder season, mid-peak, or super peak demand, depending on the needs of a utility.

transmission and distribution (T&D): This refers to the system of power lines that delivers electricity from the generator to the customer.

transmission and distribution (T&D) losses: See line losses.

total resource cost test (TRC): A benefit-cost test that compares the value of avoided energy production and power plant construction to the costs of energy efficiency measures and the program activities necessary to deliver them. The values of both energy savings and peak-demand reductions are incorporated in the TRC test.

1. Executive Summary

In 2007, the city of Austin adopted the Austin Climate Protection Plan (ACPP) to build a more sustainable community. Austin Energy established a demand savings goal of 800 MW by 2020, of which 269 MW has been achieved through program efforts from 2007 through 2011. To meet its goal, Austin Energy must capture an additional 531 MW of savings from current and future DSM efforts. Of that 531 MW, Austin Energy expects 236 MW to be captured from load management and building codes and 295 MW to be captured from energy efficiency programs.

Austin Energy engaged DNV KEMA Energy & Sustainability (DNV KEMA) (operating as KEMA, Inc. at the time) to assess the potential for electric energy (kWh) and demand (kW) savings through 2020 from company-sponsored energy-efficiency programs. The assessment produced:

- Estimates for the magnitude of potential savings on an annual basis under a range of program design scenarios
- Estimates of the costs associated with achieving those savings
- Calculations of measures and programs' cost-effectiveness based on the estimates above.

1.1 Scope and Approach

In this study, DNV KEMA estimated three basic types of energy efficiency potential using its proprietary DSM ASSYST™ model:

- **Technical potential**, defined as the complete penetration of all analyzed measures in applications where they were deemed technically feasible, from an engineering perspective
- **Economic potential**, defined as the technical potential of those energy efficiency measures that are cost-effective when compared to supply-side alternatives
- **Achievable program potential**, the amount of savings that would occur in response to specific program funding, marketing, and measure incentive levels.

DSM ASSYST™ also develops an estimate of naturally occurring savings, those savings that are projected to result from normal market forces in the absence of any utility-sponsored intervention. These savings are not included in the estimate of achievable program potential.

The model uses a bottom-up approach in which energy efficiency costs and savings are assessed at the customer segment and energy efficiency measure level. Technical and economic potential are estimated as a function of measure savings, equipment saturation, and

existing penetration of efficiency measures. Economic potential takes into account measure costs and includes only those measures that are cost effective based on the total resource cost, or TRC, test. Program savings potential is estimated for cost-effective measures based on measure economics, rebate levels, and program marketing and education efforts.

For this study, DNV KEMA constructed four different program funding scenarios to estimate Austin Energy's achievable energy efficiency potential. The first scenario, the business-as-usual (BAU) scenario, projects the current program design and implementation features across the forecast horizon. Once calibrated, the model produces outputs closely aligned with the known program savings results from the most recent program. This approach ensures that the model, to the extent possible, can appropriately represent reality using a set of known conditions.

DNV KEMA estimated program results under three additional incentive scenarios using the calibrated model. One scenario was the same as the BAU scenario except that marketing budgets were kept flat over time instead of increasing with inflation as in the BAU scenario. The second scenario allowed for incentives that covered 75 percent of incremental measure costs. In the final scenario, incentives covered 100 percent of incremental measure costs. Program marketing costs were scaled upward in the 75- and 100- percent incentive scenarios to reflect increasing program effort, and program administration costs were adjusted across scenarios proportionate to achievable program energy savings. These scenarios are referenced respectively as BAU Flat Budget, 75-percent Scenario, and 100-percent Scenario. Program energy and peak-demand savings and program cost-effectiveness were assessed under all funding scenarios.

Study results are estimates of energy and demand savings potential based on certain program assumptions. The study can be used to help target measures and customer segments for DSM programs and, by resource planners, to determine to appropriate mix of demand-side and supply-side resources. The study does not attempt to provide estimates of optimal levels of DSM activity but rather provides estimates of the savings possible at various levels of effort.

The scenarios shown in this study are also fairly broad-brush, showing potentials for incentive rates that vary by scenario but are constant for all measures within a scenario. We expect that Austin Energy will adjust incentives and related program expenditures on a measure-by-measure basis to reflect differences within markets and to enhance the amount of savings that are achievable within limited program budgets. We also expect that Austin Energy will adjust its efforts over time since some measures may eventually saturate the market.

1.2 Results

In Table 1-1, we present the DSM potential study's overall results. The table shows base energy use, Austin Energy's DSM program cumulative savings forecast from 2012 to 2020, DNV KEMA's estimates of technical and economic potential, and DNV KEMA's cumulative results from 2012 to 2020 for all four achievable potential scenarios. Austin Energy's no-DSM base forecast is 3,963 MW in 2020. Austin Energy forecasts 236 MW of demand savings from load management programs and building code changes from 2012 to 2020. Since this study focused on energy efficiency in new and existing buildings and did not address potential for load management or building codes, the base forecast for this study is 3,727 MW (Austin's no-DSM forecast minus the 236 MW from out-of-analysis programs).

To put the energy efficiency potentials in the context of Austin Energy's overall programs, the table includes a row for total DSM savings that includes energy efficiency and the estimated 236 MW of savings for load management and building codes. These can be compared to the 531 MW that remain to be captured of Austin Energy's 800 MW 2020 goal.

The BAU case falls short of Austin Energy's 2020 forecast. This is primarily due to diminishing retrofit opportunities over time as more of the market converts to high efficiency technologies, which result in savings growing more slowly in later years than in early forecast years. However, the potential at the 75-percent incentive level significantly exceeds Austin's forecast (by 24 percent). We estimate that incentives between 55 and 60 percent of incremental costs would be sufficient to meet Austin Energy's current goals.

In the 100-percent incentive scenario, we estimate that Austin Energy's DSM programs could reduce demand by 727 MW by 2020. Considering the 269 MW Austin Energy estimates that its programs have already saved from 2007 to 2011, the total savings in 2020 would be 996 MW.

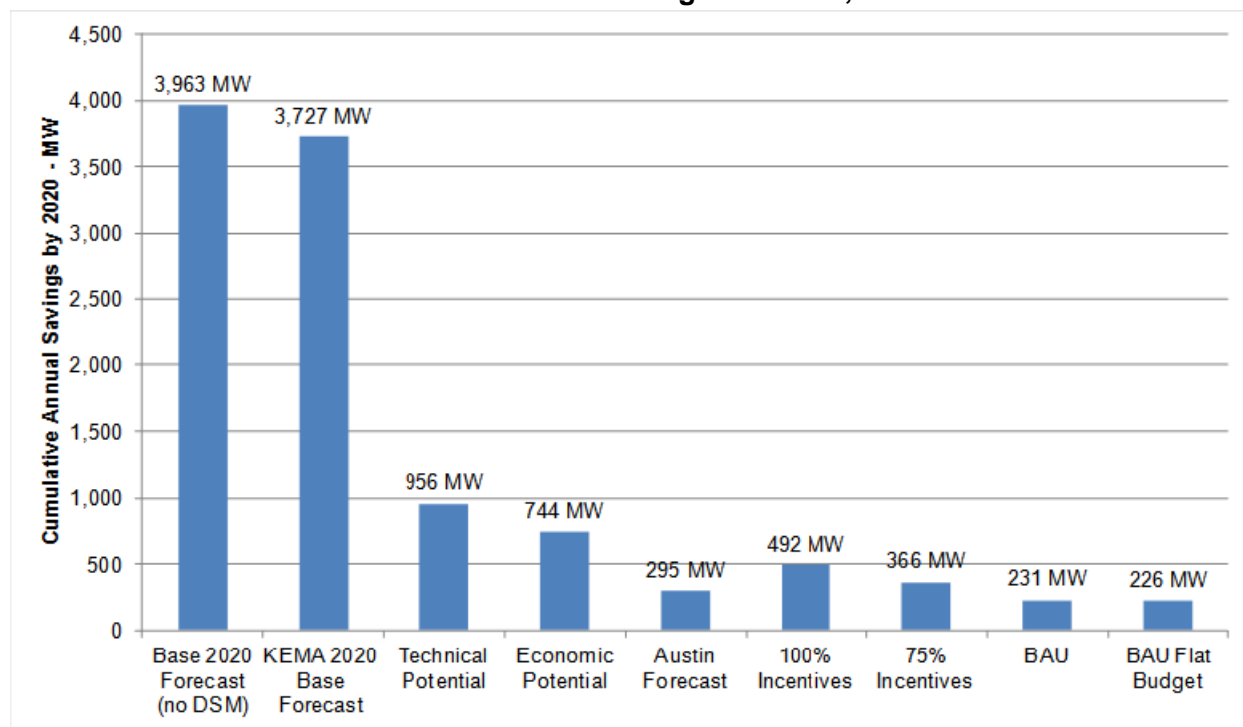
**Table 1-1
Summary of Cumulative DSM Potentials—2012–2020**

	Base 2020 Forecast	Austin Energy Program Savings Forecast	DNV KEMA Potential Estimates					
			Technical Potential	Economic Potential	Achievable Potentials			
					BAU Flat Budget	BAU	75 Percent Incentives	100 Percent Incentives
Base 2020 Forecast (No DSM)	3,963							
Out-of-analysis AE Program Savings Forecast		236						
KEMA Base 2020 Forecast	3,727							
Residential Total	1,482	133	636	509	106	107	182	254
Commercial Total	1,477	162	349	276	94	97	146	189
Industrial Total	518		84	70	26	27	37	48
Other Total	250		0	0	0	0	0	0
All Sectors Total (EE)	3,727	295	956	744	226	231	366	492
Savings % of KEMA Base		7.9%	25.7%	20.0%	6.1%	6.2%	9.8%	13.2%
Savings % of Austin No-DSM Base		7.4%	24.1%	18.8%	5.7%	5.8%	9.2%	12.4%
Savings % of Economic Potential		40%			30%	31%	49%	66%
Total DSM (in and out of KEMA analysis)		531	1,192	980	462	467	602	727
Savings % of Austin No-DSM Base		13.4%	30.1%	24.7%	11.7%	11.8%	15.2%	18.4%

Notes: Base peak demand (no DSM) is Austin Energy's forecast assuming the absence of DSM programs. Out-of-analysis savings include Austin Energy's forecasted savings from load management programs and Austin's building codes. DNV KEMA's 2020 base forecast is net of the load management and code savings. The *All Sectors Total (EE)* row excludes the out-of-analysis savings, while the *Total DSM* row includes those savings (236 MW). The demand forecast includes 20 percent for transmission and distribution and spinning reserves.

Figure 1-1 summarizes the 10-year peak-demand savings potential estimates. We estimated technical potential at 956 MW and economic potential at 744 MW. Achievable program potential ranges from a high of 492 MW under the 100-percent incentive case to 226 MW under the BAU flat budget case (Austin Energy's forecast is 295 MW). Economic potential for peak demand savings is estimated to be 21 percent of base 2020 peak demand; achievable potentials range from 13 percent of base peak demand under the 100-percent incentive case to 6 percent of base peak demand under the BAU flat budget case. All results include line losses and a factor for spinning reserves.

Figure 1-1
Estimated Peak-demand Savings Potential, 2012–2020



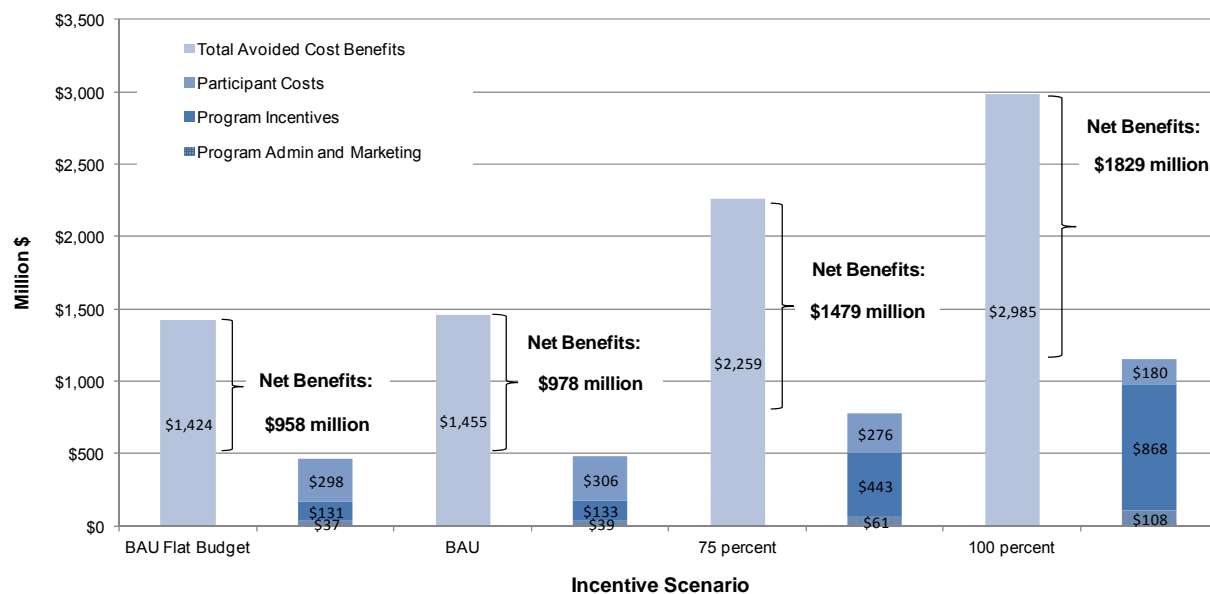
Notes: Base peak demand (no DSM) is Austin Energy's forecast assuming the absence of DSM programs. DNV KEMA's 2020 base forecast accounts for the effects of load management programs and Austin's building codes that are not modeled in this analysis, using Austin Energy's savings forecasts for those programs. Austin Energy's forecast includes savings from energy efficiency in existing and new buildings but excludes load management and code savings. The demand forecast includes 20 percent for transmission and distribution and spinning reserves.

Figure 1-2 depicts the cumulative costs and benefits under each program funding scenario from 2012 to 2020. The present value of program costs (including administration, marketing, and incentives) is \$181 million under the BAU scenario (\$177 million if budgets remain flat), \$530 million under the 75-percent incentive scenario, and \$1,015 million under the 100-percent incentive scenario. The present value of total avoided-cost benefits is \$1,455 million under the

BAU scenario, \$1,424 million under the BAU flat budget scenario, \$2,259 million under 75-percent incentives, and \$2,985 million under 100-percent incentives. The present value of *net* avoided-cost benefits¹ is \$978 million under the BAU scenario (\$958 million if budgets remain flat), \$1,479 million under 75-percent incentives, and \$1,829 million under 100-percent incentives.

As a result of dramatically increasing incentive costs for higher incentive scenarios, increases in program costs outpace the increases in benefits as one moves to higher incentive scenarios. As modeled, all program participants receive the same incentives in a given scenario, even though some customers would have accepted lower incentives. (Note, there are participant costs in the 100-percent incentive scenario because some measures are modeled as education-only programs in all scenarios and because the DSM ASSYST model assumes that measures initially purchased with program incentives are later repurchased without program incentives if they burn out during the forecast period.)

Figure 1-2
Benefits and Costs of Electric Efficiency Savings—2012–2020*



* PV (present value) of benefits and costs is calculated for 2012–2020 program years using a nominal discount rate = 4 percent and an assumed inflation rate = 2.5 percent.

¹ *Net* avoided-cost benefits. i.e., the difference between total avoided-cost benefits and total costs, which include participant costs in addition to program costs.

All four of the funding scenarios are cost-effective based on the TRC test, which is the test we used in this study to determine program cost-effectiveness. The TRC benefit-cost ratio is 3.05 for the BAU scenario (3.06 for the BAU flat budget scenario), 2.90 for the 75-percent incentive scenario, and 2.58 for the 100-percent incentive scenario. This indicates that program cost-effectiveness declines somewhat with increasing program effort, reflecting increased penetration of more measures with lower cost-effectiveness levels. Key results of our efficiency scenario forecasts from 2012 to 2020 are summarized in Table 1-2 .

Table 1-2
Summary of Achievable Electric Potential Results—2012–2020

Result - Programs	Program Scenario:			
	BAU Incentives Flat Budget	BAU Incentives	75 percent Incentives	100 percent Incentives
Total Market Energy Savings - GWh	1,458	1,482	1,932	2,307
Total Market Peak Demand Savings - MW	291	295	422	541
Program Energy Savings - GWh	1,030	1,056	1,567	1,975
Program Peak Demand Savings - MW	226	231	366	492
Program Costs - Real, \$ Million				
Administration	\$19	\$19	\$41	\$89
Marketing	\$20	\$22	\$23	\$24
Incentives	\$138	\$140	\$466	\$902
Total	\$177	\$181	\$530	\$1,015
PV Avoided Costs	\$1,424	\$1,455	\$2,259	\$2,985
PV Annual Program Costs (Adm/Mkt)	\$37	\$39	\$61	\$108
PV Net Measure Costs	\$429	\$439	\$719	\$1,048
Net Benefits	\$958	\$978	\$1,479	\$1,829
TRC Ratio	3.06	3.05	2.90	2.58

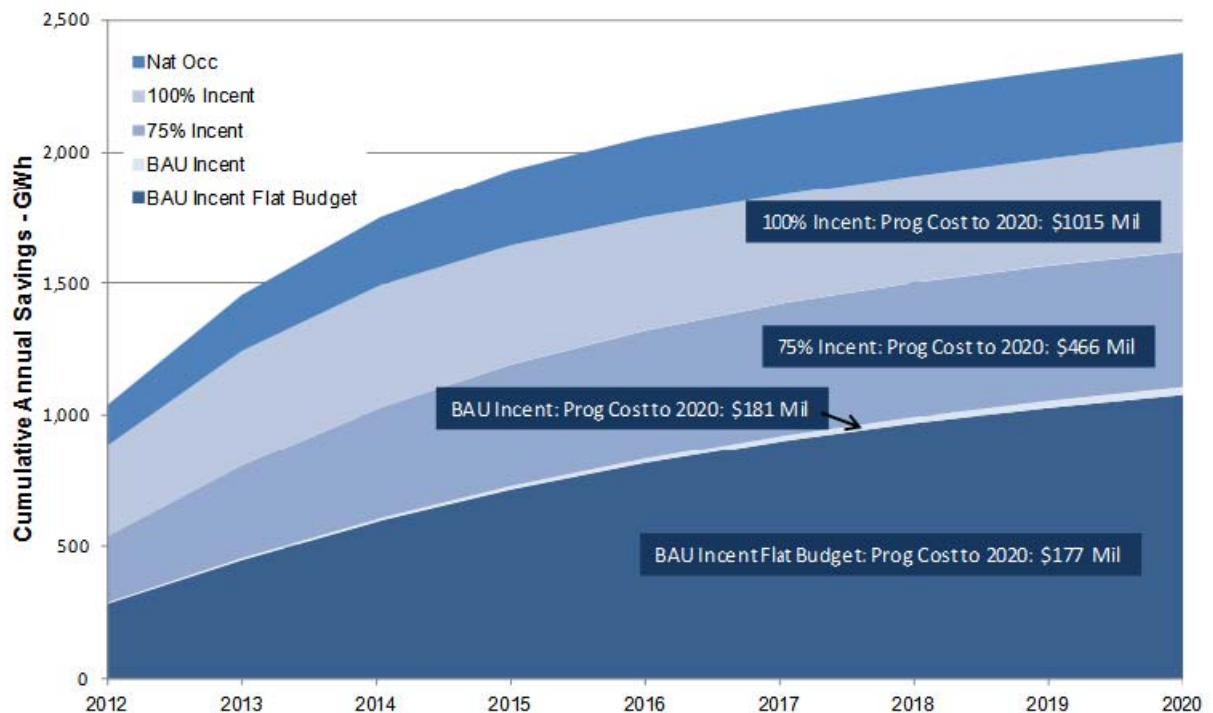
PV (present value) of benefits and costs is calculated for 2012–2020 program years using a nominal discount rate = 4 percent and an assumed inflation rate = 2.5 percent; GWh and MW savings are cumulative through 2020.

1.2.1 Achievable Savings Potentials over Time

Figure 1-3 shows estimates of achievable program potential energy savings over time. (Peak demand savings follow a similar pattern but are not shown.) Naturally occurring savings are also shown to provide a picture of total market potential. The figure shows that the rate of cumulative savings increase declines over time. This occurs because retrofit measures (measures that are not dependent on equipment turnover cycles and can be added at any time) reach high saturations over time, reducing the available pool for these opportunities and making it more difficult to capture additional savings. While the decline in additional savings is fairly modest

under the BAU scenarios, it is more pronounced in the higher incentive cases. For the 100-percent incentive scenario, savings accumulate rapidly during the first few years of the forecast horizon but then flatten out thereafter. This can be perceived as a boom-bust phenomenon—a program ramps up dramatically over a few years and then must be scaled back significantly afterward as the program’s participation declines due to high saturation levels. While the high-incentive scenario may lead to front-loaded energy savings, it could lead to dramatically reduced program effort and funding in later years, which may affect the program’s ability to evolve and continue to capture emerging opportunities.

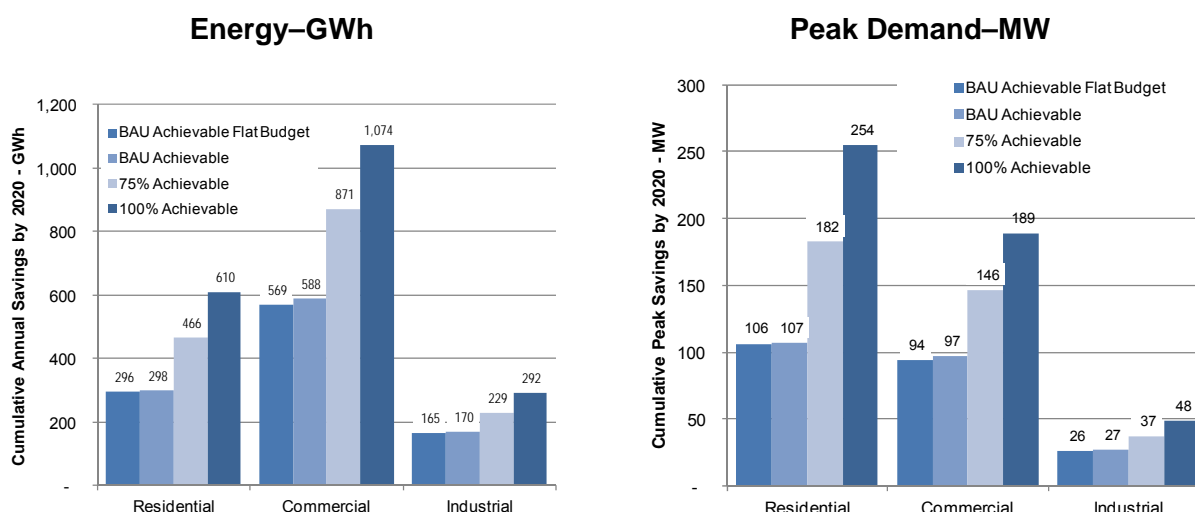
Figure 1-3
Achievable Electric Energy-Savings: All Sectors



1.2.2 Base Energy Efficiency Results by Sector

Cumulative program savings potential estimates by customer class are presented in Figure 1-4 for the 2012–2020 period. The figure shows results for each funding scenario. Achievable program energy savings are highest for the commercial sector, but peak-demand savings are highest for the residential sector.

Figure 1-4
Net Program Achievable Energy Savings (2020) by Sector



1.3 Conclusions

As the results of this study indicate, there is a significant amount of DSM potential remaining in Austin Energy's service territory. The residential and commercial sectors provide the largest sources of identified potential savings. While savings potentials in the industrial sector are lower, this segment is more complex and less understood than the other sectors, and our bottom-up analysis may understate, to some degree, all the custom energy efficiency opportunities available in this sector.

Our estimate of the savings under the BAU scenario is intended to show what can be saved with Austin Energy's current incentive levels and budgets. Although we matched Austin's budgets and savings closely in the forecast's early years, the model showed lower levels of savings in the forecast's later years. To a large extent, this result shows that Austin Energy could become a victim of its own success. As more of the market is converted to high efficiency, fewer and smaller opportunities remain for additional savings. This is particularly true of energy efficiency retrofits. The result of this effect can be seen in Figure 1-3 as the curve, which shows savings over time, flattens out in later years of the program.

Austin Energy may be able to offset this possibility through a number of approaches, for example by shifting program efforts away from saturated technologies toward technologies for which more opportunity remains. As emerging technologies enter the market or become more cost-effective, Austin may also find program opportunities there. However, while some savings

could be achieved through low-cost strategic changes, it is likely that reaching its current 2020 goals will require offering higher incentives to attract hard-to-reach customers to the program, which will require higher program budgets.

One goal of this study was to provide data to determine whether Austin Energy's current Climate Protection Plan goal of 800 MW of demand savings by 2020 can be increased to 1,000 MW. We found that at 100-percent incentives, the program could achieve 996 MW by 2020, just shy of 1,000 MW. However, this represents an extreme level of program effort and would require a more than five-fold increase in program budgets compared to business-as-usual.

2. Introduction

2.1 Overview

Austin Energy retained DNV KEMA Energy & Sustainability (DNV KEMA) to conduct this demand-side management (DSM) market potential study, based on existing and proposed energy efficiency measures. The study provides estimates of potential electricity and peak-demand savings from energy efficiency measures in Austin Energy's service territory, including technical, economic, and achievable program potential. The study does not address savings from demand response programs, and it does not address natural gas equipment usage or savings.

The scope of this study includes new and existing residential and non-residential buildings as well as industrial process savings. The study covers a 9-year period spanning 2012–2020. Given the near- to mid-term focus, the base potential analysis was restricted to DSM measures that are presently commercially available.

Data for the study come from a number of different sources including internal Austin Energy studies and data, DNV KEMA's extensive energy efficiency database, and a variety of information from third parties.

2.2 Study Approach

This study involved identifying and developing baseline end-use and measure data and developing estimates of future energy efficiency impacts under varying levels of program effort.

We performed a baseline characterization that allowed us to identify the types and approximate sizes of the various market segments that are the most likely sources of DSM potential in Austin Energy's service territory. These characteristics then served as inputs to a modeling process that incorporated Austin Energy's energy-cost parameters and specific energy efficiency measure characteristics (such as costs, savings, and existing penetration estimates) to provide more detailed potential estimates.

To aid in the analysis, we utilized the DNV KEMA's DSM ASSYST™ model. This model provides a thorough, clear, and transparent documentation database and an extremely efficient data processing system for estimating technical, economic, and achievable potential. We estimated technical, economic, and achievable program potential for the residential, commercial, and industrial sectors, with a focus on energy efficiency impacts through 2020.

2.3 Background

In 2007, the city of Austin adopted the Austin Climate Protection Plan (ACPP) to build a more sustainable community. Austin Energy established a demand savings goal of 800 MW by 2020, of which 269 MW has been achieved through program efforts from 2007 through 2011. One of the goals of this potential study is to assess whether it is feasible to increase that goal from 800 MW to 1,000 MW.

Austin Energy has employed a number of different program efforts to reach its 800 MW goal. In addition to traditional utility DSM approaches such as energy-efficiency and load management, Austin Energy develops and enforces the city of Austin's building code. Since 2007, it has aggressively stepped-up code requirements to achieve 65 percent savings over the International Energy Conservation Code (IECC) 2006 for residential buildings by 2015 and to achieve a 30 percent savings for commercial buildings. The residential savings represented by the 2015 code is intended to be sufficient to achieve zero-net energy when combined with solar panels.

The city of Austin also has an Energy Conservation and Disclosure (ECAD) ordinance requiring that homeowners have an energy audit performed prior to selling their home. These audit results must then be provided to potential buyers. Although the ordinance does not require improvements to single-family homes, it provides motivation for sellers to correct energy deficiencies prior to sale and supplies information that buyers may act upon after sale. Austin Energy collects the results of the ECAD audits, which were made available to DNV KEMA as a data source for this study.

2.4 Layout of the Report

Section 3 of the report discusses the methodology and concepts used to develop the technical, economic, and achievable potential estimates. Section 4 provides baseline results developed for the study. Section 5 discusses the results of the electric energy efficiency potential analysis over time and by sector.

The report contains the following appendices:

- Appendix A: Detailed Methodology and Model Description—Further detail on what was discussed in Section 2.
- Appendix B: Measure Descriptions—Describes the measures included in this study.
- Appendix C: Economic Inputs—Provides avoided cost, electric rate, discount rate, and inflation rate assumptions used for the study.

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- Appendix D: Building and TOU Factor Inputs—Shows the base household counts, square footage estimates for commercial building types, and base energy use by industrial segment. This appendix also includes time-of-use factors by sector and end-use.
 - Appendix E: Measure Inputs—Lists the electric measures included in the analysis with the costs, estimated savings, applicability, and estimated current saturation factors.
 - Appendix F: Non-Additive Measure Level Results—Shows energy-efficiency potential for each measure independent of any other measure.
 - Appendix G: Supply-Curve Data—Shows the data behind the energy supply curves provided in Section 5 of the report.
 - Appendix H: Achievable Program Potential—Provides the forecasts for the achievable potential scenarios.

3. Methods and Scenarios

This section provides a brief overview of the concepts, methods, and scenarios used to conduct this study. Additional methodological details are provided in Appendix A.

3.1 Characterizing the Energy Efficiency Resource

Energy efficiency has been characterized for some time as an alternative to energy supply options, such as conventional power plants that produce electricity from fossil or nuclear fuels. In the early 1980s, researchers developed and popularized the use of a conservation supply-curve paradigm to characterize the potential costs and benefits of energy conservation and efficiency. Under this framework, technologies or practices that reduced energy use through efficiency were characterized as “liberating ‘supply’ for other energy demands” and could therefore be thought of as a resource and plotted on an energy supply curve. The energy efficiency resource paradigm simply argued that the more energy efficiency or “nega-watts” produced, the fewer new plants would be needed to meet end-users’ power demands.

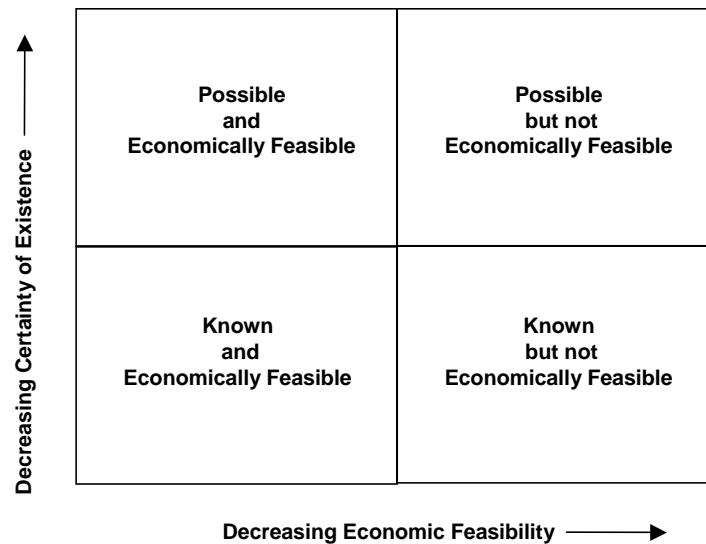
3.1.1 Defining Energy Efficiency Potential

Energy efficiency potential studies were popular throughout the utility industry from the late 1980s through the mid-1990s. This period coincided with the advent of what was called least-cost or integrated resource planning (IRP). Energy efficiency potential studies became one of the primary means of characterizing a resource’s availability and the value of energy efficiency within the overall resource planning process.

Like any resource, there are a number of ways in which an energy efficiency resource can be estimated and characterized. Definitions of energy efficiency potential are similar to definitions of potential developed for finite fossil-fuel resources, such as coal, oil, and natural gas. For example, fossil-fuel resources are typically characterized along two primary dimensions: the degree of geological certainty with which resources may be found and the likelihood that extraction of the resource will be economic. This relationship is shown conceptually in Figure 3-1.

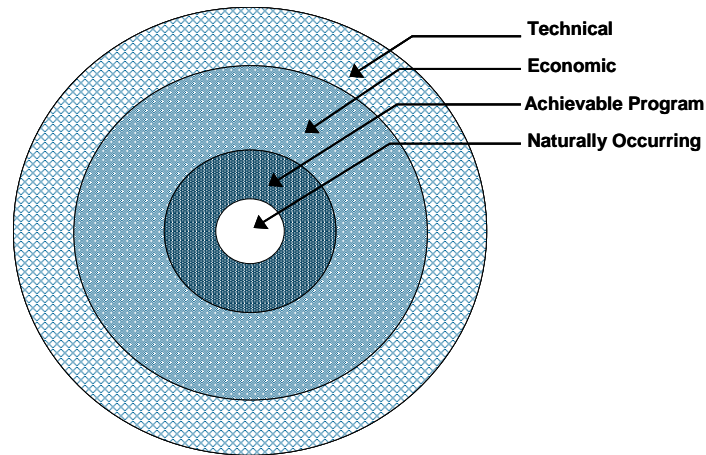
Somewhat analogously, this energy efficiency potential study defines several different *types* of energy efficiency *potential*, namely, technical, economic, achievable program, and naturally occurring. These potentials are shown conceptually in Figure 3-2 and are described below.

Figure 3-1
Conceptual Framework for Estimates of Fossil-fuel Resources



- **Technical potential** is defined in this study as the *complete* penetration of all analyzed measures in applications where they were deemed *technically* feasible from an *engineering* perspective.
- **Economic potential** refers to the *technical potential* of those energy conservation measures that are cost-effective when compared to supply-side alternatives.
- **Achievable program potential** refers to the amount of savings that would occur in response to specific program funding and measure incentive levels. Savings associated with program potential are savings that are projected beyond those that would occur naturally in the absence of any market intervention.
- **Naturally occurring potential** refers to the amount of savings estimated to occur as a result of normal market forces, that is, in the absence of any utility or governmental intervention.

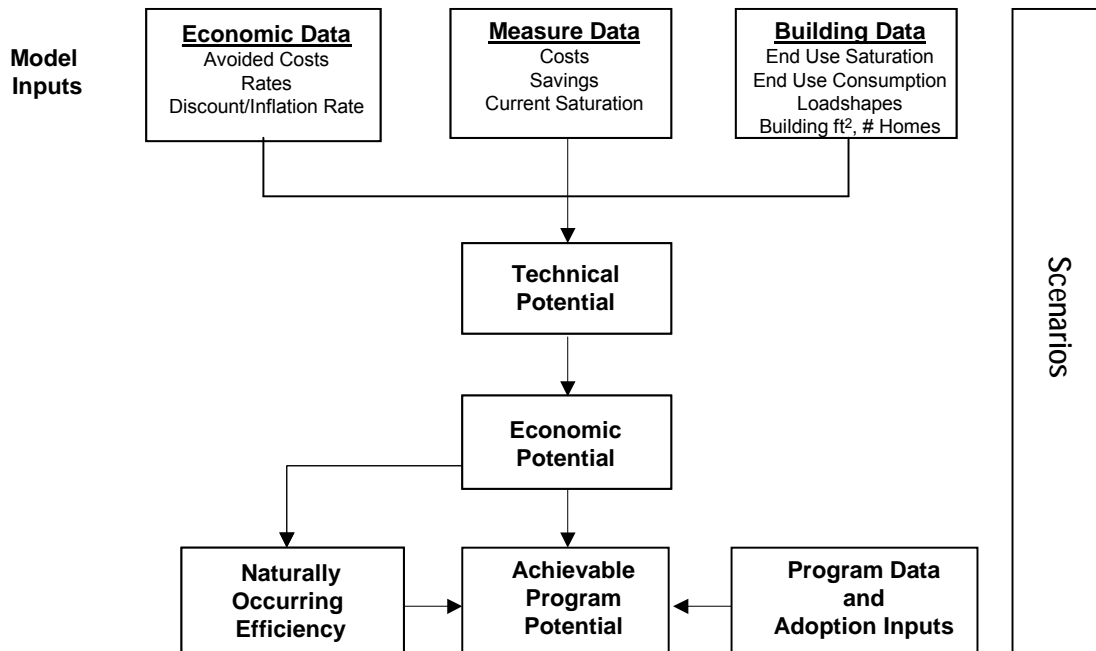
Figure 3-2
Conceptual Relationship between Energy Efficiency Potential Definitions



3.2 Summary of Analytical Steps Used

The crux of this study involves carrying out a number of basic analytical steps to produce estimates of the energy efficiency potentials introduced above. The basic analytical steps for this study are shown in relation to one another in Figure 3-3. The bulk of the analytical process for this study was carried out in a model developed by DNV KEMA for conducting energy efficiency potential studies. Details on the steps employed and analyses conducted are described in Appendix A. The model used DSM ASSYST, a Microsoft® Excel-based model, that integrates technology-specific engineering and customer behavior data with utility market saturation data, load shapes, rate projections, and marginal costs into an easily updated data management system.

Figure 3-3
Conceptual Overview of Study Process



In this study, the key steps implemented include:

Step 1: Develop Initial Input Data

- Develop a list of energy efficiency measure opportunities to include in scope. In this step, an initial draft measure list was developed and circulated internally within Austin Energy. The final measure list was developed after incorporating comments.
- Gather and develop technical data (costs and savings) on efficient measure opportunities. Measure data were gathered from a variety of sources. Measure descriptions are provided in Appendix B, and detail on measure inputs is provided in Appendix E.
- Gather, analyze, and develop information on building characteristics, including total square footage or total number of households, energy consumption and intensity by end use, end-use consumption load patterns by time of day and year (i.e., load shapes), market shares of key electric consuming equipment, and market shares of energy efficiency technologies and practices. Section 4 of this report describes the baseline data developed for this study.
- Collect data on economic parameters including avoided costs, electricity rates, discount rates, and inflation rate. These inputs are provided in Appendix C of this report.

Step 2: Estimate Technical Potential and Develop Supply Curves

- Match and integrate data on efficient measures to data on existing building characteristics to produce estimates of technical potential and energy efficiency supply curves.

Step 3: Estimate Economic Potential

- Match and integrate measure and building data with economic assumptions to produce cost indicators from different viewpoints (e.g., societal and consumer).
- Estimate total economic potential.

Step 4: Estimate Achievable Program and Naturally Occurring Potentials

- Screen initial measures for inclusion in the program's analysis. This screening accounted for factors such as cost-effectiveness, potential market size, non-energy benefits, market barriers, and potentially adverse effects associated with a measure. For this study, measures were screened using the total-resource-cost test while considering only electric avoided-cost benefits.
- Gather and develop estimates of program costs (e.g., for administration and marketing) and historic program savings.
- Develop customer adoption estimates for energy efficiency measures as a function of the economic attractiveness of the measures, barriers to their adoption, and the effects of program intervention.
- Estimate achievable program and naturally occurring potentials.

Step 5: Scenario Analyses

- Recalculate potentials under alternate program scenarios.

3.3 Scenario Analysis

Scenario analysis is a tool commonly used to structure the uncertainty and to examine the robustness of projected outcomes to changes in key underlying assumptions. This section describes the alternative scenarios under which DSM potential was estimated in this study. We developed these DSM potential scenarios for two key reasons:

1. Our estimates of potential depend on future adoptions of energy efficiency measures that are a function of data inputs and assumptions, which are themselves forecasts. For example, our projections depend on estimates of measure availability, measure cost, measure savings, measure saturation levels, retail rates, and avoided costs. Each of the inputs to our analysis is subject to some degree of uncertainty.
2. The ultimate achievable energy efficiency potential depends, by definition, on policy choices, including the level of resources and strategies used to increase measure adoption.

The cost components of program funding that vary under each scenario include:

Marketing and Education Expenditures

- Customers must be aware of efficiency measures and their associated benefits in order to adopt those measures. In our analysis, program marketing expenditures were converted to increases in awareness. Thus, under higher levels of marketing expenditures, higher levels of awareness are achieved.

Incentives and Direct Implementation Expenditures

- The higher the percentage of measure costs paid by the program, the higher the participants' benefit-cost ratios and consequently the number of measure adoptions.

Administration Expenditures

- Purely administrative costs, though necessary and important to the program process, do not directly lead to adoptions; however, they have been included in program funding because they are an input to the program's benefit-cost tests.

For each analysis, four program funding scenarios were considered: a BAU funding scenario without inflation adjustments to the budget, a BAU scenario with administrative and marketing budgets increased annually at the rate of inflation, a 75-percent incentive scenario, and a 100-percent incentive scenario. These scenarios are discussed below.

In all scenarios, ENERGY STAR office equipment and consumer electronics for the residential sector were modeled without financial incentives. Because these measures are very cost-effective, it was deemed that provision of an incentive would primarily benefit free riders.

3.3.1 Business-as-Usual Flat Budget Incentive Scenario

In this scenario, we modeled Austin Energy's existing program budgets and incentive levels. This scenario was used to calibrate the DSM ASSYST model to equate current incentive and other program effort expenditures to expected program savings. Incentives (as a percentage of incremental measure costs) varied by measure under this scenario. For this scenario, marketing and administrative budgets were held constant over the analysis period with no adjustment for inflation.

3.3.2 Business-as-Usual Incentive Scenario

This scenario is identical to the BAU Flat-Budget scenario, except that marketing and administrative budgets were increased at the rate of inflation over the analysis period.

3.3.3 Seventy-five-percent Incentive Scenario

In this scenario, incentives were increased to cover 75 percent of incremental measure costs, except for measures that had constrained incentives as discussed earlier. Program marketing and administration budgets were kept at the same level as the BAU (with inflation adjustment) scenario.

3.3.4 One-hundred-percent Incentive Scenario

In this scenario, incentives were increased to cover 100 percent of incremental measure costs, with the exception of constrained measures. Program marketing and administration budgets were kept at the BAU (with inflation adjustment) level.

3.3.5 Summary of Scenarios

Table 3-1 shows the average spending on electricity programs for each of the scenarios during the 2012–2020 forecast period.

Table 3-1
Scenario Average Spending during 2012–2020 Forecast Period (\$1000s)

Funding Level	Market Segment	Cost Components				% Incremental Measure Cost Paid
		Admin	Marketing	Incentives	Total	
BAU Incentives Flat Budget	Residential Existing	\$1,075	\$1,120	\$8,004	\$10,199	24%
	Residential New Construction	\$2	\$147	\$163	\$312	26%
	Commercial Existing	\$504	\$496	\$5,385	\$6,385	27%
	Commercial New Construction	\$331	\$301	\$0	\$632	0%
	Industrial Existing	\$130	\$124	\$1,776	\$2,029	32%
	Industrial New Construction	<u>\$32</u>	<u>\$33</u>	<u>\$0</u>	<u>\$66</u>	0%
	Total	\$2,074	\$2,221	\$15,328	\$19,623	
BAU Incentives	Residential Existing	\$1,077	\$1,234	\$8,024	\$10,335	24%
	Residential New Construction	\$2	\$162	\$164	\$327	26%
	Commercial Existing	\$521	\$546	\$5,580	\$6,647	27%
	Commercial New Construction	\$331	\$331	\$0	\$662	0%
	Industrial Existing	\$133	\$137	\$1,826	\$2,095	32%
	Industrial New Construction	<u>\$34</u>	<u>\$37</u>	<u>\$0</u>	<u>\$70</u>	0%
	Total	\$2,097	\$2,446	\$15,593	\$20,136	
75% Incentives	Residential Existing	\$2,565	\$1,295	\$19,800	\$23,660	75%
	Residential New Construction	\$1	\$170	\$1,048	\$1,219	75%
	Commercial Existing	\$1,381	\$574	\$16,908	\$18,863	75%
	Commercial New Construction	\$348	\$348	\$8,696	\$9,391	75%
	Industrial Existing	\$239	\$143	\$3,917	\$4,299	75%
	Industrial New Construction	<u>\$37</u>	<u>\$39</u>	<u>\$1,374</u>	<u>\$1,449</u>	75%
	Total	\$4,570	\$2,569	\$51,743	\$58,881	
100% Incentives	Residential Existing	\$6,581	\$1,357	\$40,005	\$47,943	100%
	Residential New Construction	\$2	\$178	\$3,213	\$3,393	100%
	Commercial Existing	\$2,492	\$601	\$26,740	\$29,833	100%
	Commercial New Construction	\$364	\$364	\$20,610	\$21,338	100%
	Industrial Existing	\$388	\$150	\$6,263	\$6,802	100%
	Industrial New Construction	<u>\$40</u>	<u>\$40</u>	<u>\$3,383</u>	<u>\$3,463</u>	100%
	Total	\$9,867	\$2,691	\$100,214	\$112,772	

4. Baseline Results

Assessing how energy is used in the Austin Energy service territory by sector, building type, and end use underlies the potential analysis. Characterizing energy use in this way anchors the savings estimates for specific measures to concrete, evidence-based estimates of energy usage by the relevant end use. For example, savings for high-efficiency room air conditioners in single-family homes would be calculated using the baseline estimate of energy used by room air conditioners in single-family homes.

The baseline analysis represents current energy use in Austin Energy's service territory. It addresses all of Austin Energy's energy use with detailed breakouts by building type and end use for the residential, commercial, and industrial sectors. Other sectors, such as agriculture, construction, and utilities, are not included in this potential study and are discussed only at an aggregate level in the baseline analysis. This section presents the results of the baseline analysis.

4.1 Residential Baseline

4.1.1 Residential Billing Analysis

DNV KEMA analyzed residential billing data for fiscal year (FY) 2011 provided by Austin Energy to obtain data by building type (as shown in Table 4-1). The billing data included a large number of accounts (57,927) that lacked a building type description, but accounted for 1.3 percent of total residential energy use. This energy use was split between single family and multifamily in proportion to the accounts with building type information. Based on discussions with Austin Energy, accounts with less than six months of billing data were excluded from the analysis.

For this study, low income was defined by customers' participation in low-income programs, which may not align closely with other definitions of low income.

Table 4-1
Residential Billing Data

	kWh	# of Accts	Avg kWh/acct
Single Family	3,009,253,646	210,250	14,313
Multifamily	1,046,638,733	141,946	7,373
Low Income	147,817,363	12,371	11,949
Total	4,203,709,742	364,567	11,531

4.1.2 Residential Saturations

DNV KEMA's primary source for residential end-use saturations were Austin Energy's *ESource Residential End-Use Study* and a database of audit results collected for compliance with Austin Energy's ECAD. ESource's study provided data about appliance ownership for Travis County (99 homes) for most of the end uses included in the baseline analysis. The ECAD's data (5,893 records) provided detailed information about floor space, insulation levels, HVAC efficiency and condition, and other building characteristics. These data were used primarily for measure saturations (see Appendix E).

In many cases, ESource's data were available by type of home, allowing us to differentiate between single-family and multifamily saturations, or by household income, which allowed us to differentiate low income (DNV KEMA used data for household incomes of less than \$25,000 to populate low-income saturations). For consumer electronics and home office equipment, ESource did not break out data by home type but did break it out by home ownership; in these cases, DNV KEMA used rent/lease as a proxy for multifamily.²

DNV KEMA used the U.S. Department of Energy's *Residential Energy Consumption Survey* (RECS) to estimate values for the remaining end uses not included in either data set (dishwashers, cooking, and dehumidifiers). DNV KEMA used data for the South Census Region to approximate Austin Energy's saturations for these end uses.

Table 4-2 shows end-use saturations for the residential sector.

For incandescent fixtures, saturation is set to 100 percent for all usage bins for consistency with DNV KEMA's data on equipment density (number of units per home), which we have as only average number of units over all homes, not average number of units per home with incandescent lighting in that usage bin. The available data were not enough to determine saturation, since the average number of lamps is the same with 100 percent saturation and 0.3 lamps per home as with 30 percent saturation and one lamp per home. DNV KEMA used 100 percent saturation here as a modeling choice that is consistent with the way we estimated the energy-use intensity. End-use energy intensities for these measures, presented later in the report, reflect the lower equipment density.

² Austin Energy reviewers noted that Austin has a high saturation of renters of single-family homes; consequently, using this proxy may not accurately reflect electronics equipment saturation in multifamily homes. However, we feel it represents the best available approximation, given the data available.

For early replacement measures, we divided the saturation for the primary equipment type into those that were modeled as ROB and those that were modeled as early replacements (retrofit). For example, we used two water heating base measures, base 40 gallon water heating (EF=0.88) and base early replacement water heating to heat pump water heater. The total electric water heating saturation is 48 percent. We assigned 5 percent to the early replacement measure based on an assessment of the reasonable maximum saturation of heat pump water heaters and assigned the remaining 43 percent to standard ROB measures. We modeled early replacement central- and room-air conditioning similarly, using an 85/15 split to divide the saturation into ROB and early replacement.

The various types of televisions (CRT, LCD, plasma) are modeled as separate types of appliances. Since homes may have multiple types of TVs (for example, a home could have two CRTs and an LCD), the saturations cannot be summed over different types to estimate the total saturation of televisions in homes.

This study addresses only electric equipment; the balance of water heating and cooking equipment uses natural gas or other fuels.

**Table 4-2
Residential End-use Saturations**

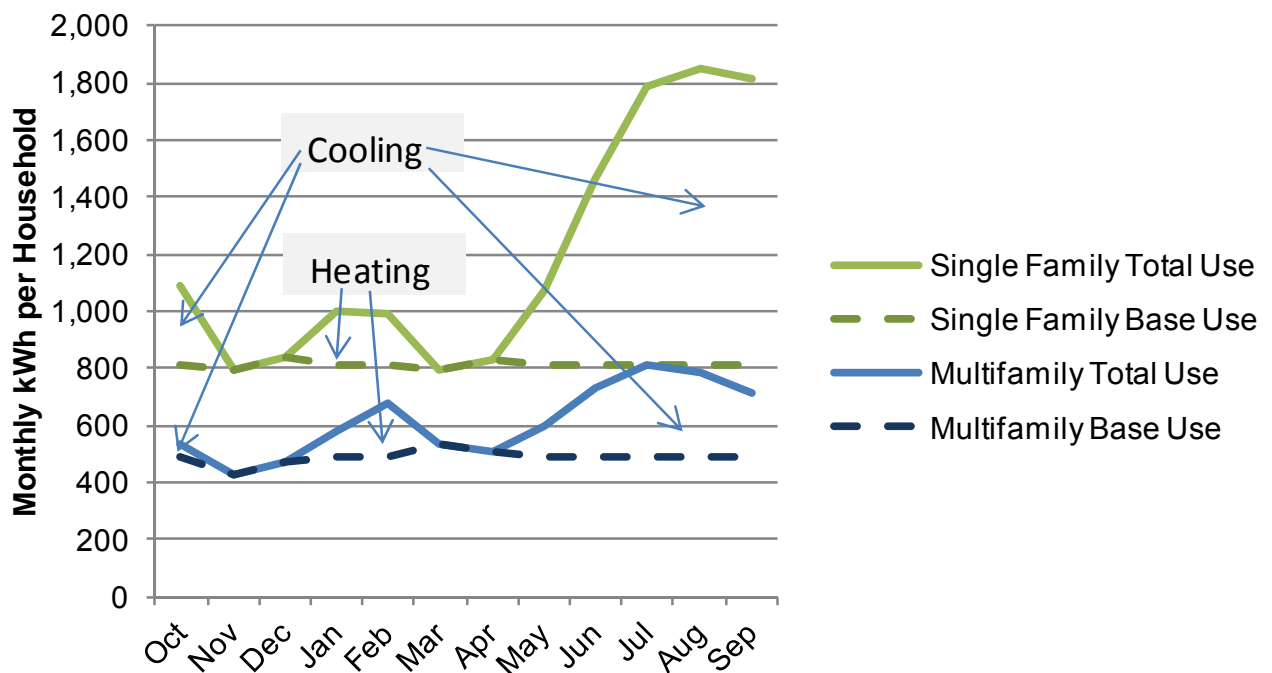
	SF	MF	Low Income	Source
Base Split-System Air Conditioner (11 SEER)	81.6%	79.9%	80.8%	ESource; assumes 85% to ROB
Base Early Replacement Split-System Air Conditioner (11 SEER)	14.4%	14.1%	14.3%	ESource; assumes 15% early replacement
Base Room Air Conditioner - EER 9.7	2.6%	5.1%	1.7%	ESource; assumes 85% to ROB
Base Early Replacement Room Air Conditioner- EER 9.0	0.5%	0.9%	0.3%	ESource; assumes 15% early replacement
Base Dehumidifier- New Federal Standard	8.6%	2.9%	3.4%	RECS 2009
Base Resistance Space Heating (Primary)	6.0%	9.0%	5.0%	ESource
Base Air-Source Heat Pump	14.0%	0.0%	7.0%	ESource
Base High-Efficiency Incandescent Lighting, <1.15 hrs/day	100.0%	100.0%	100.0%	
Base High-Efficiency Incandescent Lighting, 1.15-2.15 hrs/day	100.0%	100.0%	100.0%	
Base High-Efficiency Incandescent Lighting, 2.15-5 hrs/day	100.0%	100.0%	100.0%	
Base High-Efficiency Incandescent Lighting, >5 hrs/day	100.0%	100.0%	100.0%	
Base Lighting 15-Watt CFL, <1.15 hrs/day	84.0%	85.0%	74.0%	ESource
Base Lighting 15-Watt CFL, 1.15-2.15 hrs/day	84.0%	85.0%	74.0%	ESource
Base Lighting 15-Watt CFL, 2.15-5 hrs/day	84.0%	85.0%	74.0%	ESource
Base Lighting 15-Watt CFL, >5 hrs/day	84.0%	85.0%	74.0%	ESource
Base Fluorescent Fixture 1.8 hrs/day	100.0%	100.0%	100.0%	
Base Refrigerator	81.6%	81.6%	79.9%	ESource; assumes 85% to ROB
Base Early Replacement Refrigerator	14.4%	14.4%	14.1%	ESource; assumes 15% early replacement
Base Second Refrigerator	18.0%	9.0%	18.0%	ESource
Base Freezer	21.3%	4.0%	4.3%	ESource; assumes 85% to ROB
Base Early Replacement Freezer	3.8%	2.3%	0.8%	ESource; assumes 15% early replacement
Base 40 gal. Water Heating (EF=0.88)	43.2%	43.2%	43.2%	ESource; assumes 90% to ROB
Base Early Replacement Water Heating to Heat Pump Water Heater	4.8%	4.8%	4.8%	ESource; assumes 10% early replacement
Base Clothes Washer (MEF=1.26)	86.0%	76.0%	76.0%	ESource
Base Clothes Dryer (EF=3.01)	66.0%	66.0%	77.0%	ESource

	SF	MF	Low Income	Source
Base Dishwasher (EF=0.65)	67.0%	57.0%	32.1%	RECS 2009
Base Single Speed Pool Pump (RET)	2.5%	2.5%	0.0%	ESource (total pools, split between single speed and 2 speed)
Base Two Speed Pool Pump (1.5 hp) (ROB)	2.5%	2.5%	0.0%	ESource (total pools, split between single speed and 2 speed)
Base Plasma TV	19.0%	23.0%	31.0%	ESource
Base LCD TV	48.0%	46.0%	24.0%	ESource
Base CRT TV	72.0%	69.0%	81.0%	ESource
Base Set-Top Box	63.0%	63.0%	62.0%	ESource
Base DVD Player	62.0%	57.0%	33.0%	ESource
Base Desktop PC	76.0%	64.0%	60.0%	ESource
Base Laptop PC	73.0%	78.0%	58.0%	ESource
Base Cooking	73.5%	80.9%	72.0%	RECS 2009
Base Miscellaneous	100.0%	100.0%	100.0%	
Base House Practices	100.0%	100.0%	100.0%	

4.1.3 Residential End-use Energy Intensity

DNV KEMA used monthly billing data to separate cooling and heating energy from base loads. Austin Energy's usage was lowest in November–December and March–April. DNV KEMA attributed usage in these months to loads other than heating and cooling. DNV KEMA attributed usage in January–February in excess of this base load to heating and attributed usage above these base levels from May through October to cooling. Through this disaggregation, DNV KEMA calculated heating and cooling use per household for single family, multifamily, and low income (not shown, but similar to single family). This approach is illustrated in Figure 4-1.

Figure 4-1
Analysis of Residential Monthly Energy-use Data



Because 2011 was an unusually hot year, DNV KEMA used heating degree day (HDD) and cooling degree day data to adjust the resulting energy-use values to historic weather norms. Heating and cooling energy were adjusted by calculating energy use per degree day for the billing year and then applied that to the historic average degree day.

Table 4-3: Seasonal Heating and Cooling Degree Day Data, Billing Year and Historical

	Seasonal HDD (Nov-Mar)	Seasonal CDD (May-Sept)
FY2010	2045	2616
FY2011	1587	2818
Historical Average 1971–2000	1568	2472

HDD and CDD (base 65) are from Camp Mabry/Austin City weather station

DNV KEMA pulled additional energy-use data from a variety of sources including the RECS and the U.S. Environmental Protection Agency’s ENERGY STAR program savings calculators to determine preliminary estimates of end-use energy intensities (kWh per household for homes with that type of equipment). We then calibrated these values using the results of the earlier-mentioned billing analysis so that cooling, heating, and other end uses accounted for the correct share of residential energy.

Residential end-use energy intensities are shown in Table 4-4.

Table 4-4
Residential End-use Energy Intensities (kWh per Household with the End Use)

	Single Family	Multi- family	Low Income
Base Split-System Air Conditioner (11 SEER)	3,623	1,101	2,822
Base Early Replacement Split-System Air Conditioner (11 SEER)	4,528	1,377	3,528
Base Room Air Conditioner - EER 9.7	1,696	516	1,321
Base Early Replacement Room Air Conditioner- EER 9.0	1,815	552	1,414
Base Dehumidifier- New Federal Standard	1,064	351	851
Base Resistance Space Heating (Primary)	2,784	3,117	5,029
Base Air-Source Heat Pump	1,307	720	1,161
Base High-Efficiency Incandescent Lighting, <1.15 hrs/day	150	98	80
Base High-Efficiency Incandescent Lighting, 1.15-2.15 hrs/day	648	421	345
Base High-Efficiency Incandescent Lighting, 2.15-5 hrs/day	281	182	150
Base High-Efficiency Incandescent Lighting, >5 hrs/day	425	276	226
Base Lighting 15-Watt CFL, <1.15 hrs/day	7	4	4
Base Lighting 15-Watt CFL, 1.15-2.15 hrs/day	58	33	36
Base Lighting 15-Watt CFL, 2.15-5 hrs/day	50	29	31
Base Lighting 15-Watt CFL, >5 hrs/day	76	43	47
Base Fluorescent Fixture 1.8 hrs/day	273	93	105
Base Refrigerator	871	1,003	895
Base Early Replacement Refrigerator	871	1,003	895
Base Second Refrigerator	1,248	1,104	1,036
Base Freezer	666	767	685
Base Early Replacement Freezer	666	767	685
Base 40 gal. Water Heating (EF=0.88)	3,492	2,438	3,587
Base Early Replacement Water Heating to Heat Pump Water Heater	3,492	2,438	3,587
Base Clothes Washer (MEF=1.26)	98	113	101
Base Clothes Dryer (EF=3.01)	1,175	813	967
Base Dishwasher (EF=0.65)	196	226	202
Base Single Speed Pool Pump (RET)	997	1147	1024
Base Two Speed Pool Pump (1.5 hp) (ROB)	617	816	651
Base Plasma TV	285	328	334
Base LCD TV	192	198	206
Base CRT TV	225	172	259
Base Set-Top Box	284	275	290
Base DVD Player	40	37	42
Base Desktop PC	885	798	853
Base Laptop PC	233	235	212
Base Cooking	383	441	394

	Single Family	Multi-family	Low Income
Base Miscellaneous	2,187	48	2,243
Whole House	13,796	7,215	11,552

4.1.4 Residential Building Stock and Energy Use

DNV KEMA used the number of residential accounts as the measure of residential housing stock (see Table 4-5).

Table 4-5
Residential Housing Stock (Accounts) by Building Type

	Single Family	Multifamily	Low Income	Total
Number of Accounts	210,250	141,946	12,371	364,567

DNV KEMA then calculated energy use as the product of number of accounts, saturation, and end-use energy intensity.

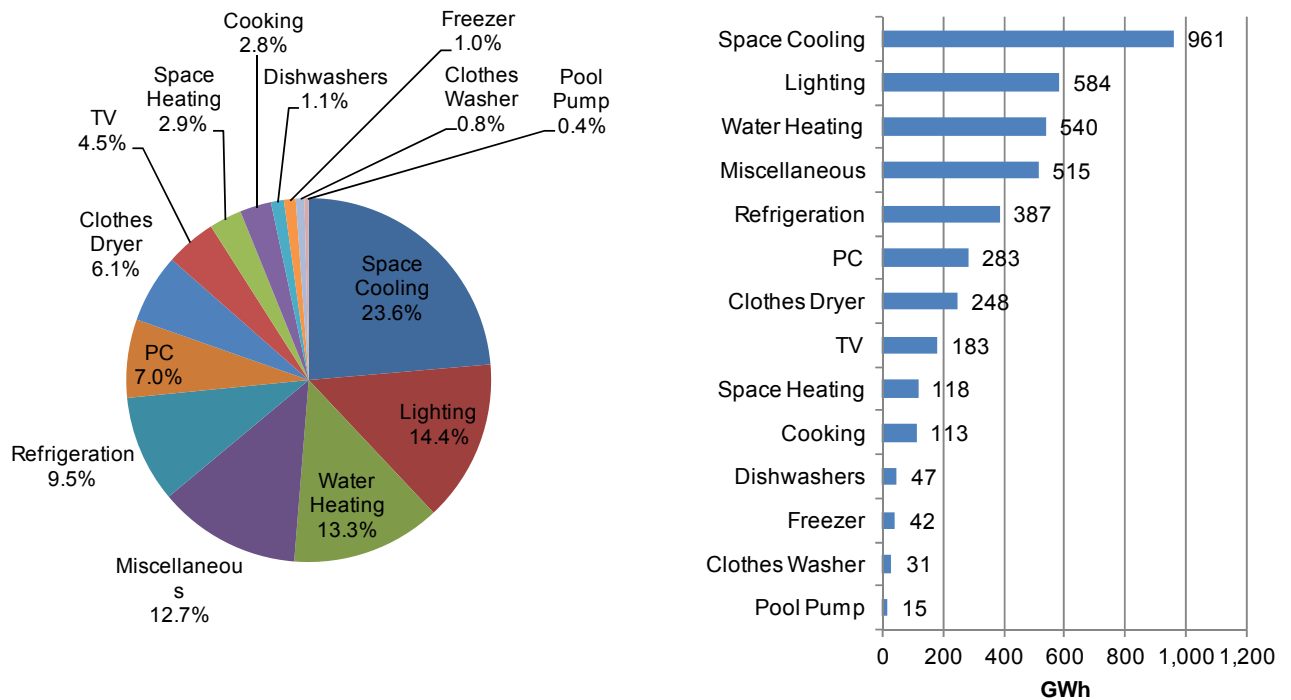
Table 4-6 shows energy use by building type and end use; Figure 4-2 summarizes energy use by end use. Space cooling uses the most energy, followed by lighting and water heating. Miscellaneous is the fourth largest category, encompassing all the equipment types for which we did not model efficiency measures. These include household equipment such as audio equipment, telephones, chargers for phones and other portable equipment, hair dryers, power tools, electric lawnmowers, electric vehicles, aquariums, pumps, remote-controlled equipment, decorative light strings, toasters, and coffee machines. Homes also often incorporate infrastructure with small but continuous loads, such as arc fault circuit interrupters and doorbell transformers. Figure 4-3 shows residential energy use by building type.

Table 4-6
Residential Energy Use by Building Type and End Use (MWh)

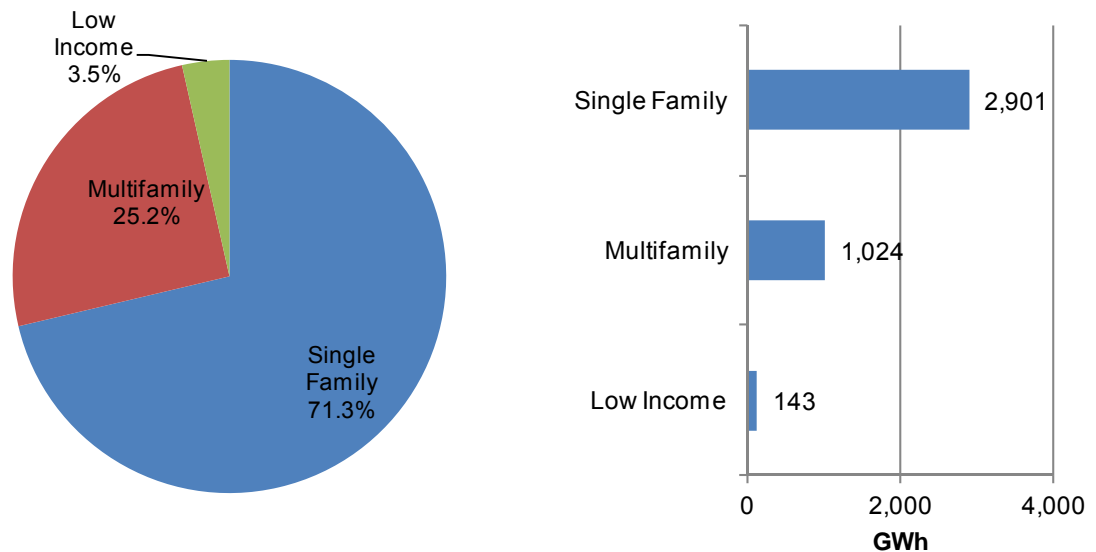
	Single Family	Multifamily	Low Income	Total
Base Split-System Air Conditioner (11 SEER)	621,541	124,894	28,191	774,625
Base Early Replacement Split-System Air Conditioner (11 SEER)	137,105	27,550	6,219	170,873
Base Room Air Conditioner - EER 9.7	9,095	3,733	278	13,106
Base Early Replacement Room Air Conditioner- EER 9.0	1,717	705	52	2,475
Base Dehumidifier- New Federal Standard	19,148	1,424	356	20,928
Base Resistance Space Heating (Primary)	35,125	39,818	3,111	78,054
Base Air-Source Heat Pump	38,459	-	1,006	39,464

	Single Family	Multifamily	Low Income	Total
Base High-Efficiency Incandescent Lighting, <1.15 hrs/day	31,583	13,852	989	46,424
Base High-Efficiency Incandescent Lighting, 1.15-2.15 hrs/day	136,241	59,753	4,268	200,262
Base High-Efficiency Incandescent Lighting, 2.15-5 hrs/day	59,050	25,898	1,850	86,798
Base High-Efficiency Incandescent Lighting, >5 hrs/day	89,319	39,174	2,798	131,291
Base Lighting 15-Watt CFL, <1.15 hrs/day	1,256	489	41	1,785
Base Lighting 15-Watt CFL, 1.15-2.15 hrs/day	10,187	3,968	329	14,485
Base Lighting 15-Watt CFL, 2.15-5 hrs/day	8,861	3,452	286	12,598
Base Lighting 15-Watt CFL, >5 hrs/day	13,403	5,221	433	19,057
Base Fluorescent Fixture 1.8 hrs/day	57,314	13,135	1,296	71,745
Base Refrigerator	149,516	116,126	8,851	274,493
Base Early Replacement Refrigerator	26,385	20,493	1,562	48,440
Base Second Refrigerator	47,226	14,108	2,306	63,640
Base Freezer	29,773	4,353	360	34,485
Base Early Replacement Freezer	5,254	2,448	64	7,766
Base 40 gal. Water Heating (EF=0.88)	317,128	149,470	19,173	485,771
Base Early Replacement Water Heating to Heat Pump Water Heater	35,236	16,608	2,130	53,975
Base Clothes Washer (MEF=1.26)	17,699	12,148	946	30,792
Base Clothes Dryer (EF=3.01)	163,094	76,147	9,212	248,453
Base Dishwasher (EF=0.65)	27,680	18,290	801	46,770
Base Single Speed Pool Pump (RET)	5,240	4,070	-	9,309
Base Two Speed Pool Pump (1.5 hp) (ROB)	3,241	2,896	-	6,137
Base Plasma TV	11,381	10,700	1,279	23,360
Base LCD TV	19,341	12,938	611	32,889
Base CRT TV	34,108	16,807	2,599	53,514
Base Set-Top Box	37,577	24,595	2,223	64,395
Base DVD Player	5,227	2,982	172	8,381
Base Desktop PC	141,394	72,487	6,333	220,214
Base Laptop PC	35,731	26,026	1,522	63,279
Base Cooking	59,255	50,635	3,510	113,400
Base Miscellaneous	459,777	6,806	27,747	494,331
Total	2,900,663	1,024,198	142,905	4,067,766

**Figure 4-2
Residential Energy Use by End Use**



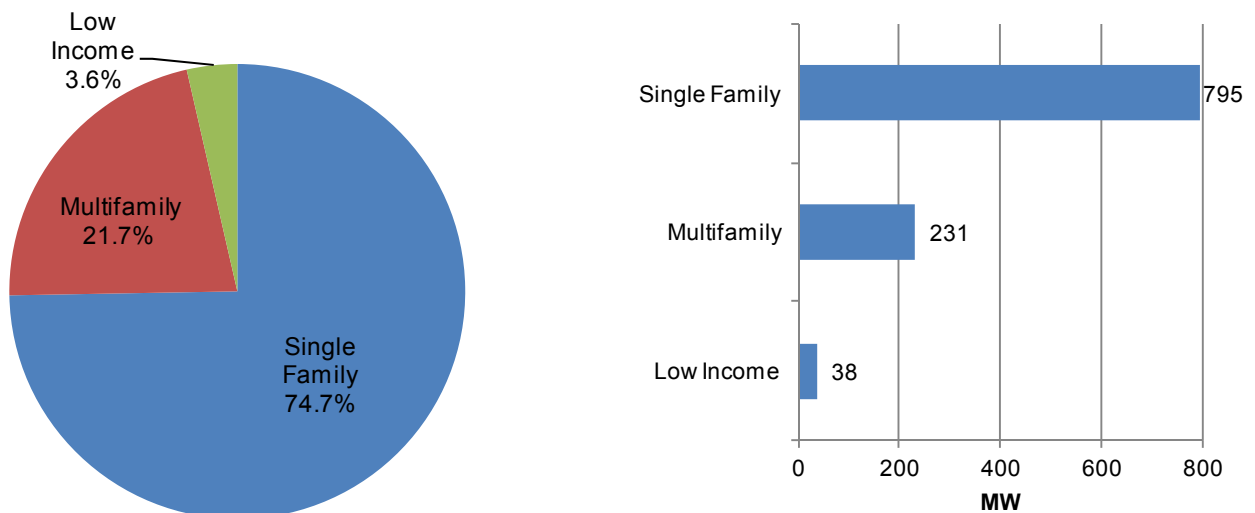
**Figure 4-3
Residential Energy Use by Building Type**



4.1.5 Residential Peak Demand

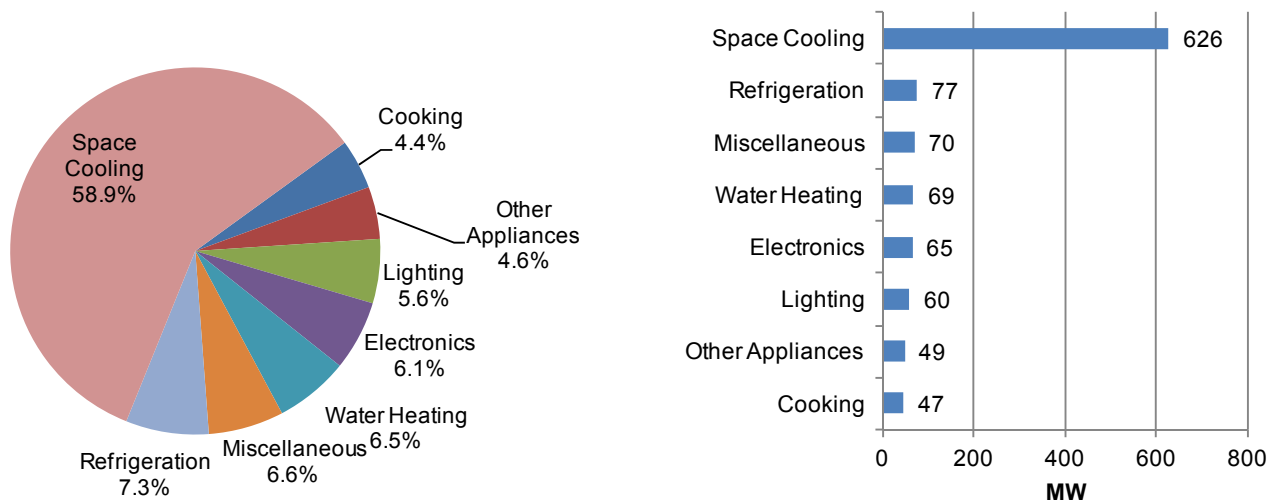
DNV KEMA calibrated residential peak demand basing it on coincident peak data from Austin Energy's December 2011 rate proposal, which presented Test Year 2009 demand by customer class.³ Figure 4-4 and Figure 4-5 summarize commercial peak demand by building type and end use, respectively.

Figure 4-4
Residential Peak Demand by Building Type



³ Austin Energy, 2011. *Rate Analysis and Recommendations Report*. Provided to the Austin City Council, December 19, 2011, Table 2.3.

Figure 4-5
Residential Peak Demand by End Use



4.2 Non-residential Baseline

4.2.1 Non-residential Building Type Analysis

Austin Energy provided non-residential billing data in four bins: city of Austin, contract accounts, key accounts, and other non-residential accounts. The city of Austin's data were for the period from October 2009 to September 2010; all others were from October 2010 to September 2011. DNV KEMA split the city of Austin's data into water/wastewater (based on the departmental information provided in the billing database) and all other, since water/wastewater is analyzed with industrial energy use in DSM ASSYST. The remainder of the city of Austin's energy use was analyzed as commercial energy use. Table 4-7 summarizes the billing data.

Table 4-7
Summary of Austin Energy's Non-residential Billing Data

	Accounts	Annual kWh	September 2011 kW
Commercial Accounts	34,371	2,998,818,532	832,391
Key Accounts	5,813	2,163,890,707	493,822
Contract Accounts	77	2,084,844,809	354,758
City of Austin, excluding Water/Wastewater	621	165,110,455	55,527
Water/Wastewater (City of Austin)	189	179,781,732	37,106
Total	41,071	7,592,446,235	1,773,604

Because the industry classification data in Austin Energy's billing data were incomplete, Christopher Frye of Austin Energy selected a database sample to be matched with NAICS codes to inform the energy use breakout by building type and sector (commercial and industrial). That sample included 7,422 accounts. Table 4-8 and Figure 4-7 show the resulting building type breakouts for the commercial sector. Table 4-9 and Figure 4-11 show the corresponding data for the industrial sector. The industrial sector is dominated by the electronics industry, which includes manufacturers of computers and consumer electronics as well as non-high-tech electric appliances and housewares.

Table 4-8
Commercial Energy Use and Billed kW by Building Type

	Annual kWh	Percentage of kWh	September 2011 kW	Percentage of kW
Office	1,818,557,330	40%	444,374	40%
Restaurant	335,912,042	7%	86,245	8%
Retail	614,638,532	14%	157,068	14%
Grocery	198,504,635	4%	38,095	3%
Warehouse	88,498,033	2%	30,642	3%
School	238,344,088	5%	92,837	8%
College	394,140,682	9%	70,377	6%
Health	197,287,774	4%	38,081	3%
Lodging	121,023,640	3%	30,822	3%
City of Austin	165,110,455	4%	55,527	5%
Other	367,776,127	8%	112,532	10%
Total	4,539,793,338		1,101,073	

Note: City of Austin excludes water/wastewater (it is analyzed with the industrial sector). "Other" commercial buildings include, but are not limited to: movie theaters, video rental businesses, gas stations, recording studios, data processing and hosting, news syndicates, libraries and archives, internet publishing, car rental and leasing, other rental and leasing, architectural and engineering services, laboratories, photography studios, veterinary services, trade schools, performing arts, sports facilities, museums, historical sites, amusement parks, arcades, casinos, golf courses, marinas, fitness centers, bowling alleys, auto repair, car washes, other repair shops, barber shops and beauty salons, funeral homes, drycleaners and laundromats, parking garages, religious organizations, courts, and correctional institutions.

**Table 4-9
Industrial Energy Use by Industry**

	Annual kWh	Percentage of kWh	September 2011 kW	Percentage of kW
Food	13,843,841	1%	3,799	1%
Textiles	4,244,421	0%	1,858	0%
Wood	2,174,334	0%	1,129	0%
Paper	941,897	0%	271	0%
Printing	54,130,937	3%	14,171	4%
Chemicals	42,610,985	2%	9,288	2%
Petroleum	1,491,313	0%	283	0%
Plastics	1,405,171	0%	568	0%
Stone, Clay, Glass	6,553,990	0%	4,646	1%
Fab. Metals	2,541,689	0%	1,137	0%
Ind. Mach	86,211,086	4%	13,937	4%
Electronics	1,596,381,411	79%	283,608	74%
Transp. Equip.	24,071,404	1%	6,364	2%
Misc.	16,156,402	1%	6,179	2%
WWTP (COA)	179,781,732	9%	37,106	10%
Total	2,032,540,614		384,344	

Note: WWTP includes only city of Austin (COA) water and wastewater facilities as identified in the city of Austin's billing database. It does not include water/ wastewater treatment by other industrial customers.

4.3 Commercial Baseline

4.3.1 Commercial Saturations

There was no local survey or audit data for the commercial sector comparable to what was available for the residential sector. Instead, DNV KEMA relied primarily on the U.S. Department of Energy's Commercial Buildings Energy Consumption Survey (CBECS) to develop equipment saturations by building type. In order to have a sufficient number of data points for reliability, DNV KEMA used data for the East South Central and West South Central census divisions. For some non-weather-sensitive measures, DNV KEMA relied on its extensive database of saturation data from other potential studies. Saturations by building type and end use are shown in Table 4-10.

DNV KEMA relied on the expertise of Austin Energy's staff members to assess the data taken from these sources based on their experiences with local customers. DNV KEMA made a

number of adjustments to lighting, space cooling (especially the mix of chillers and DX systems), and space heating.

There are nine lighting base measures. Due to recent changes to federal lighting standards, we did not analyze T12s as a separate base measure. T12s are rolled in with T8 base measures, and the effect of their higher energy use is accounted for in our energy intensity estimates. The effect of the standards on savings is captured through a standards adjustment factor.

We have three primary base measures that cover the majority of general service office lighting: 2-lamp 4-foot T8 fixtures, 4-lamp 4-foot T8 fixtures, and other fluorescent fixtures, which include U-tubes and 8-foot lamps, among others. Together, these illuminate 88 percent of office floor space.

Table 4-10
Commercial End-use Saturations by Building Type (% of Square Feet with End Use)

End Use	Office	Restaurant	Retail	Grocery	Warehouse	School	College	Health	Lodging	City of Austin	Other
Base Fluorescent Fixture, 4L 4'T8	50%	4%	19%	86%	40%	80%	34%	65%	7%	43%	37%
Base Fluorescent Fixture, 2L 4'T8, 1 EB	32%	40%	6%	0%	0%	7%	51%	17%	40%	33%	35%
Base Other Fluorescent Fixture	6%	15%	6%	0%	0%	3%	6%	6%	2%	4%	2%
Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacement	3%	17%	4%	3%	4%	2%	2%	3%	21%	5%	6%
Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacement	3%	17%	4%	3%	4%	2%	2%	3%	21%	5%	6%
Base CFL	7%	10%	2%	2%	4%	2%	5%	11%	18%	6%	5%
Base High Bay Metal Halide, 400W	2%	1%	1%	17%	24%	3%	2%	2%	1%	4%	6%
Base Parking Garage Metal Halide, 250 W	0%	0%	0%	0%	0%	0%	18%	7%	0%	0%	0%
Base Parking Garage Fluorescent	10%	0%	0%	0%	0%	0%	0%	0%	2%	8%	7%
Base Exit Sign	82%	79%	42%	99%	100%	100%	100%	100%	100%	90%	98%
Base Outdoor High Pressure Sodium 250W Lamp	42%	100%	45%	99%	43%	93%	52%	93%	74%	64%	87%
Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	42%	1%	4%	0%	0%	25%	74%	82%	30%	27%	12%
Base DX Packaged System, EER=10.3, 10 tons	43%	77%	28%	69%	78%	52%	0%	18%	25%	51%	60%
Base PTAC, EER=8.3, 1 ton	1%	8%	1%	12%	4%	11%	0%	3%	50%	4%	8%
Base Fan Motor, 5hp, 1800rpm, 87.5%	42%	50%	43%	97%	30%	33%	82%	19%	65%	48%	54%
Base Fan Motor, 15hp, 1800rpm, 91.0%	40%	0%	2%	0%	0%	60%	69%	65%	0%	41%	43%
Base Fan Motor, 40hp, 1800rpm, 93.0%	5%	0%	2%	96%	10%	37%	69%	69%	11%	19%	34%
Base Built-up Refrigeration System	0%	38%	0%	11%	3%	8%	1%	1%	2%	0%	0%
Base Self-contained Refrigeration	2%	40%	5%	100%	0%	57%	0%	5%	41%	2%	1%
Base Desktop PC	100%	75%	33%	88%	81%	95%	100%	100%	90%	88%	75%
Base Monitor, CRT	24%	27%	29%	2%	92%	75%	36%	67%	27%	31%	38%
Base Monitor, LCD	100%	95%	62%	97%	100%	93%	99%	92%	100%	100%	100%
Base Copier	94%	14%	20%	43%	72%	82%	100%	100%	51%	78%	61%
Base Laser Printer	100%	100%	98%	100%	99%	100%	100%	100%	97%	100%	99%

Table 4-10
Commercial End-use Saturations by Building Type (% of Square Feet with End Use)

End Use	Office	Restaurant	Retail	Grocery	Warehouse	School	College	Health	Lodging	City of Austin	Other
Base Data Center/Server Room	0.3%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.2%	0.0%	0%	0%
Base Water Heating	51%	30%	34%	5%	50%	30%	3%	0%	0%	42%	32%
Base Vending Machines	100%	24%	100%	100%	73%	83%	37%	88%	18%	85%	69%
Base Cooking	2%	67%	7%	97%	0%	90%	30%	22%	33%	4%	6%
Base Heating	55%	7%	30%	0%	0%	0%	0%	0%	33%	28%	1%
Base Miscellaneous	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

4.3.2 Commercial End-Use Energy Intensity

DNV KEMA developed commercial end-use energy intensity (kWh per end-use square foot) from a variety of sources, including California's *Commercial End-Use Survey*, a study which included on-site measurements of energy use. DNV KEMA has found that the CBECS energy intensities (kWh per total square feet) and end-use energy intensities provide a useful starting place for non-weather sensitive end uses. DNV KEMA then calibrated the values to agree with Austin Energy's overall consumption.

Commercial end-use energy intensities are shown in Table 4-11 by building type and end use.

Table 4-11
Commercial End-use Energy Intensity (kWh per Applicable Square Foot)

	Office	Restaurant	Retail	Grocery	Warehouse	School	College	Health	Lodging	City of Austin	Other
Base Fluorescent Fixture, 4L 4'T8	8.0	6.8	3.7	7.5	1.6	3.2	8.5	5.6	1.8	5.3	2.6
Base Fluorescent Fixture, 2L 4'T8, 1 EB	4.6	3.0	2.2	6.2	1.4	2.2	5.3	2.7	1.3	3.3	2.1
Base Other Fluorescent Fixture	3.6	0.0	1.0	0.0	2.1	0.4	2.2	2.1	0.6	2.1	0.5
Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacement	24.3	3.0	3.9	5.1	0.0	0.2	4.3	2.7	3.6	13.7	3.1
Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacement	24.3	3.0	3.9	5.1	2.8	0.2	4.3	2.7	3.6	13.7	3.1
Base CFL	1.4	0.8	0.6	6.3	0.7	1.3	1.3	0.9	0.6	1.0	0.6
Base High Bay Metal Halide, 400W	0.0	0.1	0.0	11.0	1.2	3.3	13.5	0.0	2.0	0.5	1.1
Base Parking Garage Metal Halide, 250 W	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.0	0.0	0.0
Base Parking Garage fluorescent	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.7
Base Exit Sign	0	0	0	0	0	0	0	0	0	0	0
Base Outdoor Metal Halide 295W Lamp	1.0	3.6	1.2	0.4	0.6	0.8	0.7	0.4	0.4	0.7	0.4
Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	2.6	5.2	1.9	3.2	1.0	1.2	2.3	3.8	1.8	1.84	1.1
Base DX Packaged System, EER=10.3, 10 tons	4.5	9.1	3.3	5.3	1.7	2.0	4.1	6.7	3.1	3.20	1.9
Base PTAC, EER=8.3, 1 ton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	3.3	1.60	3.2
Base Fan Motor, 5hp, 1800rpm, 87.5%	2.8	4.5	2.5	4.1	1.2	1.1	2.5	4.6	2.1	2.1	1.4
Base Fan Motor, 15hp, 1800rpm, 91.0%	2.6	4.2	2.4	3.8	1.1	1.0	2.3	4.2	1.9	1.9	1.3
Base Fan Motor, 40hp, 1800rpm, 93.0%	2.6	4.1	2.3	3.7	1.1	1.0	2.2	4.1	1.9	1.9	1.2
Base Built-up Refrigeration System	0.48	4.9	1.2	22.4	2.3	0.5	0.5	0.5	0.9	0.69	0.9
Base Self-contained Refrigeration	0.48	4.9	1.1	20.0	2.3	0.5	0.5	0.6	0.9	0.69	0.9
Base Desktop PC	1.2	0.3	0.1	0.1	0.2	0.2	0.1	0.7	0.0	0.6	0.1
Base Monitor, CRT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Base Monitor, LCD	0.4	0.1	0.0	0.0	0.1	0.1	0.0	0.2	0.0	0.2	0.0
Base Copier	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Base Laser Printer	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0
Base Data Center/Server Room	236.0	265.8	282.2	407.5	25.9	94.6	75.2	118.3	194.9	176.1	116.2

Table 4-11
Commercial End-use Energy Intensity (kWh per Applicable Square Foot)

	Office	Restaurant	Retail	Grocery	Warehouse	School	College	Health	Lodging	City of Austin	Other
Base Water Heating	0.3	2.2	0.3	0.5	0.1	0.2	0.2	0.4	1.0	0.3	0.4
Base Vending Machines	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Base Cooking	0.1	10.4	0.3	2.2	0.0	0.2	0.3	0.4	0.7	0.2	0.3
Base Heating	0.6	0.3	0.4	0.6	0.4	0.2	1.0	1.0	0.5	0.5	0.4
Base Miscellaneous	0.8	1.4	0.8	1.0	0.4	0.3	0.5	2.5	1.1	0.9	1.1

Note: Data center EUIs are per square foot of data center or server room. The saturations for data centers consider that only a small percentage of floor space for each building type is devoted to data storage activities.

4.3.3 Commercial Building Stock and Energy Use

DNV KEMA estimated commercial floor space by building type based on saturations, end-use energy intensity, and total energy use by building type. Essentially, floor space was used as a calibration factor to ensure that the modeled energy use balanced with DNV KEMA's energy-use estimates by building type; the resulting floor space is presented in Table 4-12. Commercial energy use by building type and end use is presented in Table 4-13. Figure 4-6 summarizes commercial energy use by end use, and Figure 4-7 does the same for commercial energy use by building type.

Table 4-12
Commercial Building Stock by Building Type (Thousand Square Feet)

	Office	Restaurant	Retail	Grocery	Warehouse	School	College	Health	Lodging	City of Austin	Other	Total
Floor space (1000 sf)	103,918	11,237	113,598	4,236	21,521	31,157	27,149	9,670	12,650	13,371	50,440	398,947

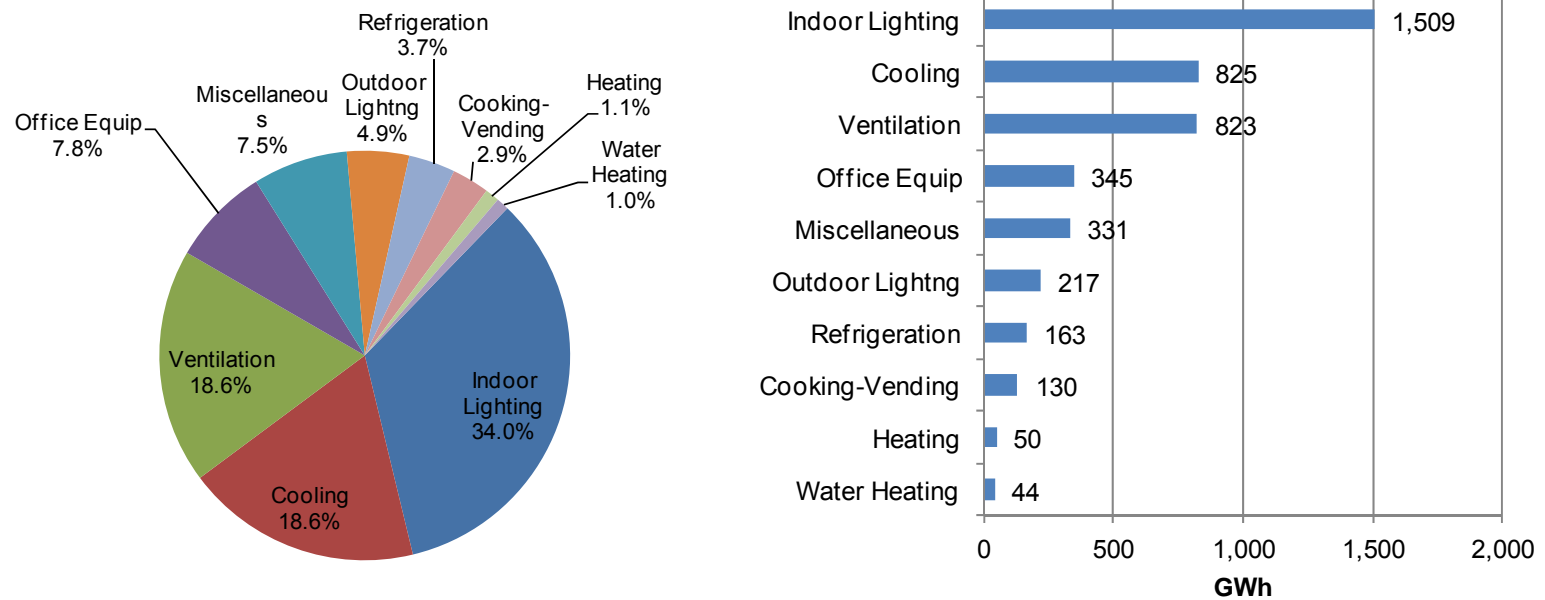
Table 4-13
Commercial Energy Use by Building Type and End Use (MWh)

	Office	Restaurant	Retail	Grocery	Warehouse	School	College	Health	Lodging	City of Austin	Other	Total
Base Fluorescent Fixture, 4L 4'T8	415,228	3,377	79,943	27,311	13,373	80,241	77,569	35,591	1,611	30,859	48,996	814,099
Base Fluorescent Fixture, 2L 4'T8, 1 EB	152,823	13,607	15,931	95	123	5,023	72,454	4,352	6,622	14,898	36,491	322,418
Base Other Fluorescent Fixture	23,732	0	7,041	0	17	399	3,575	1,151	126	1,122	466	37,630
Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacement	81,128	5,820	19,197	706	0	111	2,701	831	9,643	8,711	9,981	138,830
Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacement	81,128	5,820	19,197	706	2,379	111	2,701	831	9,643	8,711	9,981	141,210
Base CFL	10,554	870	1,325	516	670	945	1,762	881	1,449	822	1,501	21,294
Base High Bay Metal Halide, 400W	0	6	0	7,798	6,372	3,005	7,189	0	188	280	3,049	27,887
Base Parking Garage Metal Halide, 250 W	0	0	0	0	0	0	543	284	0	0	0	828
Base Parking Garage Fluorescent	1,678	0	0	0	0	0	0	0	95	457	2,165	4,394
Base Exit Sign	1,277	517	698	46	83	328	613	262	315	109	153	4,401
Base Outdoor High Pressure Sodium 250W Lamp	45,202	40,479	61,355	1,815	5,137	22,787	10,329	3,397	3,421	6,151	17,142	217,215
Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	113,986	472	9,336	0	0	8,913	47,102	30,620	6,797	6,610	6,299	230,134
Base DX Packaged System, EER=10.3, 10 tons	200,525	78,946	105,229	15,469	27,905	32,164	80	11,437	9,817	21,853	56,257	559,681
Base PTAC, EER=8.3, 1 ton	0	0	0	0	0	0	0	570	20,842	953	12,885	35,250
Base Fan Motor, 5hp, 1800rpm, 87.5%	124,233	25,755	124,926	16,891	7,655	11,358	54,638	8,310	17,160	13,407	36,784	441,118
Base Fan Motor, 15hp, 1800rpm, 91.0%	108,315	0	4,031	0	0	18,881	42,655	26,744	0	10,689	27,151	238,467
Base Fan Motor, 40hp, 1800rpm, 93.0%	12,313	0	3,950	15,155	2,304	11,500	41,802	27,849	2,692	4,881	21,114	143,560

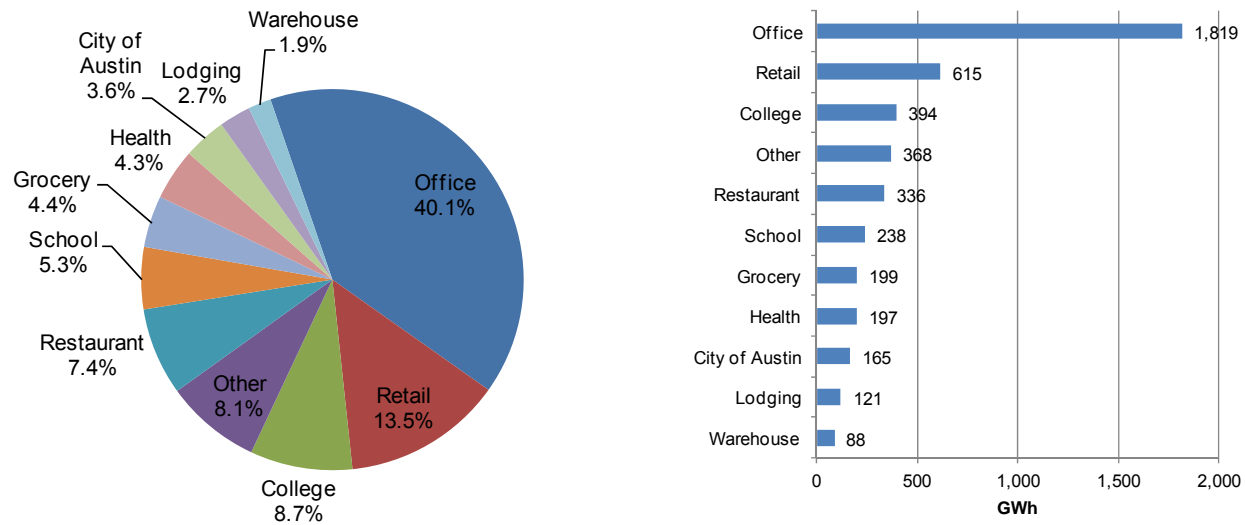
Table 4-13
Commercial Energy Use by Building Type and End Use (MWh)

	Office	Restaurant	Retail	Grocery	Warehouse	School	College	Health	Lodging	City of Austin	Other	Total
Base Built-up Refrigeration System	56	21,240	636	10,127	1,495	1,222	120	53	250	8	29	35,236
Base Self-contained Refrigeration	1,121	22,279	6,378	84,454	0	8,042	0	314	4,761	148	437	127,935
Base Desktop PC	120,320	2,195	2,681	197	3,313	7,102	2,228	6,637	477	7,239	2,966	155,356
Base Monitor, CRT	241	62	116	1	253	55	104	245	16	20	0	1,112
Base Monitor, LCD	46,752	911	2,252	63	1,212	1,833	607	1,799	144	3,148	1,072	59,792
Base Copier	3,862	73	446	29	315	127	119	568	24	241	215	6,017
Base Laser Printer	16,997	249	3,005	34	577	408	244	773	101	1,169	600	24,155
Base Data Center/Server Room	82,060	515	5,778	1,170	125	244	1,482	2,434	555	3,945	31	98,339
Base Water Heating	16,327	7,484	9,656	108	726	1,963	195	0	0	1,826	5,649	43,934
Base Vending Machines	5,947	383	11,638	697	1,441	3,288	1,181	493	265	556	1,432	27,320
Base Cooking	273	78,905	2,189	8,877	0	5,039	2,632	918	3,013	109	841	102,796
Base Heating	33,527	272	12,269	0	29	0	59	0	2,015	1,816	105	50,091
Base Miscellaneous	79,061	15,619	90,878	4,320	9,424	8,101	13,575	24,563	14,168	12,306	54,475	326,491
Total	1,778,664	325,857	600,080	196,587	84,927	233,189	388,259	191,907	116,209	163,042	358,266	4,436,988

Figure 4-6
Commercial Energy Use by End Use



**Figure 4-7
Commercial Energy Use by Building Type**



4.3.4 Commercial Peak Demand

Table 4-14 shows commercial peak demand by building type and end use. DNV KEMA calibrated sector peak demand basing it on coincident peak data from Austin Energy's December 2011 rate proposal, which presented Test Year 2009 demand by customer class.⁴ DNV KEMA summed the non-residential classes, then distributed these into commercial, industrial, and other (agriculture, construction, etc.) in proportion to non-coincident peak data from the billing database. A comparison of the coincident and non-coincident peak data presented in the rate proposal suggests that the share of peak by customer class is similar for the two types of peak. Figure 4-8 and Figure 4-9 summarize commercial peak demand by building type and end use, respectively.

⁴ Austin Energy, 2011. *Rate Analysis and Recommendations Report*. Provided to the Austin City Council, December 19, 2011, Table 2.3.

Table 4-14
Commercial Peak Demand (MW) by Building Type and End Use

	Office	Restau- rant	Retail	Grocery	Ware- house	School	College	Health	Lodging	City of Austin	Other	Total
Base Fluorescent Fixture, 4L 4'T8	63.4	0.6	12.8	4.1	2.0	6.5	15.5	5.1	0.3	4.6	7.0	122.0
Base Fluorescent Fixture, 2L 4'T8, 1 EB	23.3	2.6	2.6	0.0	0.0	0.4	14.5	0.6	1.0	2.2	5.2	52.5
Base Other Fluorescent Fixture	3.6	0.0	1.1	0.0	0.0	0.0	0.7	0.2	0.0	0.2	0.1	5.9
Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacement	12.4	1.1	3.1	0.1	0.0	0.0	0.5	0.1	1.5	1.3	1.4	21.6
Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacement	12.4	1.1	3.1	0.1	0.4	0.0	0.5	0.1	1.5	1.3	1.4	22.0
Base CFL	1.6	0.2	0.2	0.1	0.1	0.1	0.4	0.1	0.2	0.1	0.2	3.3
Base High Bay Metal Halide, 400W	0.0	0.0	0.0	1.2	0.9	0.2	1.4	0.0	0.0	0.0	0.4	4.3
Base Parking Garage Metal Halide, 175 W	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Base Parking Garage Fluorescent	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.6
Base Exit Sign	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.6
Base Outdoor High Pressure Sodium 250W Lamp	3.0	5.2	10.2	0.1	0.3	2.3	0.3	0.2	0.2	0.6	2.5	24.9
Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	52.7	0.3	6.1	0.0	0.0	2.4	23.1	13.8	3.4	3.5	3.7	109.0
Base DX Packaged System, EER=10.3, 10 tons	92.7	42.2	68.7	8.6	17.7	8.7	0.0	5.2	5.0	11.5	33.2	293.5
Base PTAC, EER=8.3, 1 ton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	10.6	0.5	7.6	18.9
Base Fan Motor, 5hp, 1800rpm, 87.5%	26.9	5.9	30.0	3.2	1.8	1.4	13.2	1.5	3.2	3.0	8.3	98.4
Base Fan Motor, 15hp, 1800rpm, 91.0%	23.4	0.0	1.0	0.0	0.0	2.3	10.3	4.7	0.0	2.4	6.2	50.3
Base Fan Motor, 40hp, 1800rpm, 93.0%	2.7	0.0	0.9	2.9	0.5	1.4	10.1	4.9	0.5	1.1	4.8	29.9
Base Built-up Refrigeration System	0.0	2.9	0.1	1.4	0.2	0.2	0.0	0.0	0.0	0.0	0.0	4.9
Base Self-contained Refrigeration	0.1	3.0	0.9	11.9	0.0	1.0	0.0	0.0	0.6	0.0	0.1	17.7
Base Desktop PC	13.6	0.4	0.4	0.0	0.4	0.5	0.4	0.8	0.1	0.8	0.3	17.7
Base Monitor, CRT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Base Monitor, LCD	5.3	0.2	0.3	0.0	0.2	0.1	0.1	0.2	0.0	0.4	0.1	6.9
Base Copier	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.7
Base Laser Printer	1.9	0.0	0.5	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.1	2.9
Base Data Center/Server Room	9.2	0.1	0.9	0.2	0.0	0.0	0.2	0.3	0.1	0.5	0.0	11.5
Base Water Heating	1.9	1.2	1.4	0.0	0.1	0.1	0.0	0.0	0.0	0.2	0.8	5.7
Base Vending Machines	0.7	0.1	1.9	0.1	0.2	0.2	0.2	0.1	0.0	0.1	0.2	3.7
Base Cooking	0.0	16.0	0.3	1.2	0.0	0.2	0.5	0.2	0.6	0.0	0.1	19.1

	Office	Restau- rant	Retail	Grocery	Ware- house	School	College	Health	Lodging	City of Austin	Other	Total
Base Heating	2.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	2.2
Base Miscellaneous	9.1	3.0	14.6	0.6	1.6	0.4	2.4	2.9	2.3	1.6	7.8	46.4
Total	362.8	86.1	161.3	36.0	26.6	28.5	94.7	41.7	31.5	36.0	92.0	997.4

Figure 4-8
Commercial Peak Demand by Building Type

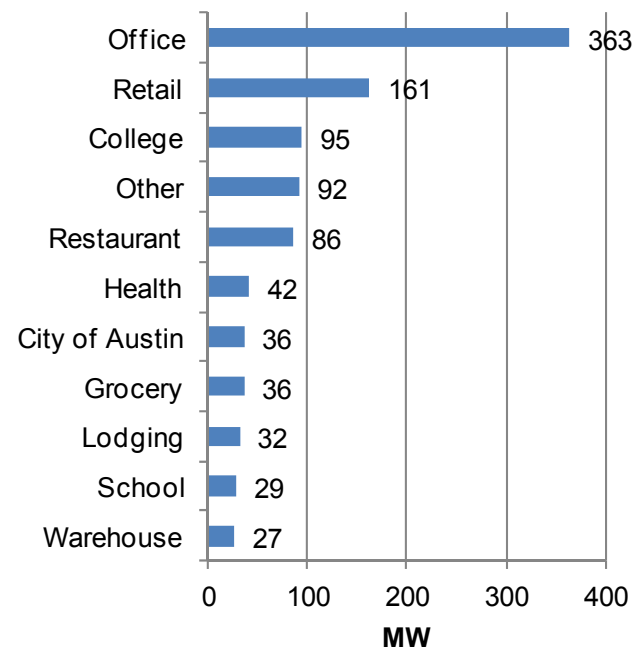
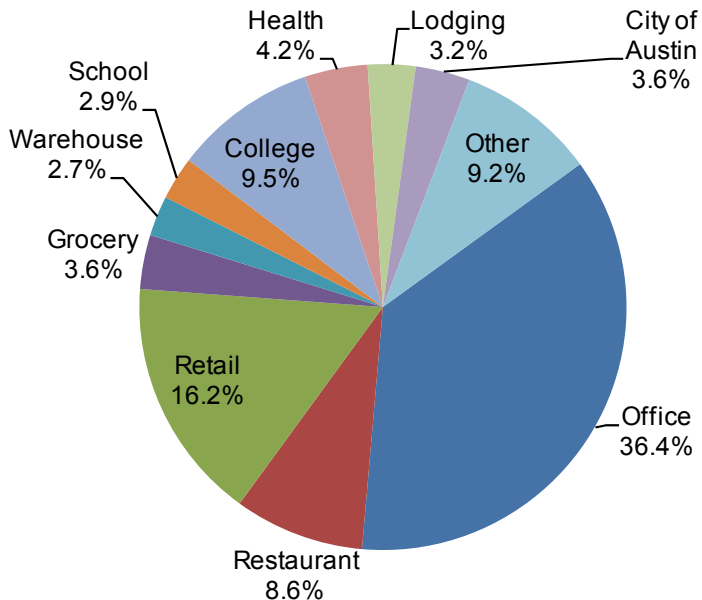
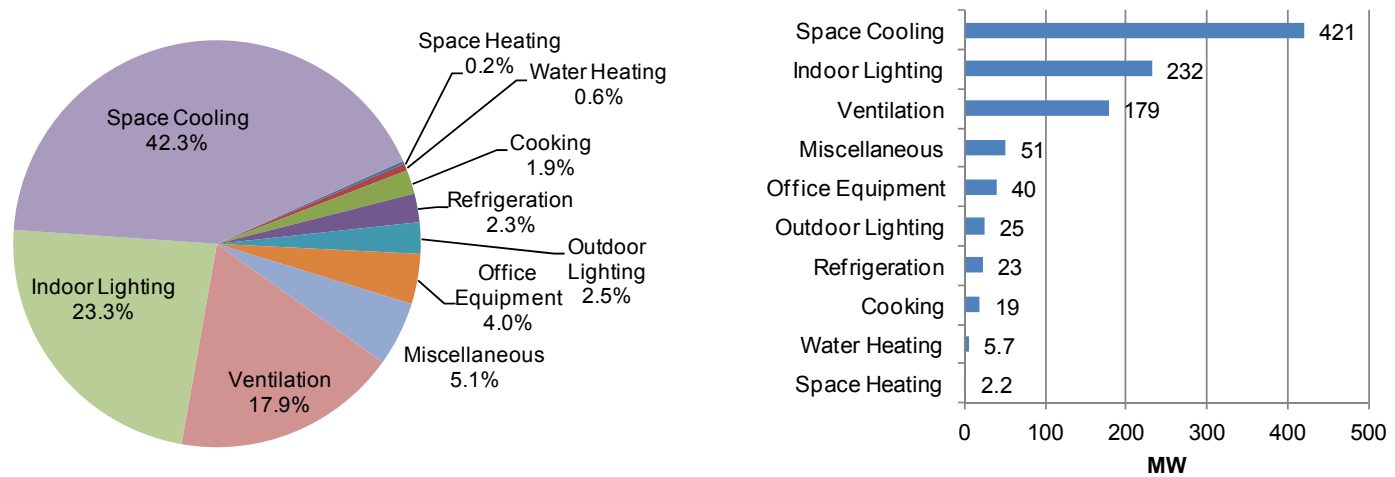


Figure 4-9
Commercial Peak Demand by End Use



4.4 Industrial Baseline

4.4.1 Industrial Saturations

Table 4-15 shows end-use saturations for the industrial sector by industry, representing the percentage of total energy use for each end use. Within each industry, the sum of the end-use saturations equals 100 percent of total industry energy use. These values were derived from the U.S. Department of Energy's *Manufacturing Energy Consumption Survey* (MECS).

Table 4-15
End-Use Saturations by Industry

	Compressed Air	Fans	Pumps	Drives	Process Heating	Refrigeration	Other Process	Chiller	DX	Lighting	Other	Total
Food	7.6%	8.3%	14.7%	14.1%	8.2%	26.0%	1.0%	0.0%	8.5%	7.4%	4.2%	100%
Textiles	3.5%	6.6%	8.9%	30.4%	10.5%	11.6%	1.5%	0.8%	12.8%	10.4%	3.0%	100%
Wood	4.5%	8.6%	11.3%	40.5%	9.3%	1.3%	0.8%	0.0%	6.7%	8.4%	8.6%	100%
Paper	3.6%	14.6%	24.2%	31.8%	11.6%	1.6%	2.1%	0.0%	4.3%	3.9%	2.3%	100%
Printing	3.6%	6.9%	9.0%	32.3%	3.6%	5.9%	0.8%	1.1%	17.6%	12.1%	7.1%	100%
Chemicals	2.5%	6.5%	26.2%	21.0%	9.3%	8.0%	14.4%	0.3%	5.5%	3.7%	2.6%	100%
Petroleum	12.3%	7.4%	49.2%	13.1%	5.0%	5.4%	0.6%	0.0%	3.6%	2.3%	1.1%	100%
Plastics	3.5%	6.6%	8.7%	31.4%	16.0%	9.0%	1.7%	0.6%	10.1%	8.6%	3.8%	100%
Stone, Clay, Glass	5.9%	13.9%	17.7%	20.1%	21.9%	2.7%	3.3%	0.0%	6.3%	5.2%	3.0%	100%
Fab. Metals	11.8%	6.6%	8.7%	21.9%	20.0%	3.5%	4.8%	0.6%	9.4%	9.4%	3.3%	100%
Ind. Mach	14.4%	5.2%	6.8%	18.3%	7.0%	2.8%	2.5%	1.3%	20.9%	14.5%	6.2%	100%
Electronics	10.1%	3.1%	4.0%	8.6%	15.3%	8.7%	7.8%	17.8%	5.9%	11.6%	7.2%	100%
Transp. Equip.	12.3%	5.5%	7.2%	11.8%	14.5%	6.2%	3.4%	1.1%	18.0%	14.6%	5.3%	100%
Misc.	8.9%	3.3%	4.3%	16.2%	10.2%	5.9%	1.5%	0.7%	24.0%	16.7%	8.2%	100%
WWTP (COA)	0.3%	30.0%	62.1%	0.0%	1.3%	0.3%	0.0%	0.3%	2.0%	4.0%	0.0%	100%

4.4.2 Industrial Energy Use

The industrial analysis in DSM ASSYST was based on kWh used (compared to square feet for commercial and households for residential). Therefore, the building stock and the energy use by industry are the same. Table 4-16 shows energy use by building type and end use, based on the billing analysis (building type) and MECS (end use). Figure 4-10 summarizes industrial energy use by end use, and Figure 4-11 shows energy use by industry.

Table 4-16
Industrial Energy Use (MWh) by Industry and End Use

	Compressed Air	Fans	Pumps	Drives	Process Heating	Refrigeration	Other Process	Chiller	DX	Lighting	Other	Total
Food	1,042	1,141	2,007	1,929	1,125	3,553	137	0	1,158	1,010	580	13,682
Textiles	146	276	370	1,266	435	485	62	33	532	435	126	4,165
Wood	98	185	243	873	200	29	17	0	143	182	185	2,154
Paper	34	136	227	298	109	15	19	0	40	37	21	936
Printing	1,911	3,617	4,743	17,060	1,914	3,111	406	575	9,294	6,368	3,752	52,750
Chemicals	1,077	2,733	11,088	8,855	3,925	3,377	6,074	145	2,344	1,550	1,093	42,263
Petroleum	183	110	730	195	75	80	8	0	53	35	17	1,484
Plastics	49	92	121	434	221	124	23	9	140	119	53	1,384
Stone, Clay, Glass	386	906	1,150	1,304	1,422	175	216	0	406	335	197	6,497
Fab. Metals	297	165	217	549	500	88	120	15	237	235	83	2,507
Ind. Mach	12,019	4,352	5,707	15,304	5,841	2,347	2,077	1,083	17,507	12,156	5,217	83,609
Electronics	155,819	47,217	61,916	132,446	235,648	133,651	119,850	275,655	91,885	178,915	111,936	1,544,938
Transp. Equip.	2,879	1,289	1,690	2,776	3,399	1,465	791	261	4,219	3,420	1,253	23,444
Misc.	1,395	518	679	2,532	1,586	926	239	102	3,752	2,610	1,278	15,617
WWTP (COA)	449	53,775	111,417	0	2,244	449	0	518	3,522	7,173	0	179,546
Total	177,782	116,511	202,304	185,820	258,645	149,877	130,040	278,394	135,232	214,579	125,791	1,974,976

Figure 4-10
Industrial Energy Consumption by End Use

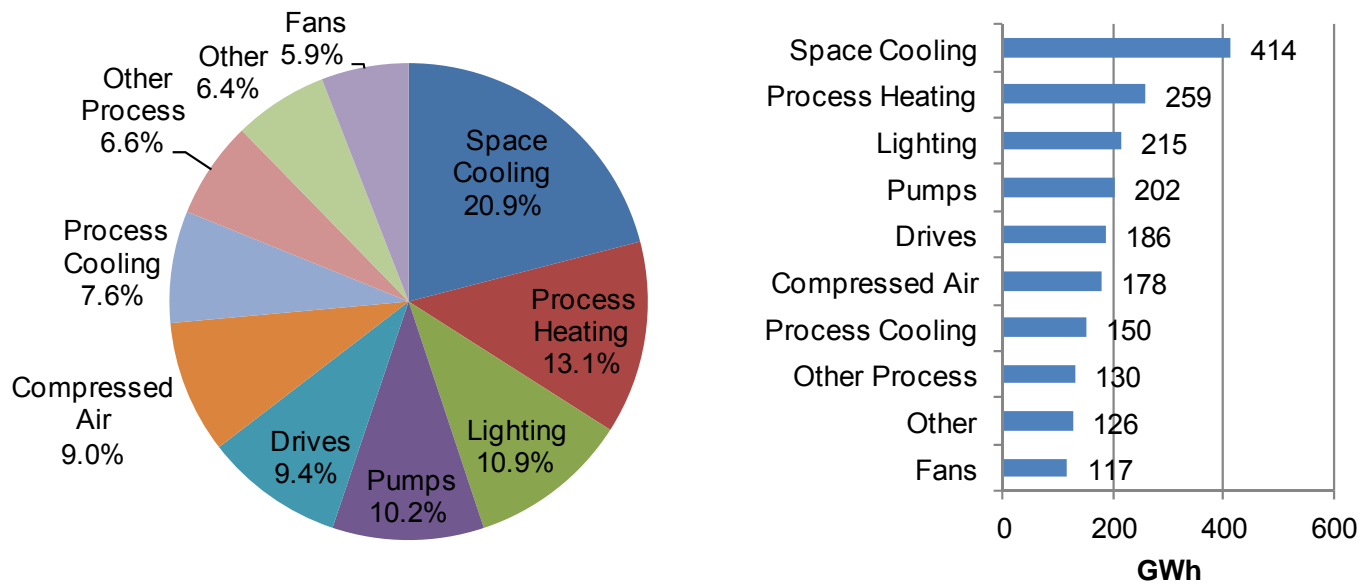
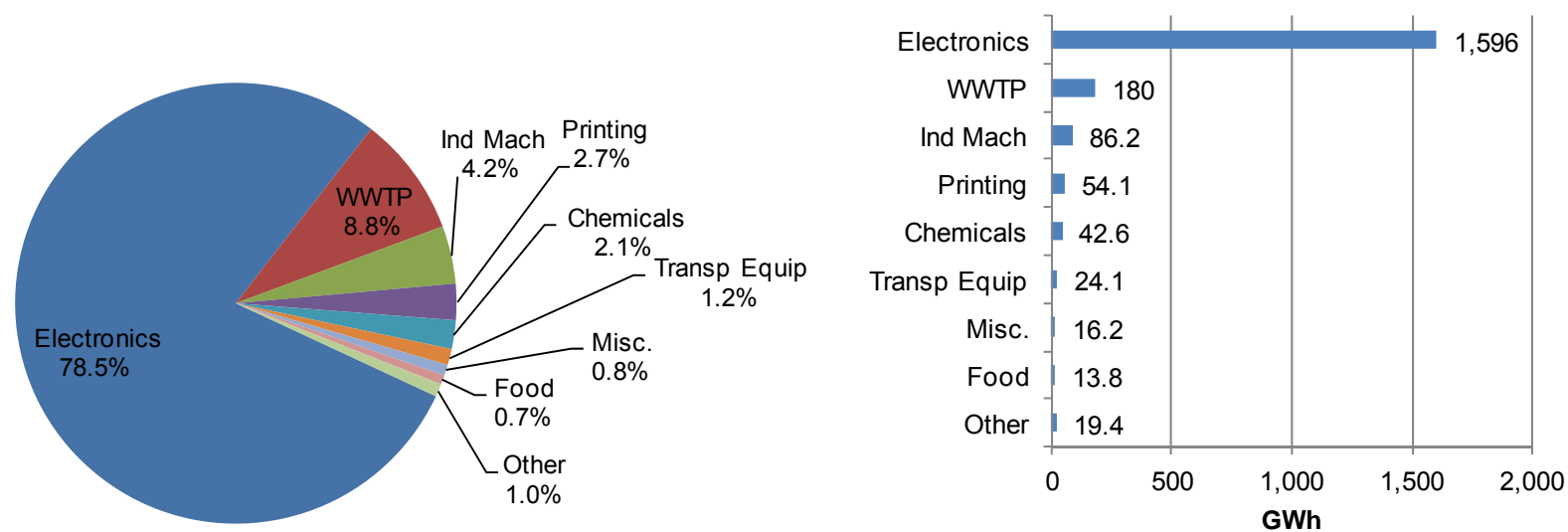


Figure 4-11
Industrial Energy Use by Industry



Note: "Other" includes stone/clay/glass, textiles, fabricated metals, lumber/furniture, petroleum, rubber/plastics, and paper.

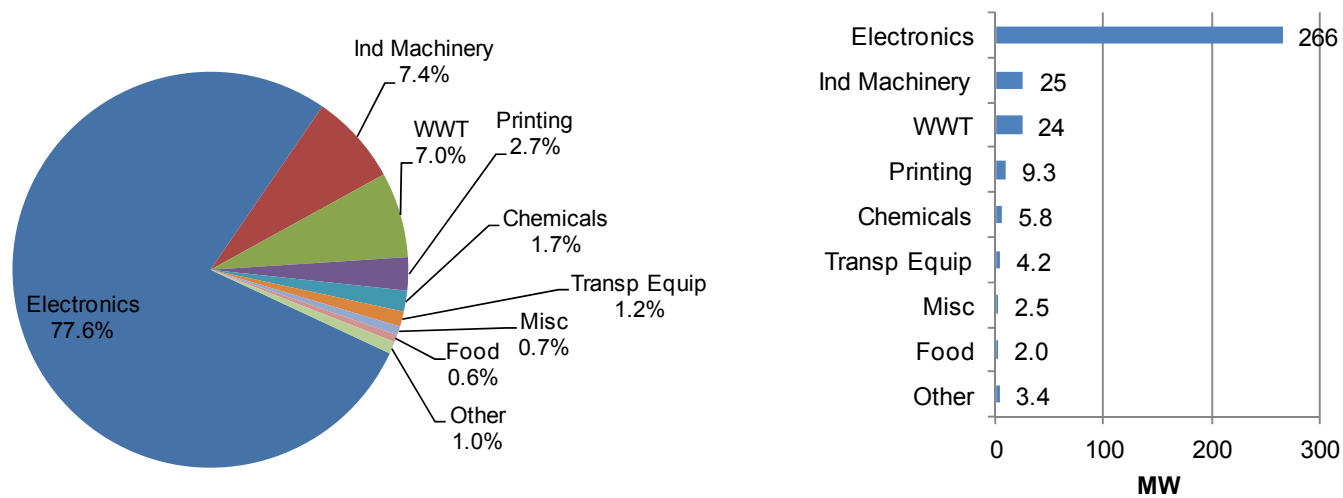
4.4.3 Industrial Peak Demand

Table 4-17 shows industrial peak demand by industry and energy use. Figure 4-12 summarizes peak demand by industry, and Figure 4-13 shows peak demand by industrial end use.

Table 4-17
Industrial Peak Demand (MW) by Industry and End Use

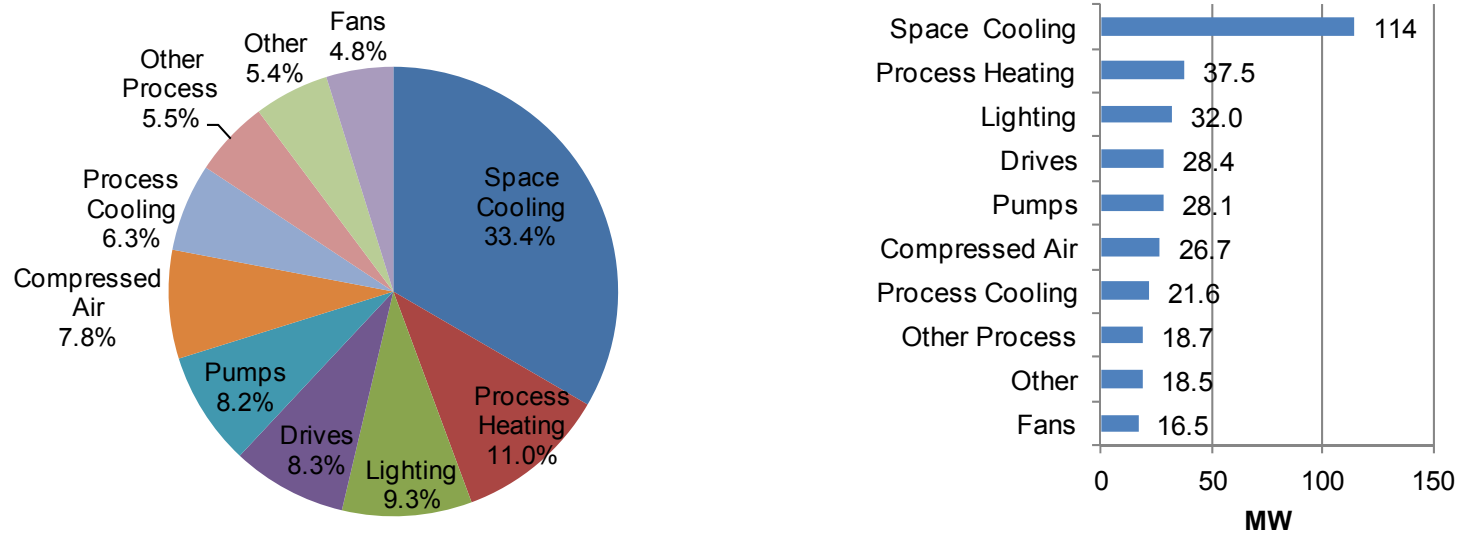
	Compressed Air	Fans	Pumps	Drives	Heating	Refrigeration	Other Process	Chiller	DX	Lighting	Other	Total
Food	0.14	0.16	0.28	0.27	0.16	0.49	0.02	0.00	0.30	0.14	0.08	2.03
Textiles	0.04	0.07	0.09	0.32	0.11	0.12	0.02	0.02	0.25	0.11	0.03	1.19
Lumber	0.02	0.03	0.04	0.15	0.03	0.00	0.00	0.00	0.04	0.03	0.03	0.38
Paper	0.00	0.01	0.02	0.03	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.09
Printing	0.29	0.55	0.72	2.57	0.29	0.47	0.06	0.16	2.62	0.96	0.57	9.26
Chemicals	0.14	0.36	1.46	1.16	0.52	0.44	0.80	0.04	0.58	0.20	0.14	5.84
Petroleum	0.02	0.01	0.10	0.03	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.20
Plastics	0.01	0.01	0.02	0.07	0.04	0.02	0.00	0.00	0.04	0.02	0.01	0.24
Stone, Clay, glass	0.05	0.12	0.15	0.17	0.19	0.02	0.03	0.00	0.10	0.04	0.03	0.89
Fab. Metals	0.05	0.03	0.03	0.09	0.08	0.01	0.02	0.00	0.07	0.04	0.01	0.42
Ind. Machinery	3.07	1.11	1.46	3.90	1.49	0.60	0.53	0.52	8.35	3.10	1.33	25.45
Electronics	22.2	6.7	8.8	18.9	33.6	19.0	17.1	73.5	24.5	25.5	16.0	265.7
Transp. Equip.	0.45	0.20	0.26	0.43	0.53	0.23	0.12	0.08	1.22	0.53	0.19	4.23
Misc.	0.18	0.07	0.09	0.33	0.21	0.12	0.03	0.02	0.92	0.34	0.17	2.48
WWT	0.06	7.02	14.55	0.00	0.29	0.06	0.00	0.13	0.86	0.94	0.00	23.91
Total	26.7	16.5	28.1	28.4	37.5	21.6	18.7	74.4	39.9	32.0	18.5	342.3

Figure 4-12
Industrial Peak Demand by Industry



Note: "Other" includes stone/clay/glass, textiles, fabricated metals, lumber/furniture, petroleum, rubber/plastics, and paper.

Figure 4-13
Industrial Peak Demand by End Use



4.5 Summary of Energy Use and Peak Demand by Sector

Figure 4-14 and Figure 4-15 summarize the breakdown for energy use and peak demand, respectively, by sector. In addition to the residential, commercial, and industrial sectors analyzed in this report, these figures include agriculture, construction, communications, transportation, and utilities (except for water/wastewater, which are included in industrial).

Figure 4-14
Summary of Energy Use by Sector

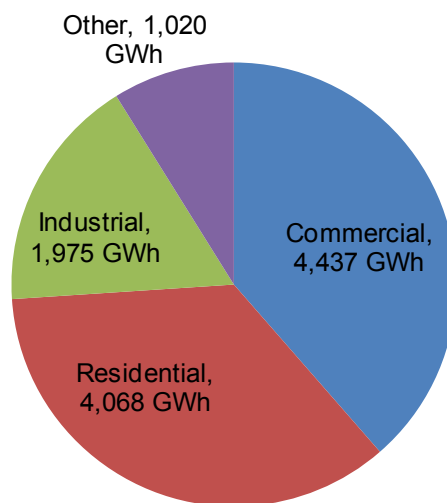
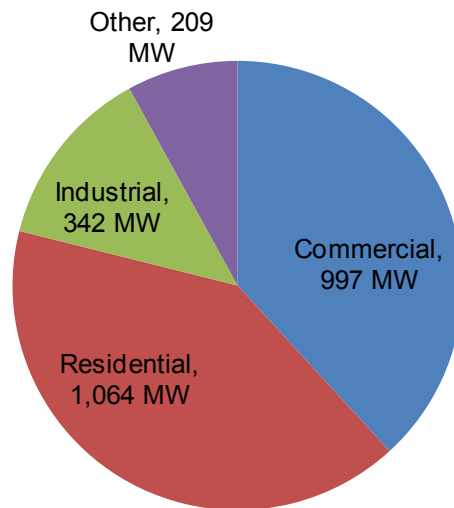


Figure 4-15
Summary of Peak Demand by Sector



4.6 2020 Baseline

Up to this point in this chapter, the analysis represents Austin Energy's 2011 energy use and peak demand, with weather adjustments applied to create an appropriate starting point for the analysis in the next chapter. To correctly identify the opportunities for energy savings, it is important to understand how energy is being used and by whom. However, to present the achievable program potential for 2012–2020, we need to estimate what energy use and peak demand would be in 2020 in the absence of the program. We turned to Austin Energy's forecast of 2020 energy use and peak demand as a basis for calibrating growth and decay rates in the model so that the base (no energy efficiency) forecast would agree with Austin Energy's.

Austin Energy's approaches to managing energy consumption include building codes, load management, Green Building, and energy efficiency programs. The focus of this report is to examine energy efficiency in new and existing buildings, which encompasses the effects of Austin Energy's energy efficiency programs and the non-code-related efforts of its Green Building program. For the purposes of this report, DNV KEMA considered the effects of Austin Energy's building codes and load management efforts to be part of the baseline energy use. Table 4-18 shows how DNV KEMA's baseline for this analysis relates to Austin Energy's no-DSM forecast and its load management and building code savings forecasts.

Table 4-18
DNV KEMA 2020 Baseline versus Austin Energy's 2020 Forecast

	Energy	Demand
	GWh	MW
No Demand Side Management Forecast 2020	14,971	3,963
- Building Codes (cumulative 2011-2020)	-332	-154
- Load Management (cumulative 2011-2020)	-3.6	-82
Baseline for DNV KEMA Analysis	14,635	3,727

Note: Energy forecast includes 7% transmission and distribution losses. Demand forecast includes 20% for transmission and distribution and spinning reserves.

In the model, the 2020 forecast relates to the base-year energy use using decay factors that are applied to existing buildings (assumed to be 0.5 percent per year) for non-residential buildings and 1 percent for residential buildings) and an annual new construction building stock adder. The 2020 forecast includes nine years of new construction, but the remaining 2011 building stock is only 91 percent of its original level for residential and 96 percent for commercial.

We set the growth rate in the building stock so that the model's energy-use output agreed with Austin Energy's forecast. The resulting forecast, by sector and by new/existing construction, is shown in Table 4-19. The table shows the surviving stock from the beginning of the analysis period (existing) and new construction between 2012 and 2020.

Table 4-19
2020 Base Energy Use and Demand Forecast

		Energy (GWh)	Demand (MW)
Residential	Existing	3,976	1,169
Commercial	Existing	4,538	1,147
Industrial	Existing	2,020	394
Other	Existing	1,092	250
Subtotal	Existing	11,626	2,959
Residential	New	1,065	313
Commercial	New	1,306	330
Industrial	New	638	124
Other	New	0	0
Subtotal	New	3,009	767
Residential	Total	5,041	1,482
Commercial	Total	5,844	1,477
Industrial	Total	2,658	518
Other	Total	1,092	250
Total		14,635	3,727

Note: Energy forecast includes 7% transmission and distribution losses. Demand forecast includes 20% for transmission and distribution and spinning reserves.

In the following chapter, we use the 2011 baseline to present technical and economic potential results. Technical and economic potential are instantaneous potentials, meaning that they estimate the savings that would accrue if everyone implemented the analyzed measures immediately. As a result, the effect of Austin's building code changes over the next several years are not addressed in these calculations. Therefore, the technical and economic potentials include some savings potential that will be captured by codes and will not be available for energy efficiency programs.

For the achievable analysis, which calculates program savings potential over the 2012–2020 period, we switched to the 2020 base for estimating percentage savings. We also re-weighted the technical and economic potential using the same approach described above for base use, so that we can make comparisons between technical, economic, and achievable potentials on the same base (that is, representing nine years of new construction and nine years of decay in existing buildings).

5. Electric Energy Efficiency Potential Results

In this section, we present estimates of electric energy efficiency potential.

Line losses are factored into all potential calculations. In addition, for consistency with Austin Energy's forecasts, an additional factor for spinning reserves is included in the demand results. The line losses (transmission and distribution) factor is 7 percent; the factor for demand, including both line losses and spinning reserves, is 20 percent. The 2011 baseline energy use and peak demand developed in Sections 4.1 through 4.5 were based on billing data and were therefore "at the meter." However, for consistency with Austin Energy's 2020 forecast, DNV KEMA's 2020 baseline (Section 4.6) included these factors. In this chapter, line losses and (for demand) spinning reserves have been added to baselines so that baselines and potential estimates can be compared on the same basis and be compared with Austin Energy's forecasts.

5.1 Technical and Economic Potential

Estimates of overall energy efficiency technical and economic potential are discussed in Section 5.1.1. More detail on these potentials is presented in Section 4. Energy-efficiency supply curves are shown in Section 5.1.3.

5.1.1 Overall Technical and Economic Potential

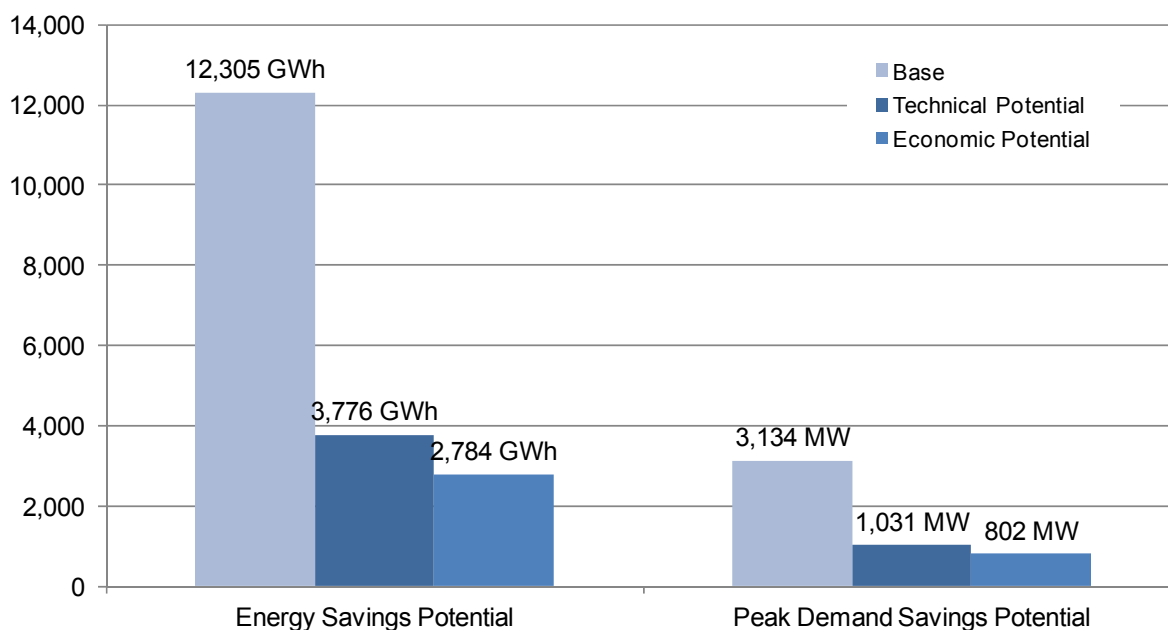
Figure 5-1 presents our overall estimates of total technical and economic potential for electrical energy and peak-demand savings for Austin Energy's service territory. *Technical potential* represents the sum of all savings from all of the measures deemed applicable and technically feasible. *Economic potential* is based on efficiency measures that are cost-effective, which is based on the total resource cost (TRC) test—a benefit-cost test that compares the value of avoided energy production and power-plant construction to the costs of energy efficiency measures and program activities necessary to deliver them. The values of both energy savings and peak-demand reductions are incorporated in the TRC test.

Energy Savings. Technical potential for existing buildings is estimated at about 3,776 GWh per year for existing buildings, and economic potential at 2,784 GWh per year (about 31 percent and 23 percent of base usage, respectively). These are the savings that would accrue if all the measures (cost-effective measures for economic potential) were installed immediately without needing to wait for stock turnover. The savings for one year's worth of new construction are 58

GWh technical potential and 57 GWh economic potential (approximately 15 percent of base usage for both).

Peak-demand Savings. Technical potential for existing buildings is estimated at about 1,031 MW, and economic potential at 802 MW (about 33 percent and 26 percent of base demand, respectively). The potentials for one year's worth of new construction are 12.5 MW technical potential and 12.4 MW economic potential (about 13 percent of base demand for both).

Figure 5-1
Estimated Electric Technical and Economic Potential for Existing Buildings,
Austin Energy's Service Territory



Note: Energy forecast includes 7% transmission and distribution losses. Demand forecast includes 20% for transmission and distribution and spinning reserves.

5.1.2 Technical and Economic Potential Detail

In this subsection, we explore technical and economic potential in more detail, looking at potentials by new versus existing buildings, sector, and end use.

5.1.2.1 Technical and Economic Potential for Existing Buildings

Existing Buildings Potentials by Sector

Figure 5-2 and Figure 5-3 show estimates of technical and economic energy and demand savings potentials by sector. Figure 5-4 and Figure 5-5 show the same potentials as a percentage of base energy and base peak demand.

As discussed in Section 4.2, this analysis separates commercial and industrial sectors from Austin Energy's non-residential customers, based on NAICS codes. Industrial is primarily manufacturing plus water/wastewater treatment.

The economic potential for the commercial and residential sectors are similar for energy, but the residential potential is greater for peak-demand savings. While the industrial sector contributes low amounts to the potentials, many industrial measures are complex, custom measures that are difficult to completely address in a bottom-up study such as this one, and this effect could lead to understating industrial potentials.

Figure 5-2
Technical and Economic Potential
for Existing Buildings
Energy Savings by Sector—GWh per Year

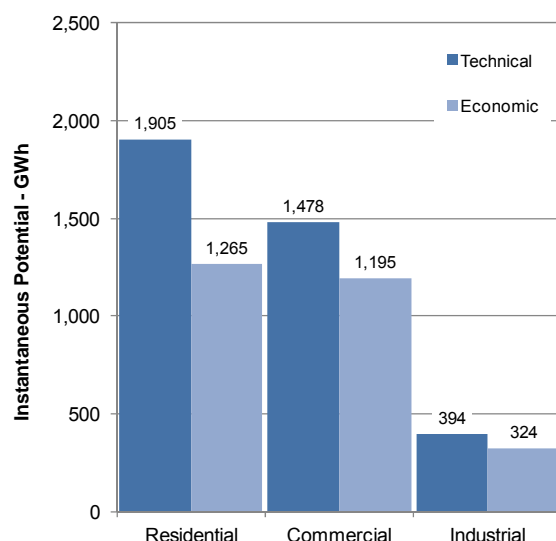
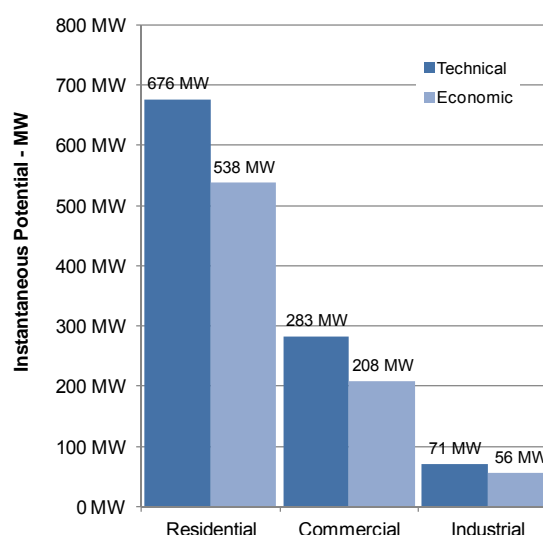


Figure 5-3
Technical and Economic Potential
for Existing Buildings
Demand Savings by Sector—MW



Note: Energy forecast includes 7% transmission and distribution losses. Demand forecast includes 20% for transmission and distribution and spinning reserves.

As shown in Figure 5-4 and Figure 5-5, the residential and commercial sectors have similar economic energy savings potential in relation to base use (29 percent and 25 percent, respectively), but the peak-demand potential is much greater for residential (42 percent versus 17 percent). The estimated savings fraction is lowest for the industrial sector, but this potential is in the 14–22 percent of cost-effective industrial savings, as estimated by the National Academy of Sciences.⁵

Figure 5-4
Technical and Economic Potential
for Existing Buildings
Percentage of Base Energy Use

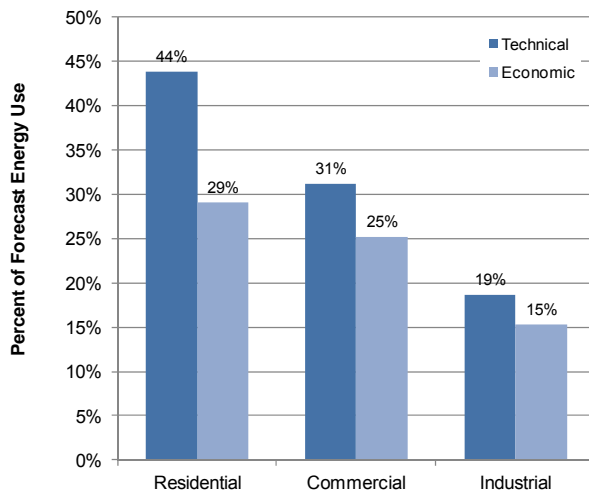
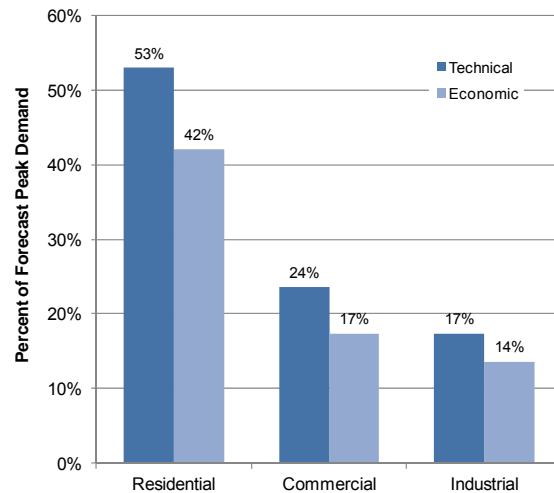


Figure 5-5
Technical and Economic Potential
for Existing Buildings
Percentage of Base Peak Demand



Note: Energy forecast includes 7% transmission and distribution losses. Demand forecast includes 20% for transmission and distribution and spinning reserves.

⁵ *Real Prospects for Energy Efficiency in the United States*, America's Energy Future Energy Efficiency Subcommittee, National Academy of Sciences, National Academy of Engineering, National Research Council, 2009.

Existing Buildings Potentials by Building Type

Figure 5-6 and Figure 5-7 show residential sector potentials by building type. Single-family homes account for about 77 percent of the economic energy savings potential, and low-income⁶ homes account for about 3.6 percent of the potential. Single-family homes account for 85 percent of demand potential.

Figure 5-6
Residential Existing Buildings
Energy-savings Potential by Building Type

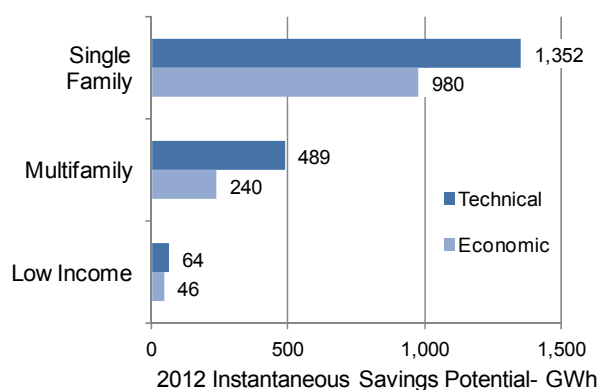
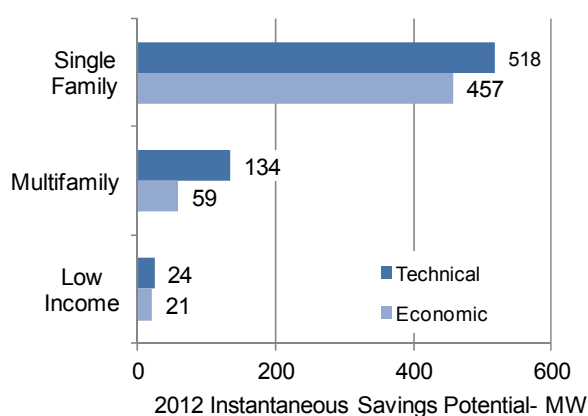


Figure 5-7
Residential Existing Buildings
Demand-savings Potential by Building Type



Note: Energy forecast includes 7% transmission and distribution losses. Demand forecast includes 20% for transmission and distribution and spinning reserves.

Figure 5-8 and Figure 5-9 show the building-type breakdown for commercial potential. Offices account for 45 percent of the economic energy-savings potential (37 percent of economic demand savings potential). Retail, restaurants, and colleges account for the next largest shares of potential.

⁶ For this study, low income was defined by customer's participation in low-income programs, which may not align closely with other definitions of low income.

Figure 5-8
Commercial Existing Buildings
Energy-savings Potential by Building Type

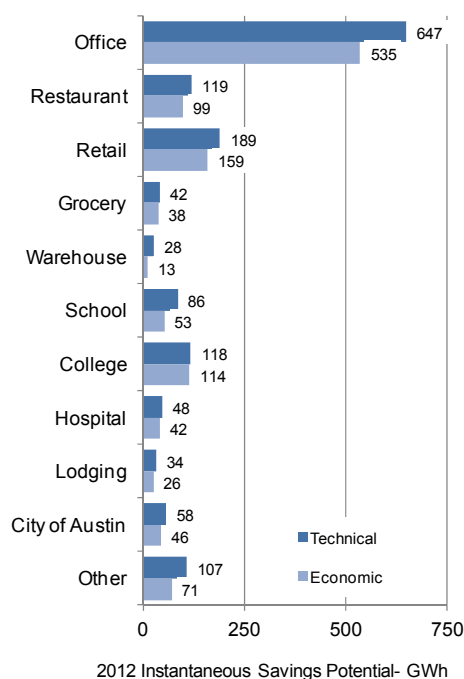
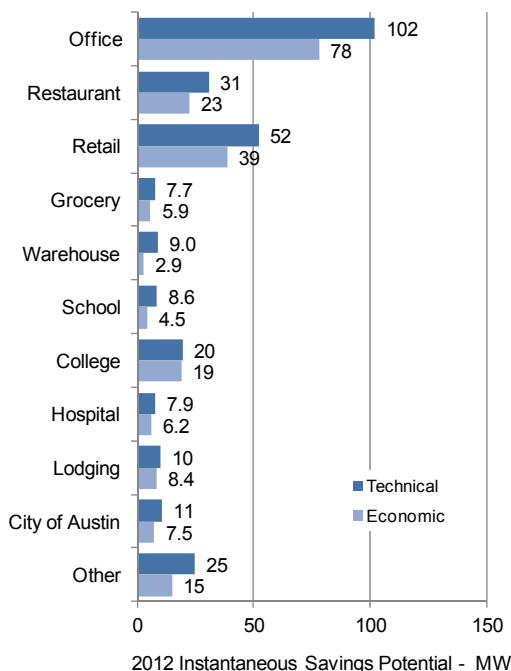


Figure 5-9
Commercial Existing Buildings
Demand-savings Potential by Building Type



Note: Energy forecast includes 7% transmission and distribution losses. Demand forecast includes 20% for transmission and distribution and spinning reserves.

Figure 5-10 and Figure 5-11 show the business-type breakdown for industrial potential. The electronics industry dominates Austin Energy's industrial sector, which is reflected in the potentials, where electronics accounts for about 69 percent of economic energy potential and 73 percent of economic demand potential. Water/wastewater is a distant second, followed by industrial machinery.

Figure 5-10
Industrial Existing Buildings Energy-savings Potential by Business Type

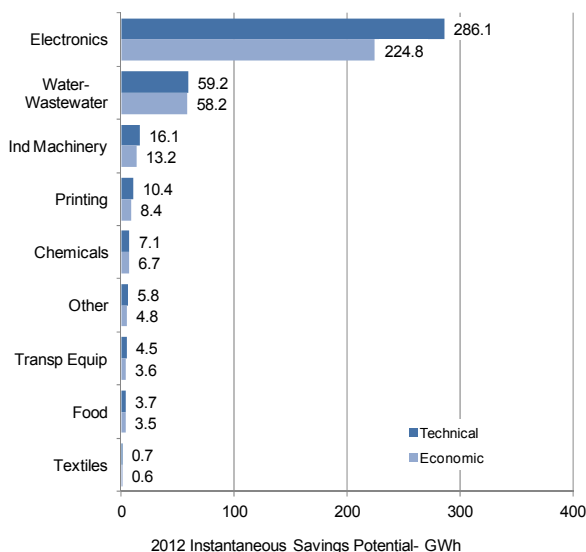
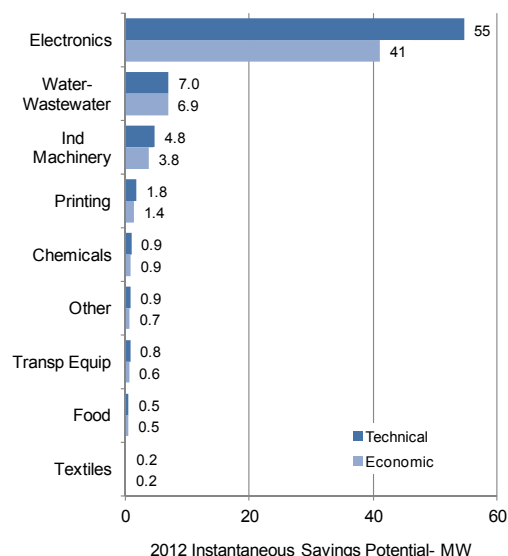


Figure 5-11
Industrial Existing Buildings Demand-savings Potential by Business Type



Note: Energy forecast includes 7% transmission and distribution losses. Demand forecast includes 20% for transmission and distribution and spinning reserves.

Existing Buildings Potentials by End Use

Figure 5-12 and Figure 5-13 show the end-use breakdown of technical and economic potential in the residential sector. Energy savings potential for existing construction is dominated by cooling, especially for peak demand. In terms of energy savings, cooling is followed by lighting, water heating, and refrigeration. For peak demand, miscellaneous has the second most potential, followed by lighting, water heating, and refrigeration. Miscellaneous has great technical potential but little economic potential.

Figure 5-12
Residential Existing Buildings
Energy-savings Potential by End Use

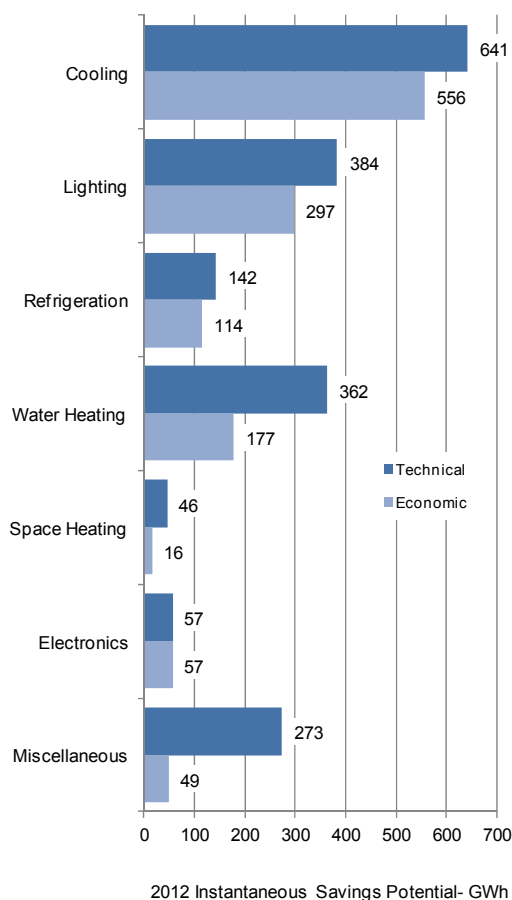
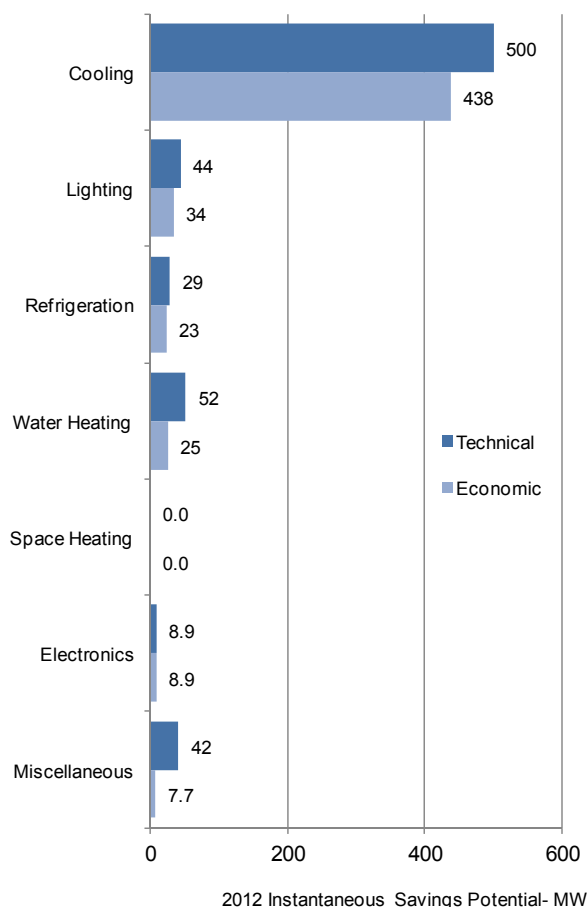


Figure 5-13
Residential Existing Buildings
Demand-savings Potential by End Use



Note: Energy forecast includes 7% transmission and distribution losses. Demand forecast includes 20% for transmission and distribution and spinning reserves.

Figure 5-14 and Figure 5-15 show the end-use breakdown of commercial potential. The lighting end use is the largest contributor to energy savings potential. For demand potential, space cooling has the greatest technical potential by far. It also has the greatest economic potential, but by a smaller margin than technical, with lighting following closely (indicating that a higher proportion of lighting measures are cost-effective). Despite more stringent upcoming lighting standards, we still expect premium T8 lamps with electronic ballasts and CFLs will remain key lighting measures.

Figure 5-14
Commercial Existing Buildings
Energy-savings Potential by End Use

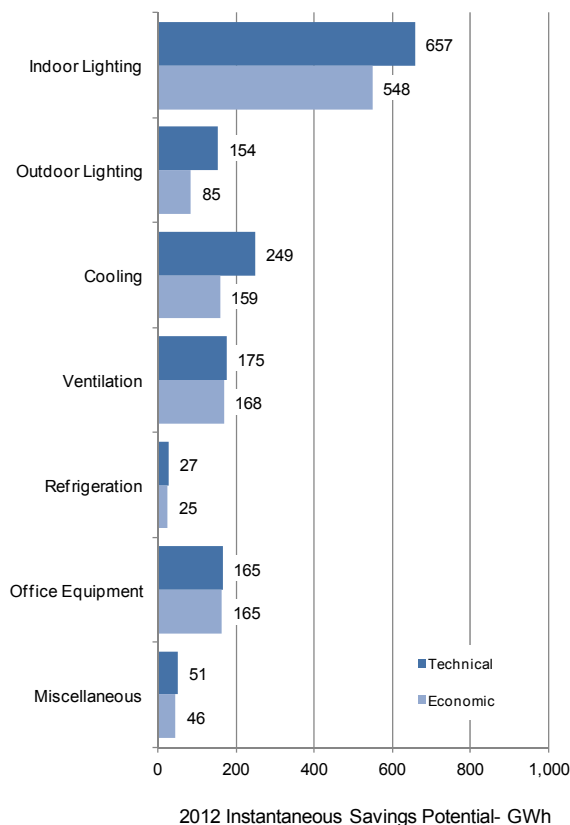
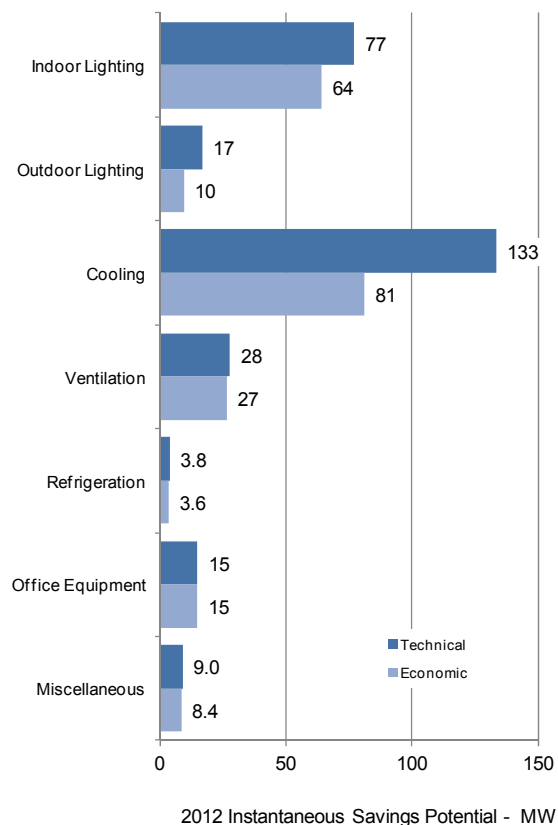


Figure 5-15
Commercial Existing Buildings
Demand-savings Potential by End Use



Note: Energy forecast includes 7% transmission and distribution losses. Demand forecast includes 20% for transmission and distribution and spinning reserves.

Figure 5-16 and Figure 5-17 show the end-use breakdown of industrial potential. Industrial potential is dominated by cross-cutting measures that are common and similar across all industries and include space cooling, lighting, and motor-based end uses (fans, compressed air, and pumps). These end uses are fairly common and similar across industries, and more is understood about them. Other process end uses (drives, heating, refrigeration, and “other”) are more heterogeneous across industries, often involving more complex technologies and systems, and are therefore more difficult to develop bottom-up potentials savings estimates for. It is possible that our analysis may be conservative on the low side for these less-understood measures.

Figure 5-16
Industrial Existing Buildings
Energy-savings Potential by End Use

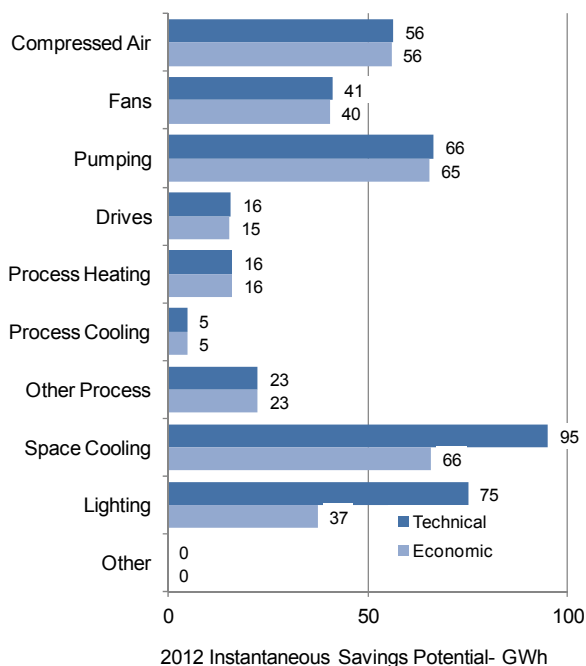
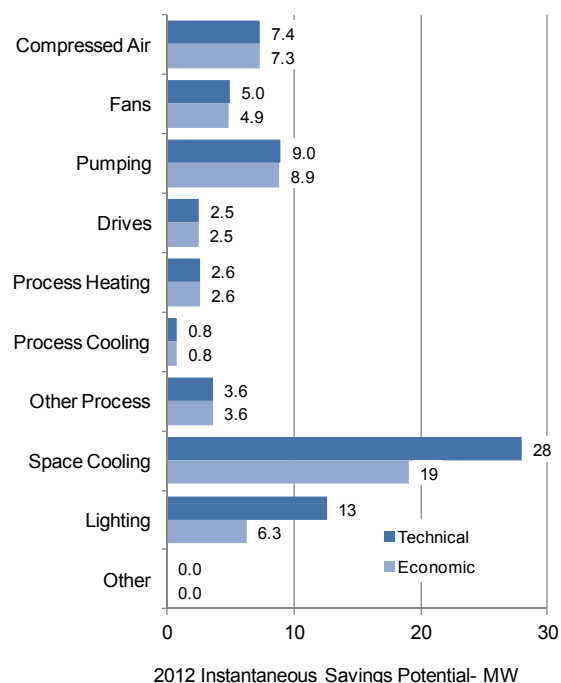


Figure 5-17
Industrial Existing Buildings
Demand-savings Potential by End Use



Note: Energy forecast includes 7% transmission and distribution losses. Demand forecast includes 20% for transmission and distribution and spin reserves.

5.1.2.2 Technical and Economic Potential for New Construction

This subsection presents technical and economic potential for one year's worth of new construction. Although the potentials for new construction look small compared to existing construction, it's important to note that by 2020, the building stock will include nine years worth of new construction that could be affected by Austin Energy's new construction programs.

New Construction Potentials by Sector

Figure 5-18 and Figure 5-19 show estimates of technical and economic energy and demand savings potential by sector. Figure 5-20 and Figure 5-21 show the same potentials as a percentage of base energy and base peak demand.

The economic energy savings potential for the residential sector is extremely low, reflecting the stringent new building codes that will save 65 percent over the reference code by 2015. This

difference is even more pronounced for peak demand. Non-residential buildings, both commercial and industrial, have significant potential. While aggressive, the upcoming non-residential building codes reach only 30 percent over the reference code. In the industrial sector, process loads are significant and not subject to building codes. Most of the new construction measures are cost-effective, so technical and economic potentials are very close in all sectors.

Figure 5-18
Technical and Economic Potential
for New Construction
Energy Savings by Sector—GWh per Year

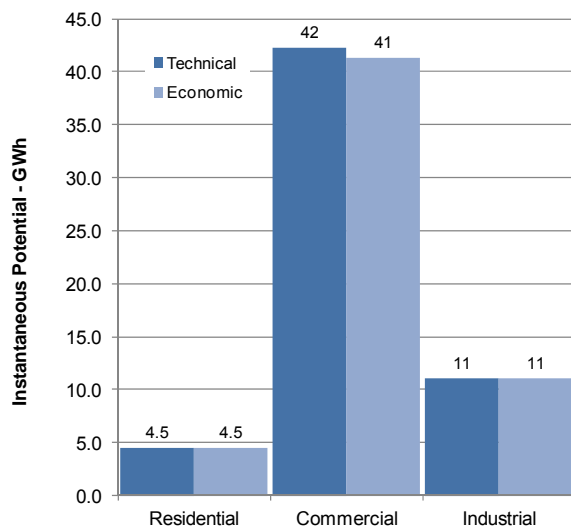
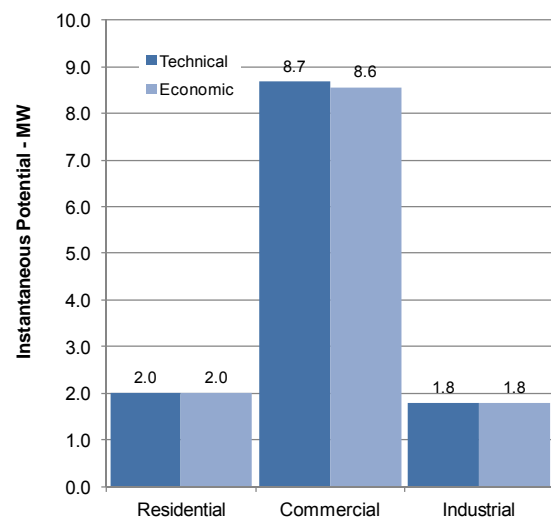


Figure 5-19
Technical and Economic Potential
for New Construction Demand Savings by
Sector—MW



Note: Energy forecast includes 7% transmission and distribution losses. Demand forecast includes 20% for transmission and distribution and spin reserves.

Figure 5-20 and Figure 5-21 show technical and economic potential for new construction as a percentage of base use.

Figure 5-20
Technical and Economic Potential
for New Construction
Percentage of Base Energy Use

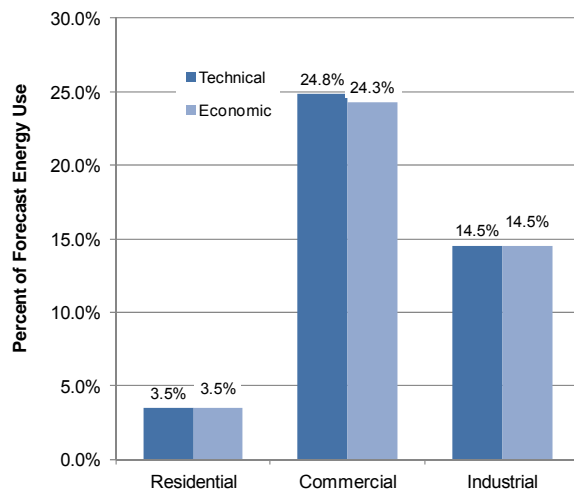
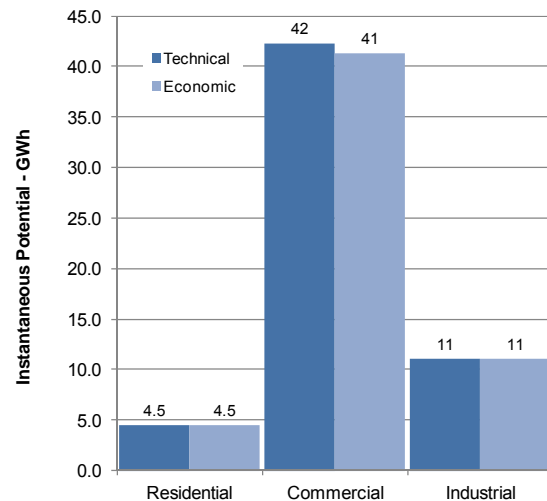


Figure 5-21
Technical and Economic Potential
for New Construction
Percentage of Base Peak Demand



Note: Energy forecast includes 7% transmission and distribution losses. Demand forecast includes 20% for transmission and distribution and spinning reserves.

New Construction Potentials by Building Type

Figure 5-22 and Figure 5-23 show the potentials in the residential sector by building type. Single-family homes account for about 71 percent of the economic potential, and low-income homes account for about 3.5 percent of the potential.

Figure 5-22
Residential New Construction
Energy-savings Potential by Building Type

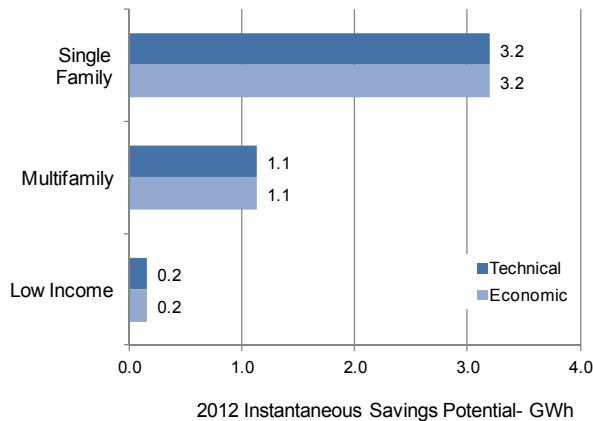
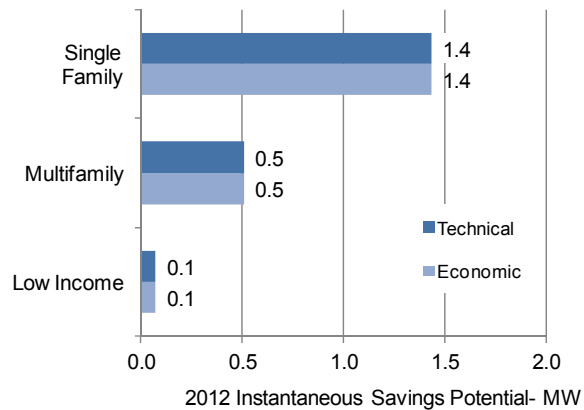


Figure 5-23
Residential New Construction Demand-savings
Potential by Building Type



Note: Energy forecast includes 7% transmission and distribution losses. Demand forecast includes 20% for transmission and distribution and spinning reserves.

Figure 5-24 and Figure 5-25 show the building-type breakdown for commercial potential. Offices account for 41 percent of the economic energy savings potential. The retail and restaurant segments account for the next largest shares of potential.

Figure 5-24
Commercial New Construction
Energy-savings Potential by Building Type

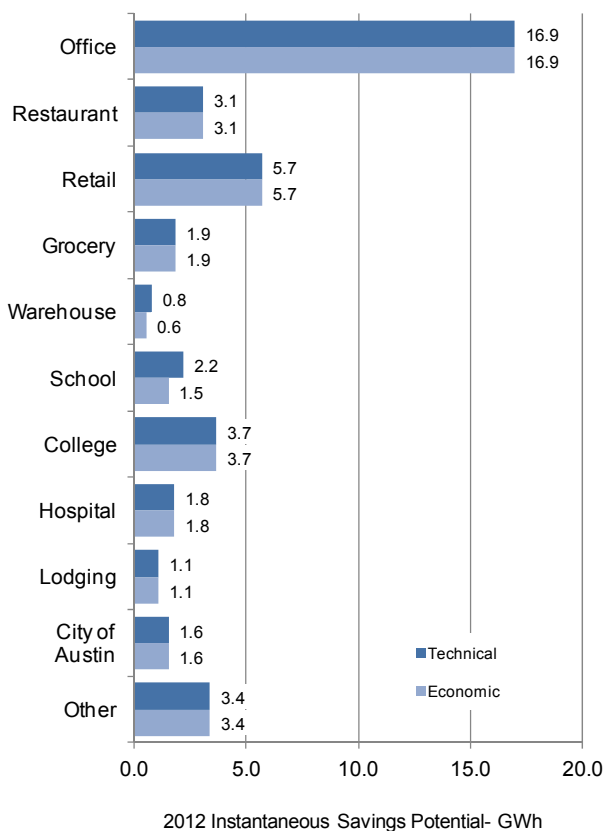
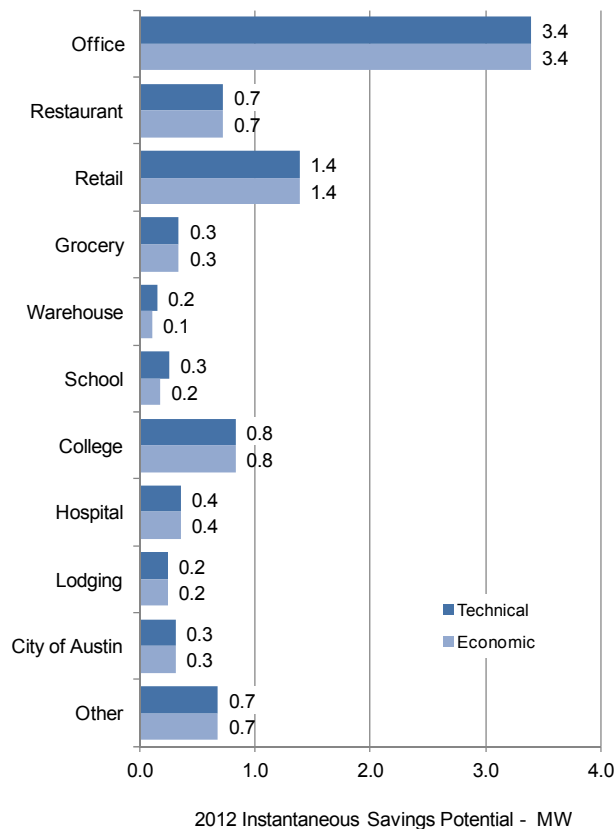


Figure 5-25
Commercial New Construction
Demand-savings Potential by Building Type



Note: Energy forecast includes 7% transmission and distribution losses. Demand forecast includes 20% for transmission and distribution and spinning reserves.

Figure 5-26 and Figure 5-27 show the building-type breakdown for industrial potential. With a relatively small number of large customers in the industrial sector, there is great uncertainty in this forecast.

Figure 5-26
Industrial New Construction Energy-savings Potential by Building Type

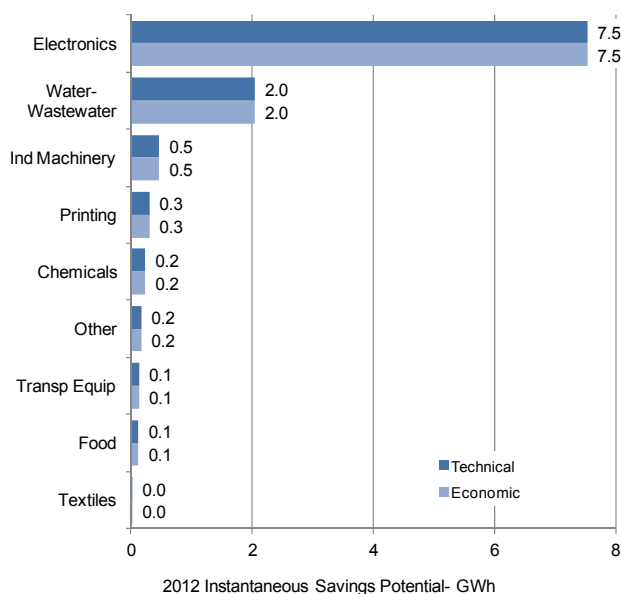
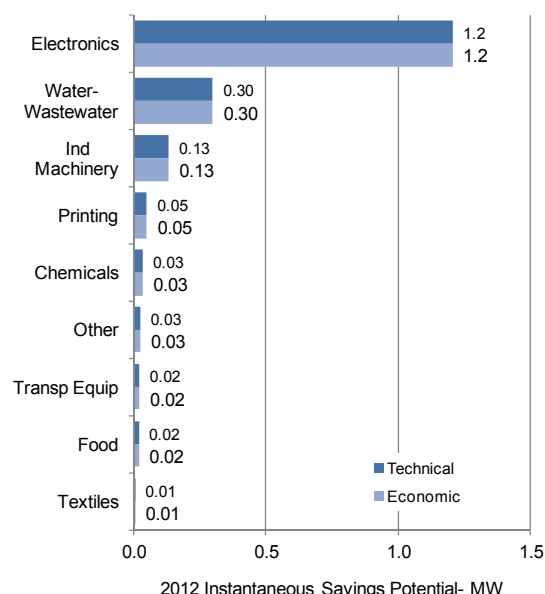


Figure 5-27
Industrial New Construction Demand-savings Potential by Building Type



Note: Energy forecast includes 7% transmission and distribution losses. Demand forecast includes 20% for transmission and distribution and spinning reserves.

5.1.3 Energy Efficiency Supply Curves

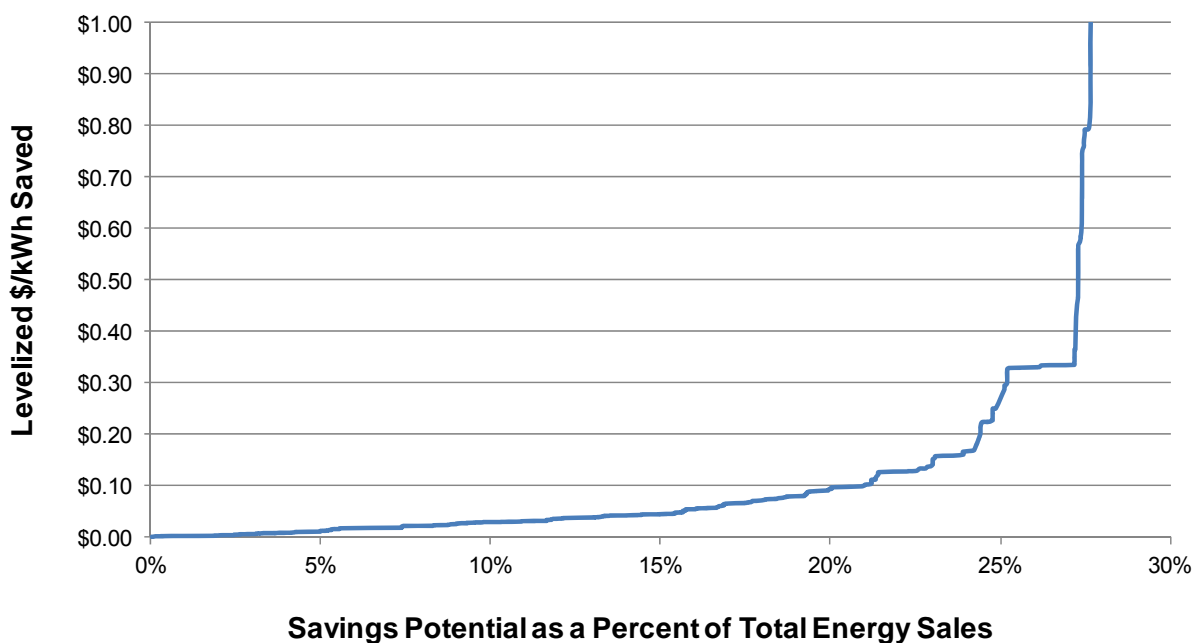
A common way to illustrate the amount of energy savings per dollar spent is to construct an energy efficiency supply curve. A supply curve is typically depicted on two axes: one captures the cost per unit of saved energy (e.g., levelized \$/kWh saved), and the other shows energy savings at each level of cost. Measures are sorted on a least-cost basis, and total savings are calculated incrementally with respect to measures that precede them. The costs of the measures are levelized over the life of the savings achieved.

Figure 5-28 and Figure 5-29 present the supply curves constructed for electric energy efficiency and peak-demand efficiency, respectively, for this study. To represent new construction and existing building measures on the same chart for savings potential through 2020, we applied a decay factor to the existing buildings potential to represent the effects of the building decay rate (assumed to be 0.5 percent for commercial buildings and 1 percent for residential buildings),

and multiplied new construction potential by nine to account for the nine program years of new construction between 2012 and 2020.

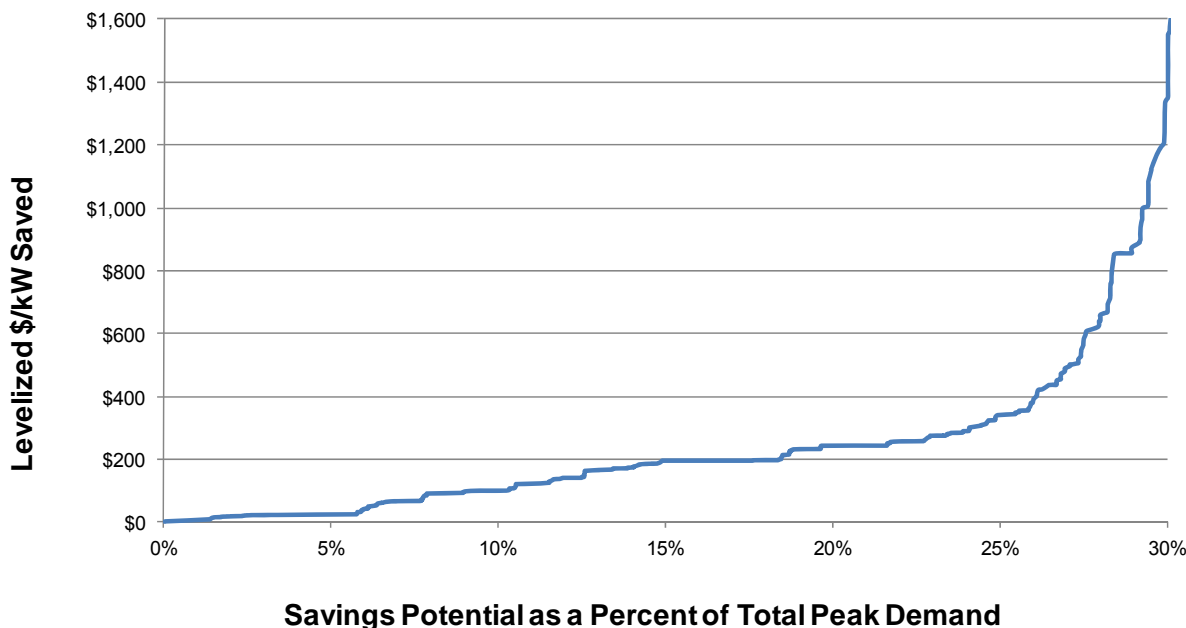
Each curve represents savings as a percentage of total energy or peak demand. These curves show that about 16 percent of energy savings are available at under \$0.05 per kWh, and about 9 percent of peak demand savings are available at under \$100 per kW. Savings potentials and levelized costs for the individual measures that comprise the supply curves are provided in Appendix G.

Figure 5-28
Electric Energy Supply Curve*



*Levelized cost per kWh saved was calculated using a 4 percent nominal discount rate.

Figure 5-29
Peak-demand Supply Curve*



*Levelized cost per kW saved was calculated using a 4 percent nominal discount rate. This includes 20 percent for transmission and distribution losses and spinning reserve.

5.2 Achievable (Program) Potential

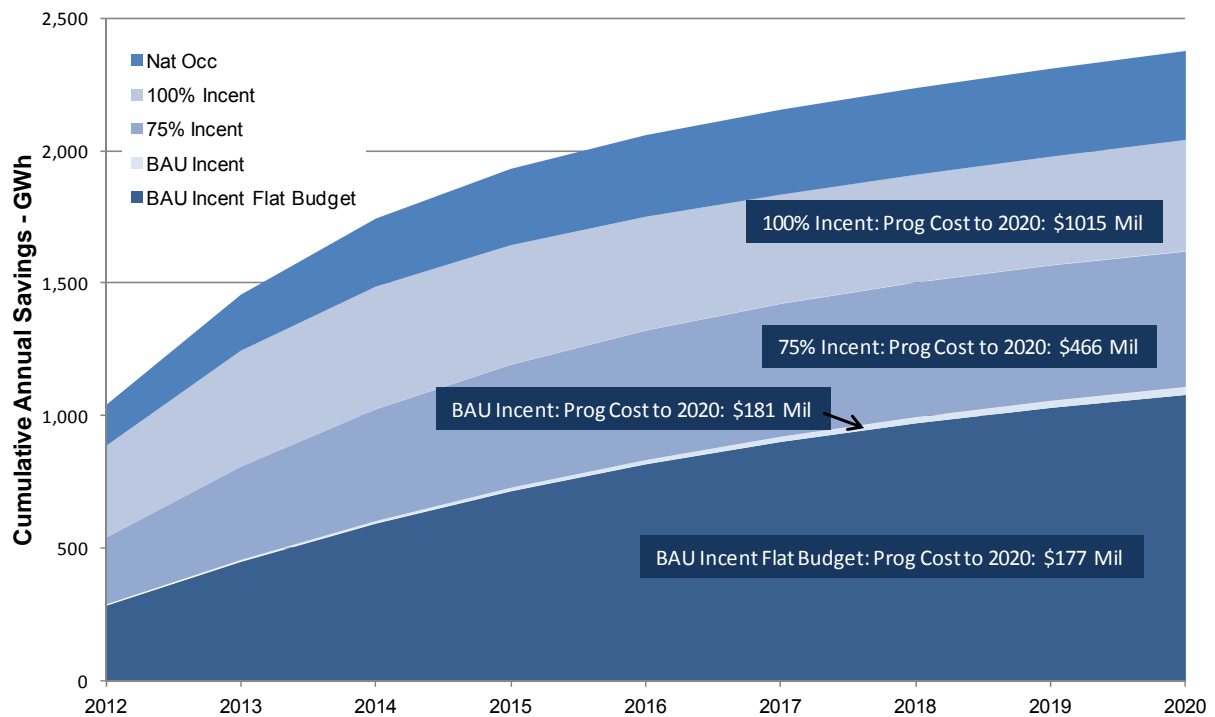
In contrast to technical and economic potential estimates, achievable potential estimates consider market and other factors that affect efficiency measure adoption. Our method of estimating measure adoption considers market barriers and reflects actual consumer- and business-implicit discount rates. This section presents results for achievable potential, first at the summary level and then by sector. More detail on achievable program potential is shown in Appendix H.

Achievable potential refers to the amount of savings that would occur in response to one or more specific program interventions. These are savings that are projected beyond those that would occur naturally in the absence of any market intervention. Because achievable potential depends on the type and degree of intervention applied, we developed potential estimates under alternative funding scenarios: BAU incentives with flat budgets (no inflation adjustment), BAU incentives (with inflation adjustment), 75-percent incentives, and 100-percent incentives. These scenarios reflect the percentage of incremental measure cost that is assumed to be paid

in customer incentives. For the BAU case, program marketing and administration costs were increased at the rate of inflation. For the BAU case with no inflation adjustment, marketing and administration budgets were kept flat. For the 75-percent and 100-percent scenarios, marketing budgets were kept at the BAU levels (with inflation adjustments), and administrative budgets were increased to account for increased participation. We estimated program energy and peak-demand savings under each scenario for the 2012–2020 period.

Figure 5-30 shows our estimates of achievable potential energy savings over time (peak demand savings follow a similar pattern). As shown in Figure 5-30, by 2020, cumulative program energy savings are projected to be 1,108 GWh under the BAU scenario (1,080 GWh for BAU with flat budgets), 1,620 GWh under the 75-percent incentive scenario, and 2,039 GWh under the 100-percent incentive scenario. (Program costs increase substantially by moving to higher incentive scenarios as the analysis the need to increase incentives to capture additional potential but also having to pay all other customers the higher incentives as well.)

Figure 5-30
Achievable Electric Energy-Savings: All Sectors



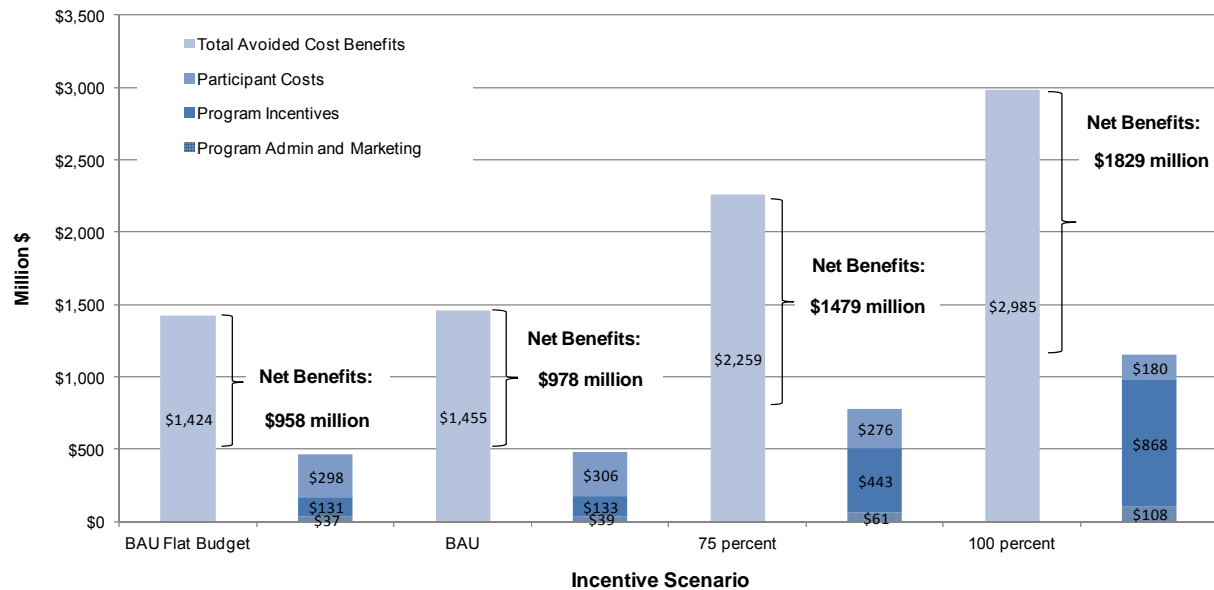
Energy forecast includes 7% transmission and distribution losses.

Figure 5-30 also shows that the increase in cumulative savings declines over time. This result occurs because retrofit measures (measures that are not dependent on equipment turnover cycles and can be added at any time) begin reaching high saturations over time, and it becomes more difficult to capture additional savings as the retrofit opportunities diminish (emerging technologies may create new opportunities, but the model only captures currently commercially available technologies). In Austin, the decline is exacerbated by the upcoming revisions to building codes, which leave less opportunity for energy-efficiency programs.

While the decline in additional savings is fairly modest in the BAU scenario, it is more pronounced in the higher incentive cases. For the 100-percent incentive scenario, savings accumulate rapidly during the first few years of the forecast horizon, but then flatten out considerably thereafter. This can be perceived as a boom-bust phenomenon – where a program ramps up dramatically over a few years, and then must be scaled back significantly afterwards as program participation declines due to high saturation levels. While the high incentive scenario may lead to front-loaded energy savings (a good thing), it could lead to dramatically reduced program effort and funding in later years, which may affect the program's ability to evolve and continue to capture emerging opportunities.

Figure 5-31 depicts costs and benefits under each funding scenario from 2012 to 2020. The present value of program costs (including administration, marketing, and incentives) is \$172 million under the BAU scenario (\$167 million if budgets are kept flat), \$504 million under the 75-percent incentive scenario, and \$976 million under the 100-percent incentive scenario. The present value of total avoided-cost benefits is \$1,455 million under the BAU scenario (\$1,424 million if budgets are kept flat), \$2,259 million under 75-percent incentives, and \$2,985 million under 100-percent incentives. The present value of *net* avoided-cost benefits, i.e., the difference between total avoided-cost benefits and total costs (which include participant costs in addition to program costs), is \$978 million under BAU (\$958 million if budgets are kept flat), \$1,479 million under 75-percent incentives, and \$1,829 million under 100-percent incentives. (Note, there are participant costs in the 100-percent incentive scenario because some measures are included as education only (no incentives) even in the 100 percent scenario case, and because the DSM Assyst model assumes measures initially purchased with program incentives are repurchased without program incentives if then burn out during the forecast period.)

Figure 5-31
Benefits and Costs of Energy Efficiency Savings—2012-2020*



* PV (present value) of benefits and costs is calculated for 2012-2020 program years using a nominal discount rate = 4 percent, and an assumed inflation rate = 2.5 percent.

All four of the funding scenarios are cost-effective based on the TRC test, which is the test used in this study to determine program cost-effectiveness. The TRC benefit-cost ratios are 3.05 for the BAU, 3.06 for BAU with flat budgets, 2.90 for the 75-percent incentive scenario, and 2.58 for the 100-percent incentive scenario. This indicates that program cost-effectiveness declines somewhat with increasing program effort, reflecting penetration of more measures with lower cost-effectiveness levels. Key results of our efficiency scenario forecasts from 2012 to 2020 are summarized in Table 5-1.

Table 5-1
Summary of Achievable Potential Results—2012–2020

Result - Programs	Program Scenario:			
	BAU Incentives Flat Budget	BAU Incentives	75 percent Incentives	100 percent Incentives
Total Market Energy Savings - GWh	1,458	1,482	1,932	2,307
Total Market Peak Demand Savings - MW	291	295	422	541
Program Energy Savings - GWh	1,030	1,056	1,567	1,975
Program Peak Demand Savings - MW	226	231	366	492
Program Costs - Real, \$ Million				
Administration	\$19	\$19	\$41	\$89
Marketing	\$20	\$22	\$23	\$24
Incentives	\$138	\$140	\$466	\$902
Total	\$177	\$181	\$530	\$1,015
PV Avoided Costs	\$1,424	\$1,455	\$2,259	\$2,985
PV Annual Program Costs (Adm/Mkt)	\$37	\$39	\$61	\$108
PV Net Measure Costs	\$429	\$439	\$719	\$1,048
Net Benefits	\$958	\$978	\$1,479	\$1,829
TRC Ratio	3.06	3.05	2.90	2.58

PV (present value) of benefits and costs is calculated for 2012-2020 program years using a nominal discount rate = 4 percent, and an assumed inflation rate = 2.5 percent; GWh and MW savings are cumulative through 2020. Energy forecast includes 7% transmission and distribution losses. Demand forecast includes 20% for transmission and distribution and spin reserves.

5.2.1 Breakdown of Achievable Potential

Cumulative net achievable potential estimates by customer class for the period of 2012-2020 are presented in Figure 5-32 and Figure 5-33. These figures show results for each funding scenario. Under the program assumptions developed for this study, achievable energy savings are highest for the commercial sector. Residential peak-demand savings are highest in all the funding scenarios. Savings increase with higher levels of funding and higher incentives for all sectors.

Figure 5-32
Achievable Energy Savings
(2020) by Sector—GWh per Year

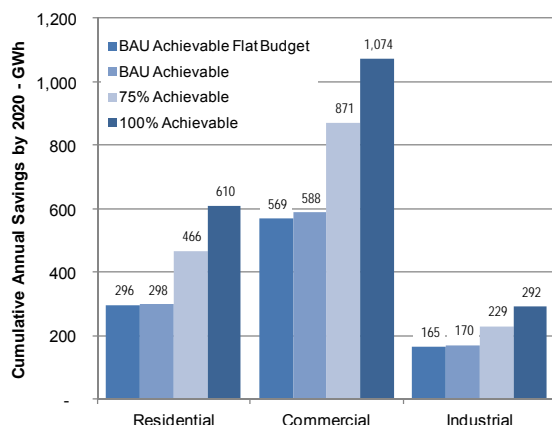
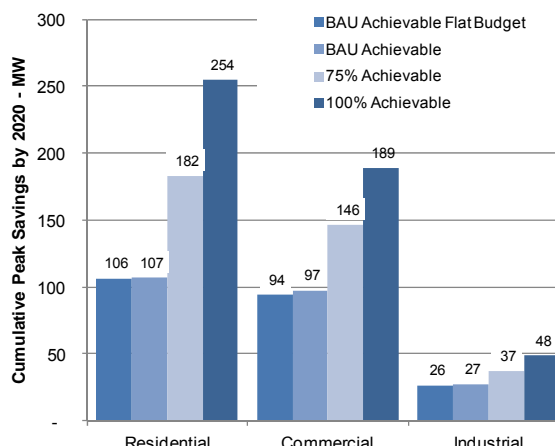


Figure 5-33
Achievable Peak-Demand Savings
(2020) by Sector—MW



Note: Energy forecast includes 7% transmission and distribution losses. Demand forecast includes 20% for transmission and distribution and spin reserves.

Table 5-2 and Table 5-3 show similar information as the previous figures, but also compare potentials to 2020 base energy use. Overall, achievable energy savings potentials range between 7 percent of base use for the BAU flat budget scenario (the equivalent of about 0.8 percent savings per year to 13.5 percent of base use for the 100-percent incentive scenario (equating to about 1.5 percent savings per year). Achievable residential energy savings potentials range between 5.9 percent and 12 percent of base usage, with commercial potentials ranging between 9.7 percent and 18 percent of base use, and industrial potentials ranging between 6.2 percent and 11 percent of base use.

Total achievable demand savings range between 6.8 percent of peak demand for the BAU flat budget scenario and 15 percent of peak demand for the 100-percent incentive scenario. The residential sector shows the widest range in demand savings relative to base demand, with less variation between scenarios for the commercial and industrial sectors.

Table 5-2
Achievable Energy Savings (2020) by Sector– GWh per Year

Sector	2020 Base Energy Use (GWh)	Cumulative Potential in 2020- GWh			
		BAU Achievable (Program) Flat Budget	BAU Achievable (Program)	75% Achievable (Program)	100% Achievable (Program)
Residential	5,041	296	298	466	610
Savings % of Base		5.9%	5.9%	9.2%	12%
Commercial	5,844	569	588	871	1,074
Savings % of Base		9.7%	10.1%	14.9%	18.4%
Industrial	2,658	165	170	229	292
Savings % of Base		6.2%	6.4%	8.6%	11.0%
Total	14,635	1,030	1,056	1,567	1,975
Savings % of Base		7.0%	7.2%	10.7%	13.5%

Note: Energy forecast includes 7% transmission and distribution losses.

Table 5-3
Achievable Demand Savings (2020) by Sector – MW

Sector	2020 Base Demand (MW)	Cumulative Potential in 2020- MW			
		BAU Achievable (Program) Flat Budget	BAU Achievable (Program)	75% Achievable (Program)	100% Achievable (Program)
Residential	1,321	106	107	182	254
Savings % of Base		8.1%	8.1%	13.8%	19.3%
Commercial	1,317	94	97	146	189
Savings % of Base		7.1%	7.4%	11.1%	14.3%
Industrial	462	26	27	37	48
Savings % of Base		5.7%	5.8%	8.1%	10.5%
Total	3,323	226	231	366	492
Savings % of Base		6.8%	7.0%	11.0%	14.8%

Note: Demand forecast includes 20% for transmission and distribution and spin reserves.

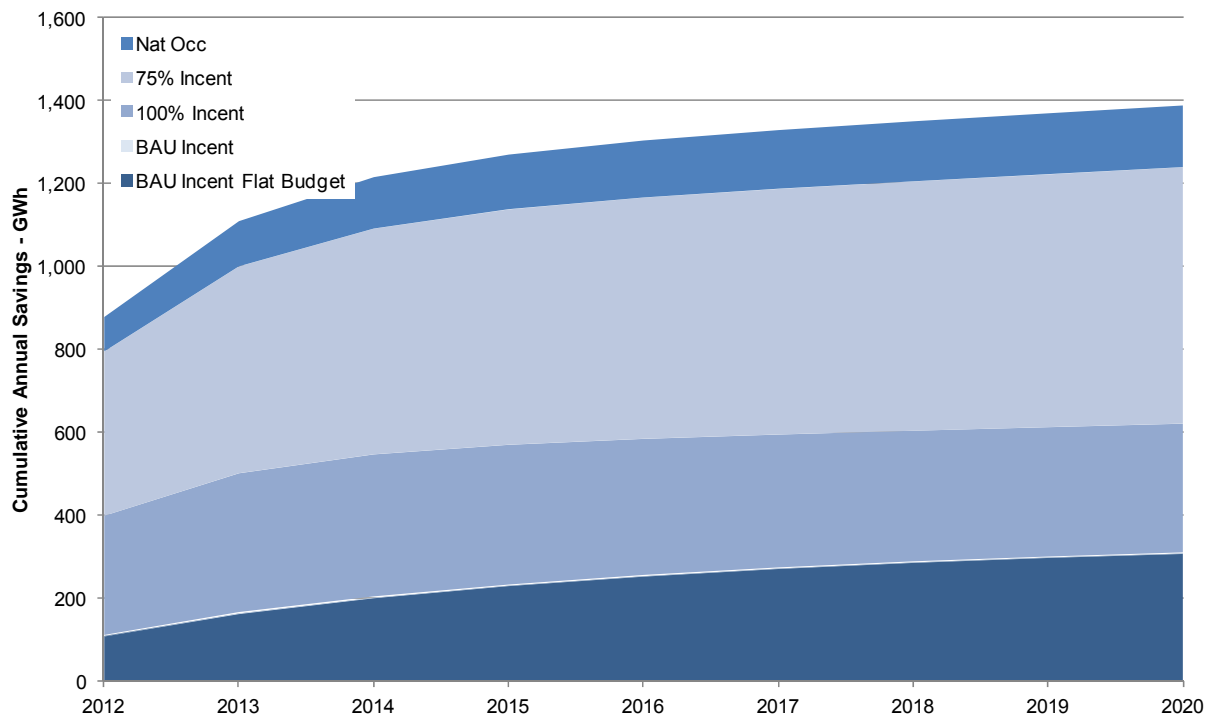
5.2.1.1 Residential Sector

Figure 5-34 shows cumulative net achievable program energy savings by program scenario for the residential sector. (Demand savings show a similar yearly pattern.) By 2020, net energy savings reach 307 GWh under the BAU scenario (306 with flat budgets), 474 GWh under the

75-percent incentive scenario, and 619 GWh under the 100-percent incentive scenario. Energy savings are most sensitive to changes in incentives in the 75- to 100-percent range.

The forecast shows a marked flattening after the first few years due to the 2015 building codes, which capture much of the savings potential in the residential sector, leaving less available for energy-efficiency programs.

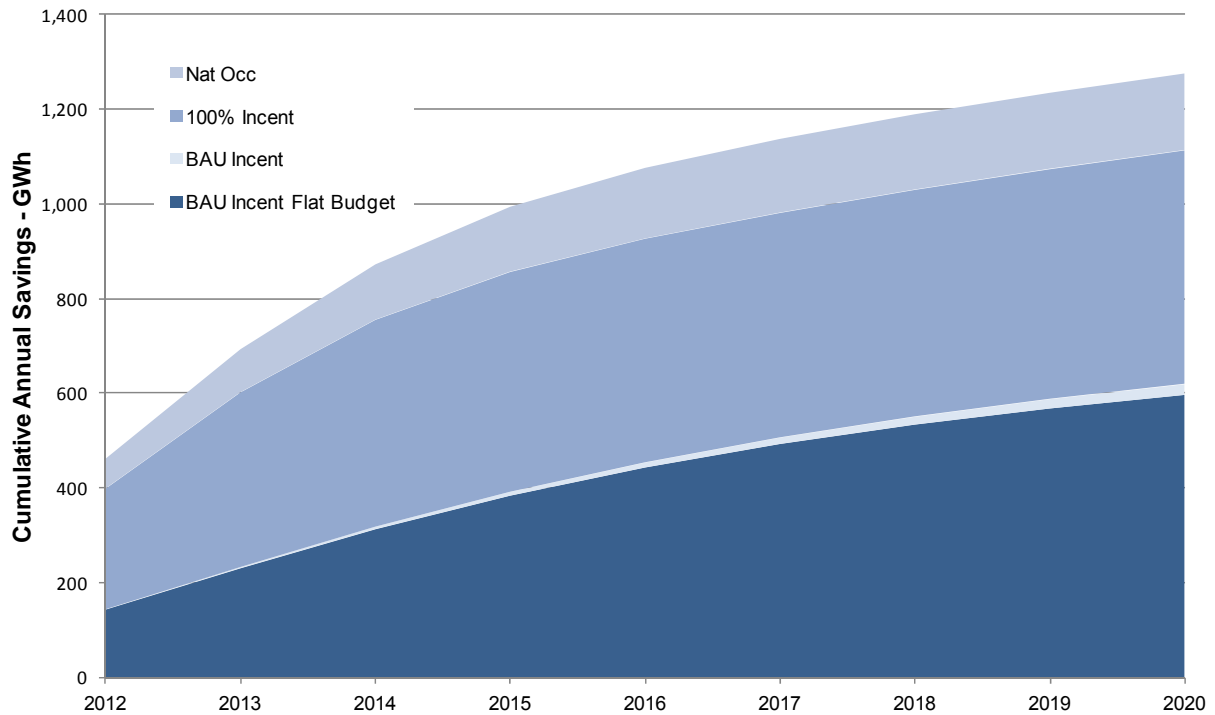
Figure 5-34
Achievable Energy Savings: Residential Sector



5.2.1.2 Commercial Sector

Figure 5-35 shows cumulative net achievable program savings by commercial program scenario. By 2020, achievable energy savings reach 620 GWh under the BAU scenario (598 GWh if budgets are kept flat), 905 GWh under the 75-percent incentive scenario, and 1,113 GWh under the 100-percent incentive scenario. Growth in savings levels off considerably after the first few years in both the 75-percent incentive scenario and the 100-percent incentive scenario.

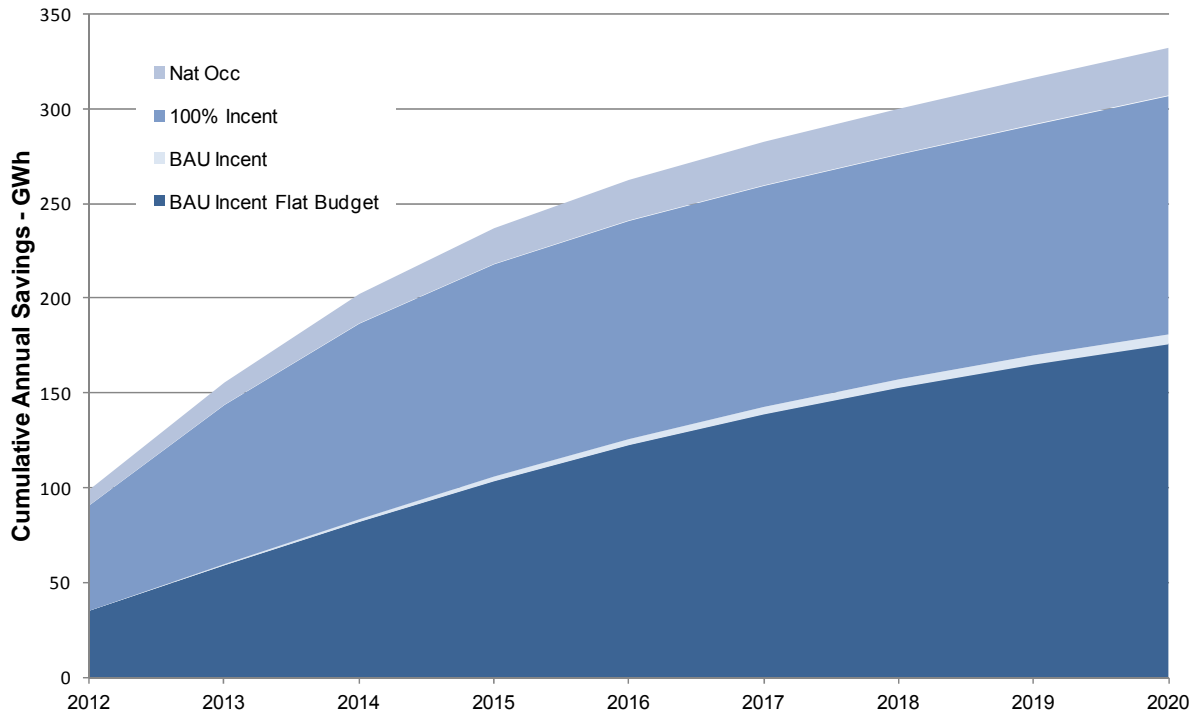
Figure 5-35
Achievable Energy Savings: Commercial Sector



5.2.1.3 Industrial Sector

Figure 5-36 shows cumulative net achievable program savings by industrial program scenario. By 2020, energy savings reach 181 GWh under the BAU scenario (176 if budgets are kept flat), 241 GWh under the 75-percent incentive scenario, and 307 GWh under the 100-percent incentive scenario.

Figure 5-36
Achievable Energy Savings: Industrial Sector



5.3 Potential Savings in Context

It is important to understand the DNV KEMA potential estimates in the context of Austin Energy's portfolio of demand-side management (DSM) programs and its current consumption and savings forecasts. Table 5-4 compares the BAU achievable results from the previous section with Austin Energy's demand savings forecast.

Austin Energy's forecast achieves 800 MW of saving from 2007 to 2020, which is its Climate Protection Plan goal. Program efforts from 2007 to 2011 have already achieved 269 MW, leaving 531 MW to be captured through current and future DSM efforts. Of that 531 MW, Austin Energy expects 295 MW to be captured through energy-efficiency programs.

To compare the results of the potential study with the Austin Energy forecast, recall that this study only estimates potential for energy efficiency measures, not building codes or load management. The effect of Austin Energy's building code and load management programs were accounted for in DNV KEMA's 2020 baseline forecast (see section 4.6). Table 5-4 shows Austin

Energy's no-DSM forecast of 2020 demand, forecasted code and load management savings, and the baseline used for the current analysis. Since this report did not analyze codes or load management, these values are the same for both the DNV KEMA analysis and the Austin Energy Forecast. The table then shows the breakout of DNV KEMA's base forecast by sector, and the potentials estimated for the business-as-usual program scenario (program budgets and incentive levels kept at current levels with adjustments for inflation).

DNV KEMA estimated a BAU savings potential by 2020 of 231 MW, compared to 295 MW in Austin Energy's forecast, a difference of 64 MW (22 percent of Austin Energy's energy-efficiency forecast and 12 percent of its total DSM portfolio forecast of 531 MW). This result suggests that meeting that MW goal, and therefore the Climate Protection Plan goal of 800 MW, may be difficult or impossible with current program budgets and incentive levels.

Table 5-5 shows the potential results for the technical and economic analyses and all four program scenarios. For ease of comparison between technical and economic potential and achievable potential, the existing building and new construction technical and economic potentials have been combined using the weighting approach described in section 4.6, applying a decay factor to existing building savings and a growth factor to new construction to estimate these potentials in 2020. All of the potentials are compared to the 2020 baseline used for reporting achievable potentials. We also show the 9-year achievable potentials as a percent of both technical and economic potential.

For comparison with the Austin Energy forecasts, Table 5-5 also shows Austin Energy's load management and building code savings forecasts. The last two rows add these to the DNV KEMA potential estimates, and show the savings as a percent of Austin's no-DSM demand forecast. While the BAU scenario left Austin Energy 12 percent short of its 800 MW 2020 goal, the potential for the 75 percent incentive scenario is 13 percent higher than the 531 MW Austin Energy needs to meet the goal. The 75 percent incentive scenario represents a significantly higher program cost, however: an average annual program cost of \$59 million compared to \$20 million for the BAU scenario.

Table 5-4
Comparison of BAU Potential Forecast and Austin Energy's Demand Savings Forecast

	DNV KEMA Forecast				Austin Energy Forecast		
	No DSM Base Load	DNV KEMA Base Forecast	DNV KEMA BAU Savings	Net Demand BAU	No DSM Base Load	Austin Savings	Net Demand
	MW	MW	MW	MW	MW	MW	MW
Base Case (No DSM)	3,963				3,963		
Building Code Total			154			154	
Load Management Total			82			82	
Total Out-of-analysis AE Program			236			236	
Baseline for DNV KEMA Analysis		3,727					3,727
Residential Total		1,482	107	1,375			
Commercial Total		1,477	97	1,380			
Industrial Total		518	27	491			
Other Total		250	0	250			
All Sectors Total		3,727	231	3,496		295	3,432
Savings % of DNV KEMA Base			6.2%			7.9%	
Savings % of Austin No-DSM Base			5.8%			7.4%	
Total DSM (in and out of DNV KEMA analysis)			467			531	
Savings % of Austin No-DSM Base			11.8%			13%	

Note: Demand forecast includes 20% for transmission and distribution and spin reserves.

Table 5-5
Summary of Demand Savings Potentials for Austin Energy

	No DSM Base Load 2020	DNV KEMA 2020 Base Forecast	Technical Potential	Economic Potential	Achievable Potentials			
					BAU Flat Budget	BAU	75 Percent Incentives	100 Percent Incentives
Austin Energy Base Case (No DSM)	3,963							
Total Out-of-analysis AE Program (same for all scenarios)			236	236	236	236	236	236
Residential Total		1,482	636	509	106	107	182	254
Commercial Total		1,477	349	276	94	97	146	189
Industrial Total		518	84	70	26	27	37	48
Other Total		250	0	0	0	0	0	0
All Sectors Total		3,727	956	744	226	231	366	492
Savings % of DNV KEMA Base			25.7%	20.0%	6.1%	6.2%	9.8%	13.2%
Savings % of Austin No-DSM Base			24.1%	18.8%	5.7%	5.8%	9.2%	12.4%
Savings % of Economic Potential					23.7%	24.2%	38.2%	51.4%
Total DSM (in and out of DNV KEMA analysis)			1,192	980	462	467	602	727
Savings % of Austin No-DSM Base			30.1%	24.7%	11.7%	11.8%	15.2%	18.4%

Note: Demand forecast includes 20% for transmission and distribution and spin reserves.



Austin Energy DSM Market Potential Assessment

Final Report Appendices



Prepared for
Austin Energy
Austin, Texas

Prepared by
DNV KEMA Energy & Sustainability
Oakland, California

June 25, 2012

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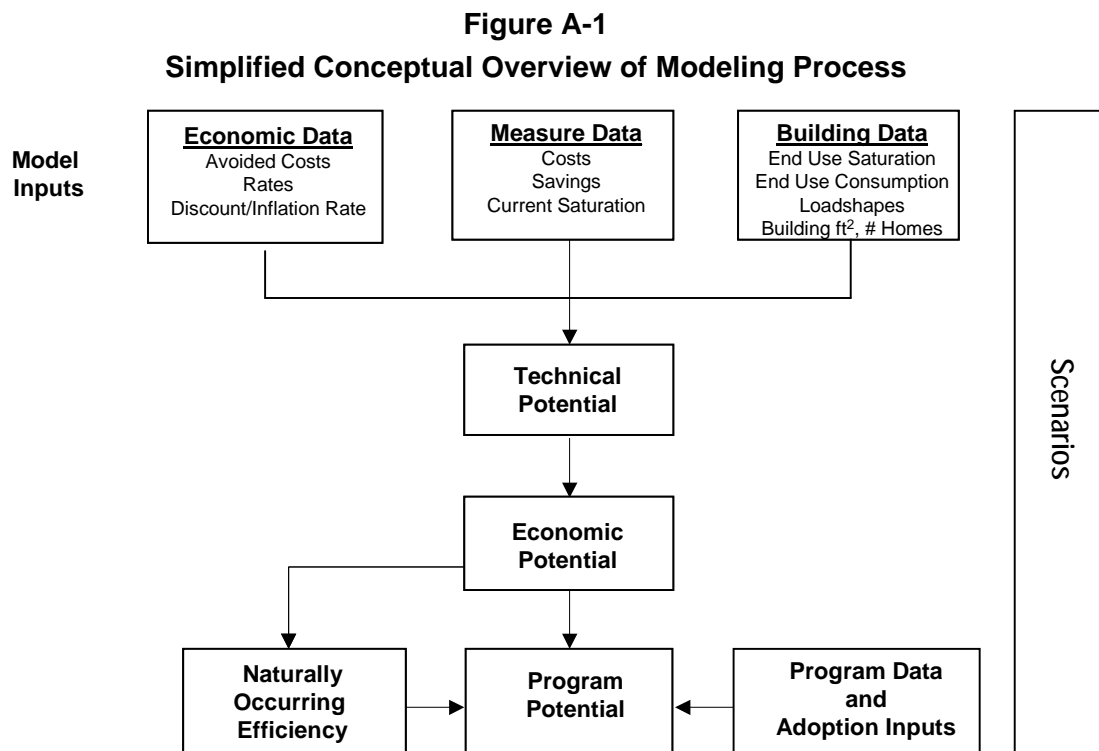
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A. Appendix A: Detailed Methodology and Model Description

In this appendix we present and discuss our basic methodology for conducting market potential studies. We also present an overview of DSM ASSYST™, our model used to develop market potential estimates. Information presented here has been extracted from several recent energy efficiency potential reports.

A.1 Overview of DSM Forecasting Method

The crux of any DSM forecasting process involves carrying out a number of systematic analytical steps that are necessary to produce accurate estimates of energy efficiency (EE) effects on system load. A simplified overview of these basic analytical steps is shown in Figure A-1.



Developing a DSM forecast is viewed by KEMA as a five-step process. The steps include:

Step 1: Develop Initial Input Data

- Develop list of EE measure opportunities to include in scope

- Gather and develop technical data (costs and savings) on efficient measure opportunities
- Gather, analyze, and develop information on building characteristics, including total square footage and households, electricity consumption and intensity by end use, end-use consumption load patterns by time of day and year (i.e., load shapes), market shares of key electric consuming equipment, and market shares of EE technologies and practices.

Step 2: Estimate Technical Potential and Develop Supply Curves

- Match and integrate data on efficient measures to data on existing building characteristics to produce estimates of technical potential and EE supply curves.

Step 3: Estimate Economic Potential

- Gather economic input data such as current and forecasted retail electric prices and current and forecasted costs of electricity generation, along with estimates of other potential benefits of reducing supply, such as the value of reducing environmental impacts associated with electricity production
- Match and integrate measure and building data with economic assumptions to produce indicators of costs from different viewpoints (e.g., utility, societal, and consumer)
- Estimate total economic potential using supply curve approach

Step 4: Estimate Achievable Program and Naturally Occurring Potentials

- Gather and develop estimates of program costs (e.g., for administration and marketing) and historic program savings
- Develop estimates of customer adoption of EE measures as a function of the economic attractiveness of the measures, barriers to their adoption, and the effects of program intervention
- Estimate achievable program and naturally occurring potentials; calibrate achievable and naturally occurring potential to recent program and market data
- Develop alternative economic estimates associated with alternative future scenarios

Step 5: Scenario Analyses and Resource Planning Inputs

- Recalculate potentials under alternate economic scenarios and deliver data in format required for resource planning.

Provided below is additional discussion of KEMA's modeling approaches for technical, economic, and achievable DSM forecasts.

A.1.1 Estimate Technical Potential and Develop Energy-Efficiency Supply Curves

Technical potential refers to the amount of energy savings or peak demand reduction that would occur with the *complete* penetration of all measures analyzed in applications where they were deemed *technically* feasible from an *engineering* perspective. Total technical potential is developed from estimates of the technical potential of individual measures as they are applied to discrete market segments (commercial building types, residential dwelling types, etc.).

A.1.1.1 Core Equation

The core equation used to calculate the energy technical potential for each individual efficiency measure, by market segment, is shown below (using a commercial example):¹

$$\begin{array}{ccccccc} \text{Technical} & & \text{Total} & & \text{Base} & & \text{Not} \\ \text{Potential of} & = & \text{Square} & \times & \text{Case} & \times & \text{Complete} \\ \text{Efficient} & & \text{Feet} & & \text{Equipment} & \times & \text{Feasibility} \\ \text{Measure} & & & & \text{EUI} & \times & \text{Savings} \\ & & & & & & \text{Factor} \end{array}$$

where:

- **Square feet** is the total floor space for all buildings in the market segment. For the residential analysis, the **number of dwelling units** is substituted for square feet.
- **Base-case equipment EUI** is the energy used per square foot by each base-case technology in each market segment. This is the consumption of the energy-using equipment that the efficient technology replaces or affects. For example, if the efficient measure were a CFL, the base EUI would be the annual kWh per square foot of an equivalent incandescent lamp. For the residential analysis, unit energy consumption (UECs), energy used per dwelling, are substituted for EUIs.
- **Applicability factor** is the fraction of the floor space (or dwelling units) that is applicable for the efficient technology in a given market segment; for the example above, the percentage of floor space lit by incandescent bulbs.
- **Not complete factor** is the fraction of applicable floor space (or dwelling units) that has not yet been converted to the efficient measure; that is, (1 minus the fraction of floor space that already has the EE measure installed).
- **Feasibility factor** is the fraction of the applicable floor space (or dwelling units) that is technically feasible for conversion to the efficient technology from an *engineering* perspective.

¹ Note that stock turnover is not accounted for in our estimates of technical and economic potential, stock turnover *is accounted for* in our estimates of achievable potential. Our definition of technical potential assumes instantaneous replacement of standard-efficiency with high-efficiency measures.

- **Savings factor** is the reduction in energy consumption resulting from application of the efficient technology.

Technical potential for peak demand reduction is calculated analogously.

An example of the core equation is shown in Table A-1 for the case of a prototypical 4-lamp 4-foot standard T-8 lighting fixture, which is replaced by a 4-lamp 4-foot premium T-8 fixture in the office segment of a large utility service territory.

Table A-1
Example of Technical Potential Calculation—Replace 4-Lamp 4-Foot Standard T-8s with
4-Lamp 4-Foot Premium T-8s in the Office Segment of a Utility Service Territory
(Note: Data are illustrative only)

Technical Potential of Efficient Measure	=	Total square feet	×	Base Case Equipment UEC	×	Applicability Factor	×	Not Complete Factor	×	Feasibility Factor	×	Savings Factor
57 million kWh		195 million		5.74		0.34		0.95		1.00		0.16

Technical EE potential is calculated in two steps. In the first step, all measures are treated *independently*; that is, the savings of each measure are not marginalized or otherwise adjusted for overlap between competing or synergistic measures. By treating measures independently, their relative economics are analyzed without making assumptions about the order or combinations in which they might be implemented in customer buildings. However, the total technical potential across measures cannot be estimated by summing the individual measure potentials directly. The cumulative savings cannot be estimated by adding the savings from the individual savings estimates because some savings would be double counted. For example, the savings from a measure that reduces heat gain into a building, such as window film, are partially dependent on other measures that affect the efficiency of the system being used to cool the building, such as a high-efficiency chiller; the more efficient the chiller, the less energy saved from the application of the window film.

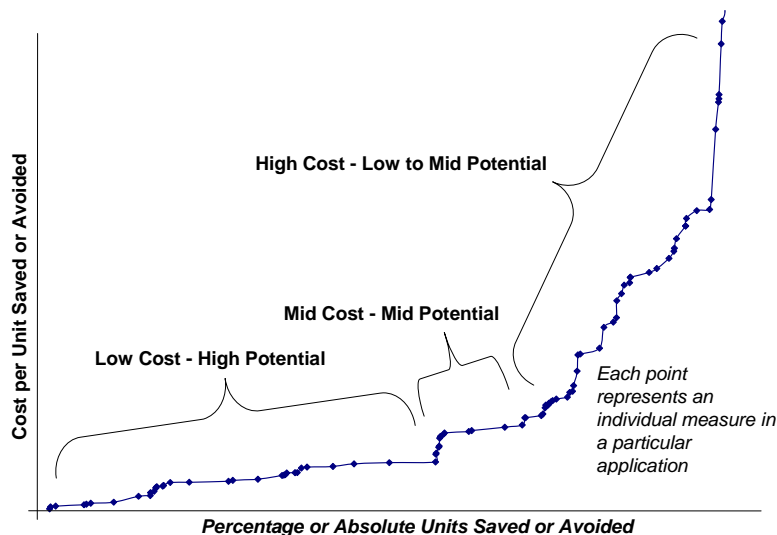
A.1.1.2 Use of Supply Curves

In the second step, cumulative technical potential is estimated using an EE supply curve approach.² This method eliminates the double-counting problem. In Figure A-2, we present a

² This section describes conservation supply curves as they have been defined and implemented in numerous studies. Readers should note that Stoff 1995 describes several technical errors in the definition

generic example of a supply curve. As shown in the figure, a supply curve typically consists of two axes—one that captures the cost per unit of saving a resource or mitigating an impact (e.g., \$/kWh saved or \$/ton of carbon avoided) and the other that shows the amount of savings or mitigation that could be achieved at each level of cost. The curve is typically built up across individual measures that are applied to specific base-case practices or technologies by market segment. Savings or mitigation measures are sorted on a least-cost basis, and total savings or impacts mitigated are calculated incrementally with respect to measures that precede them. Supply curves typically, but not always, end up reflecting diminishing returns, i.e., as costs increase rapidly and savings decrease significantly at the end of the curve.

Figure A-2
Generic Illustration of EE Supply Curve



As noted above, the cost dimension of most EE supply curves is usually represented in dollars per unit of energy savings. Costs are usually annualized (often referred to as “levelized”) in supply curves. For example, EE supply curves usually present levelized costs per kWh or kW saved by multiplying the initial investment in an efficient technology or program by the “capital recovery rate” (CRR):

and implementation of conservation supply curves in the original and subsequent conservation supply curve studies. Stoft concludes that conservation supply curves are not “true” supply curves in the standard economic sense but can still be useful (albeit with his recommended improvements) for their intended purpose (demonstration of cost-effective conservation opportunities).

$$CRR = \frac{d}{1 - (1 + d)^{-n}}$$

where d is the real discount rate and n is the number of years over which the investment is written off (i.e., amortized).

Thus,

Levelized Cost per kWh Saved = Initial Cost x CRR/Annual Energy Savings

Levelized Cost per kW Saved = Initial Cost x CRR/Peak Demand Savings

The levelized cost per kWh and kW saved are useful because they allow simple comparison of the characteristics of EE with the characteristics of energy supply technologies. However, the levelized cost per kW saved is a biased indicator of cost-effectiveness because all of the efficiency measure costs are arbitrarily allocated to peak savings.

Returning to the issue of EE supply curves, Table A-2 shows a simplified numeric example of a supply curve calculation for several EE measures applied to commercial lighting for a hypothetical population of buildings. What is important to note is that in an EE supply curve, the measures are sorted by relative cost—from least to most expensive. In addition, the energy consumption of the system being affected by the efficiency measures goes down as each measure is applied. As a result, the savings attributable to each subsequent measure decrease if the measures are interactive. For example, the occupancy sensor measure shown in Table 1-2 would save more at less cost per unit saved if it were applied to the base-case consumption before the T8 lamp and electronic ballast combination. Because the T8 electronic ballast combination is more cost-effective, however, it is applied first, reducing the energy savings potential for the occupancy sensor. Thus, in a typical EE supply curve, the base-case end-use consumption is reduced with each unit of EE that is acquired. Notice in Table 1-2 that the total end-use GWh consumption is recalculated after each measure is implemented, thus reducing the base energy available to be saved by the next measure.

Table A-2 shows an example that would represent measures for one base-case technology in one market segment. These calculations are performed for all of the base-case technologies, market segments, and measure combinations in the scope of a study. The results are then ordered by levelized cost and the individual measure savings are summed to produce the EE potential for the entire sector.

In the next subsection, we discuss how economic potential is estimated as a subset of the technical potential.

Table A-2
Sample Technical Potential Supply Curve Calculation for Commercial Lighting
(Note: Data are illustrative only)

Measure	Total End Use Consumption of Population (GWh)	Applicable, Not Complete and Feasible (1000s of ft ²)	Average kWh/ft ² of population	Savings %	GWh Savings	Levelized Cost (\$/kWh saved)
Base Case: T12 lamps with Magnetic Ballast	425	100,000	4.3	N/A	N/A	N/A
1. T8 w. Elec. Ballast	425	100,000	4.3	21%	89	\$0.04
2. Occupancy Sensors	336	40,000	3.4	10%	13	\$0.11
3. Perimeter Dimming	322	10,000	3.2	45%	14	\$0.25
With all measures	309		3.1	27%	116	

A.1.2 Estimation of Economic Potential

Economic potential is typically used to refer to the *technical potential* of those energy conservation measures that are cost effective when compared to either supply-side alternatives or the price of energy. Economic potential takes into account the fact that many EE measures cost more to purchase initially than do their standard-efficiency counterparts. The incremental costs of each efficiency measure are compared to the savings delivered by the measure to produce estimates of energy savings per unit of additional cost. These estimates of EE resource costs can then be compared to estimates of other resources such as building and operating new power plants.

A.1.2.1 Cost Effectiveness Tests

To estimate economic potential, it is necessary to develop a method by which it can be determined that a measure or program is *economic*. There is a large body of literature that debates the merits of different approaches to calculating whether a public purpose investment in EE is cost effective (Chamberlin and Herman 1993, RER 2000, Ruff 1988, Stoft 1995, and Sutherland 2000). We usually utilize the total resource cost (TRC) test to assess cost effectiveness. The TRC is a form of societal benefit-cost test. Other tests that have been used in analyses of program cost-effectiveness by EE analysts include the utility cost, ratepayer impact measure (RIM), and participant tests. These tests are discussed in detail the CASPM.

Before discussing the TRC test and how it is often used in our DSM forecasts, we present below a brief introduction to the basic tests as described in the CASPM:³

- **Total Resource Cost Test**—The TRC test measures the net costs of a demand-side management program as a resource option based on the total costs of the program, including both the participants' and the utility's costs. The test is applicable to conservation, load management, and fuel substitution programs. For fuel substitution programs, the test measures the net effect of the impacts from the fuel not chosen versus the impacts from the fuel that is chosen as a result of the program. TRC test results for fuel substitution programs should be viewed as a measure of the economic efficiency implications of the total energy supply system (gas and electric). A variant on the TRC test is the societal test. The societal test differs from the TRC test in that it includes the effects of externalities (e.g. environmental, national security), excludes tax credit benefits, and uses a different (societal) discount rate.
- **Participant Test**—The participant test is the measure of the quantifiable benefits and costs to the customer due to participation in a program. Since many customers do not base their decision to participate in a program entirely on quantifiable variables, this test cannot be a complete measure of the benefits and costs of a program to a customer.
- **Utility (Program Administrator) Test**—The program administrator cost test measures the net costs of a demand-side management program as a resource option based on the costs incurred by the program administrator (including incentive costs) and excluding any net costs incurred by the participant. The benefits are similar to the TRC benefits. Costs are defined more narrowly.
- **Ratepayer Impact Measure Test**—The ratepayer impact measure (RIM) test measures what happens to customer bills or rates due to changes in utility revenues and operating costs caused by the program. Rates will go down if the change in revenues from the program is greater than the change in utility costs. Conversely, rates or bills will go up if revenues collected after program implementation are less than the total costs incurred by the utility in implementing the program. This test indicates the direction and magnitude of the expected change in customer bills or rate levels.

The key benefits and costs of the various cost-effectiveness tests are summarized in Table A-3.

³ These definitions are direct excerpts from the California Standard Practice Manual, October 2001.

Table A-3
Summary of Benefits and Costs of California Standard Practice Manual Tests

Test	Benefits	Costs
TRC Test	Generation, transmission and distribution savings Participants avoided equipment costs (fuel switching only)	Generation costs Program costs paid by the administrator Participant measure costs
Participant Test	Bill reductions Incentives Participants avoided equipment costs (fuel switching only)	Bill increases Participant measure costs
Utility (Program Administrator) Test	Generation, transmission and distribution savings	Generation costs Program costs paid by the administrator Incentives
Ratepayer Impact Measure Test	Generation, transmission and distribution savings Revenue gain	Generation costs Revenue loss Program costs paid by the administrator Incentives

Generation, transmission and distribution savings (hereafter, energy benefits) are defined as the economic value of the energy and demand savings stimulated by the interventions being assessed. These benefits are typically measured as induced changes in energy consumption, valued using some mix of avoided costs. Statewide values of avoided costs are prescribed for use in implementing the test. Electricity benefits are valued using three types of avoided electricity costs: avoided distribution costs, avoided transmission costs, and avoided electricity generation costs.

Participant costs are comprised primarily of incremental measure costs. Incremental measure costs are essentially the costs of obtaining EE. In the case of an add-on device (say, an adjustable-speed drive or ceiling insulation), the incremental cost is simply the installed cost of the measure itself. In the case of equipment that is available in various levels of efficiency (e.g., a central air conditioner), the incremental cost is the excess of the cost of the high-efficiency unit over the cost of the base (reference) unit.

Administrative costs encompass the real resource costs of program administration, including the costs of administrative personnel, program promotions, overhead, measurement and evaluation, and shareholder incentives. In this context, administrative costs are not defined to include the costs of various incentives (e.g., customer rebates and salesperson incentives) that may be offered to encourage certain types of behavior. The exclusion of these incentive costs reflects

the fact that they are essentially transfer payments. That is, from a societal perspective they involve offsetting costs (to the program administrator) and benefits (to the recipient).

A.1.2.2 Use of the Total Resource Cost to Estimate Economic Potential

We often use the TRC test in two ways in our model. First, we develop an estimate of economic potential by calculating the TRC of individual measures and applying the methodology described below. Second, we develop estimates of whether different program scenarios are cost effective.

Economic potential can be defined either inclusively or exclusively of the costs of programs that are designed to increase the adoption rate of EE measures. *In many of our projects, we define economic potential to **exclude** program costs.* We do so primarily because program costs are dependent on a number of factors that vary significantly as a function of program delivery strategy. There is no single estimate of program costs that would accurately represent such costs across the wide range of program types and funding levels possible. Once an assumption is made about program costs, one must also link those assumptions to expectations about market response to the types of interventions assumed. Because of this, we believe it is more appropriate to factor program costs into our analysis of *program potential*. Thus, our definition of *economic potential* is that portion of the technical potential that passes our economic screening test (described below) exclusive of program costs. Economic potential, like technical potential, is a theoretical quantity that will exceed the amount of potential we estimate to be achievable through current or more aggressive program activities.

As implied in Table A-3 and defined in the CASPM 2001, the TRC focuses on resource savings and counts benefits as utility-avoided supply costs and costs as participant costs and utility program costs. It ignores any impact on rates. It also treats financial incentives and rebates as transfer payments; i.e., the TRC is not affected by incentives. The somewhat simplified benefit and cost formulas for the TRC are presented in Equations A-1 and A-2 below.

Equation A-1

$$\text{Benefits} = \sum_{t=1}^N \frac{\text{Avoided Costs of Supply}_{p,t}}{(1+d)^{t-1}}$$

Equation A-2

$$\text{Costs} = \sum_{t=1}^N \frac{\text{Program Cost}_t + \text{Participant Cost}_t}{(1 + d)^{t-1}}$$

Where:

- d = the discount rate
- p = the costing period
- t = time (in years)
- n = 20 years

A nominal discount rate is typically used in the analysis, as inflation is taken into account separately. We use a *normalized* measure life of 20 years to capture the benefit of long-lived measures. Measures with measure lives shorter than 20 years are “re-installed” in our analysis as many times as necessary to reach the normalized 20-year life of the analysis.

The avoided costs of supply are calculated by multiplying measure energy savings and peak demand impacts by per-unit avoided costs by costing period. Energy savings are allocated to costing periods and peak impacts estimated using load shape factors.

As noted previously, in the *measure-level* TRC calculation used to estimate economic potential, program costs are excluded from Equation A-2. Using the supply curve methodology discussed previously, measures are ordered by TRC (highest to lowest) and then the *economic* potential is calculated by summing the energy savings for all of the technologies for which the marginal TRC test is greater than 1.0. In the example in Table A-4, the economic potential would include the savings for measures 1 and 2, but exclude saving for measure 3 because the TRC is less than 1.0 for measure 3. The supply curve methodology, when combined with estimates of the TRC for individual measures, produces estimates of the economic potential of efficiency improvements. By definition and intent, this estimate of economic potential is a theoretical quantity that will exceed the amount of potential we estimate to be achievable through program activities in the final steps of our analyses.

Table A-4
Sample Use of Supply Curve Framework to Estimate Economic Potential
(Note: Data are illustrative only)

Measure	Total End Use Consumption of Population (GWh)	Applicable, Not Complete and Feasible Sq.Feet (000s)	Average kWh/ft ² of population	Savings %	GWh Savings	Total Resource Cost Test	Savings Included in Economic Potential?
Base Case: T12 lamps with Magnetic Ballast	425	100,000	4.3	N/A	N/A	N/A	N/A
1. T8 w. Elec. Ballast	425	100,000	4.3	21%	89	2.5	Yes
2. Occupancy Sensors	336	40,000	3.4	10%	13	1.3	Yes
3. Perimeter Dimming	322	10,000	3.2	45%	14	0.8	No
Technical Potential with all measures				27%	116		
Economic Potential with measures for which TRC Ratio > 1.0				24%	102		

A.1.3 Estimation of Program and Naturally occurring Potentials

In this section we present the method we employ to estimate the fraction of the market that adopts each EE measure in the presence and absence of EE programs. We define:

- **Program potential** as the amount of savings that would occur in response to one or more specific market interventions
- **Naturally occurring potential** as the amount of savings estimated to occur as a result of normal market forces, that is, in the absence of any utility or governmental intervention.

Our estimates of program potential are typically the most important results of the modeling process. Estimating technical and economic potentials are necessary steps in the process from which important information can be obtained; however, the end goal of the process is better understanding how much of the remaining potential can be captured in programs, whether it would be cost-effective to increase program spending, and how program costs may be expected to change in response to measure adoption over time.

A.1.3.1 Adoption Method Overview

We use a method of estimating adoption of EE measures that applies equally to be our program and naturally occurring analyses. Whether as a result of natural market forces or aided by a program intervention, the rate at which measures are adopted is modeled in our method as a function of the following factors:

- The availability of the adoption opportunity as a function of capital equipment turnover rates and changes in building stock over time
- Customer awareness of the efficiency measure
- The cost-effectiveness of the efficiency measure
- Market barriers associated with the efficiency measure.

The method we employ is executed in the measure penetration module of KEMA's DSM ASSYST™ model.

In many of our projects, only measures that pass the measure-level TRC test are put into the penetration module for estimation of customer adoption.

A.1.3.2 Availability

A crucial part of the model is a stock accounting algorithm that handles capital turnover and stock decay over a period of up to 20 years. In the first step of our achievable potential method, we calculate the number of customers for whom each measure will apply. The input to this calculation is the total floor space available for the measure from the technical potential analysis, i.e., the total floor space multiplied by the applicability, not complete, and feasibility factors described previously. We call this the *eligible* stock. The stock algorithm keeps track of the amount of floor space available for each efficiency measure in each year based on the total eligible stock and whether the application is new construction, retrofit, or replace-on-burnout.⁴

Retrofit measures are available for implementation by the entire eligible stock. The eligible stock is reduced over time as a function of adoptions⁵ and building decay.⁶ Replace-on-burnout measures are available only on an annual basis, approximated as equal to the inverse of the service life.⁷ The annual portion of the eligible market that does not accept the replace-on-burnout measure does not have an opportunity again until the end of the service life.

⁴ Replace-on-burnout measures are defined as the efficiency opportunities that are available only when the base equipment turns over at the end of its service life. For example, a high-efficiency chiller measure is usually only considered at the end of the life of an existing chiller. By contrast, retrofit measures are defined to be constantly available, for example, application of a window film to existing glazing.

⁵ That is, each square foot that adopts the retrofit measure is removed from the eligible stock for retrofit in the subsequent year.

⁶ Buildings do not last forever. An input to the model is the rate of decay of the existing floor space. Floor space typically decays at a very slow rate.

⁷ For example, a base-case technology with a service life of 15 years is only available for replacement to a high-efficiency alternative each year at the rate of 1/15 times the total eligible stock. For example, the fraction of the market that does not adopt the high-efficiency measure in year t will not be available to adopt the efficient alternative again until year $t + 15$.

New construction applications are available for implementation in the first year. Those customers that do not accept the measure are given subsequent opportunities corresponding to whether the measure is a replacement or retrofit-type measure.

A.1.3.3 Awareness

In our modeling framework, customers cannot adopt an efficient measure merely because there is stock available for conversion. Before they can make the adoption choice, they must be aware and informed about the efficiency measure. Thus, in the second stage of the process, the model calculates the portion of the available market that is *informed*. An initial user-specified parameter sets the initial level of awareness for all measures. Incremental awareness occurs in the model as a function of the amount of money spent on awareness/information building and how well those information-building resources are directed to target markets. User-defined program characteristics determine how well information-building money is targeted. Well-targeted programs are those for which most of the money is spent informing only those customers that are in a position to implement a particular group of measures. Untargeted programs are those in which advertising cannot be well focused on the portion of the market that is available to implement particular measures. The penetration module in DSM ASSYST has a target effectiveness parameter that is used to adjust for differences in program advertising efficiency associated with alternative program types.

The model also controls for information retention. An information decay parameter in the model is used to control for the percentage of customers that will retain program information from one year to the next. Information retention is based on the characteristics of the target audience and the temporal effectiveness of the marketing techniques employed.

A.1.3.4 Adoption

The portion of the total market that is available and informed can now face the choice of whether or not to adopt a particular measure. Only those customers for whom a measure is available for implementation (stage 1) and, of those customers, only those who have been informed about the program/measure (stage 2), are in a position to make the implementation decision.

In the third stage of our penetration process, the model calculates the fraction of the market that adopts each efficiency measure as a function of the participant test. The participant test is a benefit-cost ratio that is generally calculated as follows:

Equation A-3

$$\text{Benefits} = \sum_{t=1}^N \frac{\text{Customer Bill Savings (\$)}_t}{(1+d)^{t-1}}$$

Equation A-4

$$\text{Costs} = \sum_{t=1}^N \frac{\text{Participant Costs (\$)}_t}{(1+d)^{t-1}}$$

Where:

- d = the discount rate
- t = time (in years)
- n = 20 years

We use a *normalized* measure life of 20 years in order to capture the benefits associated with long-lived measures. Measures with lives shorter than 20 years are “re-installed” in our analysis as many times as necessary to reach the normalized 20-year life of the analysis.

The bill reductions are calculated by multiplying measure energy savings and customer peak demand impacts by retail energy and demand rates.

The model uses measure implementation curves to estimate the percentage of the informed market that will accept each measure based on the participant’s benefit-cost ratio. The model provides enough flexibility so that each measure in each market segment can have a separate implementation rate curve. The functional form used for the implementation curves is:

$$y = \frac{a}{\left(1 + e^{-\frac{\ln x}{4}}\right) \times \left(1 + e^{-\ln(bx)}\right)}$$

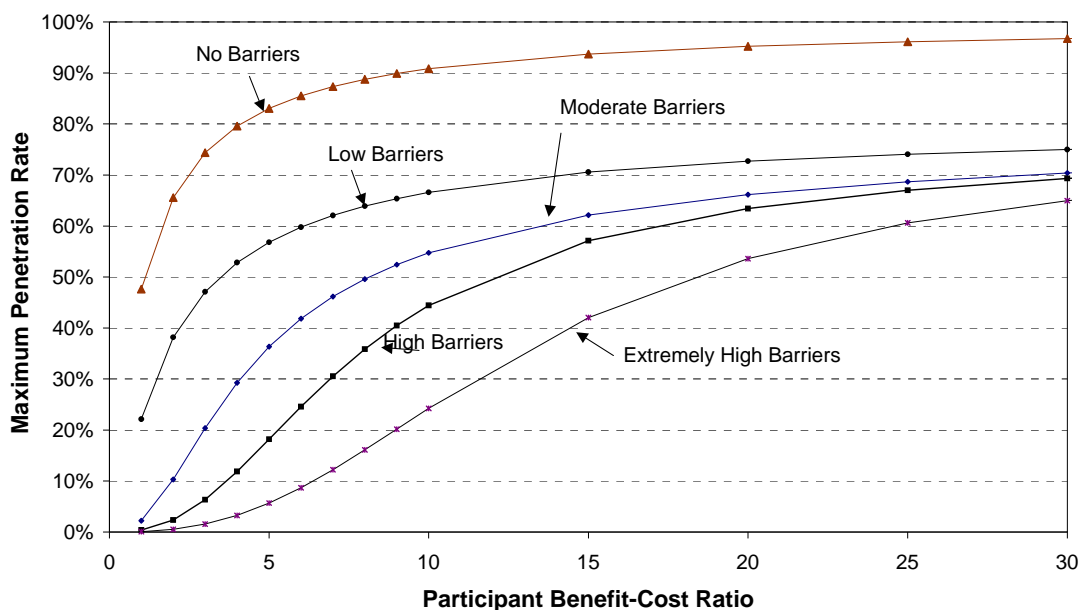
where:

- y = the fraction of the market that installs a measure in a given year from the pool of informed applicable customers;
- x = the customer’s benefit-cost ratio for the measure;
- a = the maximum annual acceptance rate for the technology;
- b = the inflection point of the curve. It is generally 1 over the benefit-cost ratio that

will give a value of 1/2 the maximum value; and
 $c =$ the parameter that determines the general shape (slope) of the curve.

The primary curves utilized in our model are shown in Figure A-3. These curves produce base year program results that are calibrated to actual measure implementation results associated with major IOU commercial efficiency programs over the past several years. Different curves are used to reflect different levels of market barriers for different efficiency measures. A list of market barriers is shown in Table A-5. It is the existence of these barriers that necessitates program interventions to increase the adoption of EE measures.

Figure A-3
Primary Measure Implementation Curves Used in Adoption Model



Note that for the moderate, high barrier, and extremely high curves, the participant benefit-cost ratios have to be very high before significant adoption occurs. This is because the participant benefit-cost ratios are based on a 15-percent discount rate. This discount rate reflects likely adoption if there were no market barriers or market failures, as reflected in the no-barriers curve

in the figure. Experience has shown, however, that actual adoption behavior correlates with implicit discount rates several times those that would be expected in a perfect market.⁸

⁸ For some, it is easier to consider adoption as a function of simple payback. However, the relationship between payback and the participant benefit-cost ratio varies depending on measure life and discount rate. For a long-lived measure of 15 years with a 15-percent discount rate, the equivalent payback at which half of the market would adopt a measure is roughly 6 months, based on the high barrier curve in Figure 2-3. At a 1-year payback, one-quarter of the market would adopt the measure. Adoption reaches near its maximum at a 3-month payback. The curves reflect the real-world observation that implicit discount rates can average up to 100 percent.

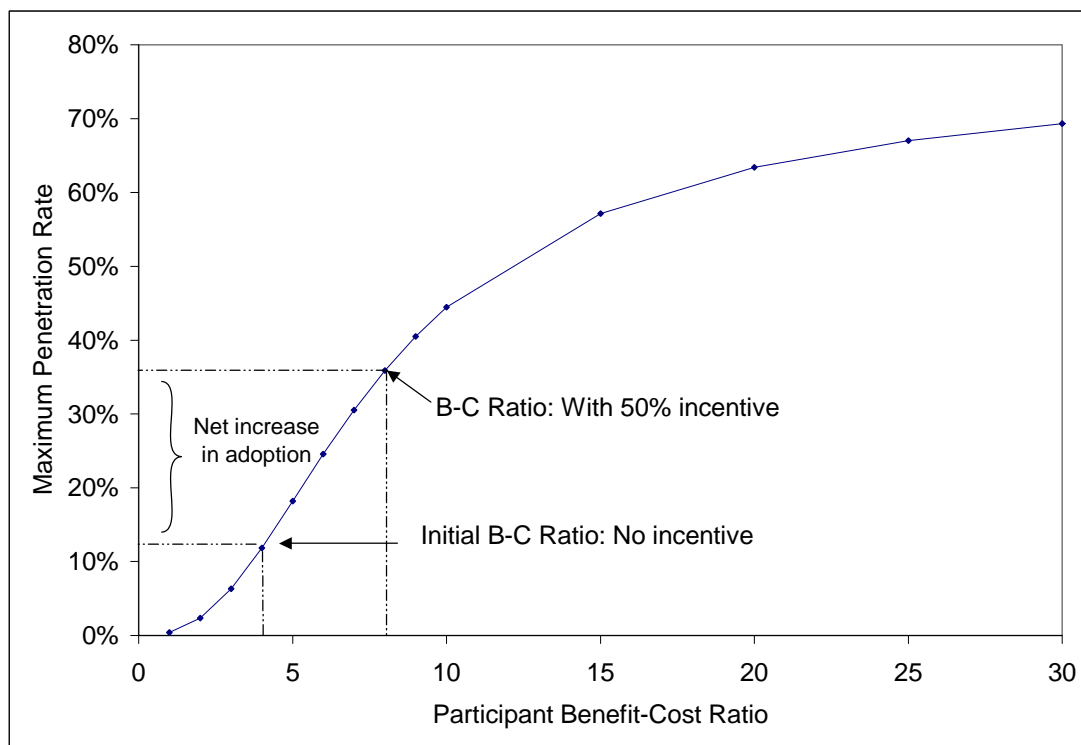
Table A-5
Summary Description of Market Barriers from Eto, Prah, Schlegel 1997

Barrier	Description
Information or Search Costs	The costs of identifying energy-efficient products or services or of learning about energy-efficient practices, including the value of time spent finding out about or locating a product or service or hiring someone else to do so.
Performance Uncertainties	The difficulties consumers face in evaluating claims about future benefits. Closely related to high search costs, in that acquiring the information needed to evaluate claims regarding future performance is rarely costless.
Asymmetric Information and Opportunism	The tendency of sellers of energy-efficient products or services to have more and better information about their offerings than do consumers, which, combined with potential incentives to mislead, can lead to sub-optimal purchasing behavior.
Hassle or Transaction Costs	The indirect costs of acquiring EE, including the time, materials and labor involved in obtaining or contracting for an energy-efficient product or service. (Distinct from search costs in that it refers to what happens once a product has been located.)
Hidden Costs	Unexpected costs associated with reliance on or operation of energy-efficient products or services - for example, extra operating and maintenance costs.
Access to Financing	The difficulties associated with the lending industry's historic inability to account for the unique features of loans for energy savings products (i.e., that future reductions in utility bills increase the borrower's ability to repay a loan) in underwriting procedures.
Bounded Rationality	The behavior of an individual during the decision-making process that either seems or actually is inconsistent with the individual's goals.
Organization Practices or Customs	Organizational behavior or systems of practice that discourage or inhibit cost-effective EE decisions, for example, procurement rules that make it difficult to act on EE decisions based on economic merit.
Misplaced or Split incentives	Cases in which the incentives of an agent charged with purchasing EE are not aligned with those of the persons who would benefit from the purchase.
Product or Service Unavailability	The failure of manufacturers, distributors or vendors to make a product or service available in a given area or market. May result from collusion, bounded rationality, or supply constraints.
Externalities	Costs that are associated with transactions, but which are not reflected in the price paid in the transaction.
Non-externality Pricing	Factors other than externalities that move prices away from marginal cost. An example arises when utility commodity prices are set using ratemaking practices based on average (rather than marginal) costs.
Inseparability of Product Features	The difficulties consumers sometimes face in acquiring desirable EE features in products without also acquiring (and paying for) additional undesired features that increase the total cost of the product beyond what the consumer is willing to pay.
Irreversibility	The difficulty of reversing a purchase decision in light of new information that may become available, which may deter the initial purchase, for example, if energy prices decline, one cannot resell insulation that has been blown into a wall.

The model estimates adoption under both naturally occurring and program intervention situations. There are only two differences between the naturally occurring and program

analyses. First, in any program intervention case in which measure incentives are provided, the participant benefit-cost ratios are adjusted based on the incentives. Thus, if an incentive that pays 50 percent of the incremental measure cost is applied in the program analysis, the participant benefit-cost ratio for that measure will double (since the costs have been halved). The effect on the amount of adoption estimated will depend on where the pre- and post-incentive benefit-cost ratios fall on the curve. This effect is illustrated in Figure A-4.

Figure A-4
Illustration of Effect of Incentives on Adoption Level
as Characterized in Implementation Curves



In many of our projects achievable potential EE forecasts are developed for several scenarios, ranging from base levels of program intervention, through moderate levels, up to an aggressive EE acquisition scenario. Uncertainty in rates and avoided costs are often characterized in alternate scenarios. The final results produced are annual streams of achievable program impacts (energy and demand by time-of-use period) and all societal and participant costs (program costs plus end-user costs).

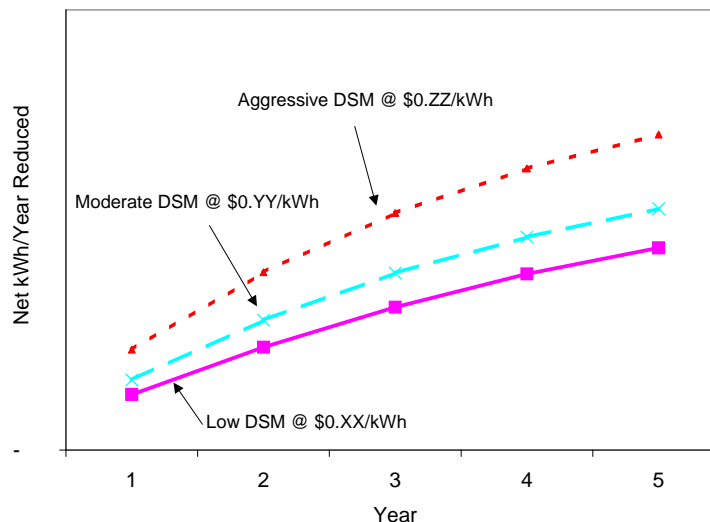
A.1.4 Scenario Analyses

Achievable potential forecasts can be developed for multiple scenarios. For example, program savings can be modeled under low levels of program intervention, through moderate levels, up to an aggressive DSM acquisition scenario. Uncertainty in rates and avoided costs can be characterized in alternate scenarios as well. The final results produced will be annual streams of achievable DSM program impacts (energy and demand by time-of-use period) and all societal and participant costs. An example of the types of outputs that have been produced for similar studies in the past is shown in Table A-6 and Figure A-5.

Table A-6
Example Format of DSM ASSYST Achievable Potential Outputs

DSM ASSYST Program Output	2006	2007	2008	etc.
Annual Energy Savings (kWh)				
Summer Period Energy Savings (kWh)				
Non Summer Period Energy Savings (kWh)				
Net Annual Energy Savings (kWh)				
Summer Period Net Energy Savings (kWh)				
Non Summer Period Net Energy Savings (kWh)				
Peak Demand Savings (kW)				
Net Peak Demand Savings (kW)				
Annual Program Costs				
Supplemental Customer Costs				

Figure A-5
Example of DSM Scenario Outputs



A.1.5 Measure “Bundles” for Complex End Uses

Although potential can be estimated through measure-specific analyses for many sectors and end uses, there are some cases where the measure-specific approach becomes problematic because of the complexity or heterogeneity of the base-case energy systems being addressed. Two key examples are industrial processes and some aspects of residential and commercial new construction.

In the industrial case, there may be dozens or even hundreds of individual measures that can be applied to industrial processes throughout the population of industrial facilities in a service territory; however, analyzing each of these opportunities, though possible, is impractical within a resource and time-constrained study such as this one.

In the case of new construction, the problem is sometimes that an equipment substitution paradigm does not fit the real-world circumstances in which efficiency levels are improved. For example, in commercial lighting, virtually all new buildings tend to have electronic ballasts and T-8 lamps, as well as CFLs, and other high-efficiency components. These high-efficiency components are generally needed to meet Title 24 efficiency requirements; however, the overall lighting system efficiency can often be increased by using these same components in smarter designs configurations or by combining with other features such as daylighting.

For both of these situations, our approach on recent related work has been to bundle multiple individual efficiency measures into somewhat simplified efficiency levels. For example, lighting levels for commercial new construction might be set at 10- and 20-percent improvement over Title 24 standards (as they are often specified in the Savings by Design program planning documents). Similarly, for industrial compressed air systems, we have bundled savings opportunities into three levels where both savings and costs increase with each level. We then estimate an incremental cost for achieving each of the efficiency levels. An example of these results developed in a recent study for industrial motors, compressed air, and processes in California is shown in Table A-7.

Once the levels efficiency are specified in terms of costs and savings, they are run through the modeling system as if they were individual measures. Thus, cost-effectiveness indicators are calculated for each level, those that pass the TRC are included in the achievable potential forecasting, and adoption is modeled using the same process as described above. Although we recommend using this approach for complex end uses in the proposed study because it creates a manageable forecasting process, care must be taken in developing the levels and recognizing that this approach results in some aggregation bias.

A.2 DSM ASSYST™ Model Description

DSM ASSYST™ (Demand-Side Management Technology Assessment System) is a tool developed to assess the technical, economic and market potential of DSM technologies in the residential, commercial and industrial sectors. Based on user-specified information about base technologies, conservation technologies, load shapes, utility avoided costs, utility service rates, and economic parameters, DSM ASSYST yields numeric data for a variety of criteria. The user can then evaluate and compare technologies. DSM ASSYST allows the user to analyze each DSM technology in multiple combinations of building types, market segments, end uses, and vintages both individually and compared to other DSM technology options.

Table A-7

Example of Industrial Efficiency Levels Developed for a Recent California Potential Study

DSM ASSYST ADDITIVE SUPPLY ANALYSIS			Year				
Vintage: Existing			2011				
Sector: Industrial Scenario: Base							
End Use	Measure Number	Measure	GWH Savings	MW Savings	Levelized Cost per KWh Saved \$/kWh	Levelized Cost per KW Saved \$/kW	Total Resource Cost Test TRC
Motors	101	Replace 1-5 HP Motor	248.7	34.1	\$0.10	\$698	0.8
Motors	102	Add 1-5 HP VSD	447.1	61.3	\$0.14	\$1,019	0.6
Motors	103	Motor Practices Level 1	607.0	83.2	\$0.06	\$440	1.3
Motors	104	Motor Practices Level 2	539.1	73.9	\$0.24	\$1,764	0.3
Motors	121	Replace 21-50 HP Motor	78.1	10.7	\$0.09	\$661	0.9
Motors	122	Add 21-50 HP VSD	319.0	43.7	\$0.04	\$278	2.1
Motors	123	Motor Practices Level 1	404.3	55.4	\$0.03	\$211	2.7
Motors	124	Motor Practices Level 2	361.9	49.6	\$0.12	\$840	0.7
Motors	151	Replace 201-500 HP Motor	143.5	19.7	\$0.03	\$201	2.8
Motors	152	Add 201-500 HP VSD	516.6	70.8	\$0.01	\$106	5.4
Motors	153	Motor Practices Level 1	598.6	82.0	\$0.02	\$152	3.7
Motors	154	Motor Practices Level 2	554.9	76.0	\$0.08	\$586	1.0
Compressed Air	202	CAS Level 1	433.9	59.5	\$0.02	\$168	3.4
Compressed Air	203	CAS Level 2	453.6	62.2	\$0.05	\$362	1.6
Compressed Air	204	CAS Level 3	325.5	44.6	\$0.13	\$936	0.6
Other Process	301	Process Level 1	1,031.8	141.4	\$0.03	\$190	3.0
Other Process	302	Process Level 2	1,219.7	167.1	\$0.05	\$345	1.7
Other Process	303	Process Level 3	767.3	105.1	\$0.25	\$1,831	0.3

The current version of DSM ASSYST uses a combination of Microsoft Excel spreadsheets and Visual Basic (VB) programming software. All input and output data are stored in spreadsheets. The VB modules read input data from various spreadsheets, perform the various analyses, and store output results into spreadsheets.

There are three major VB analysis modules: Basic, Supply, and Penetration. Figure A-6 provides an overview of the model process and key inputs. Each module is briefly described below.

A.2.1 Basic Module

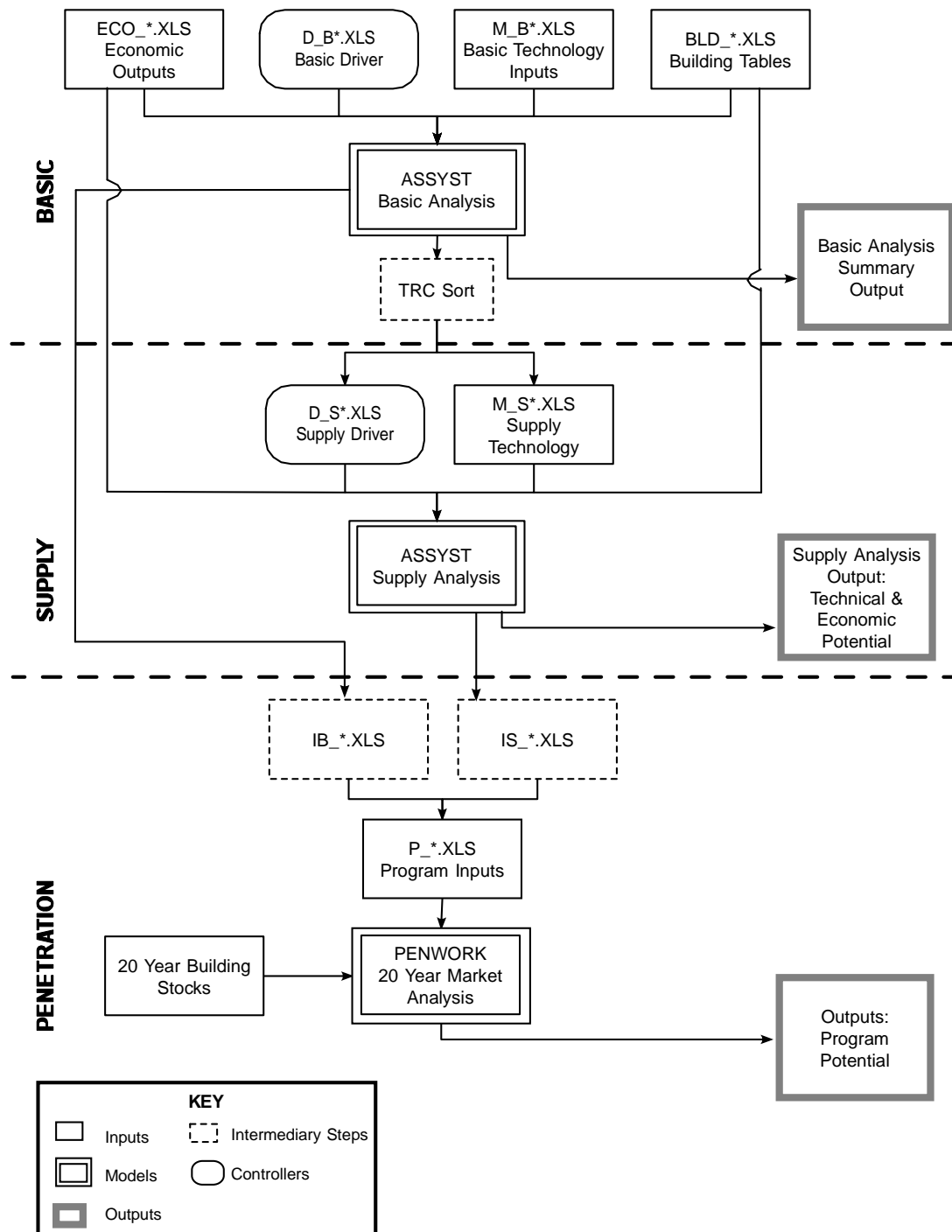
In the Basic module, each technology is assessed individually by comparing it to a base case. Comparisons are made at a high degree of segmentation. The segmentation may include, but is not limited to sector, building type, end use, vintage and geographic area.

The Basic module reads four types of information, contained within four spreadsheet files. These files include:

- **Economic:** containing utility rates paid by customers, discount rates, avoided costs, and other utility-specific economic parameters
- **Building:** containing square footage or number of households and load shape data
- **Measure:** containing technology based inputs for the Basic Analysis

- **Driver:** containing information that drives the analysis process.

Figure A-6
DSM ASSYST Analytic Flow



The output files produced by the Basic module include a Summary Basic Output file that contains an assessment of how much energy and demand each technology will save relative to the base case within each segment. In addition, the summary contains cost data, savings fractions, before and after EUIs or UECs, service life, the levelized costs of implementing the technology, and results of economic tests including the TRC test, participant test, and customer payback.

This module also produces a second file that contains all the measures that were assessed in the Basic Analysis sorted in the highest to lowest TRC order within each market segment and end use. This file serves as an input file for the Supply module.

A.2.2 Supply Module

In the Supply Module each technology, within each market segment, is stacked, or implemented, such that all energy savings are realized from preceding technologies prior to the implementation of all subsequent technologies. The stacking order generally follows the TRC sort order, highest to lowest, resulting from the Basic module.

The Supply module requires two input files: a Driver file and a modified output file from the Basic module. As in the Basic module, the Driver file contains instructions for the analysis process. The output file from the basic analysis must be modified in Excel to address overlapping measures, such as different SEER levels or measures that are direct substitutes for each other.

Output from the Supply module contains the technical and economic potential plus energy and demand supply curves. The Supply module produces measure-level information that can be incorporated into the input file for the Penetration module.

A.2.3 Penetration Module

The Penetration (or Program Potential) module of ASSYST is designed to calculate the costs and net energy and demand savings from DSM programs under a variety of marketing scenarios. This module estimates the net impact and cost of a program over time by forecasting the naturally occurring penetration of each measure as well as the penetration of each measure given the program activities (i.e., incentives and awareness building).

Using a stock accounting algorithm over a period of 20 years, this module first calculates the number of customers for whom the measure will apply. Second, the model calculates the number of informed customers based on the amount of money spent on advertising. Third, the

model calculates the number of customers who will implement the technology based on their benefit/cost ratio. Finally, the model compares the number of customers that implement the technology due to the program with those who would take the technology anyway (naturally occurring). Per-unit energy and demand savings are applied to the net number of customers (total minus naturally occurring) over the 20-year period. After completing the analysis, the results are automatically summed across measures to provide program-level costs and savings for 20 years, and formatted for input into Integrated Resource Planning models.

A program input file is used to define a program and provide the building stock forecast. The program characterization variables include:

- Incentive Levels
- Incentive Budget Constraints
- Yearly Incentive Adjuster
- Technology Acceptance Curve Parameters
- Administration Budgets
- Advertising Budgets
- Awareness Decay Rate
- Target Effectiveness
- Advertising Effective Ratio.

B. Appendix B: Measure Descriptions

This appendix describes the energy efficiency measures used in the study.

B.1 Residential Measures

This subsection provides brief descriptions of the residential electric measures included in this study. Measures are grouped by end use.

B.1.1 HVAC Equipment

Central air conditioner upgrade: Air conditioner equipment includes a compressor, an air-cooled or evaporatively-cooled condenser (located outdoors), an expansion valve, and an evaporator coil (located in the supply air duct near the supply fan). Cooling efficiencies vary based on the quality of the materials used, the size of equipment, the condenser type, and the configuration of the system. Central air conditioners may be of the unitary variety (all components housed in a factory-built assembly) or be a split system (an outdoor condenser section and an indoor evaporator section connected by refrigerant lines and with the compressor at either the outdoor or indoor location). Efficient air conditioner measures involve the upgrade of a standard efficiency unit (13 SEER) to a higher efficiency unit (15 SEER or higher), assuming quality installation.

Central air conditioner early replacement: For this measure we assume replacement of an older central air conditioner (11 SEER) with a new high-efficiency unit (15 SEER). Energy savings are diminished to account for the fact that a fraction of the associated energy savings would have been realized at the end of the older unit's useful life, when a minimum EER unit would have been purchased as a replacement.

Air Source Heat Pump (for space heating): Heat pumps consist of a refrigeration system using a direct expansion cycle. Equipment includes a compressor, an air-cooled or evaporatively-cooled condenser (located outdoors), an expansion valve, an evaporator coil (located in the supply air duct near the supply fan) and a reversing valve to change the DX cycle from cooling to heating when required. The cooling and heating efficiencies vary based on the quality of the materials used, the size of equipment, the condenser type and the configuration of the system. Heat pumps may be of the unitary variety (all components housed in a factory-built assembly) or be a split system (an outdoor condenser section and an indoor evaporator section connected by refrigerant lines and with the compressor at either the outdoor or indoor location).

We assume the replacement of a 13 SEER, 7.7 HSPF heat pump with a 15 SEER, 8.2 HSPF unit.

AC maintenance: The efficiency of a central air conditioner can be reduced if the unit is not properly maintained. This group of measures includes both indoor and outdoor coil cleaning, as well as other standard efficiency practices such as filter replacement.

Proper refrigerant charging and air flow: This measure involves diagnostic and repair services for existing central air conditioners to improve their efficiency. Inspection and services of AC systems involves checking the refrigerant level, cleaning the coils, cleaning the blower, cleaning or replacing filters, and making sure air is flowing properly through the system.

High efficiency room air conditioner: Window (or wall) mounted room air conditioners are designed to cool individual rooms or spaces. This type of unit incorporates a complete air-cooled refrigeration and air-handling system in an individual package. Cooled air is discharged in response to thermostatic control to meet room requirements. Each unit has a self-contained, air-cooled direct expansion (DX) cooling system and associated controls. Room air conditioners are rated by energy efficiency ratio (EER), which is cooling output divided by power consumption. The efficient room air conditioner measure involves the upgrade of a standard efficiency unit (9 EER) to a higher efficiency unit (EER 10.8 or 11.3).

Ductless split heat pump: Ductless, mini-split-system heat pumps (mini splits) are appropriate retrofits for homes with non-ducted heating systems, such as boilers. Like standard air-source heat pumps, mini splits have an outdoor compressor/condenser and an indoor air-handling unit. The small size and lack of ducts makes these units a flexible choice for heating and cooling individual rooms. Models can have as many as four indoor air handling units connected to one outdoor unit.

Room air conditioner early replacement: For this measure we assume replacement of an older room air conditioner (EER 8.5) with a new high-efficiency unit (EER 11.3). Energy savings are diminished to account for the fact that a fraction of the associated energy savings would have been realized at the end of the older unit's useful life, when a minimum EER unit would have been purchased as a replacement.

High-efficiency dehumidifier: ENERGY STAR® qualified dehumidifiers use less energy to remove moisture from the air on account of more efficient refrigeration coils, fans, and compressors. Savings are compared to a unit meeting the minimum federal standard.

Ceiling fans: ENERGY STAR® Ceiling Fans save energy through improved motors and blade designs. Ceiling fans save energy from space conditioning in the summer by creating a wind chill, and during the winter by distributing hot air evenly throughout the room.

Proper sizing and quality install: Most HVAC systems are typically over-sized by contractors for a variety of reasons: as a precaution against peak day temperatures or future problems from duct leaks, improper flow across the coils, and improper charge, or because they replace older systems with the same size (or larger) unit – even though the house may have been made more energy efficient since it was originally constructed (through home improvements, window replacements, insulation, caulking, and so on). Oversized air conditioners will be more expensive and tend to cycle, rather than run continuously, during both typical and peak cooling periods. This more frequent cycling reduces overall operating efficiency and also results in more variable indoor humidity levels. This measure assumes the contractor performs an Air Conditioning Contractors of America (ACCA) Manual J calculation to size the HVAC system and an ACCA Manual D calculation to size the ducts. These calculations take into account climate, house and site characteristics and orientation, air exchange rates, occupancy, and heat-emitting appliances. Since our central air conditioner upgrade measure includes quality installation, this measure applies only to the installation of standard efficiency equipment.

Programmable thermostat: ENERGY STAR® programmable thermostats come pre-programmed with settings intended to deliver energy savings without sacrificing comfort. The settings vary for the cooling and heating months, with specific temperature ranges and setback points for the morning, daytime, evening, and night. Programmable thermostat settings may also be changed to reflect individual schedules and preferences.

B.1.2 Building Envelope

Duct repair: An ideal duct system would be free of leaks, especially when the ducts are outside the conditioned space. Leakage in unsealed ducts varies considerably with the fabricating machinery used, the methods for assembly, installation workmanship, and age of the ductwork. To seal ducts, a wide variety of sealing methods and products exist. Care should be taken to tape or otherwise seal all joints to minimize leakage in all duct systems and the sealing material should have a projected life of 20 to 30 years. Current duct sealing methods include use of computer-controlled aerosol and pre- and post-sealing duct pressurization testing.

Duct insulation: Insulation material inhibits the transfer of heat through the air-supply duct. Several types of ducts and duct insulation are available, including flexible duct, pre-insulated flexible duct, duct board, duct wrap, tacked or glued rigid insulation, and water proof hard shell

materials for exterior ducts. Duct insulation for existing construction involves wrapping un-insulated ducts with an R-4 insulating material.

Sealed attic w/sprayed foam insulated roof deck: By applying expanding sprayed foam insulation directly to the underside of the roof down to the soffit areas and gable end walls, this measure seals the entire attic space and significantly reduces heat gain from the exterior roof. This effectively brings the duct system into the conditioned space of the house, resulting in reduced attic temperatures and reduced radiative losses in the duct system, as well as reduced humidity and infiltration.

ENERGY STAR® windows: Windows which meet the ENERGY STAR® requirements have U-value and solar heat gain coefficients (SHGC) specified by climate zone, and are certified by the National Fenestration Rating Council (NFRC). These are modeled as a replace on burnout measure, so the costs are not the full cost of the window and installation, but rather the cost compared to installing a new non-ENERGY STAR® window.

Comprehensive shell air sealing - infiltration reduction: Professional installation of weather stripping, caulking, and expanding foam insulation aided by a blower door test. These measures reduce energy consumption by improving the tightness of the building shell and limiting heat gain and loss.

Self-install weatherization: Installation of weather stripping, caulking, and expanding foam insulation from a spray can to fix easily found leaks and reduce air infiltration, completed by the homeowner.

Ceiling and floor insulation: Thermal insulation is material or combinations of materials that are used to inhibit the flow of heat energy by conductive, convective, and radiative transfer modes. By inhibiting the flow of heat energy, thermal insulation can conserve energy by reducing heat loss or gain of a structure. An important characteristic of insulating materials is the thermal resistivity, or R-value. The R-value of a material is the reciprocal of the time rate of heat flow through a unit of this material in a direction perpendicular to two areas of different temperatures.

Basement insulation: Basement walls are typically insulated by constructing a stud wall inside the house foundation, and insulating it as any interior wall. This increases the cost of basement insulation compared to crawlspace insulation (in addition to the taller wall height to be insulated). The cost-effectiveness of basement insulation depends on whether the basement will be conditioned. Basement insulation includes rim joist insulation.

Wall insulation: For existing construction, this measure involves adding R-13 insulation to un-insulated walls. This is usually accomplished by drilling holes into the building's siding or interior walls and blowing in insulation material.

B.1.3 Lighting

Compact fluorescent lighting (CFLs): Compact fluorescent lamps are designed to replace standard incandescent lamps. They are approximately four times more efficient than incandescent light sources. Screw-in modular lamps have reusable ballasts that typically last the life of four lamps. This study takes into account recently enacted Federal standards under the Energy Policy and Conservation Act. The standards mandate an increase in efficiency of approximately 30% for the majority of residential incandescent light bulbs using a phased approach, beginning with 100 watt bulbs in 2012 and ending with 40 watt bulbs in 2014. It was that this would result in a shift to a high efficiency incandescent lamps baseline for the specified bulb types.

LED general purpose lighting: A light emitting diode (LED) is a solid state lighting (SSL) technology that produces light by passing electrons through a semiconductor material, which is mounted on a heat sink and encased in a lens. Each LED is 7 mm to 9 mm on a side, and typically mounted in arrays on a circuit board, which is in turn mounted on another heat sink and encased in a fixture or bulb. This technology is revolutionizing the field in terms of light quality, energy efficiency, and design. However, poor manufacturing has led to a range of problems in early products, notably color degradation and prematurely dimmed diodes from under-performing heat sinks, and "burnt out" diodes from faulty circuit boards. ENERGY STAR® provides rigorous standards to certify quality LED lighting fixtures, which are commercially available and currently rebated in numerous energy efficiency programs, and has recently completed an LED bulb specification around which products are being rapidly developed. LED general purpose lighting is applied as a measure to both high efficiency incandescent lighting and to base CFLs.

Super T-8 lamps with electronic ballasts: T-8 lamps are a smaller diameter fluorescent lamp than T-12 lamps. When paired with specially designed electronic ballasts, T-8 lamps provide more lumens per watt, resulting in energy savings. Electronic ballasts replace the standard core and coil technology in magnetic ballasts with solid-state components. This technology allows for more consistent control over ballast output and converts power to higher frequencies, causing the fluorescent lamps to operate more efficiently. For existing first generation T-8 systems, this measure is specified as an upgrade to efficiency levels associated with optimal Super T-8 lamp-ballast combinations on a replace-on-burnout basis.

Photocell/time clock (outdoor lighting): Photocells automatically turn off lights when the sensor detects enough ambient light. Used on outdoor fixtures, photocells ensure that the lamp is turned off during daylight hours. Photocells can be combined with other lighting controls, such as motion sensors or time clocks. Time clocks are devices that can be programmed to turn lights on and off according to a set schedule.

B.1.4 Water Heat

Heat pump water heater: Air-to-water heat pump water heaters extract low-grade heat from the air then transfer this heat to the water by means of an immersion coil. This is the most commonly utilized residential heat pump water heater. The air-to-water heat pump unit includes a compressor, air-to-refrigerant evaporator coil, evaporator fan, water circulating pump, refrigerant-to-water condenser coil, expansion valve, and controls. Residential heat pump water heaters replace base electric units with the same tank capacities.

Early replacement water heater to heat pump water heater: For this measure we assume replacement of an older water heater with a heat pump water heater as a retrofit measure. Energy savings are diminished to account for the fact that a fraction of the associated energy savings would have been realized at the end of the older unit's useful life, when a new unit meeting current standards would have been purchased.

High efficiency water heater: Higher efficiency water heaters have greater insulation to reduce standby heat loss.

Solar water heater: Heat transfer technology that uses the sun's energy to warm water. Solar water heaters preheat water supplied to a conventional domestic hot water heating system. The energy savings for the system depend on solar radiation, air temperatures, water temperatures at the site, and the hot water use pattern.

Tankless water heater: Also known as "instant" or "on-demand" water heaters, tankless units function only when a hot water faucet is turned on. There is no energy required to maintain the temperature of the water in a tank, eliminating standby losses.

Low-flow showerhead: Many households are still equipped with showerheads using 3+ gallons per minute. Low flow showerheads can significantly reduce water heating energy for a nominal cost. Typical low-flow showerheads use 1.0-2.5 gallons per minute compared to conventional flow rate of 3.5-6.0 gallons per minute. The reduction in shower water use can

substantially lower water heating energy use since showering accounts for about one-fourth of total domestic hot water energy use.

Pipe wrap: Thermal insulation is material or combinations of materials that are used to inhibit the flow of heat energy by conductive, convective, and radiative transfer modes. By inhibiting the flow of heat energy, thermal insulation can conserve energy by reducing heat loss or gain.

Faucet aerators: Water faucet aerators are threaded screens that attach to existing faucets. They reduce the volume of water coming out of faucets while introducing air into the water stream. A standard non-conserving faucet aerator has a typical flow rate of 3-5 gallons per minute. A water-saving aerator can reduce the flow to 1-2 gallons per minute. The reduction in the flow rate will lower hot water use and save energy (kitchen and bathroom sinks utilize approximately 7 percent of total domestic hot water energy use).

B.1.5 Appliances

High efficiency refrigerator: We model both an ENERGY STAR® and a CEE Tier 2 refrigerator. ENERGY STAR® refrigerators must exceed the stringent July 1, 2001 minimum federal standards for refrigerator energy consumption by at least 10%. As specified for this study, the average efficiency improvement is 20% for ENERGY STAR® and 25% for CEE Tier II. An energy efficient refrigerator/freezer is designed by improving the various components of the cabinet and refrigeration system. These component improvements include cabinet insulation, compressor efficiency, evaporator fan efficiency, defrost controls, mullion heaters, oversized condenser coils, and improved door seals.

Early replacement refrigerator: We model an ENERGY STAR® refrigerator as an early replacement measure. Energy savings are diminished to account for the fact that a fraction of the associated energy savings would have been realized at the end of the older unit's useful life, when a minimum efficiency unit would have been purchased as a replacement.

Refrigerator/freezer recycling: For this measure we assume replacement of an older refrigerator (10 years old or more) with a new standard-efficiency refrigerator. The early replacement assumes that the same new refrigerator would have been bought, only six years later. Savings for this measure result for six years because the newer refrigerators, given the stringent efficiency standards implemented in 2001, use much less energy than older units.

High efficiency freezer: Stand-alone freezers include either upright or chest models. Efficient freezers should exceed standard efficiencies by 10 percent or more. As specified for this study, the average efficiency improvement is 15 percent.

Early replacement freezer: We also model an ENERGY STAR® freezer as an early replacement measure. Energy savings are diminished to account for the fact that a fraction of the associated energy savings would have been realized at the end of the older unit's useful life, when a minimum efficiency unit would have been purchased as a replacement.

ENERGY STAR® dishwasher: ENERGY STAR® labeled dishwashers save by using both improved technology for the primary wash cycle, and by using less hot water to clean. They include more effective washing action, energy efficient motors and other advanced technology such as sensors that determine the length of the wash cycle and the temperature of the water necessary to clean the dishes.

High efficiency clothes washer: A standard clothes washer uses various temperatures, water levels, and cycle durations to wash clothes depending on the clothing type and size of the laundry load. A high-efficiency vertical-axis clothes washer, which eliminates the warm rinse option and utilizes a spray technology to rinse clothes, can significantly reduce washer-related energy. Such machines also utilize a spin cycle that eliminates more water from the clothes than conventional clothes washers and are generally driven by more efficient motors. A horizontal axis clothes washer utilizes a cylinder that rotates horizontally to wash, rinse, and spin the clothes. These types of washing machines can be top loading or front loading, and utilize significantly less water (hot and cold) than the standard vertical axis machines. A vertical axis machine generally fills the tub until all of the clothes are immersed in water. In contrast, the horizontal axis machine only requires about one third of the tub to be full, since the rotation of the drum around its axis forces the clothes into the water and thus can drastically reduce the total energy use for washing. These machines are also easier on clothes and use less detergent. We consider two levels of clothes washer efficiency: an ENERGY STAR® clothes washer and a CEE Tier 3 clothes washer.

High efficiency clothes dryer: High efficiency clothes dryers incorporate moisture sensors and prevent the frequency and magnitude of over-drying compared to clothes dryers without moisture sensors. The Federal minimum Energy Factor (pounds of clothing per kilowatt hour) is 3.01, and does not vary widely between models currently on the market.

Heat pump clothes dryer: These clothes dryers are sometimes referred to as “ventless” dryers because the warm, moist process air is passed in a closed-loop cycle from the tumbler through

a heat pump. The refrigerant first takes energy out of the process air sufficient to cool it to the ambient dew point in order to condense any water vapor, which is then drained. Then the cycle transfers heat back into the dehumidified process air, which is passed into the clothes tumbler, and the cycle repeats.

B.1.6 Home Electronics

ENERGY STAR® home electronics (televisions, set-top boxes, DVD players, laptop and desktop computers): ENERGY STAR® qualified home electronics have off-mode power draws of 1 watt or less. Some home electronic devices spend the vast majority of their time in off-mode but often continue to draw a small “trickle charge” to maintain clock or other memory functions. Reductions in off-mode power draws can thus produce significant reductions in total energy consumption without changing on-mode power consumption characteristics. In addition, some products, such as TVs and computers, have active mode power requirements. Savings from ENERGY STAR® home electronics considered in this study were estimated based data from the Environmental Protection Agency.

Smart power strip: These power strips use a variety of controls to reduce standby power consumption of home electronics, including timers, occupancy sensors, and secondary outlets which automatically turn off in tandem with a pre-specified outlet.

B.1.7 Whole House Measures

Behavioral conservation: Indirect feedback approaches utilize energy information report mailers that motivate customers to use less, while direct feedback interventions use in-home energy-use monitors.

Residential new construction: Austin Energy’s Green Buildings Program required additional savings for new construction beyond Austin’s already stringent code. Recent and anticipated changes to the building code have captured most of the cost-effective heating and cooling savings. The costs and savings for this measure are come primarily from improvements to appliances.

B.1.8 Other End Uses

ENERGY STAR® ventilating fans: These fans use improved blade design and high performance motors to significantly increase efficiency while decreasing noise. If the fan has a light source, it must be fluorescent or LED.

Variable-speed pool pump: This measure saves energy much in the same way as two-speed pool pumps, with the exception that variable-speed pumps are able to further optimize pump operation and pool water flows to match the specific needs and requirements of individual owners.

Plug Load Controls/Smart Power Strip: Most consumer electronics and office equipment devices use some electricity even when turned off. This electricity may be used to power remote control receivers, indicator lights, volatile memory, or networking features. Although the power draw from any one device is small there are many such devices in a typical home. For example, a home theater system can comprise five or more components with such standby losses, adding up to 10 watts or more of continuous power draw, even when the devices are turned off. Smart power strips cut power to these devices entirely when not in use, eliminating standby losses. One approach used by such devices is to have primary and subsidiary outlets, with the subsidiary outlets being powered only when the device plugged into the primary outlet is turned on. For example, a computer might be plugged into the primary outlet, and the monitor, speakers and printer would be plugged into subsidiary outlets.

B.2 Commercial Measures

This subsection provides brief descriptions of the commercial measures included in this study.

B.2.1 Lighting

Super T-8 lamps with electronic ballast: T-8 lamps are a smaller diameter fluorescent lamp than T-12 lamps. When paired with specially designed electronic ballasts, T-8 lamps provide more lumens per watt, resulting in energy savings. Electronic ballasts replace the standard core and coil technology in magnetic ballasts with solid-state components. This technology allows for more consistent control over ballast output and converts power to higher frequencies, causing the fluorescent lamps to operate more efficiently. For existing first generation T-8 systems, this measure is specified as an upgrade to efficiency levels associated with optimal Super T-8 lamp-ballast combinations on a replace-on-burnout basis. Due to federal lighting standards that will phase out T12 lamps, the base measure for super T-8 lamps is a standard T-8 lamp.

T-5 high-output lighting with electronic ballast: Like T8 lamps, straight tube T5 lamps are available in nominal 2', 3', 4', and 5' lengths. Standard T-5 lamps have light output and efficiency comparable to T-8/electronic ballast systems. High output T-5 lamps have considerably higher light output: a 1-lamp high output T-5 cross-section can replace a 2-lamp T-8 cross-section. The 5/8" bulb diameter of the T-5 lamp lends itself to low profile luminaires well-suited for cove

lighting and display case lighting. Its smaller scale allows for sleeker fluorescent indirect and direct/indirect pendants and shallower profile recessed troffer type luminaires. Because of variances in actual lamp lengths and a different socket design, the T-5 lamp cannot easily be retrofitted in existing T-12 and T-8 luminaires. Consequently, use the T-5 lamp to its best advantage in specially designed luminaires.

Induction lamps: The primary difference between induction lighting and conventional fluorescent lamps is that induction lighting does not have an electrical connection going inside the glass bulb (electrodeless). Instead, energy is transferred wirelessly into the glass envelope via electromagnetic induction. Induction lamps typically take the place of HID lamps. Their advantage is both long life and quick start, which unlike HID lamps, allows them to be turned off and on with the demand. Although induction lamps have a longer service life than other lamp technology they are also more expensive. They are most often used in places where the lamps are difficult to reach and replace. Induction lamps have very long lifetimes (100,000 hours), excellent color rendering, and perform well in a wide temperature range. They have better lumen maintenance than HID lamps. Our study looks at two applications for induction lighting-- high bay lighting and streetlighting.

Ceramic metal halide lamps: Metal halide lamps are HID lamps, which are approximately four times more efficacious than incandescent lamps. Metal halide (MH) lamps are a form of high intensity discharge (HID) lighting with good lighting efficiency and excellent color rendition.

Pulse-start metal halide lamps: Pulse start lamps have a greater light output than standard metal halide, provide a white light and require special ballasts and fixtures for each specific lamp. The pulse start metal halide combined with new, more efficient low current crest factor ballasts using high voltage igniters provides higher light levels initially (20% more) and significantly more maintained light over time (40% more) than today's standard metal halide.

Compact fluorescent lighting (CFLs): Compact fluorescent lamps are designed to replace standard incandescent lamps. They are approximately four times more efficacious than incandescent light sources. Screw-in modular lamps have reusable ballasts that typically last for four lamp lives.

Cold cathode fluorescent lamps: The term cold cathode refers to the fact that the cathode is not independently heated, as it is in conventional fluorescent lamps. Unlike conventional fluorescent lamps, cold cathode lamps reach full brightness instantly, can be operated in rapid on off cycles without degrading the lamp lifetime, and operate in cold ambient temperatures. This makes them appropriate for some applications where a conventional fluorescent lamp

would not be appropriate. Cold cathode lamps are significantly more expensive than conventional fluorescents but have a much longer life.

Lighting control tune-up: This involves various measures to optimize the customer's current lighting control systems, with measures such as: relocating/tuning occupancy sensors, relocating photocells, optimizing sweep timers, repairing lighting timers, and adjust lighting schedules.

Occupancy sensors: Occupancy sensors (infrared or ultrasonic motion detection devices) turn lights on upon entry of a person into a room, and then turn the lights off from ½ minute to 20 minutes after they have left. Occupancy sensors require proper installation and calibration. Their savings depend on the mounting type.

Continuous dimming: (Emerging Technology) Dimming electronic ballasts can be incorporated into a daylighting strategy around the perimeter of office buildings or in areas under skylights. These systems use photocells to reduce power consumption and light output when daylight is available.

Delamping: One way to quickly and inexpensively reduce lighting load is to remove existing fluorescent lamps, for example removing one lamp from a two lamp fixture. This technique is called "delamping". Delamping reduces light levels, and is appropriate only for spaces where the resulting light level is adequate for productivity and safety. Ballast characteristics also affect the feasibility of delamping, as the ballast must be rated appropriated to operate with fewer lamps.

Outdoor lighting controls (photocells and timeclocks): Photocells can be used to automatically control both outdoor lamps and indoor lamps adjacent to skylights and windows. When lights do not need to be on all night, a photocell in series with a time clock provides maximum savings and eliminates the need for manual operation and seasonal time clock adjustments. Time clocks enable users to turn on and off electrical equipment at specific times during the day or week.

LED lighting: A light emitting diode (LEDs) is a semiconductor light source. They have been use for many years in niche application (such as indicator lights), but it was not until the late 1990's that high-output white LEDs became feasible. Over the last decade, LEDs have begun appearing in a variety of illumination applications. LEDs have the potential to be more efficient than fluorescent lighting, although efficacy varies widely between products (but in general continues to improve). They have long lifetimes (about 50,000 hours), are shock resistant and

dimnable, can be cycled rapidly, and they perform well in low temperatures. The light from LEDs is highly directional, creating challenges for luminaire design, which is reflected in highly variable luminaire performance. This study considers LED lighting as a measure for indoor lighting and outdoor lighting.

LED technology, both in the LEDs themselves and in luminaire design, continues to change rapidly. In certain applications (architectural lighting, undercabinet lighting, streetlighting), highly effective LED products are available and competitive on a life-cycle-cost basis with incandescent and fluorescent technologies. In other applications, such as commercial ambient lighting, LED products are not yet competitive on a performance or cost basis. That could easily change in the next few years, given the rapid pace of technological change and innovation.

LED exit sign: Exit signs were an early application of LED technology. Since exit signs are typically red or green, colored LEDs could be used directly, without the colored filter necessary when using a white light source. LED exit signs require significantly less maintenance than incandescent or CFL exit sign. Even a CFL would need to be replaced every year or two, while an LED sign could go without maintenance for up to 10 years. Because exit signs are operated continuously, the energy savings are significant.

Bi-level LED outdoor lighting: Bi-level lighting is designed to operate at a minimum level of light output until occupancy is detected (e.g. through a motion sensor), then temporarily increase to a higher level of illumination.

High performance lighting retrofit/replacement: Because of the interaction between lighting measures (daylighting, controls, etc.), the costs and benefits may not be additive. We allocate a percent of the applicable stock to comprehensive lighting retrofits, at a 25 percent savings level.

B.2.2 Space Cooling

Chiller efficiency upgrade: Centrifugal chillers are used in building types which normally use water-based cooling systems and have cooling requirements greater than 200 tons. Centrifugal chillers reject heat through a water cooled condenser or cooling tower. In general, efficiency levels for centrifugal chillers start at 0.80 kW/ton (for older units) and may go as high as 0.4 kW/ton. This measure involves installation of a high-efficiency chiller (0.51 kW per ton) versus a standard unit (0.58 kW per ton). This measure also serves in the potential analysis as a proxy for other non-centrifugal chiller systems.

High-efficiency chiller motors: This measure involves replacement of standard efficiency motors that power compressor systems on chillers. High-efficiency chiller motors have typically

have efficiencies exceeding 90% and are typically electronically-commutated motors, which produce higher average operating efficiencies at partial loads compared to standard efficiency, brushed DC compressor motors.

VSD – cooling circulation pumps: Variable speed drives installed on chilled water pumps can reduce energy use by varying the pump speed according to the building's demand for cooling. There is also a reduction in piping losses associated with this measure, which can have a major impact on the heating loads and energy use for a building. Pump speeds, however, can generally only be reduced to a minimum specified rate, because chillers and the control valves may require a minimum flow rate to operate.

VSD – cooling tower fans: Energy usage in cooling tower fans can be reduced by installing electronic variable speed drives (VSDs). VSDs are a far more efficient method of regulating speed or torque than other control mechanisms. Energy required to operate a fan motor can be reduced significantly during reduced load conditions by installing a VSD.

Chiller tune-up/diagnostics: In addition to some of the activities conducted in a DX tune-up, an optimization of the chilled water plant can include activities such as: optimizing CW/CHW set points, improving chiller staging, trimming pump impellers, resetting chilled water supply temperature, and staging cooling tower fan operation.

Energy management system: The term Energy Management System (EMS) refers to a complete building control system which usually can include controls for both lighting and HVAC systems. The HVAC control system may include on/off scheduling and warm-up routines. The complete lighting and HVAC control systems are generally integrated using a personal computer and control system software.

EMS optimization: Energy management systems are frequently underutilized and have hundreds of minor inefficiencies throughout the system. Optimization of the existing system frequently results in substantial savings to the measures controlled by the EMS (e.g. lighting, HVAC) by minimizing waste. Improvements can include: building start-up schedule adjustments, improving integrated sequence of operations, calibration of sensors, and relocation of OA sensors.

DX packaged system efficiency upgrade: A single-package A/C unit consists of a single package (or cabinet housing) containing a condensing unit, a compressor, and an indoor fan/coil. An additional benefit of package units is that there is no need for field-installed refrigerant piping, thus minimizing labor costs and the possibility of contaminating the system

with dirt, metal, oxides or non-condensing gases. We look at two efficiency levels, EERs of 10.9 and an EER 13.4, compared to a base case unit with EER=10.3. We also consider a 10.3 EER device with automated fault detection.

Tune up/advanced diagnostics: The assumed tune-up includes cleaning the condenser and evaporator coils, establishing optimal refrigerant levels, and purging refrigerant loops of entrained air. The qualifying relative performance range for a tune-up is between 60 and 85 percent of the rated efficiency of the unit. This measure includes fresh air economizer controls providing demand control ventilation and consisting of a logic module, enthalpy sensor(s), and CO2 sensors in appropriate applications.

Window film: Reflective window film is an effective way to reduce solar energy gains, thus reducing mechanical cooling energy consumption. Windows affect building energy use through thermal heat transfer (U-value), solar heat gains (shading coefficient), daylighting (visible light transmittance), and air leakage.

Programmable thermostat: Setback programmable thermostats are appropriate controls for HVAC equipment that serve spaces with regular occupied and unoccupied periods, resulting in long periods of time when heating and cooling set points can be adjusted.

Roof / ceiling insulation: Thermal insulation is material or combinations of materials that are used to inhibit the flow of heat energy by conductive, convective, and radiative transfer modes. By inhibiting the flow of heat energy, thermal insulation can conserve energy by reducing heat loss or gain of a structure. An important characteristic of insulating materials is the thermal resistance, or R-value. The R-value of a material is the reciprocal of the time rate of heat flow through a unit of this material in a direction perpendicular to two areas of different temperatures.

Installation of air-side economizers: Air-side economizers reduce the energy consumption associated with cooling by providing access to outside air – when temperatures permit – in lieu of using mechanical cooling of recirculated indoor air.

Duct insulation: Insulation material inhibits the transfer of heat through air supply ducts or hot water pipes. Several types of ducts and duct insulation are available, including flexible duct, pre-insulated flexible duct, duct board, duct wrap, tacked or glued rigid insulation, and water proof hard shell materials for exterior ducts.

Duct repair and sealing: An ideal duct system would be free of leaks, especially when the ducts are outside the conditioned space. Leakage in unsealed ducts varies considerably with the fabricating machinery used, the methods for assembly, installation workmanship, and age of

the ductwork. To seal ducts, a wide variety of sealing methods and products exist. Care should be taken to tape or otherwise seal all joints to minimize leakage in all duct systems and the sealing material should have a projected life of 20-30 years. Current duct sealing methods include use of computer-controlled aerosol and pre- and post-sealing duct pressurization testing.

DX coil cleaning: A dirty coil cannot supply proper heat transfer, leading to higher energy consumption and reduced cooling capacity. Coil cleaning should be a routine maintenance measure, but in practice many systems operate with fouled coils.

Geothermal heat pump: A geothermal, or ground-source, heat pump operates on the same principle as more common air-source heat pumps. But unlike air-source heat pumps, which transfers heat to or from the outside air, geothermal heat pumps exchange heat with the ground. Underground temperatures maintain a relatively constant temperature throughout the year, especially compared to air temperatures, which increases the system efficiency compared to an air-source heat pump. Because the system relies on extensive subterranean piping for heat exchange, geothermal heat pumps are expensive to install, and installation opportunities in existing buildings are limited.

High efficiency packaged terminal air conditioner: A packaged terminal air conditioner (PTAC) is a self-contained heating and air conditioning system commonly found in hotels. High efficiency units are available, offering significant energy savings in the lodging industry.

Hotel room controllers: Large amounts of energy are wasted in the lodging industry heating, cooling, and lighting unoccupied hotel room. Hotel guest room energy management control systems use occupancy sensors to determine whether anyone is present in the room, and adjusts the HVAC settings for energy savings when the room is empty.

B.2.3 Ventilation

Motor efficiency upgrade: Premium-efficiency motors use additional copper to reduce electrical losses and better magnetic materials to reduce core losses, and are generally built to more precise tolerances. Consequently, such motors are more reliable, resulting in reduced downtime and replacement costs. Premium-efficiency motors may also carry longer manufacturer's warranties.

VFD on motor installation: Energy usage in HVAC systems can be reduced by installing electronic variable frequency drives (VFDs) on ventilation fans. VFDs are a far more efficient method of regulating speed or torque than throttling valves, inlet vanes and fan dampers.

Energy required to operate a fan motor can be reduced as much as 85% during reduced load conditions by installing a VFD.

Installation of demand-controlled ventilation (via occupancy sensors, CO2 sensors, etc.):

Often, usage of a building's ventilation control goes beyond what is necessary to maintain a healthy and comfortable environment. A variety of controls can save energy by limiting the use of the ventilation system to minimum amount necessary. Sensors that detect critical contaminants activate ventilations systems only when necessary. Occupancy sensors limit the operation ventilation systems to periods when the building is in use.

Air handler optimization: Optimization of a building's air-handling system is concerned principally with the proper sizing and configuration of its HVAC units. Energy savings can result from a variety of improvements, including reduced equipment loads and better functionality of existing equipment.

Electronically commutated motors (ECM) on air-handler unit: Air handler models with the lowest electrical use ratings employ ECMs. ECMs, also known as brushless DC motors or variable speed blower motors, have two principal advantages over the typical permanent magnet split capacitor (PSC) blower motors found in the majority of air handlers. First, ECMs are claimed to be 20% to 30% more efficient than standard blower motors. Second, the typical ECM blower can produce a much wider range of airflow than a PSC blower, which typically has only three or four set speeds over a narrow range. Because power consumption by an air handler rises with the cube of airflow, the ability to reduce airflow when appropriate can dramatically reduce the electrical power draw by the air handler.

Energy recovery ventilation: These systems provide a controlled way of ventilating a building while minimizing energy loss. Heating energy requirements are reduced during the winter season by transferring heat from the warm inside air being exhausted to the fresh (but cold) supply air. Similarly, in the summer, the inside air being exhausted cools the warmer supply air and reduces cooling energy requirements.

Separate makeup air/exhaust hoods: Ventilation requirements in restaurants and grocery stores are driven both by occupancy and by the need to exhaust fumes from food preparation activities. Standard ventilation and exhaust systems operate at constant speeds that are most often matched to maximum ventilation requirements. Systems that modulate both exhaust and make-up air flow rates in response to measurements of "smoke" and temperature in the exhaust hood reduce exhaust and make-up air flow rates when full exhaust capacity is not required, and can thereby produce significant reduction in fan power and space conditioning energy use.

B.2.4 Refrigeration

Motor efficiency upgrade for fans and compressors: In addition to saving energy, premium-efficiency motors are more reliable, resulting in reduced downtime and replacement costs.

Strip curtains: Installing strip curtains on doorways to walk-in boxes and refrigerated warehouses can produce energy savings due to decreased infiltration of outside air into the refrigerated space. Although refrigerated spaces have doors, these doors are often left open, for example during product delivery and store stocking activities.

Night covers: Installing film or blanket type night covers on display cases can significantly reduce the infiltration of warm ambient air into the refrigerated space. This reduction in display case loads in turn reduces the electric use of the central plant, including compressors and condensers, thus saving energy. The target market for this measure is small, independently owned grocery stores and other stores that are typically closed at night and restock their shelves during the day. The target cases are vertical displays, with a single- or double-air curtain, and tub (coffin) type cases.

Variable speed compressor retrofit: A variable speed compressor is a screw or reciprocating compressor whose current is modulated by a frequency inverter. A controller senses the compressor suction pressure and modulates the current and therefore the motor speed in response to changes in this pressure. When low load conditions exist, the current to the compressor motor is decreased, decreasing the compressor work done on the refrigerant.

Floating head pressure controls: Floating head pressure controls allow a refrigeration system to operate under lower condensing temperature and pressure settings, where compressor operation is most efficient, working against a relatively low head pressure. The condensing temperature is allowed to float below the design set point of, say, 95 deg. F under lower outdoor temperatures, which in-turn lowers the condensate pressure. In a conventional system a higher fixed condensing temperature set point is used which results in a lowered capacity for the system, requires extra power, and may overload the compressor motor. Energy savings can be realized if the refrigeration system head pressure is allowed to float during periods of low ambient temperature, when the condensing temperature can be dramatically reduced.

Refrigeration commissioning: Refrigeration commissioning refers to a process whereby refrigeration systems are subject to inspection on a variety of criteria to ensure efficiency. The commissioning process can involve tests that cover a system's controls for humidity and temperature, anti-condensation, and heat recovery, among others.

Demand defrost: Defrost of a refrigeration system is critical to its efficient operation. Demand defrost uses a pressure-sensing device to activate the defrost cycle when it detects a significant drop in pressure of the air across the refrigeration coil. Because load during defrost can be three times that of normal operation, defrosting on demand only – not when an individual operator deems it necessary – can save energy by minimizing the amount of time spent on defrosting.

Humidistat controls: A humidistat control is a control device to turn refrigeration display case anti-sweat heaters off when ambient relative humidity is low enough that sweating will not occur. Anti-sweat heaters evaporate moisture by heating the door rails, case frame and glass of display cases. Savings result from reducing the operating hours of the anti-sweat heaters, which without a humidistat control generally run continuously. There are various types of control strategies including cycling on a fixed schedule.

LED display lighting: This measure involves the replacement of standard fluorescent tube lighting fixtures within medium and low-temperature display cases with LED fixtures. The higher luminous efficacy of LED lamps compared to T-8 and T-5 fluorescent lamps delivers significant energy savings and also results in lower heat gains inside refrigerator and freezer cases, which in turn reduces the effective load served by the compressor. LED fixtures also exhibit much longer service lives compared to T-8 or T-5 fixtures and very little maintenance requirements.

Fiber optic display lighting: Fiber optics can be used to distribute light from a single light source located outside the refrigerator system to multiple display cases. Lighting energy use is reduced, because a single high efficiency light source (e.g. metal halide) serves multiple cases. But the bigger savings are in the refrigeration: by taking the light source outside the refrigerated space, it reduces the load on the compressor. While this technology has been used in demonstration projects, it is not a mature technology.

High R-value glass doors: This measure involves the replacement of standard glass doors on refrigerated display cases with advanced glass doors that incorporate heat-reflective treated glass and/or low-conductivity gas fills between panes to produce high R-values. The greater insulation properties of the insulated glass doors reduce condensation buildup and reduce or eliminate the need for anti-sweat heaters.

Multiplex compressor systems: Multiplex refrigeration systems involve the use of multiple compressors in parallel, rather than single compressors, to serve specific refrigeration loads. Multiplex systems are designed so that compressors can be selectively selected and cycled in order to better match changes in refrigeration load dynamically and increase the overall operational efficiency of the compressors.

Oversized air cooled condenser: The use of oversized condensers can provide additional “natural sub-cooling” of the condensed refrigerant, which results in lower-temperature refrigerant liquid in the system, lower evaporator temperatures, and reduced load on the compressor.

Freezer/cooler replacement gaskets: Worn out freezer/cooler door gaskets can result in significant leakage and increased cooling energy consumption. Regular replacement of worn door gaskets reduces unnecessary air leaks and can lead to significant refrigeration energy savings.

ENERGY STAR® refrigeration: The Environmental Protection Agency’s ENERGY STAR® program labels high-efficiency commercial refrigerators, freezers, and ice machines. High efficiency units are designed with components such as ECM evaporator and condenser fan motors, hot gas anti-sweat heaters, or high-efficiency compressors, which significantly reduce energy consumption. Compared to standard models, ENERGY STAR labeled commercial refrigerators and freezers can lead to energy savings of as much as 35 percent with a 1.3 year payback.

B.2.5 Office Equipment

Power management enabling: Most PCs, monitors, printers and copiers have the capability of entering a low-power “sleep” mode when idle. However devices may come with this feature disabled or users may disable it for a variety of reasons. Enabling power management reduces energy use when devices are left idle during the day, or when a device is left on overnight. Most savings occur off-peak. This measure can be applied to PCs, PC monitors, printers and copiers.

ENERGY STAR® or better office equipment: For many years, virtually all PCs and monitors met the ENERGY STAR® efficiency requirements, which required only that devices be capable of entering a low-power “sleep” mode after a period of inactivity. The Environmental Protection Agency (EPA) has tightened its requirements, adding active-mode power requirements to the specifications. Choosing ENERGY STAR® PCs, monitors, copiers and printers can reduce energy use both in all power modes.

Data center energy efficiency: Data centers are facilities that are densely packed with electronic equipment for data processing, data storage, and networking. Ranging from a server closet in a small building to building that provide remote data operations to multiple clients, data centers are extremely energy intensive, both for the information architecture and the for cooling required to support it. We analyze three scenarios for reduce energy use in data centers, taken

from a 2007 EPA report:⁹ (1) Improved operations focuses on operational improvements with little or no capital investment. (1) Best Practices assumes the adoption of practices and technologies used in the most energy-efficient of today's data centers. (3) State of the Art Practices represents the maximum efficiency achievable using available technologies.

B.2.6 Water Heating

High efficiency water heater: Higher efficiency water heaters have greater insulation to reduce standby heat loss. For this study, efficiency of the base unit (measured as the Energy Factor) is specified as 0.88, whereas the efficiency of the high efficiency electric water heater is specified as 0.93.

Heat pump water heater: Air-to-water heat pump water heaters extract low-grade heat from the air then transfer this heat to the water by means of an immersion coil. This is the most commonly utilized residential heat pump water heater. The air-to-water heat pump unit includes a compressor, air-to-refrigerant evaporator coil, evaporator fan, water circulating pump, refrigerant-to-water condenser coil, expansion valve, and controls. Residential heat pump water heaters replace base electric units with the same tank capacities. For this study, efficiency of the base unit (measured as the Energy Factor) is specified as 0.88, whereas the efficiency of the heat pump water heater is specified as 2.9.

Solar water heater: Heat transfer technology that uses the sun's energy to warm water. Solar water heaters preheat water supplied to a conventional domestic hot water heating system. The energy savings for the system depend on solar radiation, air temperatures, water temperatures at the site, and the hot water use pattern.

Demand-controlled circulating systems: Hot water circulation systems are designed to maintain water in hot water pipes at a pre-determined temperature and prevent excess water demand (and associated water heating energy) from waiting for hot water to arrive from the water heater. Demand-controlled circulating systems provide additional savings by optimizing pumping energy requirements to only specific moments of hot water demand. This is achieved through the integration of an electronic controller on the circulation pump that is triggered by a switch engaged by the consumer at the point of hot water demand.

⁹ EPA, 2007. *Report to Congress on Server and Data Center Energy Efficiency, Public Law 109-431*.

Available at:

http://www.energystar.gov/ia/partners/prod_development/downloads/EPA_Datacenter_Report_Congress_Final1.pdf

Heat recovery units: This measure is heat transfer strategy that uses the heat rejected during the refrigerant cycle on air conditioning units to heat water.

Pipe wrap: Thermal insulation is material or combinations of materials that are used to inhibit the flow of heat energy by conductive, convective, and radiative transfer modes. By inhibiting the flow of heat energy, thermal insulation can conserve energy by reducing heat loss or gain.

Heat trap: Heat traps are valves or loops of pipe, which allow water to flow into the water heater tank but prevent unwanted hot-water flow out of the tank that would otherwise occur due to convection.

Tankless water heater: Tankless water heaters eliminate the standby tank (and associated losses) of a standard water heater. The water is heated instantaneously by a high energy heat source that can be either gas or electric.

B.2.7 Cooking

Convection oven: Convection ovens use a small fan to circulate hot air within the oven cavity. Circulating air can heat food more efficiently than the still air found in conventional ovens. The hot air in the oven can be heated by gas or electricity. In general, a convection oven will save 30% of the energy used by an oven. These savings result from burners cycling off for a longer period.

ENERGY STAR® fryer: Fryers cook foods by submerging them in hot animal or vegetable oils, and utilize a range of different burner types. In order to qualify as ENERGY STAR, electric fryers must meet a minimum cooking efficiency 80 percent while also meeting a maximum idle energy rate of 1,000 watts. Energy efficient fryers offer shorter cook times and higher production rates through advanced burner and heat exchanger designs. Fry pot insulation reduces standby losses resulting in a lower idle energy rate.

ENERGY STAR® steamer: Commercial steam cookers are versatile appliances which can be used to quickly prepare any foods that do not require a crust. Steamers come in a variety of configurations but generally resemble an oven, with between one and four gasketed and windowless compartments. The stacked compartments typically accommodate a standard 12 by 20-inch hotel pan. Pressure steamers have an external boiler that produces potable steam under pressure, and atmospheric steamers have a steam generator located directly below the compartments. Both require a water line and drain hookup. In contrast, the connectionless steamer is a closed loop system with a reservoir that is periodically drained and refilled.

Significant improvements in water- and energy- efficiency are achieved because no steam is allowed to escape down the condensate drain.

ENERGY STAR® hot food holding cabinet: Hot food holding cabinets maintain heated foods at a safe temperature for commercial food service. ENERGY STAR units use 65 percent less energy than standard models. ENERGY STAR units must meet a maximum idle energy rate of 40 watts/ft³. Models that meet this requirement incorporate better insulation to reduce heat loss. Other energy-saving features, such as magnetic door gaskets, auto-door closures, and dutch doors, may also be incorporated.

Vending misers: The Vending Miser is an after-market energy control technology for refrigerated vending machines. It incorporates an occupancy sensor, thermostat, and timer to power down the vending machine for extended period, while periodically repowering the device to ensure that the product stays cold.

B.3 Industrial Measures

This subsection provides brief descriptions of the industrial measures included in this study. First measures that cut across industries are described, followed by descriptions of industry-specific measures.

B.3.1 Cross-Cutting Electricity Efficiency Measures

Replace motors: This measure refers to the replacement of existing motors with high-efficiency motors. High-efficiency motors reduce energy losses through improved design, better materials, tighter tolerances, and improved manufacturing techniques. With proper installation, high-efficiency motors can run cooler than standard motors and can consequently have higher service factors, longer bearing life, longer insulation life, and less vibration.

Adjustable speed drives (ASDs): Adjustable speed drives better match motor speed to load and can therefore lead to significant energy savings compared to constant speed motors. Typical energy savings associated with ASDs range from 7-60%.

Motor practices: This measure refers to proper motor maintenance. The purposes of motor maintenance are to prolong motor life and to foresee a motor failure. Motor maintenance measures can be categorized as either preventive or predictive. Preventive measures, whose purpose is to prevent unexpected downtime of motors, include electrical consideration, voltage imbalance minimization, motor ventilation, alignment, and lubrication, and load consideration.

The purpose of predictive motor maintenance is to observe ongoing motor temperature, vibration, and other operating data to identify when it becomes necessary to overhaul or replace a motor before failure occurs. The savings associated with ongoing motor maintenance could range from 2-30% of total motor system energy use.

Compressed air - operation and maintenance (O&M): Inadequate maintenance can lower compression efficiency and increase air leakage or pressure variability, as well as lead to increased operating temperatures, poor moisture control, and excessive contamination. Improved maintenance will reduce these problems and save energy. Proper maintenance includes regular motor lubrication, replacement of air lubricant separators, fan and pump inspection, and filter replacement.

Compressed air – controls: The objective of any control strategy is to shut off unneeded compressors or delay bringing on additional compressors until needed. Energy savings for sophisticated controls have been around 12% annually. Available controls for compressed air systems include start/stop, load/unload, throttling, multi-step, variable speed, and network controls.

Compressed air - system optimization: This is a general measure that refers to compressed air system improvements (besides sizing, controls, and maintenance) that allow it to perform at maximum energy efficiency. Such improvements could include reducing leaks, better load management, minimizing pressure drops throughout the system, reducing air inlet temperatures, and recovering waste compressor heat for other facility applications.

Compressed air – sizing: This measure refers to the proper sizing of compressors, regulators, and distribution pipes. Oversizing of compressors can result in wasted energy. By properly sizing regulators, compressed air will be saved that is otherwise wasted as excess air. Pipes must be sized correctly for optimal performance or resized to fit the current compressor system. Increasing pipe diameters typically reduces annual energy consumption by 3%.

Pumps - operation and maintenance (O&M): Inadequate maintenance can lower pump system efficiency, cause pumps to wear out more quickly, and increase costs. Better maintenance will reduce these problems and also save energy. Proper pump system maintenance includes bearing inspection and repair, bearing lubrication, replacement of worn impellers, and inspection and replacement of mechanical seals.

Pumps – controls: The objective of pump control strategies is to shut off unneeded pumps or, alternatively, to reduce pump load until needed. In addition to energy savings, proper pump control can lead to reduced maintenance costs and increased pump life.

Pumps - system optimization: This is a general measure that refers to pump system improvements (besides sizing, controls, and maintenance) that allow it to perform at maximum energy efficiency. Such improvements could include pump demand reduction, high-efficiency pumps, impeller trimming, and installing multiple pumps for variable loads.

Pumps – sizing: Pumps that are sized inappropriately result in unnecessary losses. Where peak loads can be reduced, pump size can also be reduced. Replacing oversized pumps with pumps that are properly sized can save 15-25% of the electricity consumption of a pumping system (on average for U.S. industry).

Fans - operation and maintenance (O&M): This measure refers to the improvement of general O&M practice for fans, such as tightening belts, cleaning fans, and changing filters regularly.

Fans – controls: The objective of fan control strategies is to shut off unneeded fans or, alternatively, to reduce fan load until needed. In addition to energy savings, proper fan control can lead to reduced maintenance costs and increased pump life.

Fans - system optimization: This measure refers to general strategies for optimizing fans from a systems perspective, and includes such actions as better inlet and outlet design and reduction of fan sizing, where appropriate.

Fans - improve components: This measure refers to the improvement of fan components, such as replacing standard v-belts with cog v-belts and upgrading to the most energy efficient motors possible.

Replace T-8 with premium T-8 and electronic ballasts: Replacing T-8 lamps with premium T-8 lamps with electronic ballasts save significant energy.

Metal halides/fluorescents: Metal halide lamps can replace mercury or fluorescent lamps with energy savings of 50%. For even further savings, high-intensity fluorescent lamps can be installed, which can yield 50% electricity savings over standard metal halide (high-intensity discharge) systems.

Compact fluorescent lighting (CFLs): Compact fluorescent lighting fixtures are designed to replace standard incandescent lighting fixtures. They are approximately four times more efficacious than incandescent light sources.

Controls/sensors: Lights can be shut off during non-working hours by automatic controls, such as occupancy sensors, which turn off lights when a space becomes unoccupied. Manual controls can also be used in addition to automatic controls to save additional energy in small areas.

Chiller efficiency upgrade: Centrifugal chillers are used in building types which normally use water-based cooling systems and have cooling requirements greater than 200 tons. Centrifugal chillers reject heat through a water cooled condenser or cooling tower. In general, efficiency levels for centrifugal chillers start at 0.80 kW/ton (for older units) and may go as high as 0.4 kW/ton. This measure involves installation of a high-efficiency chiller (0.51 kW per ton) versus a standard unit (0.58 kW per ton). This measure also serves in the potential analysis as a proxy for other non-centrifugal chiller systems.

HVAC management system: An energy monitoring and control system supports the efficient operation of HVAC systems by monitoring, controlling, and tracking system energy consumption. Such systems continuously manage and optimize HVAC system energy consumption while also providing building engineers and energy managers with a valuable diagnostic tool for tracking energy consumption and identifying potential HVAC system problems.

Cooling circulation pumps – variable speed drives (VSDs): Variable speed drives better match motor speed to load and can therefore lead to significant energy savings compared to constant speed drives. This measure considers the installation of VSDs on cooling circulation pumps.

DX tune up/advanced diagnostics: The tune-up includes cleaning the condenser and evaporator coils, establishing optimal refrigerant levels, and purging refrigerant loops of entrained air. The qualifying relative performance range for a tune-up is between 60 and 85 percent of the rated efficiency of the unit. This measure includes fresh air economizer controls providing demand control ventilation and consisting of a logic module, enthalpy sensor(s), and CO² sensors in appropriate applications.

DX packaged system, EER=10.9, 10 tons: A single-package A/C unit consists of a single package (or cabinet housing) containing a condensing unit, a compressor, and an indoor

fan/coil. An additional benefit of package units is that there is no need for field-installed refrigerant piping, thus minimizing labor costs and the possibility of contaminating the system with dirt, metal, oxides or non-condensing gases. This measure involves installation of a TIER 2 high-efficiency unit (EER=10.9) versus a standard unit (EER=10.3).

Window film: Low-emittance windows are an effective strategy for improving building insulation. Low-emittance windows can lower the heat transmitted into a building and therefore increase its insulating ability. There are two types of Low-E glass, high solar transmitting (for regions with higher winter utility bills) and low solar transmitting (for regions with higher summer utility bills).

Programmable thermostat: A programmable thermostat controls temperature settings of space heating and cooling, and allows settings to be optimized based on occupancy and use of the building. This reduces unnecessary heating and cooling outside hours of building use. It may also help in building cooling using nighttime cooling.

Chiller O&M/tune up: This measure refers to the proper inspection and maintenance of chilled water systems. This can include setting correct head pressure, maintaining correct levels of refrigerant, and selecting and running appropriate compressors for part load. Energy saving can also be achieved by cleaning the condensers and evaporators to prevent scale buildup.

Cool roof: The color and material of a building structure surface will determine the amount of solar radiation absorbed by that surface. By using an appropriate reflective material to coat the roof, the roof will absorb less solar radiation and consequently reduce the cooling load.

Replace v-belts: Inventory data suggest that 4% of pumps have V-belt drives, many of which can be replaced with direct couplings to save energy. Based on assessments in several industries, the savings associated with V-belt replacement are estimated at 4%.

Custom measures –drives: In addition to the sector-specific drive measures defined below, custom measures offer the potential for additional energy savings. Costs and savings for this measure were based on program data for custom projects for other utilities.

Custom measures – process heating: In addition to the sector-specific process heating measures defined below, custom measures offer the potential for additional energy savings. Costs and savings for this measure were based on program data for custom projects for other utilities.

Custom measures – process cooling: In addition to the sector-specific process cooling measures defined below, custom measures offer the potential for additional energy savings. Costs and savings for this measure were based on program data for custom projects for other utilities.

Custom measures – other process: In addition to the sector-specific process measures defined below, custom measures offer the potential for additional energy savings. Costs and savings for this measure were based on program data for custom projects for other utilities.

B.3.2 Sector-Specific Efficiency Measures

B.3.2.1 NAICS 311: Food Manufacturing

NAICS 312: Beverage and Tobacco Product Manufacturing

Efficient refrigeration – operations: Refrigeration is an important energy user in the food industries. Operations of refrigeration systems can be improved by applying appropriate settings, opening refrigerated space as short as possible, reducing leakage by controlling doorways, making sure that refrigerated space is used optimally, optimization of defrosting cycle, as well as other small operational changes.

Optimization refrigeration: The refrigeration system can be optimized by improving the operation of the compressors, selecting cooling systems with high COP values, reducing losses in the coolant distribution system, improved insulation of the cooled space, variable speed drives on cooling system, and optimizing the temperature setting of the cooling system.

Bakery – process: Process improvements in the bakery can reduce electricity consumption through selection of energy-efficient equipment for the different processes, optimization of electric ovens, and good housekeeping (e.g. switching equipment off when not in use).

Bakery – process (mixing): About 35% of electricity in bakeries is used to mix and knead the dough. When selecting equipment electricity use should be one of the considerations as energy is the largest cost on a life-cycle basis. Today, energy use is not a criterion. High-efficiency motors, speed control and other measures may reduce electricity consumption.

B.3.2.2 NAICS 313: Textile Mills

NAICS 314: Textile Product Mills

NAICS 315: Textile Product Mills

NAICS 316: Leather and Allied Product Manufacturing

Drying (UV/IR): This measure refers to the use of direct heating methods, such as infrared dryers. Direct heating provides significant energy savings because it eliminates the inefficiency of transferring heat to air and from the air to the wet material. The energy efficiency of direct heating is about 90%.

Membranes for wastewater: Membrane technologies focus on separating the water from the contaminants using semi-permeable membranes and applied pressure differentials. Membrane filtration of wastewater is typically more energy efficient than evaporation methods, and can lead to significant reductions in facility freshwater intake.

O&M/drives spinning machines: Electric motors are the single largest electricity user in spinning mills. Optimization of motor use, proper maintenance procedures (e.g. preventative maintenance), use of new high-efficiency motors instead of re-winding, and switching off equipment when not in use can help improve energy efficiency.

B.3.2.3 NAICS 321: Wood Product Manufacturing NAICS 337: Household and Institutional Furniture and Kitchen Cabinet Manufacturing

Air conveying systems: Pneumatic or air conveying systems are used to transport material (e.g. sawdust, fibers) in the lumber industry. Energy efficiency improvement is feasible by optimizing the lay-out of the systems, reducing leakages, reducing bends in the system, and improving compressor operations (see also with compressed air systems).

Optimize drying processes: This is a general measure, which refers to the optimization of drying systems through such actions as the use of controls, heat recovery, insulation, and good housekeeping/maintenance.

Heat pumps – drying: This measure refers to the recovery of low grade heat from the drying process via a heat pump, where cost effective.

B.3.2.4 NAICS 322: Paper Manufacturing

Gap forming paper machine: The gap former produces a paper of equal and uniform quality at a higher rate of speed. Coupling the former with a press section rebuild or an improvement in the drying capacity increases production capacity by as much as 30%. Energy savings from gap formers come from reduced electricity consumption per ton of product produced.

High consistency forming: In high consistency forming, the furnish (process pulp) which enters at the forming stage has more than double the consistency (3%) than normal furnish. This measure increases forming speed, and reduces dewatering and vacuum power requirements. Application of this technology is limited to specific paper grades, especially low-basis weight grades such as tissue, toweling, and newsprint. Electricity savings are estimated at 8%.

Optimization control PM: Large electric motors are used to run the paper machine. Optimization of the paper machine will reduce electricity use of the drives. Improved control strategies will improve throughput, reduce breakage and downtime, improving the energy efficiency per unit of throughput. Variable speed drives may help to optimize the energy use in water pumps in the paper machine.

B.3.2.5 NAICS 323: Printing and Related Support Activities

Efficient practices printing press: Optimizing the use of the printing press by reducing production losses, switching off of the press when not in use and other improved operational practices.

Efficient printing press (fewer cylinders): New printing press designs allow the use of fewer cylinders (or rollers). This reduces the electricity use to drive the printing machine.

Light cylinders: Reducing the weight of the cylinders (or rollers) in the printing machine will reduce the power needed to drive the machine. Using lightweight materials for cylinders has been demonstrated in Europe.

B.3.2.6 NAICS 324: Petroleum and Coal Products

Process controls (batch + site): This is a general measure to implement computer-based process controls, where applicable, to monitor and optimize various processes from an energy consumption perspective. In general, by monitoring key process parameters, processes can be fine tuned to minimize energy consumption while still meeting quality and productivity requirements. Control systems can also reduce the time required to perform complex tasks and can often improve product quality and consistency while optimizing process operations. This measure could include the installation of controls based on neural networks, knowledge based systems, or improved sensor technology.

Power recovery: Various processes run at elevated pressures, enabling the opportunity for power recovery from the pressure in the flue gas. The major application for power recovery in

the petroleum refinery is the fluid catalytic cracker (FCC). However, power recovery can also be applied to hydrocrackers or other equipment operated at elevated pressures. A power recovery turbine or turbo expander is used to recover energy from the pressure. The recovered energy can be used to drive the FCC compressor or to generate power.

Efficient desalter: Alternative designs for desalting include multi-stage desalters and a combination of AC and DC fields. These alternative designs may lead to increased efficiency and lower energy consumption.

B.3.2.7 NAICS 325: Chemical Manufacturing

Clean room – controls: Reduced recirculation air change rates, while still meeting quality control and regulatory standards can reduce energy use, optimized chilled water systems, reduction of clean room exhaust, and, occasionally, a clean room is classified at a higher cleanliness level than is necessary for its current use, and by declassifying energy can be saved.

Clean room – new designs: When designing a clean room, energy use should be a primary consideration. Benchmarking tools and design tools are being developed to help improve the energy efficiency of new clean room systems. Furthermore, in the design phase the system can be optimized for improved air filtration quality and efficiency, and the use of cooling towers in lieu of water chillers.

Process controls (batch + site): See discussion for NAICS 324.

B.3.2.8 NAICS 326: Plastics and Rubber Products Manufacturing

O&M – extruders/injection molding: Improved operation and maintenance procedures of extruders, optimization of extruder settings, optimization of the extruder screw shape, optimization of the shape/thickness of the product, and reduction of standby time.

Extruders/injection molding – multipump: The use of multiple pumps and an appropriate control system allow reduced energy use of the extruder when not working at full capacity, only using the pump(s) needed.

Direct drive extruders: Use of a direct drive, instead of a gearbox or belt, will reduce the losses by approximately 15% in extruders.

Intelligent extruder: Intelligent extruder refers to a software system and associated support services for monitoring and control of compounding extruders to improve material quality, reduce waste and energy use, with minimal addition of new sensors or changes to the factory floor system components. Emphasis is on process improvements to the mixing, melting and devolatilization of base resins, fillers, pigments, fire retardants and other additives in the “finishing” stage of high value added engineering polymer materials.

Injection molding – impulse cooling: Impulse cooling regulates the cooling water use increasing the cooling rate and reducing productivity (and downtime).

Injection molding – direct drive: Use of a direct drive, instead of a gearbox or belt, will reduce the losses by approximately 20% in injection molding machines.

B.3.2.9 NAICS 327: Nonmetallic Mineral Product Manufacturing

Efficient grinding: This is a general measure that refers to efficient grinding technologies, which can include the use of high-efficiency classifiers or separators.

Process controls: See discussion for NAICS 324.

Top-heating (glass): Most electric furnaces use electrodes in the batch to melt the raw materials into glass. Newer designs with top-mounted electrodes can improve and maintain product quality, and obtain a higher share of salable glass, which leads to lower energy intensities (energy per kg of glass produced).

Process optimization: This is a general measure, which refers to the optimization of grinding and melting systems through such actions as the use of controls, heat recovery, insulation, and good housekeeping/maintenance.

B.3.2.10 NAICS 332: Fabricated Metal Products

NAICS 333: Machinery Manufacturing

NAICS 336: Transportation Equipment

Optimization process (M&T): This is a general measure for optimizing the efficiency of painting processes, via such actions as the use of process controls, proper maintenance, and reducing the airflow rates in paint booths.

Scheduling: Optimization of the scheduling of various pieces of equipment can reduce downtime and hence save energy. Furthermore, improved control strategies can reduce standby energy use of equipment as part of an optimized scheduling system.

Efficient curing ovens: Efficiency options for curing ovens include the optimization of oven insulation, the use of heat recovery techniques, and the use of direct heating methods, such as infrared heating, microwave heating, and ultraviolet heating.

Machinery: Many machines (e.g. metal processing) use electricity or compressed air to drive the equipment. The use of compressed air systems should be minimized and replaced by direct drive systems, because of the low efficiency of the compressed air supply. Furthermore, many machines do not use high-efficiency motors or speed controls.

New Transformers - Welding: Transformers incur two types of losses: no-load losses in the transformer core that are constant regardless of the load being served, and load losses in the transformer's electrical circuit that change depending on the loading conditions. The NEMA Premium Efficiency Transformer Program requires 30 percent fewer losses than existing DOE standards for dry-type distribution transformers. Efficiencies range from 98 percent to more than 99 percent, depending on the size of the transformer, compared to 97 percent for the DOE standard.

B.3.2.11 NAICS 334: Computers and Electronic Products

NAICS 335: Electrical Equipment, Appliance, and Component Manufacturing

Scheduling: See discussion for NAICS 332.

Efficient curing ovens: See discussion for NAICS 332.

Machinery: See discussion for NAICS 332.

Efficient processes (welding, etc.): New more power efficient welding technology is developed. For welding robots, new servo-based systems reduce energy use.

B.3.2.12 NAICS 339: Miscellaneous Manufacturing

Scheduling: See discussion for NAICS 332.

Efficient Machinery: See discussion for NAICS 332.

Process heating: Induction furnaces are often used for electric process heating. Improved operation and maintenance can reduce part-load operation, downtime and tap-to-tap time. Furthermore, high-frequency induction furnaces improve energy use.

Process controls: See discussion for NAICS 324.

B.3.2.13 Water/Wastewater

Efficient Machinery: See discussion for NAICS 332.

C. Appendix C: Economic Inputs

Avoided costs presented in this appendix were taken from Austin Energy's Rate Analysis and Recommendations Report to the Austin City Council, dated December 19, 2011. Due to the complexity of rate structures and demand charges, rates are entered into the model as average rates (revenue divided by kWh sales).

APPENDIX C - ECONOMIC PARAMETERS

Residential Electricity

UTILITY NAME	Austin Energy
SECTOR	Res
BATCH #	1
UTILITY DISCOUNT RATE	4.00%
CUSTOMER DISCOUNT RATE	7.0%
GENERAL INFLATION RATE (Measure)	2.5%
BASE YEAR	2012
START YEAR	2012
DIFFERENCE	0
UTILITY LINE LOSS RATE	7.00%

ENERGY COSTS AND RATES

		Rate/Time Periods					
Segment 1	Existing	Name	Summer On-Peak	Summer Mid-Peak	Summer Off-Peak	Winter Mid-Peak	Winter Off-Peak
RATE TYPE	Residential	Abbreviation	SON	SMID	SOFF	WMID	WOFF
ENERGY UNITS	\$/kWh	Hours	516	1436	976	3888	1944
DEMAND UNITS	\$/kW						TOTAL
							8760

Year	AVOIDED ENERGY COSTS BY TIME PERIOD					AVOIDED DEMAND COSTS BY TIME PERIOD					Residential ENERGY RATES				
	SON \$/kWh	SMID \$/kWh	SOFF \$/kWh	WMID \$/kWh	WOFF \$/kWh	SON \$/kWh	SMID \$/kWh	SOFF \$/kWh	WMID \$/kWh	WOFF \$/kWh	SON \$/kWh	SMID \$/kWh	SOFF \$/kWh	WMID \$/kWh	WOFF \$/kWh
2012	0.0367	0.0367	0.0367	0.0367	0.0367	235.8643	0.0000	0.0000	0.0000	0.0000	0.0641	0.0641	0.0641	0.0470	0.0470
2013	0.0376	0.0376	0.0376	0.0376	0.0376	241.7609	0.0000	0.0000	0.0000	0.0000	0.0658	0.0658	0.0658	0.0482	0.0482
2014	0.0385	0.0385	0.0385	0.0385	0.0385	247.8049	0.0000	0.0000	0.0000	0.0000	0.0674	0.0674	0.0674	0.0494	0.0494
2015	0.0395	0.0395	0.0395	0.0395	0.0395	254.0000	0.0000	0.0000	0.0000	0.0000	0.0691	0.0691	0.0691	0.0506	0.0506
2016	0.0405	0.0405	0.0405	0.0405	0.0405	260.3500	0.0000	0.0000	0.0000	0.0000	0.0708	0.0708	0.0708	0.0519	0.0519
2017	0.0415	0.0415	0.0415	0.0415	0.0415	266.8588	0.0000	0.0000	0.0000	0.0000	0.0726	0.0726	0.0726	0.0532	0.0532
2018	0.0425	0.0425	0.0425	0.0425	0.0425	273.5302	0.0000	0.0000	0.0000	0.0000	0.0744	0.0744	0.0744	0.0545	0.0545
2019	0.0436	0.0436	0.0436	0.0436	0.0436	280.3685	0.0000	0.0000	0.0000	0.0000	0.0763	0.0763	0.0763	0.0559	0.0559
2020	0.0447	0.0447	0.0447	0.0447	0.0447	287.3777	0.0000	0.0000	0.0000	0.0000	0.0782	0.0782	0.0782	0.0573	0.0573
2021	0.0458	0.0458	0.0458	0.0458	0.0458	294.5621	0.0000	0.0000	0.0000	0.0000	0.0801	0.0801	0.0801	0.0587	0.0587
2022	0.0469	0.0469	0.0469	0.0469	0.0469	301.9262	0.0000	0.0000	0.0000	0.0000	0.0821	0.0821	0.0821	0.0602	0.0602
2023	0.0481	0.0481	0.0481	0.0481	0.0481	309.4744	0.0000	0.0000	0.0000	0.0000	0.0842	0.0842	0.0842	0.0617	0.0617
2024	0.0493	0.0493	0.0493	0.0493	0.0493	317.2112	0.0000	0.0000	0.0000	0.0000	0.0863	0.0863	0.0863	0.0632	0.0632
2025	0.0505	0.0505	0.0505	0.0505	0.0505	325.1415	0.0000	0.0000	0.0000	0.0000	0.0884	0.0884	0.0884	0.0648	0.0648
2026	0.0518	0.0518	0.0518	0.0518	0.0518	333.2700	0.0000	0.0000	0.0000	0.0000	0.0906	0.0906	0.0906	0.0664	0.0664
2027	0.0531	0.0531	0.0531	0.0531	0.0531	341.6018	0.0000	0.0000	0.0000	0.0000	0.0929	0.0929	0.0929	0.0681	0.0681
2028	0.0544	0.0544	0.0544	0.0544	0.0544	350.1418	0.0000	0.0000	0.0000	0.0000	0.0952	0.0952	0.0952	0.0698	0.0698
2029	0.0558	0.0558	0.0558	0.0558	0.0558	358.8954	0.0000	0.0000	0.0000	0.0000	0.0976	0.0976	0.0976	0.0715	0.0715
2030	0.0572	0.0572	0.0572	0.0572	0.0572	367.8678	0.0000	0.0000	0.0000	0.0000	0.1001	0.1001	0.1001	0.0733	0.0733
2031	0.0586	0.0586	0.0586	0.0586	0.0586	377.0644	0.0000	0.0000	0.0000	0.0000	0.1026	0.1026	0.1026	0.0752	0.0752
2032	0.0601	0.0601	0.0601	0.0601	0.0601	386.4911	0.0000	0.0000	0.0000	0.0000	0.1051	0.1051	0.1051	0.0770	0.0770
2033	0.0616	0.0616	0.0616	0.0616	0.0616	396.1533	0.0000	0.0000	0.0000	0.0000	0.1077	0.1077	0.1077	0.0790	0.0790
2034	0.0631	0.0631	0.0631	0.0631	0.0631	406.0572	0.0000	0.0000	0.0000	0.0000	0.1104	0.1104	0.1104	0.0809	0.0809
2035	0.0647	0.0647	0.0647	0.0647	0.0647	416.2086	0.0000	0.0000	0.0000	0.0000	0.1132	0.1132	0.1132	0.0830	0.0830
2036	0.0663	0.0663	0.0663	0.0663	0.0663	426.6138	0.0000	0.0000	0.0000	0.0000	0.1160	0.1160	0.1160	0.0850	0.0850
2037	0.0680	0.0680	0.0680	0.0680	0.0680	437.2792	0.0000	0.0000	0.0000	0.0000	0.1189	0.1189	0.1189	0.0872	0.0872
2038	0.0697	0.0697	0.0697	0.0697	0.0697	448.2111	0.0000	0.0000	0.0000	0.0000	0.1219	0.1219	0.1219	0.0893	0.0893
2039	0.0714	0.0714	0.0714	0.0714	0.0714	459.4164	0.0000	0.0000	0.0000	0.0000	0.1250	0.1250	0.1250	0.0916	0.0916
2040	0.0732	0.0732	0.0732	0.0732	0.0732	470.9018	0.0000	0.0000	0.0000	0.0000	0.1281	0.1281	0.1281	0.0939	0.0939

APPENDIX C - ECONOMIC PARAMETERS

Commercial Electricity

UTILITY NAME	Austin Energy
SECTOR	Com
BATCH #	1
UTILITY DISCOUNT RATE	4.00%
CUSTOMER DISCOUNT RATE	7.0%
GENERAL INFLATION RATE (Measure)	2.5%
BASE YEAR	2012
START YEAR	2012
DIFFERENCE	0
UTILITY LINE LOSS RATE	7.00%

ENERGY COSTS AND RATES

Segment 1	Existing
RATE TYPE	Commercial
ENERGY UNITS	\$/kWh
DEMAND UNITS	\$/kW

Rate/Time Periods						
Name	Summer On-Peak	Summer Mid-Peak	Summer Off-Peak	Winter Mid-Peak	Winter Off-Peak	
Abbreviation	SON	SMID	SOFF	WMID	WOFF	TOTAL
Hours	516	1436	976	3888	1944	8760

Year	AVOIDED ENERGY COSTS BY TIME PERIOD					AVOIDED DEMAND COSTS BY TIME PERIOD					COMMERCIAL ENERGY RATES				
	SON \$/kWh	SMID \$/kWh	SOFF \$/kWh	WMID \$/kWh	WOFF \$/kWh	SON \$/kWh	SMID \$/kWh	SOFF \$/kWh	WMID \$/kWh	WOFF \$/kWh	SON \$/kWh	SMID \$/kWh	SOFF \$/kWh	WMID \$/kWh	WOFF \$/kWh
2012	0.0367	0.0367	0.0367	0.0367	0.0367	235.8643	0.0000	0.0000	0.0000	0.0000	0.0675	0.0675	0.0675	0.0675	0.0675
2013	0.0376	0.0376	0.0376	0.0376	0.0376	241.7609	0.0000	0.0000	0.0000	0.0000	0.0692	0.0692	0.0692	0.0692	0.0692
2014	0.0385	0.0385	0.0385	0.0385	0.0385	247.8049	0.0000	0.0000	0.0000	0.0000	0.0709	0.0709	0.0709	0.0709	0.0709
2015	0.0395	0.0395	0.0395	0.0395	0.0395	254.0000	0.0000	0.0000	0.0000	0.0000	0.0727	0.0727	0.0727	0.0727	0.0727
2016	0.0405	0.0405	0.0405	0.0405	0.0405	260.3500	0.0000	0.0000	0.0000	0.0000	0.0745	0.0745	0.0745	0.0745	0.0745
2017	0.0415	0.0415	0.0415	0.0415	0.0415	266.8588	0.0000	0.0000	0.0000	0.0000	0.0764	0.0764	0.0764	0.0764	0.0764
2018	0.0425	0.0425	0.0425	0.0425	0.0425	273.5302	0.0000	0.0000	0.0000	0.0000	0.0783	0.0783	0.0783	0.0783	0.0783
2019	0.0436	0.0436	0.0436	0.0436	0.0436	280.3685	0.0000	0.0000	0.0000	0.0000	0.0803	0.0803	0.0803	0.0803	0.0803
2020	0.0447	0.0447	0.0447	0.0447	0.0447	287.3777	0.0000	0.0000	0.0000	0.0000	0.0823	0.0823	0.0823	0.0823	0.0823
2021	0.0458	0.0458	0.0458	0.0458	0.0458	294.5621	0.0000	0.0000	0.0000	0.0000	0.0843	0.0843	0.0843	0.0843	0.0843
2022	0.0469	0.0469	0.0469	0.0469	0.0469	301.9262	0.0000	0.0000	0.0000	0.0000	0.0864	0.0864	0.0864	0.0864	0.0864
2023	0.0481	0.0481	0.0481	0.0481	0.0481	309.4744	0.0000	0.0000	0.0000	0.0000	0.0886	0.0886	0.0886	0.0886	0.0886
2024	0.0493	0.0493	0.0493	0.0493	0.0493	317.2112	0.0000	0.0000	0.0000	0.0000	0.0908	0.0908	0.0908	0.0908	0.0908
2025	0.0505	0.0505	0.0505	0.0505	0.0505	325.1415	0.0000	0.0000	0.0000	0.0000	0.0931	0.0931	0.0931	0.0931	0.0931
2026	0.0518	0.0518	0.0518	0.0518	0.0518	333.2700	0.0000	0.0000	0.0000	0.0000	0.0954	0.0954	0.0954	0.0954	0.0954
2027	0.0531	0.0531	0.0531	0.0531	0.0531	341.6018	0.0000	0.0000	0.0000	0.0000	0.0978	0.0978	0.0978	0.0978	0.0978
2028	0.0544	0.0544	0.0544	0.0544	0.0544	350.1418	0.0000	0.0000	0.0000	0.0000	0.1002	0.1002	0.1002	0.1002	0.1002
2029	0.0558	0.0558	0.0558	0.0558	0.0558	358.8954	0.0000	0.0000	0.0000	0.0000	0.1027	0.1027	0.1027	0.1027	0.1027
2030	0.0572	0.0572	0.0572	0.0572	0.0572	367.8678	0.0000	0.0000	0.0000	0.0000	0.1053	0.1053	0.1053	0.1053	0.1053
2031	0.0586	0.0586	0.0586	0.0586	0.0586	377.0644	0.0000	0.0000	0.0000	0.0000	0.1079	0.1079	0.1079	0.1079	0.1079
2032	0.0601	0.0601	0.0601	0.0601	0.0601	386.4911	0.0000	0.0000	0.0000	0.0000	0.1106	0.1106	0.1106	0.1106	0.1106
2033	0.0616	0.0616	0.0616	0.0616	0.0616	396.1533	0.0000	0.0000	0.0000	0.0000	0.1134	0.1134	0.1134	0.1134	0.1134
2034	0.0631	0.0631	0.0631	0.0631	0.0631	406.0572	0.0000	0.0000	0.0000	0.0000	0.1162	0.1162	0.1162	0.1162	0.1162
2035	0.0647	0.0647	0.0647	0.0647	0.0647	416.2086	0.0000	0.0000	0.0000	0.0000	0.1191	0.1191	0.1191	0.1191	0.1191
2036	0.0663	0.0663	0.0663	0.0663	0.0663	426.6138	0.0000	0.0000	0.0000	0.0000	0.1221	0.1221	0.1221	0.1221	0.1221
2037	0.0680	0.0680	0.0680	0.0680	0.0680	437.2792	0.0000	0.0000	0.0000	0.0000	0.1252	0.1252	0.1252	0.1252	0.1252
2038	0.0697	0.0697	0.0697	0.0697	0.0697	448.2111	0.0000	0.0000	0.0000	0.0000	0.1283	0.1283	0.1283	0.1283	0.1283
2039	0.0714	0.0714	0.0714	0.0714	0.0714	459.4164	0.0000	0.0000	0.0000	0.0000	0.1315	0.1315	0.1315	0.1315	0.1315
2040	0.0732	0.0732	0.0732	0.0732	0.0732	470.9018	0.0000	0.0000	0.0000	0.0000	0.1348	0.1348	0.1348	0.1348	0.1348

APPENDIX C - ECONOMIC PARAMETERS

Industrial Electricity

UTILITY NAME	Austin Energy
SECTOR	Ind
BATCH #	1
UTILITY DISCOUNT RATE	4.00%
CUSTOMER DISCOUNT RATE	7.0%
GENERAL INFLATION RATE (Measure)	2.5%
BASE YEAR	2012
START YEAR	2012
DIFFERENCE	0
UTILITY LINE LOSS RATE	7.00%

ENERGY COSTS AND RATES

Segment 1	Existing
RATE TYPE	Industrial
ENERGY UNITS	\$/kWh
DEMAND UNITS	\$/kW

Rate/Time Periods						
Name	Summer On-Peak	Summer Mid-Peak	Summer Off-Peak	Winter Mid-Peak	Winter Off-Peak	
Abbreviation	SON	SMID	SOFF	WMID	WOFF	TOTAL
Hours	516	1436	976	3888	1944	8760

Year	AVOIDED ENERGY COSTS BY TIME PERIOD					AVOIDED DEMAND COSTS BY TIME PERIOD					Industrial ENERGY RATES				
	SSUP \$/kWh	SON \$/kWh	SMID \$/kWh	SOFF \$/kWh	WON \$/kWh	SSUP \$/kW	SON \$/kW	SMID \$/kW	SOFF \$/kW	WON \$/kW	SSUP \$/kWh	SON \$/kWh	SMID \$/kWh	SOFF \$/kWh	WON \$/kWh
2012	0.0367	0.0367	0.0367	0.0367	0.0367	235.8643	0.0000	0.0000	0.0000	0.0000	0.0473	0.0473	0.0473	0.0473	0.0473
2013	0.0376	0.0376	0.0376	0.0376	0.0376	241.7609	0.0000	0.0000	0.0000	0.0000	0.0485	0.0485	0.0485	0.0485	0.0485
2014	0.0385	0.0385	0.0385	0.0385	0.0385	247.8049	0.0000	0.0000	0.0000	0.0000	0.0497	0.0497	0.0497	0.0497	0.0497
2015	0.0395	0.0395	0.0395	0.0395	0.0395	254.0000	0.0000	0.0000	0.0000	0.0000	0.0509	0.0509	0.0509	0.0509	0.0509
2016	0.0405	0.0405	0.0405	0.0405	0.0405	260.3500	0.0000	0.0000	0.0000	0.0000	0.0522	0.0522	0.0522	0.0522	0.0522
2017	0.0415	0.0415	0.0415	0.0415	0.0415	266.8588	0.0000	0.0000	0.0000	0.0000	0.0535	0.0535	0.0535	0.0535	0.0535
2018	0.0425	0.0425	0.0425	0.0425	0.0425	273.5302	0.0000	0.0000	0.0000	0.0000	0.0548	0.0548	0.0548	0.0548	0.0548
2019	0.0436	0.0436	0.0436	0.0436	0.0436	280.3685	0.0000	0.0000	0.0000	0.0000	0.0562	0.0562	0.0562	0.0562	0.0562
2020	0.0447	0.0447	0.0447	0.0447	0.0447	287.3777	0.0000	0.0000	0.0000	0.0000	0.0576	0.0576	0.0576	0.0576	0.0576
2021	0.0458	0.0458	0.0458	0.0458	0.0458	294.5621	0.0000	0.0000	0.0000	0.0000	0.0590	0.0590	0.0590	0.0590	0.0590
2022	0.0469	0.0469	0.0469	0.0469	0.0469	301.9262	0.0000	0.0000	0.0000	0.0000	0.0605	0.0605	0.0605	0.0605	0.0605
2023	0.0481	0.0481	0.0481	0.0481	0.0481	309.4744	0.0000	0.0000	0.0000	0.0000	0.0620	0.0620	0.0620	0.0620	0.0620
2024	0.0493	0.0493	0.0493	0.0493	0.0493	317.2112	0.0000	0.0000	0.0000	0.0000	0.0636	0.0636	0.0636	0.0636	0.0636
2025	0.0505	0.0505	0.0505	0.0505	0.0505	325.1415	0.0000	0.0000	0.0000	0.0000	0.0652	0.0652	0.0652	0.0652	0.0652
2026	0.0518	0.0518	0.0518	0.0518	0.0518	333.2700	0.0000	0.0000	0.0000	0.0000	0.0668	0.0668	0.0668	0.0668	0.0668
2027	0.0531	0.0531	0.0531	0.0531	0.0531	341.6018	0.0000	0.0000	0.0000	0.0000	0.0685	0.0685	0.0685	0.0685	0.0685
2028	0.0544	0.0544	0.0544	0.0544	0.0544	350.1418	0.0000	0.0000	0.0000	0.0000	0.0702	0.0702	0.0702	0.0702	0.0702
2029	0.0558	0.0558	0.0558	0.0558	0.0558	358.8954	0.0000	0.0000	0.0000	0.0000	0.0719	0.0719	0.0719	0.0719	0.0719
2030	0.0572	0.0572	0.0572	0.0572	0.0572	367.8678	0.0000	0.0000	0.0000	0.0000	0.0737	0.0737	0.0737	0.0737	0.0737
2031	0.0586	0.0586	0.0586	0.0586	0.0586	377.0644	0.0000	0.0000	0.0000	0.0000	0.0756	0.0756	0.0756	0.0756	0.0756
2032	0.0601	0.0601	0.0601	0.0601	0.0601	386.4911	0.0000	0.0000	0.0000	0.0000	0.0775	0.0775	0.0775	0.0775	0.0775
2033	0.0616	0.0616	0.0616	0.0616	0.0616	396.1533	0.0000	0.0000	0.0000	0.0000	0.0794	0.0794	0.0794	0.0794	0.0794
2034	0.0631	0.0631	0.0631	0.0631	0.0631	406.0572	0.0000	0.0000	0.0000	0.0000	0.0814	0.0814	0.0814	0.0814	0.0814
2035	0.0647	0.0647	0.0647	0.0647	0.0647	416.2086	0.0000	0.0000	0.0000	0.0000	0.0834	0.0834	0.0834	0.0834	0.0834
2036	0.0663	0.0663	0.0663	0.0663	0.0663	426.6138	0.0000	0.0000	0.0000	0.0000	0.0855	0.0855	0.0855	0.0855	0.0855
2037	0.0680	0.0680	0.0680	0.0680	0.0680	437.2792	0.0000	0.0000	0.0000	0.0000	0.0876	0.0876	0.0876	0.0876	0.0876
2038	0.0697	0.0697	0.0697	0.0697	0.0697	448.2111	0.0000	0.0000	0.0000	0.0000	0.0898	0.0898	0.0898	0.0898	0.0898
2039	0.0714	0.0714	0.0714	0.0714	0.0714	459.4164	0.0000	0.0000	0.0000	0.0000	0.0921	0.0921	0.0921	0.0921	0.0921
2040	0.0732	0.0732	0.0732	0.0732	0.0732	470.9018	0.0000	0.0000	0.0000	0.0000	0.0944	0.0944	0.0944	0.0944	0.0944

D. Appendix D: Building and TOU Inputs

APPENDIX D

Residential Electric Building Stock Table
Number of Homes

Segment	Single Family Building Type 1	Multifamily Building Type 2	Low Income Building Type 3
Existing	210,250	141,946	12,371
New	8,413	5,680	495

APPENDIX D

Residential Electric End Use Load Shape Table
(Fraction of annual energy)

Building Type	End Use 1 - Space Cooling					End Use 2 - Lighting					End Use 3 - Refrigeration					End Use 4 - Freezer					End Use 5 - Water Heating				
	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF
Single Family	0.2048	0.3288	0.1872	0.2052	0.0740	0.0643	0.1751	0.0647	0.5474	0.1485	0.0713	0.1789	0.1138	0.4331	0.2029	0.0722	0.1781	0.1135	0.4271	0.2092	0.0561	0.1649	0.0500	0.5721	0.1568
Multifamily	0.2048	0.3288	0.1872	0.2052	0.0740	0.0643	0.1751	0.0647	0.5474	0.1485	0.0713	0.1789	0.1138	0.4331	0.2029	0.0722	0.1781	0.1135	0.4271	0.2092	0.0561	0.1649	0.0500	0.5721	0.1568
Low Income	0.2048	0.3288	0.1872	0.2052	0.0740	0.0643	0.1751	0.0647	0.5474	0.1485	0.0713	0.1789	0.1138	0.4331	0.2029	0.0722	0.1781	0.1135	0.4271	0.2092	0.0561	0.1649	0.0500	0.5721	0.1568

Residential Electric End Use Load Shape Table - Continued
(Fraction of annual energy)

Building Type	End Use 6 - Clothes Washer					End Use 7 - Clothes Dryer					End Use 8 - Dishwasher					End Use 9 - Space Heating					End Use 10 - Cooking				
	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF
Single Family	0.0747	0.2373	0.0207	0.6507	0.0165	0.0701	0.2028	0.0219	0.6457	0.0595	0.0940	0.1882	0.0183	0.6827	0.0168	0.0016	0.0070	0.0046	0.6590	0.3278	0.1192	0.1636	0.0180	0.6728	0.0264
Multifamily	0.0747	0.2373	0.0207	0.6507	0.0165	0.0701	0.2028	0.0219	0.6457	0.0595	0.0940	0.1882	0.0183	0.6827	0.0168	0.0016	0.0070	0.0046	0.6590	0.3278	0.1192	0.1636	0.0180	0.6728	0.0264
Low Income	0.0747	0.2373	0.0207	0.6507	0.0165	0.0701	0.2028	0.0219	0.6457	0.0595	0.0940	0.1882	0.0183	0.6827	0.0168	0.0016	0.0070	0.0046	0.6590	0.3278	0.1192	0.1636	0.0180	0.6728	0.0264

Residential Electric End Use Load Shape Table - Continued
(Fraction of annual energy)

Building Type	End Use 11 - TV					End Use 12 - Pool Pump					End Use 13 - Cooling and Heating					End Use 14 - Miscellaneous					End Use 15 - House				
	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF
Single Family	0.0821	0.1740	0.0755	0.5087	0.1597	0.0624	0.2838	0.0181	0.6106	0.0252	0.1205	0.2325	0.1177	0.4083	0.1209	0.0562	0.1306	0.1045	0.4970	0.2117	0.12055	0.2325	0.11772	0.40833	0.1209
Multifamily	0.0821	0.1740	0.0755	0.5087	0.1597	0.0624	0.2838	0.0181	0.6106	0.0252	0.1205	0.2325	0.1177	0.4083	0.1209	0.0562	0.1306	0.1045	0.4970	0.2117	0.12055	0.2325	0.11772	0.40833	0.1209
Low Income	0.0821	0.1740	0.0755	0.5087	0.1597	0.0624	0.2838	0.0181	0.6106	0.0252	0.1205	0.2325	0.1177	0.4083	0.1209	0.0562	0.1306	0.1045	0.4970	0.2117	0.12055	0.2325	0.11772	0.40833	0.1209

APPENDIX D

Residential Electric Peak To Energy Relationship Table (Utility Coincidence)

(Ratio of peak kW to average kW)

Building Type	End Use 1 - Space Cooling					End Use 2 - Lighting					End Use 3 - Refrigeration					End Use 4 - Freezer					End Use 5 - Water Heating				
	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF
Single Family	1.6342	1.8803	1.8828	0.1458	0.1487	0.8201	2.0959	2.7260	1.2332	2.5890	1.3400	1.0608	1.0922	0.9491	0.9687	0.9984	1.0187	1.0433	0.8729	0.8911	1.1771	0.9056	1.2659	1.0778	1.9251
Multifamily	1.6342	1.8803	1.8828	0.1458	0.1487	0.8201	2.0959	2.7260	1.2332	2.5890	1.3400	1.0608	1.0922	0.9491	0.9687	0.9984	1.0187	1.0433	0.8729	0.8911	1.1771	0.9056	1.2659	1.0778	1.9251
Low Income	1.6342	1.8803	1.8828	0.1458	0.1487	0.8201	2.0959	2.7260	1.2332	2.5890	1.3400	1.0608	1.0922	0.9491	0.9687	0.9984	1.0187	1.0433	0.8729	0.8911	1.1771	0.9056	1.2659	1.0778	1.9251

Residential Electric Peak To Energy Relationship Table (Utility Coincidence) - Continued

(Ratio of peak kW to average kW)

Building Type	End Use 6 - Clothes Washer					End Use 7 - Clothes Dryer					End Use 8 - Dishwasher					End Use 9 - Space Heating					End Use 10 - Cooking				
	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF
Single Family	1.0141	0.6940	2.5943	0.3299	3.2557	0.9854	0.8346	3.2742	0.7808	3.7174	1.2821	1.6149	4.5871	1.2833	3.1345	0.0000	0.0000	0.0000	2.6075	2.0650	1.7772	0.8192	1.4790	2.0901	3.3289
Multifamily	1.0141	0.6940	2.5943	0.3299	3.2557	0.9854	0.8346	3.2742	0.7808	3.7174	1.2821	1.6149	4.5871	1.2833	3.1345	0.0000	0.0000	0.0000	2.6075	2.0650	1.7772	0.8192	1.4790	2.0901	3.3289
Low Income	1.0141	0.6940	2.5943	0.3299	3.2557	0.9854	0.8346	3.2742	0.7808	3.7174	1.2821	1.6149	4.5871	1.2833	3.1345	0.0000	0.0000	0.0000	2.6075	2.0650	1.7772	0.8192	1.4790	2.0901	3.3289

Residential Electric Peak To Energy Relationship Table (Utility Coincidence) - Continued

(Ratio of peak kW to average kW)

Building Type	End Use 11 - TV					End Use 12 - Pool Pump					End Use 13 - Cooling and Heating					End Use 14 - Miscellaneous					End Use 15 - House				
	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF
Single Family	0.8854	2.4088	3.4461	1.6692	3.0756	0.7629	0.0754	0.4868	0.1344	0.6096	1.7111	1.5802	1.8355	1.1082	1.4632	1.2808	1.3428	1.9702	2.3858	2.1203	1.7111	1.5802	1.8355	1.1082	1.4632
Multifamily	0.8854	2.4088	3.4461	1.6692	3.0756	0.7629	0.0754	0.4868	0.1344	0.6096	1.7111	1.5802	1.8355	1.1082	1.4632	1.2808	1.3428	1.9702	2.3858	2.1203	1.7111	1.5802	1.8355	1.1082	1.4632
Low Income	0.8854	2.4088	3.4461	1.6692	3.0756	0.7629	0.0754	0.4868	0.1344	0.6096	1.7111	1.5802	1.8355	1.1082	1.4632	1.2808	1.3428	1.9702	2.3858	2.1203	1.7111	1.5802	1.8355	1.1082	1.4632

APPENDIX D

Commercial Electric Building Stock Table
Square Feet

Segment	Office Building Type 1	Restaurant Building Type 2	Retail Building Type 3	Grocery Building Type 4	Warehouse Building Type 5	School Building Type 6	College Building Type 7	Health Building Type 8	Lodging Building Type 9	City of Austin Building Type 10	Other Building Type 11
Existing	103,917,911	11,236,873	113,598,105	4,235,770	21,520,759	31,157,291	27,149,160	9,670,309	12,649,714	13,370,581	50,440,182
New	3,725,175	402,811	4,072,183	151,841	771,461	1,116,904	973,224	346,654	453,458	479,299	1,808,143

APPENDIX D

**Commercial Electric End Use Load Shape Table
(Fraction of annual energy)**

Building Type	End Use 1 - Indoor Lighting					End Use 2 - Outdoor Lighting					End Use 3 - Cooling					End Use 4 - Ventilation				
	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF
Office	0.0777	0.1945	0.0616	0.5504	0.1158	0.0401	0.0809	0.1900	0.2789	0.4102	0.1535	0.3105	0.0580	0.4230	0.0549	0.0803	0.1968	0.0736	0.5059	0.1434
Restaurant	0.0880	0.2006	0.0469	0.5683	0.0962	0.0556	0.0879	0.1708	0.3137	0.3720	0.1620	0.3261	0.0572	0.4219	0.0328	0.0810	0.1994	0.0827	0.5018	0.1351
Retail	0.0778	0.2047	0.0524	0.5646	0.1006	0.0612	0.0867	0.1709	0.3080	0.3733	0.1916	0.3723	0.0369	0.3855	0.0137	0.0852	0.2079	0.0647	0.5339	0.1083
Grocery	0.0705	0.1902	0.0738	0.5199	0.1455	0.0419	0.0817	0.1854	0.2902	0.4007	0.1621	0.3440	0.0704	0.3804	0.0430	0.0694	0.1859	0.0906	0.4883	0.1658
Warehouse	0.0753	0.1838	0.0734	0.5350	0.1325	0.0365	0.0745	0.1936	0.2761	0.4192	0.2230	0.3966	0.0615	0.3040	0.0150	0.0901	0.1995	0.0783	0.4831	0.1491
School	0.0502	0.1992	0.0494	0.5997	0.1014	0.0471	0.0806	0.1823	0.2844	0.4057	0.1360	0.4291	0.0162	0.4132	0.0054	0.0569	0.2333	0.0231	0.6004	0.0863
College	0.0811	0.1714	0.0542	0.5785	0.1148	0.0323	0.0695	0.1999	0.2691	0.4293	0.1643	0.2999	0.0614	0.4153	0.0592	0.0839	0.1930	0.0643	0.5353	0.1234
Health	0.0681	0.1871	0.0801	0.5112	0.1536	0.0380	0.0779	0.1931	0.2772	0.4139	0.1368	0.3008	0.1006	0.3855	0.0764	0.0642	0.1718	0.1048	0.4534	0.2058
Lodging	0.0698	0.1806	0.0849	0.4964	0.1683	0.0394	0.0745	0.1955	0.2680	0.4225	0.1445	0.3030	0.0971	0.3741	0.0812	0.0659	0.1738	0.1054	0.4457	0.2092
City of Austin	0.0755	0.1988	0.0591	0.5559	0.1106	0.0504	0.0846	0.1764	0.3032	0.3854	0.1678	0.3405	0.0565	0.3916	0.0435	0.0817	0.2022	0.0730	0.5023	0.1408
Other	0.0733	0.2032	0.0566	0.5614	0.1055	0.0607	0.0884	0.1627	0.3274	0.3607	0.1821	0.3705	0.0549	0.3603	0.0321	0.0831	0.2077	0.0723	0.4987	0.1382

**Commercial Electric End Use Load Shape Table - Continued
(Fraction of annual energy)**

Building Type	End Use 5 - Refrigeration					End Use 6 - Office Equipment					End Use 7 - Water Heating					End Use 8 - Vending				
	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF
Office	0.0602	0.1688	0.1067	0.4534	0.2108	0.0621	0.1870	0.0851	0.5005	0.1653	0.0588	0.1651	0.0814	0.5128	0.1819	0.0643	0.1968	0.0739	0.5226	0.1424
Restaurant	0.0639	0.1739	0.1043	0.4564	0.2015	0.0862	0.2034	0.0459	0.5716	0.0928	0.0758	0.1938	0.0384	0.6078	0.0843	0.0827	0.1859	0.0671	0.5247	0.1396
Retail	0.0648	0.1765	0.1057	0.4528	0.2002	0.0757	0.2063	0.0530	0.5644	0.1006	0.0698	0.1874	0.0467	0.5931	0.1030	0.0779	0.2030	0.0549	0.5590	0.1052
Grocery	0.0678	0.1824	0.1078	0.4463	0.1958	0.0779	0.2055	0.0512	0.5663	0.0991	0.0715	0.1869	0.0499	0.5870	0.1047	0.0699	0.1918	0.0729	0.5288	0.1366
Warehouse	0.0768	0.2049	0.1205	0.4160	0.1818	0.0708	0.1983	0.0648	0.5493	0.1168	0.0656	0.1691	0.0701	0.5462	0.1490	0.0791	0.1792	0.0774	0.5208	0.1435
School	0.0598	0.1709	0.1067	0.4541	0.2085	0.0402	0.2021	0.0588	0.5720	0.1268	0.0373	0.2102	0.0491	0.6073	0.0961	0.0346	0.2012	0.0492	0.6020	0.1129
College	0.0625	0.1680	0.1037	0.4608	0.2049	0.0687	0.1716	0.0625	0.5626	0.1346	0.0816	0.1647	0.0517	0.5838	0.1183	0.0703	0.1667	0.0591	0.5684	0.1355
Health	0.0621	0.1725	0.1038	0.4591	0.2024	0.0631	0.1889	0.0824	0.5071	0.1585	0.0571	0.1664	0.0782	0.5224	0.1759	0.0621	0.1940	0.0785	0.5153	0.1501
Lodging	0.0627	0.1727	0.1016	0.4636	0.1995	0.0684	0.1880	0.0790	0.5109	0.1536	0.0617	0.1726	0.0691	0.5512	0.1454	0.0739	0.1819	0.0818	0.5016	0.1608
City of Austin	0.0623	0.1722	0.1065	0.4527	0.2064	0.0647	0.1958	0.0731	0.5268	0.1395	0.0627	0.1703	0.0705	0.5376	0.1588	0.0684	0.1984	0.0674	0.5372	0.1287
Other	0.0643	0.1755	0.1063	0.4521	0.2019	0.0673	0.2046	0.0612	0.5532	0.1137	0.0666	0.1756	0.0596	0.5624	0.1358	0.0725	0.2000	0.0608	0.5517	0.1151

**Commercial Electric End Use Load Shape Table - Continued
(Fraction of annual energy)**

Building Type	End Use 9 - Cooking					End Use 10 - Heating					End Use 11 - Miscellaneous					End Use 12 - Whole Building				
	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF
Office	0.0638	0.2367	0.0345	0.6100	0.0551	0.0322	0.1081	0.0606	0.5694	0.2297	0.0643	0.1968	0.0739	0.5226	0.1424	0.0858	0.2102	0.0741	0.4944	0.1355
Restaurant	0.0868	0.2071	0.0410	0.5852	0.0799	0.0036	0.0172	0.0138	0.6767	0.2887	0.0827	0.1859	0.0671	0.5247	0.1396	0.0897	0.2074	0.0705	0.5054	0.1270
Retail	0.0757	0.2275	0.0325	0.6100	0.0543	0.0037	0.0230	0.0292	0.6323	0.3119	0.0779	0.2030	0.0549	0.5590	0.1052	0.0940	0.2211	0.0625	0.5092	0.1132
Grocery	0.0630	0.2090	0.0631	0.5533	0.1116	0.0015	0.0098	0.0122	0.4647	0.5118	0.0699	0.1918	0.0729	0.5288	0.1366	0.0743	0.1947	0.0948	0.4650	0.1712
Warehouse	0.0692	0.2185	0.0453	0.5935	0.0735	0.0015	0.0143	0.0130	0.7749	0.1963	0.0791	0.1792	0.0774	0.5208	0.1435	0.0816	0.1967	0.0938	0.4709	0.1569
School	0.0293	0.2166	0.0354	0.6543	0.0643	0.0033	0.0162	0.0094	0.7000	0.2711	0.0346	0.2012	0.0492	0.6020	0.1129	0.0622	0.2237	0.0576	0.5306	0.1259
College	0.0795	0.1838	0.0535	0.5751	0.1082	0.0455	0.1420	0.0512	0.5878	0.1734	0.0703	0.1667	0.0591	0.5684	0.1355	0.0864	0.1850	0.0699	0.5193	0.1394
Health	0.0754	0.2124	0.0474	0.5848	0.0801	0.0328	0.1092	0.1045	0.4592	0.2944	0.0621	0.1940	0.0785	0.5153	0.1501	0.0773	0.2016	0.0934	0.4661	0.1616
Lodging	0.0842	0.2127	0.0437	0.5839	0.0755	0.0147	0.0497	0.0498	0.4414	0.4446	0.0739	0.1819	0.0818	0.5016	0.1608	0.0815	0.1959	0.0924	0.4563	0.1739
City of Austin	0.0678	0.2230	0.0442	0.5882	0.0768	0.0229	0.0753	0.0449	0.5791	0.2778	0.0684	0.1984	0.0674	0.5372	0.1287	0.0840	0.2081	0.0749	0.4944	0.1387
Other	0.0718	0.2093	0.0538	0.5665	0.0985	0.0136	0.0424	0.0292	0.5888	0.3259	0.0725	0.2000	0.0608	0.5517	0.1151	0.0823	0.2060	0.0757	0.4943	0.1418

APPENDIX D

Commercial Electric Peak To Energy Relationship Table (Utility Coincidence)
(Ratio of peak kW to average kW)

Building Type	End Use 1 - Indoor Lighting					End Use 2 - Outdoor Lighting					End Use 3 - Cooling					End Use 4 - Ventilation				
	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF
Office	1.0145	0.5555	0.9120	0.9841	1.0250	0.8542	4.0697	1.1744	2.5496	1.0835	1.5534	0.6037	1.6148	1.0015	1.8414	1.3897	0.7043	1.1060	0.9639	1.0483
Restaurant	1.1278	0.9251	1.5195	1.1315	1.9539	1.1863	4.0370	1.2423	2.7103	1.1806	1.7016	1.0463	2.2599	2.2032	2.2353	1.4684	1.0048	1.2890	1.1433	1.4725
Retail	1.0653	0.5839	0.9230	0.9111	1.2565	1.4046	4.0748	1.2787	2.9642	1.2045	1.7584	0.7755	2.3603	2.2250	3.1173	1.4540	0.8259	1.1798	1.1068	1.4399
Grocery	1.1061	0.8740	1.1078	0.9991	1.2997	0.9298	3.9123	1.1581	2.4843	1.0756	1.7673	1.0254	2.2046	2.3400	2.1904	1.4170	0.9740	1.1307	1.0502	1.2150
Warehouse	1.0148	0.6049	0.7970	0.9664	1.0124	0.7657	4.4553	1.1495	2.7324	1.0633	1.4703	0.8386	2.5190	1.6279	3.9060	1.3563	0.9569	1.3810	0.9839	1.2009
School	0.8362	0.3652	0.8735	0.5672	0.8730	1.1054	4.4750	1.3141	2.9634	1.1936	1.0282	0.1502	1.3406	0.0933	0.5729	1.1043	0.1757	0.8558	0.3749	1.7085
College	1.2724	0.9635	1.1870	1.2519	1.5101	0.4037	4.7791	1.1038	3.1073	1.0309	1.5402	0.9428	1.5456	1.8888	0.9923	1.4867	1.0256	1.1470	1.2048	1.6182
Health	1.0880	0.7261	0.9426	0.9253	0.9867	0.8037	4.1266	1.1228	2.5113	1.0431	1.7044	0.9580	1.5812	1.6898	2.4979	1.4263	0.9428	1.0256	1.0052	1.0125
Lodging	1.1643	1.1692	1.0991	1.1991	1.3557	0.8079	4.5010	1.1132	2.7260	1.0601	1.8081	1.1319	1.7666	2.1138	0.6958	1.4716	1.0063	1.0425	1.0670	1.0286
City of Austin	1.0102	0.5532	0.9068	0.9237	1.1014	1.0382	4.1506	1.2426	2.8307	1.1940	1.6136	0.7158	1.9369	1.2181	1.4957	1.3990	0.7577	1.1767	0.9916	1.1487
Other	1.0059	0.5508	0.9015	0.8632	1.1778	1.2222	4.2314	1.3109	3.1119	1.3044	1.6738	0.8279	2.2590	1.4347	1.1499	1.4082	0.8110	1.2474	1.0194	1.2491

Commercial Electric Peak To Energy Relationship Table (Utility Coincidence) - Continued
(Ratio of peak kW to average kW)

Building Type	End Use 5 - Refrigeration					End Use 6 - Office Equipment					End Use 7 - Water Heating					End Use 8 - Vending				
	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF
Office	1.0737	0.9323	0.9937	0.9708	1.0005	0.9367	0.6421	0.9433	0.7963	0.9691	1.0006	0.7026	0.9533	0.8929	0.9173	0.9245	0.5307	0.9345	0.7751	0.9708
Restaurant	1.0914	0.9509	1.0228	1.0110	1.0503	1.1229	0.7924	1.2606	1.0658	1.6871	1.0783	0.5994	1.0804	0.8742	1.5581	1.1880	1.0216	1.3917	1.1978	1.5667
Retail	1.0778	0.9337	0.9989	1.0128	1.0490	1.0237	0.4994	0.9080	0.8063	1.1372	1.0419	0.4995	0.9234	0.7860	1.1259	1.0662	0.6268	0.9875	0.9240	1.2899
Grocery	1.0760	0.9422	1.0115	1.0439	1.0876	1.1074	0.6435	1.0496	0.9295	1.3953	1.1154	0.6853	0.9780	0.8949	1.2755	1.0884	0.6980	0.8462	0.8937	1.0673
Warehouse	1.1143	0.9812	1.0538	1.1396	1.1735	0.9231	0.4202	0.7340	0.7659	0.8863	0.9486	0.5332	0.8034	0.7518	0.8515	1.0773	0.7343	0.9705	1.0929	1.1935
School	1.0716	0.9241	0.9929	0.9431	0.9981	0.8339	0.4386	1.0545	0.4556	0.9711	0.7616	0.2565	0.7253	0.4399	0.9533	0.8276	0.3561	1.0126	0.4392	0.9251
College	1.1175	0.9981	1.0218	1.0321	1.0595	1.1976	0.7618	1.0086	1.0413	1.1873	1.1697	1.0150	1.2502	1.1590	1.8142	1.2873	1.0574	1.2197	1.1432	1.4327
Health	1.0805	0.9274	1.0033	0.9759	1.0171	0.9880	0.6234	0.9149	0.7551	0.9469	0.9894	0.6868	0.9183	0.7226	0.8824	0.9952	0.6154	0.9179	0.7443	0.9566
Lodging	1.0937	0.9472	1.0241	0.9981	1.0521	1.0800	0.8236	1.0095	0.9311	1.2330	1.1262	0.8166	0.8860	0.9299	1.2258	1.1546	0.9857	1.1715	1.1523	1.2815
City of Austin	1.0804	0.9386	0.9988	0.9868	1.0108	0.9190	0.5441	0.8905	0.7576	0.9717	1.0261	0.7255	0.9629	0.9267	1.1282	0.9745	0.5611	0.9358	0.8332	1.0841
Other	1.0871	0.9448	1.0039	1.0028	1.0211	0.9013	0.4462	0.8377	0.7188	0.9743	1.0515	0.7484	0.9726	0.9605	1.3391	1.0245	0.5915	0.9370	0.8914	1.1975

Commercial Electric Peak To Energy Relationship Table (Utility Coincidence) - Continued
(Ratio of peak kW to average kW)

Building Type	End Use 9 - Cooking					End Use 10 - Heating					End Use 11 - Miscellaneous					End Use 12 - Whole Building				
	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF
Office	0.6944	0.1425	0.5386	0.4938	0.6726	0.9572	0.6358	0.8057	0.7960	0.6184	0.9245	0.5307	0.9345	0.7751	0.9708	1.0755	0.6585	1.0842	0.9463	1.0628
Restaurant	1.2034	0.7617	1.3015	1.1117	1.9409	0.3762	1.0306	0.6719	0.0670	1.2509	1.1880	1.0216	1.3917	1.1978	1.5667	1.1993	0.9841	1.3262	1.2721	1.4335
Retail	0.9857	0.3701	0.6771	0.7027	1.4269	0.9663	0.4240	0.2291	0.0610	0.6528	1.0662	0.6268	0.9875	0.9240	1.2899	1.1873	0.7647	1.1608	1.1634	1.2631
Grocery	1.1016	0.5602	0.7198	0.7902	1.1119	0.4666	0.4345	0.3017	0.0246	0.4232	1.0884	0.6980	0.8462	0.8937	1.0673	1.1321	0.9405	1.0921	1.1071	1.1516
Warehouse	0.8867	0.1921	0.4704	0.6603	0.6874	0.3258	0.0425	0.3652	0.0802	0.1129	1.0773	0.7343	0.9705	1.0929	1.1935	1.0700	0.8376	1.0255	1.0804	1.1075
School	0.6453	0.1290	0.5520	0.2402	0.6211	1.3106	0.1943	0.2266	0.8375	1.6802	0.8276	0.3561	1.0126	0.4392	0.9251	0.8631	1.0540	0.6112	1.0961	
College	1.2101	0.8708	1.2880	1.1404	1.7463	1.0337	1.0984	1.1526	0.7648	2.5057	1.2873	1.0574	1.2197	1.1432	1.4327	1.1991	1.0776	1.1931	1.3290	1.4254
Health	1.1786	0.4619	0.4426	0.8672	0.5991	0.9384	0.9356	0.7606	0.6583	0.6572	0.9952	0.6154	0.9179	0.7443	0.9566	1.1600	0.8510	1.0911	1.0393	1.1054
Lodging	1.2679	0.8014	0.5201	1.1041	2.1115	1.0290	0.7957	0.5250	0.2634	1.7506	1.1546	0.9857	1.1715	1.1523	1.2815	1.2458	1.1349	1.1992	1.3097	1.2236
City of Austin	0.9025	0.3880	0.6509	0.7152	1.0340	1.0072	0.7883	0.7172	0.5606	1.2697	0.9745	0.5611	0.9358	0.8332	1.0841	1.0957	0.7472	1.1119	1.0122	1.1303
Other	1.1106	0.6336	0.7631	0.9365	1.3954	1.0572	0.9408	0.6287	0.3251	1.9211	1.0245	0.5915	0.9370	0.8914	1.1975	1.1158	0.8359	1.1396	1.0780	1.1977

APPENDIX D

Industrial Electric Building Stock Table
Base Electricity Use (kWh)

Segment	Food Building Type 1	Textiles-Apparel Building Type 2	Lumber-Furniture Building Type 3	Paper Building Type 4	Printing Building Type 5	Chemicals Building Type 6	Petroleum Building Type 7	Rubber-Plastics Building Type 8
Existing	13,681,744	4,165,417	2,154,260	936,235	52,749,665	42,262,555	1,483,924	1,384,384
New	490,453	149,319	77,224	33,561	1,890,932	1,514,998	53,195	49,626

Industrial Electric Building Stock Table - Continued
Base Electricity Use (kWh)

Segment	Stone-Clay-Glass Building Type 9	Prim Metals Building Type 10	Fab Metals Building Type 11	Ind Mach Building Type 12	Electronics Building Type 13	Transp Equip Building Type 14	Misc Ind Building Type 15	Water/WW Building Type 16
Existing	6,497,151	0	2,506,522	83,609,086	1,544,937,690	23,444,344	15,616,993	179,546,404
New	232,905	0	89,852	2,997,159	55,381,819	840,416	559,827	6,436,251

APPENDIX D

Industrial Electric End Use Load Shape Table
(Fraction of annual energy)

Building Type	End Use 1 - Compressed Air					End Use 2 - Fans					End Use 3 - Pumping					End Use 4 - Drives				
	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF
Food	0.0619	0.1541	0.1049	0.4578	0.2213	0.0619	0.1541	0.1049	0.4578	0.2213	0.0619	0.1541	0.1049	0.4578	0.2213	0.0619	0.1541	0.1049	0.4578	0.2213
Textiles-Apparel	0.1766	0.5070	0.1352	0.1634	0.0178	0.1766	0.5070	0.1352	0.1634	0.0178	0.1766	0.5070	0.1352	0.1634	0.0178	0.1766	0.5070	0.1352	0.1634	0.0178
Lumber-Furniture	0.0755	0.1719	0.1005	0.4583	0.1937	0.0755	0.1719	0.1005	0.4583	0.1937	0.0755	0.1719	0.1005	0.4583	0.1937	0.0755	0.1719	0.1005	0.4583	0.1937
Paper	0.0419	0.1159	0.0821	0.5062	0.2539	0.0419	0.1159	0.0821	0.5062	0.2539	0.0419	0.1159	0.0821	0.5062	0.2539	0.0419	0.1159	0.0821	0.5062	0.2539
Printing	0.0672	0.1730	0.1171	0.4284	0.2143	0.0672	0.1730	0.1171	0.4284	0.2143	0.0672	0.1730	0.1171	0.4284	0.2143	0.0672	0.1730	0.1171	0.4284	0.2143
Chemicals	0.0584	0.2121	0.1537	0.3665	0.2093	0.0584	0.2121	0.1537	0.3665	0.2093	0.0584	0.2121	0.1537	0.3665	0.2093	0.0584	0.2121	0.1537	0.3665	0.2093
Petroleum	0.0584	0.2121	0.1537	0.3665	0.2093	0.0584	0.2121	0.1537	0.3665	0.2093	0.0584	0.2121	0.1537	0.3665	0.2093	0.0584	0.2121	0.1537	0.3665	0.2093
Rubber-Plastics	0.0709	0.1732	0.1201	0.4269	0.2089	0.0709	0.1732	0.1201	0.4269	0.2089	0.0709	0.1732	0.1201	0.4269	0.2089	0.0709	0.1732	0.1201	0.4269	0.2089
Stone-Clay-Glass	0.0578	0.1589	0.1113	0.4500	0.2220	0.0578	0.1589	0.1113	0.4500	0.2220	0.0578	0.1589	0.1113	0.4500	0.2220	0.0578	0.1589	0.1113	0.4500	0.2220
Prim Metals	0.0717	0.1604	0.0890	0.4955	0.1833	0.0717	0.1604	0.0890	0.4955	0.1833	0.0717	0.1604	0.0890	0.4955	0.1833	0.0717	0.1604	0.0890	0.4955	0.1833
Fab Metals	0.0698	0.1795	0.1034	0.4579	0.1893	0.0698	0.1795	0.1034	0.4579	0.1893	0.0698	0.1795	0.1034	0.4579	0.1893	0.0698	0.1795	0.1034	0.4579	0.1893
Ind Mach	0.1134	0.1878	0.0475	0.5978	0.0534	0.1134	0.1878	0.0475	0.5978	0.0534	0.1134	0.1878	0.0475	0.5978	0.0534	0.1134	0.1878	0.0475	0.5978	0.0534
Electronics	0.0640	0.1731	0.1081	0.4516	0.2032	0.0640	0.1731	0.1081	0.4516	0.2032	0.0640	0.1731	0.1081	0.4516	0.2032	0.0640	0.1731	0.1081	0.4516	0.2032
Transp Equip	0.0712	0.1737	0.0969	0.4671	0.1911	0.0712	0.1737	0.0969	0.4671	0.1911	0.0712	0.1737	0.0969	0.4671	0.1911	0.0712	0.1737	0.0969	0.4671	0.1911
Misc Ind	0.0580	0.1578	0.1068	0.4527	0.2246	0.0580	0.1578	0.1068	0.4527	0.2246	0.0580	0.1578	0.1068	0.4527	0.2246	0.0580	0.1578	0.1068	0.4527	0.2246
Water/WW	0.0580	0.1578	0.1068	0.4527	0.2246	0.0580	0.1578	0.1068	0.4527	0.2246	0.0580	0.1578	0.1068	0.4527	0.2246	0.0580	0.1578	0.1068	0.4527	0.2246

Industrial Electric End Use Load Shape Table - Continued
(Fraction of annual energy)

Building Type	End Use 5 - Process Heating					End Use 6 - Refrigeration					End Use 7 - Other Process					End Use 8 - Cooling				
	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF
Food	0.0619	0.1541	0.1049	0.4578	0.2213	0.0619	0.1541	0.1049	0.4578	0.2213	0.0619	0.1541	0.1049	0.4578	0.2213	0.0619	0.1541	0.1049	0.4578	0.2213
Textiles-Apparel	0.1766	0.5070	0.1352	0.1634	0.0178	0.1766	0.5070	0.1352	0.1634	0.0178	0.1766	0.5070	0.1352	0.1634	0.0178	0.1766	0.5070	0.1352	0.1634	0.0178
Lumber-Furniture	0.0755	0.1719	0.1005	0.4583	0.1937	0.0755	0.1719	0.1005	0.4583	0.1937	0.0755	0.1719	0.1005	0.4583	0.1937	0.0755	0.1719	0.1005	0.4583	0.1937
Paper	0.0419	0.1159	0.0821	0.5062	0.2539	0.0419	0.1159	0.0821	0.5062	0.2539	0.0419	0.1159	0.0821	0.5062	0.2539	0.0419	0.1159	0.0821	0.5062	0.2539
Printing	0.0672	0.1730	0.1171	0.4284	0.2143	0.0672	0.1730	0.1171	0.4284	0.2143	0.0672	0.1730	0.1171	0.4284	0.2143	0.0672	0.1730	0.1171	0.4284	0.2143
Chemicals	0.0584	0.2121	0.1537	0.3665	0.2093	0.0584	0.2121	0.1537	0.3665	0.2093	0.0584	0.2121	0.1537	0.3665	0.2093	0.0584	0.2121	0.1537	0.3665	0.2093
Petroleum	0.0584	0.2121	0.1537	0.3665	0.2093	0.0584	0.2121	0.1537	0.3665	0.2093	0.0584	0.2121	0.1537	0.3665	0.2093	0.0584	0.2121	0.1537	0.3665	0.2093
Rubber-Plastics	0.0709	0.1732	0.1201	0.4269	0.2089	0.0709	0.1732	0.1201	0.4269	0.2089	0.0709	0.1732	0.1201	0.4269	0.2089	0.0709	0.1732	0.1201	0.4269	0.2089
Stone-Clay-Glass	0.0578	0.1589	0.1113	0.4500	0.2220	0.0578	0.1589	0.1113	0.4500	0.2220	0.0578	0.1589	0.1113	0.4500	0.2220	0.0578	0.1589	0.1113	0.4500	0.2220
Prim Metals	0.0717	0.1604	0.0890	0.4955	0.1833	0.0717	0.1604	0.0890	0.4955	0.1833	0.0717	0.1604	0.0890	0.4955	0.1833	0.0717	0.1604	0.0890	0.4955	0.1833
Fab Metals	0.0698	0.1795	0.1034	0.4579	0.1893	0.0698	0.1795	0.1034	0.4579	0.1893	0.0698	0.1795	0.1034	0.4579	0.1893	0.0698	0.1795	0.1034	0.4579	0.1893
Ind Mach	0.1134	0.1878	0.0475	0.5978	0.0534	0.1134	0.1878	0.0475	0.5978	0.0534	0.1134	0.1878	0.0475	0.5978	0.0534	0.1134	0.1878	0.0475	0.5978	0.0534
Electronics	0.0640	0.1731	0.1081	0.4516	0.2032	0.0640	0.1731	0.1081	0.4516	0.2032	0.0640	0.1731	0.1081	0.4516	0.2032	0.0640	0.1731	0.1081	0.4516	0.2032
Transp Equip	0.0712	0.1737	0.0969	0.4671	0.1911	0.0712	0.1737	0.0969	0.4671	0.1911	0.0712	0.1737	0.0969	0.4671	0.1911	0.0712	0.1737	0.0969	0.4671	0.1911
Misc Ind	0.0580	0.1578	0.1068	0.4527	0.2246	0.0580	0.1578	0.1068	0.4527	0.2246	0.0580	0.1578	0.1068	0.4527	0.2246	0.0580	0.1578	0.1068	0.4527	0.2246
Water/WW	0.0580	0.1578	0.1068	0.4527	0.2246	0.0580	0.1578	0.1068	0.4527	0.2246	0.0580	0.1578	0.1068	0.4527	0.2246	0.0580	0.1578	0.1068	0.4527	0.2246

APPENDIX D

Industrial Electric End Use Load Shape Table - Continued
(Fraction of annual energy)

Building Type	End Use 9 - Lighting					End Use 10 - Other					End Use 11 - Whole Building				
	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF
Food	0.0619	0.1541	0.1049	0.4578	0.2213	0.0619	0.1541	0.1049	0.4578	0.2213	0.0619	0.1541	0.1049	0.4578	0.2213
Textiles-Apparel	0.1766	0.5070	0.1352	0.1634	0.0178	0.1766	0.5070	0.1352	0.1634	0.0178	0.1766	0.5070	0.1352	0.1634	0.0178
Lumber-Furniture	0.0755	0.1719	0.1005	0.4583	0.1937	0.0755	0.1719	0.1005	0.4583	0.1937	0.0755	0.1719	0.1005	0.4583	0.1937
Paper	0.0419	0.1159	0.0821	0.5062	0.2539	0.0419	0.1159	0.0821	0.5062	0.2539	0.0419	0.1159	0.0821	0.5062	0.2539
Printing	0.0672	0.1730	0.1171	0.4284	0.2143	0.0672	0.1730	0.1171	0.4284	0.2143	0.0672	0.1730	0.1171	0.4284	0.2143
Chemicals	0.0584	0.2121	0.1537	0.3665	0.2093	0.0584	0.2121	0.1537	0.3665	0.2093	0.0584	0.2121	0.1537	0.3665	0.2093
Petroleum	0.0584	0.2121	0.1537	0.3665	0.2093	0.0584	0.2121	0.1537	0.3665	0.2093	0.0584	0.2121	0.1537	0.3665	0.2093
Rubber-Plastics	0.0709	0.1732	0.1201	0.4269	0.2089	0.0709	0.1732	0.1201	0.4269	0.2089	0.0709	0.1732	0.1201	0.4269	0.2089
Stone-Clay-Glass	0.0578	0.1589	0.1113	0.4500	0.2220	0.0578	0.1589	0.1113	0.4500	0.2220	0.0578	0.1589	0.1113	0.4500	0.2220
Prim Metals	0.0717	0.1604	0.0890	0.4955	0.1833	0.0717	0.1604	0.0890	0.4955	0.1833	0.0717	0.1604	0.0890	0.4955	0.1833
Fab Metals	0.0698	0.1795	0.1034	0.4579	0.1893	0.0698	0.1795	0.1034	0.4579	0.1893	0.0698	0.1795	0.1034	0.4579	0.1893
Ind Mach	0.1134	0.1878	0.0475	0.5978	0.0534	0.1134	0.1878	0.0475	0.5978	0.0534	0.1134	0.1878	0.0475	0.5978	0.0534
Electronics	0.0640	0.1731	0.1081	0.4516	0.2032	0.0640	0.1731	0.1081	0.4516	0.2032	0.0640	0.1731	0.1081	0.4516	0.2032
Transp Equip	0.0712	0.1737	0.0969	0.4671	0.1911	0.0712	0.1737	0.0969	0.4671	0.1911	0.0712	0.1737	0.0969	0.4671	0.1911
Misc Ind	0.0580	0.1578	0.1068	0.4527	0.2246	0.0580	0.1578	0.1068	0.4527	0.2246	0.0580	0.1578	0.1068	0.4527	0.2246
Water/WW	0.0580	0.1578	0.1068	0.4527	0.2246	0.0580	0.1578	0.1068	0.4527	0.2246	0.0580	0.1578	0.1068	0.4527	0.2246

Industrial Electric Peak To Energy Relationship Table (Utility Coincidence)
(Ratio of peak kW to average kW)

Building Type	End Use 1 - Compressed Air					End Use 2 - Fans					End Use 3 - Pumping					End Use 4 - Drives				
	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF
Food	1.1505	1.0000	1.0000	1.0000	1.0000	1.1505	1.0000	1.0000	1.0000	1.0000	1.1505	1.0000	1.0000	1.0000	1.0000	1.1505	1.0000	1.0000	1.0000	1.0000
Textiles-Apparel	0.7453	1.0000	1.0000	1.0000	1.0000	0.7453	1.0000	1.0000	1.0000	1.0000	0.7453	1.0000	1.0000	1.0000	1.0000	0.7453	1.0000	1.0000	1.0000	1.0000
Lumber-Furniture	1.1462	1.0000	1.0000	1.0000	1.0000	1.1462	1.0000	1.0000	1.0000	1.0000	1.1462	1.0000	1.0000	1.0000	1.0000	1.1462	1.0000	1.0000	1.0000	1.0000
Paper	1.1430	1.0000	1.0000	1.0000	1.0000	1.1430	1.0000	1.0000	1.0000	1.0000	1.1430	1.0000	1.0000	1.0000	1.0000	1.1430	1.0000	1.0000	1.0000	1.0000
Printing	1.1597	1.0000	1.0000	1.0000	1.0000	1.1597	1.0000	1.0000	1.0000	1.0000	1.1597	1.0000	1.0000	1.0000	1.0000	1.1597	1.0000	1.0000	1.0000	1.0000
Chemicals	1.1600	1.0000	1.0000	1.0000	1.0000	1.1600	1.0000	1.0000	1.0000	1.0000	1.1600	1.0000	1.0000	1.0000	1.0000	1.1600	1.0000	1.0000	1.0000	1.0000
Petroleum	1.1600	1.0000	1.0000	1.0000	1.0000	1.1600	1.0000	1.0000	1.0000	1.0000	1.1600	1.0000	1.0000	1.0000	1.0000	1.1600	1.0000	1.0000	1.0000	1.0000
Rubber-Plastics	1.1636	1.0000	1.0000	1.0000	1.0000	1.1636	1.0000	1.0000	1.0000	1.0000	1.1636	1.0000	1.0000	1.0000	1.0000	1.1636	1.0000	1.0000	1.0000	1.0000
Stone-Clay-Glass	1.1632	1.0000	1.0000	1.0000	1.0000	1.1632	1.0000	1.0000	1.0000	1.0000	1.1632	1.0000	1.0000	1.0000	1.0000	1.1632	1.0000	1.0000	1.0000	1.0000
Prim Metals	1.1706	1.0000	1.0000	1.0000	1.0000	1.1706	1.0000	1.0000	1.0000	1.0000	1.1706	1.0000	1.0000	1.0000	1.0000	1.1706	1.0000	1.0000	1.0000	1.0000
Fab Metals	1.1457	1.0000	1.0000	1.0000	1.0000	1.1457	1.0000	1.0000	1.0000	1.0000	1.1457	1.0000	1.0000	1.0000	1.0000	1.1457	1.0000	1.0000	1.0000	1.0000
Ind Mach	1.1603	1.0000	1.0000	1.0000	1.0000	1.1603	1.0000	1.0000	1.0000	1.0000	1.1603	1.0000	1.0000	1.0000	1.0000	1.1603	1.0000	1.0000	1.0000	1.0000
Electronics	1.1482	1.0000	1.0000	1.0000	1.0000	1.1482	1.0000	1.0000	1.0000	1.0000	1.1482	1.0000	1.0000	1.0000	1.0000	1.1482	1.0000	1.0000	1.0000	1.0000
Transp Equip	1.1210	1.0000	1.0000	1.0000	1.0000	1.1210	1.0000	1.0000	1.0000	1.0000	1.1210	1.0000	1.0000	1.0000	1.0000	1.1210	1.0000	1.0000	1.0000	1.0000
Misc Ind	1.1620	1.0000	1.0000	1.0000	1.0000	1.1620	1.0000	1.0000	1.0000	1.0000	1.1620	1.0000	1.0000	1.0000	1.0000	1.1620	1.0000	1.0000	1.0000	1.0000
Water/WW	1.1620	1.0000	1.0000	1.0000	1.0000	1.1620	1.0000	1.0000	1.0000	1.0000	1.1620	1.0000	1.0000	1.0000	1.0000	1.1620	1.0000	1.0000	1.0000	1.0000

APPENDIX D

Industrial Electric Peak To Energy Relationship Table (Utility Coincidence) - Continued

(Ratio of peak kW to average kW)

Building Type	End Use 5 - Process Heating					End Use 6 - Refrigeration					End Use 7 - Other Process					End Use 8 - Cooling				
	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF
Food	1.1505	1.0000	1.0000	1.0000	1.0000	1.1505	1.0000	1.0000	1.0000	1.0000	1.1505	1.0000	1.0000	1.0000	1.0000	2.1516	1.0000	1.0000	1.0000	1.0000
Textiles-Apparel	0.7453	1.0000	1.0000	1.0000	1.0000	0.7453	1.0000	1.0000	1.0000	1.0000	0.7453	1.0000	1.0000	1.0000	1.0000	1.3938	1.0000	1.0000	1.0000	1.0000
Lumber-Furniture	1.1462	1.0000	1.0000	1.0000	1.0000	1.1462	1.0000	1.0000	1.0000	1.0000	1.1462	1.0000	1.0000	1.0000	1.0000	2.1435	1.0000	1.0000	1.0000	1.0000
Paper	1.1430	1.0000	1.0000	1.0000	1.0000	1.1430	1.0000	1.0000	1.0000	1.0000	1.1430	1.0000	1.0000	1.0000	1.0000	2.1376	1.0000	1.0000	1.0000	1.0000
Printing	1.1597	1.0000	1.0000	1.0000	1.0000	1.1597	1.0000	1.0000	1.0000	1.0000	1.1597	1.0000	1.0000	1.0000	1.0000	2.1688	1.0000	1.0000	1.0000	1.0000
Chemicals	1.1600	1.0000	1.0000	1.0000	1.0000	1.1600	1.0000	1.0000	1.0000	1.0000	1.1600	1.0000	1.0000	1.0000	1.0000	2.1694	1.0000	1.0000	1.0000	1.0000
Petroleum	1.1600	1.0000	1.0000	1.0000	1.0000	1.1600	1.0000	1.0000	1.0000	1.0000	1.1600	1.0000	1.0000	1.0000	1.0000	2.1694	1.0000	1.0000	1.0000	1.0000
Rubber-Plastics	1.1636	1.0000	1.0000	1.0000	1.0000	1.1636	1.0000	1.0000	1.0000	1.0000	1.1636	1.0000	1.0000	1.0000	1.0000	2.1760	1.0000	1.0000	1.0000	1.0000
Stone-Clay-Glass	1.1632	1.0000	1.0000	1.0000	1.0000	1.1632	1.0000	1.0000	1.0000	1.0000	1.1632	1.0000	1.0000	1.0000	1.0000	2.1753	1.0000	1.0000	1.0000	1.0000
Prim Metals	1.1706	1.0000	1.0000	1.0000	1.0000	1.1706	1.0000	1.0000	1.0000	1.0000	1.1706	1.0000	1.0000	1.0000	1.0000	2.1892	1.0000	1.0000	1.0000	1.0000
Fab Metals	1.1457	1.0000	1.0000	1.0000	1.0000	1.1457	1.0000	1.0000	1.0000	1.0000	1.1457	1.0000	1.0000	1.0000	1.0000	2.1426	1.0000	1.0000	1.0000	1.0000
Ind Mach	1.1603	1.0000	1.0000	1.0000	1.0000	1.1603	1.0000	1.0000	1.0000	1.0000	1.1603	1.0000	1.0000	1.0000	1.0000	2.1698	1.0000	1.0000	1.0000	1.0000
Electronics	1.1482	1.0000	1.0000	1.0000	1.0000	1.1482	1.0000	1.0000	1.0000	1.0000	1.1482	1.0000	1.0000	1.0000	1.0000	2.1472	1.0000	1.0000	1.0000	1.0000
Transp Equip	1.1210	1.0000	1.0000	1.0000	1.0000	1.1210	1.0000	1.0000	1.0000	1.0000	1.1210	1.0000	1.0000	1.0000	1.0000	2.0965	1.0000	1.0000	1.0000	1.0000
Misc Ind	1.1620	1.0000	1.0000	1.0000	1.0000	1.1620	1.0000	1.0000	1.0000	1.0000	1.1620	1.0000	1.0000	1.0000	1.0000	2.1730	1.0000	1.0000	1.0000	1.0000
Water/WW	1.1620	1.0000	1.0000	1.0000	1.0000	1.1620	1.0000	1.0000	1.0000	1.0000	1.1620	1.0000	1.0000	1.0000	1.0000	2.1730	1.0000	1.0000	1.0000	1.0000

Industrial Electric Peak To Energy Relationship Table (Utility Coincidence) - Continued

(Ratio of peak kW to average kW)

Building Type	End Use 9 - Lighting					End Use 10 - Other					End Use 11 - Whole Building				
	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF	SON	SMID	SOFF	WMID	WOFF
Food	1.1505	1.0000	1.0000	1.0000	1.0000	1.1505	1.0000	1.0000	1.0000	1.0000	2.1516	1.0000	1.0000	1.0000	1.0000
Textiles-Apparel	0.7453	1.0000	1.0000	1.0000	1.0000	0.7453	1.0000	1.0000	1.0000	1.0000	1.3938	1.0000	1.0000	1.0000	1.0000
Lumber-Furniture	1.1462	1.0000	1.0000	1.0000	1.0000	1.1462	1.0000	1.0000	1.0000	1.0000	2.1435	1.0000	1.0000	1.0000	1.0000
Paper	1.1430	1.0000	1.0000	1.0000	1.0000	1.1430	1.0000	1.0000	1.0000	1.0000	2.1376	1.0000	1.0000	1.0000	1.0000
Printing	1.1597	1.0000	1.0000	1.0000	1.0000	1.1597	1.0000	1.0000	1.0000	1.0000	2.1688	1.0000	1.0000	1.0000	1.0000
Chemicals	1.1600	1.0000	1.0000	1.0000	1.0000	1.1600	1.0000	1.0000	1.0000	1.0000	2.1694	1.0000	1.0000	1.0000	1.0000
Petroleum	1.1600	1.0000	1.0000	1.0000	1.0000	1.1600	1.0000	1.0000	1.0000	1.0000	2.1694	1.0000	1.0000	1.0000	1.0000
Rubber-Plastics	1.1636	1.0000	1.0000	1.0000	1.0000	1.1636	1.0000	1.0000	1.0000	1.0000	2.1760	1.0000	1.0000	1.0000	1.0000
Stone-Clay-Glass	1.1632	1.0000	1.0000	1.0000	1.0000	1.1632	1.0000	1.0000	1.0000	1.0000	2.1753	1.0000	1.0000	1.0000	1.0000
Prim Metals	1.1706	1.0000	1.0000	1.0000	1.0000	1.1706	1.0000	1.0000	1.0000	1.0000	2.1892	1.0000	1.0000	1.0000	1.0000
Fab Metals	1.1457	1.0000	1.0000	1.0000	1.0000	1.1457	1.0000	1.0000	1.0000	1.0000	2.1426	1.0000	1.0000	1.0000	1.0000
Ind Mach	1.1603	1.0000	1.0000	1.0000	1.0000	1.1603	1.0000	1.0000	1.0000	1.0000	2.1698	1.0000	1.0000	1.0000	1.0000
Electronics	1.1482	1.0000	1.0000	1.0000	1.0000	1.1482	1.0000	1.0000	1.0000	1.0000	2.1472	1.0000	1.0000	1.0000	1.0000
Transp Equip	1.1210	1.0000	1.0000	1.0000	1.0000	1.1210	1.0000	1.0000	1.0000	1.0000	2.0965	1.0000	1.0000	1.0000	1.0000
Misc Ind	1.1620	1.0000	1.0000	1.0000	1.0000	1.1620	1.0000	1.0000	1.0000	1.0000	2.1730	1.0000	1.0000	1.0000	1.0000
Water/WW	1.1620	1.0000	1.0000	1.0000	1.0000	1.1620	1.0000	1.0000	1.0000	1.0000	2.1730	1.0000	1.0000	1.0000	1.0000

E. Appendix E: Electric Measure Inputs

Residential Electric Measure Inputs			BASE TECHNOLOGY EUIs (kWh/home)		
Segment	Measure #	Measure Description	Single Family	Multifamily	Low Income
Existing	100	Base Split-System Air Conditioner (11 SEER)	3,623	1,101	2,822
Existing	130	Base Early Replacement Split-System Air Conditioner (11 SEER)	4,528	1,377	3,528
Existing	140	Base Room Air Conditioner - EER 9.7	1,696	516	1,321
Existing	160	Base Early Replacement Room Air Conditioner- EER 9.0	1,815	552	1,414
Existing	170	Base Dehumidifier- New Federal Standard	1,064	351	851
Existing	200	Base Resistance Space Heating (Primary)	2,784	3,117	5,029
Existing	250	Base Air-Source Heat Pump, 13 SEER, 7.7 HSPF	1,307	720	1,161
Existing	300	Base High-Efficiency Incandescent Lighting, <1.15 hrs/day	150	98	80
Existing	310	Base High-Efficiency Incandescent Lighting, 1.15-2.15 hrs/day	648	421	345
Existing	320	Base High-Efficiency Incandescent Lighting, 2.15-5 hrs/day	281	182	150
Existing	330	Base High-Efficiency Incandescent Lighting, >5 hrs/day	425	276	226
Existing	340	Base Lighting 15 Watt CFL, <1.15 hrs/day	7	4	4
Existing	350	Base Lighting 15 Watt CFL, 1.15-2.15 hrs/day	58	33	36
Existing	360	Base Lighting 15 Watt CFL, 2.15-5 hrs/day	50	29	31
Existing	370	Base Lighting 15 Watt CFL, >5 hrs/day	76	43	47
Existing	380	Base Fluorescent Fixture 1.8 hrs/day	273	93	105
Existing	400	Base Refrigerator	871	1,003	895
Existing	410	Base Early Replacement Refrigerator	871	1,003	895
Existing	420	Base Second Refrigerator	1,248	1,104	1,036
Existing	430	Base Freezer	666	767	685
Existing	440	Base Early Replacement Freezer	666	767	685
Existing	500	Base 40 gal. Water Heating (EF=0.88)	3,492	2,438	3,587
Existing	550	Base Early Replacement Water Heating to Heat Pump Water Heater	3,492	2,438	3,587
Existing	600	Base Clotheswasher (MEF=1.26)	98	113	101
Existing	610	Base Clothes Dryer (EF=3.01)	1,175	813	967
Existing	700	Base Dishwasher (EF=0.65)	196	226	202
Existing	800	Base Single Speed Pool Pump (RET)	997	1,147	1,024
Existing	810	Base Two Speed Pool Pump (1.5 hp) (ROB)	617	816	651
Existing	900	Base Plasma TV	285	328	334
Existing	910	Base LCD TV	192	198	206
Existing	920	Base CRT TV	225	172	259
Existing	930	Base Set-Top Box	284	275	290
Existing	940	Base DVD Player	40	37	42
Existing	950	Base Desktop PC	885	798	853
Existing	960	Base Laptop PC	233	235	212
Existing	970	Base Cooking	383	441	394
Existing	980	Base Miscellaneous	2,187	48	2,243
Existing	990	Base House Practices	13,796	7,215	11,552
New	100	Base City of Austin Code Home	10,220	5,345	8,557
New	104	Base 2015 City of Austin Code Home	8,954	4,683	7,497

Residential Electric Measure Inputs							NPV of Lifetime O & M Cost	Implementation		Full = 1 Incr. = 0		Full Unit Cost	Relative Energy Reduction Factors					Implementation Type		
Segment	Measure #	Measure Description	Savings Units	Cost Units	Unit Equipment Cost	Unit Labor Cost		Cost Factor	Service Life	Initial Cost	Replace Cost		SON	SMID	SOFF	WMID	WOFF	End 1=1 time Use 2=ROB	Cost Source	
Existing	100	Base Split-System Air Conditioner (13 SEER)	home	ton	\$0.00	\$0.00	\$0.00	\$0.00	14	1	1	\$0.00	1.20	1.13	0.60	1.09	0.60	1	2	DNV KEMA Database
Existing	101	15 SEER (12.72 EER) Split-System Air Conditioner w/ quality install	home	unit	\$593.00	\$100.00	\$0.00	\$693.00	14	1	1	\$693.00	1.00	1.00	1.00	1.00	1.00	1	2	DNV KEMA Database
Existing	102	17 SEER (12.28 EER) Split-System Air Conditioner w/ quality install	home	unit	\$1,185.00	\$100.00	\$0.00	\$1,285.00	14	1	1	\$1,285.00	1.00	1.00	1.00	1.00	1.00	1	2	DNV KEMA Database
Existing	103	AC Maintenance (Indoor Coil Cleaning)	home	unit	\$0.00	\$100.00	\$0.00	\$100.00	4	1	1	\$100.00	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	104	AC Maintenance (Outdoor Coil Cleaning)	home	unit	\$0.00	\$60.00	\$0.00	\$60.00	4	1	1	\$60.00	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	105	AC Maintenance and/or tune-up	home	unit	\$0.00	\$50.00	\$0.00	\$50.00	4	1	1	\$50.00	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	107	Ceiling R-0 to R-38 Insulation (base split-system)	home	sq ft	\$0.67	\$0.36	\$0.00	\$1.03	30	1	1	\$1.03	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	108	Ceiling R-0 to R-49 Insulation (base split-system)	home	sq ft	\$0.88	\$0.37	\$0.00	\$1.25	30	1	1	\$1.25	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	109	Ceiling R-11 to R-38 Insulation (base split-system)	home	sq ft	\$0.46	\$0.31	\$0.00	\$0.77	30	1	1	\$0.77	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	110	Ceiling R-11 to R-49 Insulation (base split-system)	home	sq ft	\$0.66	\$0.36	\$0.00	\$1.02	30	1	1	\$1.02	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	111	Ceiling R-19 to R-38 Insulation (base split-system)	home	sq ft	\$0.33	\$0.34	\$0.00	\$0.66	30	1	1	\$0.66	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	112	Ceiling R-19 to R-49 Insulation (base split-system)	home	sq ft	\$0.44	\$0.36	\$0.00	\$0.80	30	1	1	\$0.80	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	113	Comprehensive Shell Air Sealing - Inf. Reduction (base split-system)	home	sq ft	\$0.09	\$0.00	\$0.00	\$0.09	10	1	1	\$0.09	1.00	1.00	1.00	1.00	1.00	1	1	Ohio TRM, \$120 per 1000 sq ft of home, tech saturation adjusts
Existing	114	Duct Insulation	home	lin foot	\$5.24	\$0.00	\$0.00	\$5.24	18	1	1	\$5.24	1.00	1.00	1.00	1.00	1.00	1	1	DEER 2008
Existing	115	Duct Repair	home	home	\$36.34	\$287.99	\$0.00	\$324.33	18	1	1	\$324.33	1.00	1.00	1.00	1.00	1.00	1	1	DEER 2008
Existing	116	Programmable Thermostat (base split-system)	home	unit	\$19.00	\$14.35	\$0.00	\$33.35	15	1	1	\$33.35	1.20	0.72	1.20	1.05	1.00	1	1	DNV KEMA Database
Existing	117	Proper Refrigerant Charging and Air Flow	home	ton	\$14.11	\$28.23	\$0.00	\$42.34	10	1	1	\$42.34	1.00	1.00	1.00	1.00	1.00	1	1	DEER 2008, Average costs
Existing	118	Proper Sizing and Quality Install	home	ton	\$0.00	\$110.00	\$0.00	\$110.00	18	1	1	\$110.00	1.30	1.30	0.90	0.50	0.50	1	2	DNV KEMA Database
Existing	119	Sealed Attic w/Sprayed Foam Insulated Roof Deck (base split-system)	home	sq ft	\$1.90	\$0.00	\$0.00	\$1.90	30	1	1	\$1.90	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	120	Self Install Weatherization (base split-system)	home	home	\$6.52	\$0.00	\$0.00	\$6.52	10	1	1	\$6.52	1.00	1.00	1.00	1.00	1.00	1	1	Average cost of various weatherization products at home depot
Existing	121	Wall Blow-in R-0 to R-13 Insulation (base split-system)	home	sq ft	\$0.15	\$0.30	\$0.00	\$0.45	30	1	1	\$0.45	1.00	1.00	1.00	1.00	1.00	1	1	DEER 2008
Existing	122	Single Pane Windows to ENERGY STAR (base split-system)	home	sq ft	\$2.42	\$0.00	\$0.00	\$2.42	25	1	1	\$2.42	1.00	1.00	1.00	1.00	1.00	1	2	http://www.efficientwindows.org/energycosts.cfm
Existing	123	Double Pane Windows to ENERGY STAR (base split-system)	home	sq ft	\$8.15	\$0.00	\$0.00	\$8.15	25	1	1	\$8.15	1.00	1.00	1.00	1.00	1.00	1	2	http://www.weathermaster-window.com/glass.html
Existing	130	Base Early Replacement Split-System Air Conditioner (13 SEER)	home	unit	\$0.00	\$0.00	\$0.00	\$0.00	7	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	131	15 SEER (12.72 EER) Split-System Air Conditioner--early replacement	home	unit	\$514.00	\$0.00	\$0.00	\$514.00	7	1	1	\$514.00	1.00	1.00	1.00	1.00	1.00	1	1	KEMA Early Replacement Calc
Existing	140	Base Room Air Conditioner - EER 9.7	home	unit	\$0.00	\$0.00	\$0.00	\$0.00	12	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	1	2	DNV KEMA Database
Existing	141	HE Room Air Conditioner - Energy star EER 10.8	home	unit	\$50.00	\$0.00	\$0.00	\$50.00	12	1	1	\$50.00	1.00	1.00	1.00	1.00	1.00	1	2	DNV KEMA Database
Existing	142	HE Room Air Conditioner - CEE Tier 1 EER 11.3	home	unit	\$53.00	\$0.00	\$0.00	\$53.00	12	1	1	\$53.00	1.00	1.00	1.00	1.00	1.00	1	2	CT PSD
Existing	143	Ceiling Fans (base RAC)	home	unit	\$80.00	\$40.00	\$0.00	\$120.00	15	1	1	\$120.00	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	144	Single Pane Windows to ENERGY STAR (base RAC)	home	sq ft	\$2.42	\$0.00	\$0.00	\$2.42	25	1	1	\$2.42	1.00	1.00	1.00	1.00	1.00	1	2	http://www.efficientwindows.org/energycosts.cfm
Existing	145	Double Pane with Glazing to Energy Star (base RAC)	home	sq ft	\$8.15	\$0.00	\$0.00	\$8.15	25	1	1	\$8.15	1.00	1.00	1.00	1.00	1.00	1	2	http://www.weathermaster-window.com/glass.html
Existing	146	Ceiling R-0 to R-38 Insulation (base RAC)	home	sq ft	\$0.67	\$0.36	\$0.00	\$1.03	30	1	1	\$1.03	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	147	Ceiling R-0 to R-49 Insulation (base RAC)	home	sq ft	\$0.88	\$0.37	\$0.00	\$1.25	30	1	1	\$1.25	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	148	Ceiling R-11 to R-38 Insulation (base RAC)	home	sq ft	\$0.46	\$0.31	\$0.00	\$0.77	30	1	1	\$0.77	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	149	Ceiling R-11 to R-49 Insulation (base RAC)	home	sq ft	\$0.66	\$0.36	\$0.00	\$1.02	30	1	1	\$1.02	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	150	Ceiling R-19 to R-38 Insulation (base RAC)	home	sq ft	\$0.33	\$0.34	\$0.00	\$0.66	30	1	1	\$0.66	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	151	Ceiling R-19 to R-49 Insulation (base RAC)	home	sq ft	\$0.44	\$0.36	\$0.00	\$0.80	30	1	1	\$0.80	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	152	Wall 2x4 R-0 to Blow-In R-13 Insulation (base RAC)	home	sq ft	\$0.15	\$0.30	\$0.00	\$0.45	30	1	1	\$0.45	1.00	1.00	1.00	1.00	1.00	1	1	DEER 2008
Existing	153	Self Install Weatherization (base RAC)	home	home	\$6.52	\$0.00	\$0.00	\$6.52	10	1	1	\$6.52	1.00	1.00	1.00	1.00	1.00	1	1	Average cost of various weatherization products at home depot
Existing	154	Infiltration Reduction (base RAC)	home	sq ft	\$0.09	\$0.00	\$0.00	\$0.09	10	1	1	\$0.09	1.00	1.00	1.00	1.00	1.00	1	1	Ohio TRM, \$120 per 1000 sq ft of home, tech saturation adjusts
Existing	155	Ductless Split Heat Pump	home	unit	\$238.92	\$0.00	\$0.00	\$238.92	18	1	1	\$238.92	1.00	1.00	1.00	1.00	1.00	1	1	MA and CT Heat Pump study, 2.7 ton unit, 4% of savings from cooling
Existing	160	Base Early Replacement Room Air Conditioner- EER 9.7	home	Unit	\$0.00	\$0.00	\$0.00	\$0.00	12	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	161	EER 8.5 AC Early Replacement, CEE Tier 1 EER 11.3	home	Unit	\$67.71	\$0.00	\$0.00	\$67.71	12	1	1	\$67.71	1.00	1.00	1.00	1.00	1.00	1	1	KEMA Early Replacement Calc
Existing	170	Base Dehumidifier - New Federal Standard	home	unit	\$0.00	\$0.00	\$0.00	\$0.00	12	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	14	2	PSD 2008 & Energy Star
Existing	171	Energy Star Dehumidifier (ROB)	home	unit	\$10.00	\$0.00	\$0.00	\$10.00	12	1	1	\$10.00	1.00	1.00	1.00	1.00	1.00	14	2	PSD 2008 & Energy Star
Existing	200	Base Resistance Space Heating (Primary)	home	Unit	\$1,252.66	\$0.00	\$0.00	\$1,252.66	18	1	1	\$1,252.66	1.00	1.00	1.00	1.00	1.00	9	2	DNV KEMA Database
Existing	201	Air Source Heat Pump	home	Unit	\$4,155.00	\$0.00	\$0.00	\$4,155.00	18	0	0	\$4,155.00	1.00	1.00	1.00	1.00	1.00	9	2	DNV KEMA Database
Existing	202	Ceiling R-0 to R-38 Insulation (base space heating)	home	sq ft	\$0.45	\$0.25	\$0.00	\$0.70	30	1	1	\$0.70	1.00	1.00	1.00	1.00	1.00	9	1	DNV KEMA Database
Existing	203	Ceiling R-0 to R-49 Insulation (base space heating)	home	sq ft	\$0.56	\$0.24	\$0.00	\$0.80	30	1	1	\$0.80	1.00	1.00	1.00	1.00	1.00	9	1	DNV KEMA Database
Existing	204	Ceiling R-11 to R-38 Insulation (base space heating)	home	sq ft	\$0.33	\$0.22	\$0.00	\$0.55	30	1	1	\$0.55	1.00	1.00	1.00	1.00	1.00	9	1	DNV KEMA Database
Existing	205	Ceiling R-11 to R-49 Insulation (base space heating)	home	sq ft	\$0.46	\$0.25	\$0.00	\$0.71	30	1	1	\$0.71	1.00	1.00	1.00	1.00	1.00	9	1	DNV KEMA Database
Existing	206	Ceiling R-19 to R-38 Insulation (base space heating)	home	sq ft	\$0.18	\$0.19	\$0.00	\$0.38	30	1	1	\$0.38	1.00	1.00	1.00	1.00	1.00	9	1	DNV KEMA Database
Existing	207	Ceiling R-19 to R-49 Insulation (base space heating)	home	sq ft	\$0.31	\$0.25	\$0.00	\$0.56	30	1	1	\$0.56	1.00	1.00	1.00	1.00	1.00	9	1	DNV KEMA Database
Existing	208	Wall Blow-in R-0 to R-13 Insulation (base space heating)	home	sq ft	\$0.17	\$0.32	\$0.00	\$0.49	30	1	1	\$0.49	1.00	1.00	1.00	1.00	1.00	9	1	DEER 2008
Existing	209	Basement insulation R-11 (base space heating)	home	sq ft	\$0.29	\$0.58	\$0.00	\$0.87	30	1	1	\$0.87	1.00	1.00	1.00	1.00	1.00	9	1	DNV KEMA Database
Existing	210	Floor R-0 to R-19 Insulation-Batts (base space heating)	home	sq ft	\$0.38	\$0.51	\$0.00	\$0.89	30	1	1	\$0.89	1.00	1.00	1.00	1.00	1.00	9	1	DEER 2008
Existing	211	Comprehensive Shell Air Sealing - Inf. Reduction (base space heating)	home	sq ft	\$0.03	\$0.00	\$0.00	\$0.03	10	1	1	\$0.03	1.00	1.00	1.00	1.00	1.00	9	1	Ohio TRM, \$120 per 1000 sq ft of home, tech saturation adjusts
Existing	212	Self Install Weatherization (base space heating)	home	home	\$3.48	\$0.00	\$0.00	\$3.48	10	1	1	\$3.48	1.00	1.00	1.00	1.00	1.00	9	1	Average cost of various weatherization products at home depot
Existing	213	Single Pane Windows to ENERGY STAR(base space heating)	home	sq ft	\$21.45	\$0.00	\$0.00	\$21.45	25	1	1	\$21.45	1.00	1.00	1.00	1.00	1.00	9	2	http://www.efficientwindows.org/energycosts.cfm
Existing	214	Double Pane Windows to ENERGY STAR (base space heating)	home	sq ft	\$4.35	\$0.00	\$0.00	\$4.35	25	1	1	\$4.35	1.00	1.00	1.00	1.00	1.00	9	2	window.com/glass.html

Residential Electric Measure Inputs							NPV of Lifetime O & M Cost	Implementation		Full = 1 Incr. = 0		Full Unit Cost	Relative Energy Reduction Factors					Implementation Type		
Segment	Measure #	Measure Description	Savings Units	Cost Units	Unit Equipment Cost	Unit Labor Cost		Cost Factor	Service Life	Initial Cost	Replace Cost		SON	SMID	SOFF	WMID	WOFF	End 1=1 time Use 2=ROB	Cost Source	
Existing	217	Programmable Thermostat (base space heating)	home	unit	\$31.66	\$19.00	\$0.00	\$50.66	10	1	1	\$50.66	1.00	1.00	1.00	0.90	1.20	9	1	DEER 2008
Existing	250	Base Air-Source Heat Pump, 13 SEER, 7.7 HSPF	home	Unit	\$4,155.00	\$0.00	\$0.00	\$4,155.00	18	1	1	\$4,155.00	1.00	1.00	1.00	1.00	1.00	9	2	DNV KEMA Database
Existing	251	High Efficiency Air Source Heat Pump, 15 SEER, 8.2 HSPF	home	Unit	\$4,873.00	\$0.00	\$0.00	\$4,873.00	18	0	0	\$4,873.00	1.00	1.00	1.00	1.00	1.00	9	2	Process)
Existing	252	Ceiling R-0 to R-38 Insulation (base ASHP)	home	sq ft	\$0.45	\$0.25	\$0.00	\$0.70	30	1	1	\$0.70	1.00	1.00	1.00	1.00	1.00	9	1	DNV KEMA Database
Existing	253	Ceiling R-0 to R-49 Insulation (base ASHP)	home	sq ft	\$0.56	\$0.24	\$0.00	\$0.80	30	1	1	\$0.80	1.00	1.00	1.00	1.00	1.00	9	1	DNV KEMA Database
Existing	254	Ceiling R-11 to R-38 Insulation (base ASHP)	home	sq ft	\$0.33	\$0.22	\$0.00	\$0.55	30	1	1	\$0.55	1.00	1.00	1.00	1.00	1.00	9	1	DNV KEMA Database
Existing	255	Ceiling R-11 to R-49 Insulation (base ASHP)	home	sq ft	\$0.46	\$0.25	\$0.00	\$0.71	30	1	1	\$0.71	1.00	1.00	1.00	1.00	1.00	9	1	DNV KEMA Database
Existing	256	Ceiling R-19 to R-38 Insulation (base ASHP)	home	sq ft	\$0.18	\$0.19	\$0.00	\$0.38	30	1	1	\$0.38	1.00	1.00	1.00	1.00	1.00	9	1	DNV KEMA Database
Existing	257	Ceiling R-19 to R-49 Insulation (base ASHP)	home	sq ft	\$0.31	\$0.25	\$0.00	\$0.56	30	1	1	\$0.56	1.00	1.00	1.00	1.00	1.00	9	1	DNV KEMA Database
Existing	258	Wall Blow-in R-0 to R-13 Insulation (base ASHP)	home	sq ft	\$0.17	\$0.32	\$0.00	\$0.49	30	1	1	\$0.49	1.00	1.00	1.00	1.00	1.00	9	1	DEER 2008
Existing	259	Basement insulation R-11 (base ASHP)	home	sq ft	\$0.29	\$0.58	\$0.00	\$0.87	30	1	1	\$0.87	1.00	1.00	1.00	1.00	1.00	9	1	DNV KEMA Database
Existing	260	Floor R-0 to R-19 Insulation-Batts (base ASHP)	home	sq ft	\$0.38	\$0.51	\$0.00	\$0.89	30	1	1	\$0.89	1.00	1.00	1.00	1.00	1.00	9	1	DEER 2008
Existing	261	Comprehensive Shell Air Sealing - Inf. Reduction (base ASHP)	home	sq ft	\$0.03	\$0.00	\$0.00	\$0.03	10	1	1	\$0.03	1.00	1.00	1.00	1.00	1.00	9	1	saturation adjusts
Existing	262	Self Install Weatherization (base ASHP)	home	home	\$3.48	\$0.00	\$0.00	\$3.48	10	1	1	\$3.48	1.00	1.00	1.00	1.00	1.00	9	1	products at home depot
Existing	263	Single Pane Windows to ENERGY STAR(base ASHP)	home	sq ft	\$21.45	\$0.00	\$0.00	\$21.45	25	1	1	\$21.45	1.00	1.00	1.00	1.00	1.00	9	2	fm
Existing	264	Double Pane Windows to ENERGY STAR (base ASHP)	home	sq ft	\$4.35	\$0.00	\$0.00	\$4.35	25	1	1	\$4.35	1.00	1.00	1.00	1.00	1.00	9	2	window.com/glass.html
Existing	265	Programmable Thermostat (base ASHP)	home	unit	\$31.66	\$19.00	\$0.00	\$50.66	10	1	1	\$50.66	1.00	1.00	1.00	0.90	1.20	9	1	DEER 2008
Existing	300	Base High-Efficiency Incandescent Lighting,<1.15 hrs/day	lamp	lamp	\$1.00	\$0.00	\$0.00	\$1.00	1000	1	1	\$1.00	1.00	1.00	1.00	1.00	1.00	2	1	Home Depot Website
Existing	301	CFL 15W (base HE incandescent<1.15 hrs/day)	lamp	lamp	\$1.25	\$0.00	\$0.00	\$1.25	8000	0	0	\$1.25	1.00	1.00	1.00	1.00	1.00	2	1	DNV KEMA Database
Existing	302	CFL 15W - Specialty (base HE incandescent<1.15 hrs/day)	lamp	lamp	\$9.00	\$0.00	\$0.00	\$9.00	8000	0	0	\$9.00	1.00	1.00	1.00	1.00	1.00	2	1	Home Depot Website
Existing	303	LEDs (base HE incandescent<1.15 hrs/day)	lamp	lamp	\$24.00	\$0.00	\$0.00	\$24.00	35000	0	0	\$24.00	1.00	1.00	1.00	1.00	1.00	2	1	Home Depot Website
Existing	310	Base High-Efficiency Incandescent Lighting,1.15-2.15 hrs/day	lamp	lamp	\$1.00	\$0.00	\$0.00	\$1.00	1000	1	1	\$1.00	1.00	1.00	1.00	1.00	1.00	2	1	Home Depot Website
Existing	311	CFL 15W (base HE incandescent 1.15-2.15 hrs/day)	lamp	lamp	\$1.51	\$0.00	\$0.00	\$1.51	8000	0	0	\$1.51	1.00	1.00	1.00	1.00	1.00	2	1	DNV KEMA Database
Existing	312	CFL 15W - Specialty (base HE incandescent 1.15-2.15 hrs/day)	lamp	lamp	\$9.00	\$0.00	\$0.00	\$9.00	8000	0	0	\$9.00	1.00	1.00	1.00	1.00	1.00	2	1	Home Depot Website
Existing	313	LEDs (base HE incandescent 1.15-2.15 hrs/day)	lamp	lamp	\$24.00	\$0.00	\$0.00	\$24.00	35000	0	0	\$24.00	1.00	1.00	1.00	1.00	1.00	2	1	Home Depot Website
Existing	320	Base High-Efficiency Incandescent Lighting,2.15-5 hrs/day	lamp	lamp	\$1.00	\$0.00	\$0.00	\$1.00	1000	1	1	\$1.00	1.00	1.00	1.00	1.00	1.00	2	1	Home Depot Minneapolis, Sept 2011
Existing	321	CFL 15W (base HE incandescent 2.15-5 hrs/day)	lamp	lamp	\$1.51	\$0.00	\$0.00	\$1.51	8000	0	0	\$1.51	1.00	1.00	1.00	1.00	1.00	2	1	DNV KEMA Database
Existing	322	CFL 15W - Specialty (base HE incandescent 2.15-5 hrs/day)	lamp	lamp	\$9.00	\$0.00	\$0.00	\$9.00	8000	0	0	\$9.00	1.00	1.00	1.00	1.00	1.00	2	1	Home Depot Website
Existing	323	LEDs (base HE incandescent 2.15-5 hrs/day)	lamp	lamp	\$24.00	\$0.00	\$0.00	\$24.00	35000	0	0	\$24.00	1.00	1.00	1.00	1.00	1.00	2	1	Home Depot Website
Existing	330	Base High-Efficiency Incandescent Lighting,>5 hrs/day	lamp	lamp	\$1.00	\$0.00	\$0.00	\$1.00	1000	1	1	\$1.00	1.00	1.00	1.00	1.00	1.00	2	1	Home Depot Website
Existing	331	CFL 15W (base HE incandescent >5 hrs/day)	lamp	lamp	\$1.51	\$0.00	\$0.00	\$1.51	8000	0	0	\$1.51	1.00	1.00	1.00	1.00	1.00	2	1	DNV KEMA Database
Existing	332	CFL 15W - Specialty (base HE incandescent >5 hrs/day)	lamp	lamp	\$9.00	\$0.00	\$0.00	\$9.00	8000	0	0	\$9.00	1.00	1.00	1.00	1.00	1.00	2	1	Home Depot Website
Existing	333	LEDs (base HE incandescent >5 hrs/day)	lamp	lamp	\$24.00	\$0.00	\$0.00	\$24.00	35000	0	0	\$24.00	1.00	1.00	1.00	1.00	1.00	2	1	Home Depot Website
Existing	340	Base Lighting 15 Watt CFL, <1.15 hrs/day	lamp	lamp	\$1.51	\$0.00	\$0.00	\$1.51	8000	1	1	\$1.51	1.00	1.00	1.00	1.00	1.00	2	1	Home Depot Website
Existing	341	LEDs (base CFL < 1.15 hrs/day)	lamp	lamp	\$24.00	\$0.00	\$0.00	\$24.00	35000	0	0	\$24.00	1.00	1.00	1.00	1.00	1.00	2	1	Home Depot Website
Existing	342	Photocell/timelock (outdoor) (base CFL < 1.15 hrs/day)	home	fixture	\$20.00	\$0.00	\$0.00	\$20.00	70000	1	1	\$20.00	1.20	1.13	0.60	1.09	0.60	2	1	DNV KEMA Database
Existing	350	Base Lighting 15 Watt CFL, 1.15-2.15 hrs/day	lamp	lamp	\$1.51	\$0.00	\$0.00	\$1.51	8000	1	1	\$1.51	1.00	1.00	1.00	1.00	1.00	2	1	Home Depot Website
Existing	351	LEDs (base CFL 1.15-2.15 hrs/day)	lamp	lamp	\$24.00	\$0.00	\$0.00	\$24.00	35000	0	0	\$24.00	1.00	1.00	1.00	1.00	1.00	2	1	Home Depot Website
Existing	352	Photocell/timelock (outdoor) (base CFL 1.15-2.15 hrs/day)	home	fixture	\$20.00	\$0.00	\$0.00	\$20.00	70000	1	1	\$20.00	1.20	1.13	0.60	1.09	0.60	2	1	DNV KEMA Database
Existing	360	Base Lighting 15 Watt CFL, 2.15-5 hrs/day	lamp	lamp	\$1.51	\$0.00	\$0.00	\$1.51	8000	1	1	\$1.51	1.00	1.00	1.00	1.00	1.00	2	1	Home Depot Website
Existing	361	LEDs (base CFL 2.15-5 hrs/day)	lamp	lamp	\$24.00	\$0.00	\$0.00	\$24.00	35000	0	0	\$24.00	1.00	1.00	1.00	1.00	1.00	2	1	Home Depot Website
Existing	362	Photocell/timelock (outdoor) (base CFL 2.15-5 hrs/day)	home	fixture	\$20.00	\$0.00	\$0.00	\$20.00	70000	1	1	\$20.00	1.20	1.13	0.60	1.09	0.60	2	1	DNV KEMA Database
Existing	370	Base Lighting 15 Watt CFL, >5 hrs/day	lamp	lamp	\$1.51	\$0.00	\$0.00	\$1.51	8000	1	1	\$1.51	1.00	1.00	1.00	1.00	1.00	2	1	Home Depot Website
Existing	371	LEDs (base CFL >5 hrs/day)	lamp	lamp	\$24.00	\$0.00	\$0.00	\$24.00	35000	0	0	\$24.00	1.00	1.00	1.00	1.00	1.00	2	1	Home Depot Website
Existing	372	Photocell/timelock (outdoor) (base CFL >5 hrs/day)	home	fixture	\$20.00	\$0.00	\$0.00	\$20.00	70000	1	1	\$20.00	1.20	1.13	0.60	1.09	0.60	2	1	DNV KEMA Database
Existing	380	Base Fluorescent Fixture, 2L4T8, 1.8 hrs/day	fixture	fixture	\$0.00	\$0.00	\$0.00	\$0.00	25000	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	2	1	DNV KEMA Database
Existing	381	ROB 2L4' Premium T8	fixture	fixture	\$4.00	\$0.00	\$0.00	\$4.00	25000	1	1	\$4.00	1.00	1.00	1.00	1.00	1.00	2	2	2011 MA TRM
Existing	400	Base Refrigerator	home	unit	\$0.00	\$0.00	\$0.00	\$0.00	12	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	3	2	CEC HERS
Existing	401	HE Refrigerator (Energy Star)	home	unit	\$79.00	\$0.00	\$0.00	\$79.00	12	1	1	\$79.00	1.00	1.00	1.00	1.00	1.00	3	2	CT PSD
Existing	402	HE Refrigerator (CEE Tier 2)	home	unit	\$179.00	\$0.00	\$0.00	\$179.00	12	1	1	\$179.00	1.00	1.00	1.00	1.00	1.00	3	2	CEE 2007, DOE 2005
Existing	410	Base Early Replacement Refrigerator	home	unit	\$0.00	\$0.00	\$0.00	\$0.00	12	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	3	1	DNV KEMA Database
Existing	411	Refrigerator - Early Replacement (Energy Star)	home	unit	\$204.19	\$0.00	\$0.00	\$204.19	5	1	1	\$204.19	1.00	1.00	1.00	1.00	1.00	3	1	KEMA Early Replacement Calc
Existing	420	Base Second Refrigerator	home	unit	\$0.00	\$0.00	\$0.00	\$0.00	5	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	3	1	DNV KEMA Database
Existing	421	Refrigerator Recycling - second refrigerator	home	unit	\$125.00	\$0.00	\$0.00	\$125.00	5	1	1	\$125.00	1.00	1.00	1.00	1.00	1.00	3	1	Cost of removal
Existing	430	Base Freezer	home	unit	\$0.00	\$0.00	\$0.00	\$0.00	12	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	4	2	DNV KEMA Database
Existing	431	Freezer (Energy Star)	home	unit	\$59.99	\$0.00	\$0.00	\$59.99	12	1	1	\$59.99	1.00	1.00	1.00	1.00	1.00	4	2	DNV KEMA Database
Existing	440	Base Early Replacement Freezer	home	unit	\$0.00	\$0.00	\$0.00	\$0.00	12	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	4	1	DNV KEMA Database
Existing	441	Freezer - Early Replacement (Energy Star)	home	unit	\$75.28	\$0.00	\$0.00	\$75.28	12	1	1	\$75.28	1.00	1.00	1.00	1.00	1.00	4	1	KEMA Early Replacement Calc
Existing	500	Base 40 gal. Water Heating (EF=0.88)	home	unit	\$0.00	\$0.00	\$0.00	\$0.00	15	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	5	2	CEC HERS report
Existing	502	Faucet Aerators (1.5 GPM)	home	unit	\$8.00	\$0.00	\$0.00	\$8.00	5	1	1	\$8.00	1.00	1.00	1.00	1.00	1.00	5	1	DNV KEMA Database
Existing	503	HE Water Heater (EF=0.93)	home	unit	\$72.30	\$0.00	\$0.00	\$72.30	10	1	1	\$72.30	1.00	1.00	1.00	1.00	1.00	5	2	CEC HERS report
Existing	504	Heat Pump Water Heater - Energy Star	home	unit	\$1,288.02	\$122.83	\$0.00	\$1,410.85	12	1	1	\$1,410.85	1.00	1.00	1.00	1.00	1.00	5	2	CEC HERS report
Existing	505	Low Flow Showerhead 1.5 Gal/Min	home	unit	\$22.95	\$0.00	\$0.00	\$22.95	5	1	1	\$22.95	1.00	1.00	1.00	1.00	1.00	5	1	CEC HERS report
Existing	506	Pipe Wrap	home	lin foot	\$0.37	\$0.00	\$0.00	\$0.37	15	1	1	\$0.37	1.00	1.00	1.00	1.00	1.00	5	1	CEC HERS report
Existing	507	Solar Domestic Water Heating	home	unit	\$1,650.00	\$1,850.00	\$0.0													

Residential Electric Measure Inputs																			Implementation	
Segment	Measure #	Measure Description	Savings Units	Cost Units	Unit Equipment Cost	Unit Labor Cost	NPV of Lifetime O & M Cost	Implementation Cost Factor	Service Life	Full = 1		Full Unit Cost	Relative Energy Reduction Factors					End 1=1 time Use 2=ROB	Cost Source	
										Initial Cost	Replace Cost		SON	SMID	SOFF	WMID	WOFF			
Existing	510	Tier 3 CW (MEF=2.20) (base WH)	home	unit	\$393.16	\$0.00	\$0.00	\$393.16	11	1	1	\$393.16	1.00	1.00	1.00	1.00	1.00	6	2	Incremental Costs from CT PSD, ratio of costs that go to energy used for hot water
Existing	511	Energy Star Dishwasher (EF=0.72) (base WH)	home	unit	\$143.22	\$0.00	\$0.00	\$143.22	11	1	1	\$143.22	1.00	1.00	1.00	1.00	1.00	8	2	Revised DEER 2008, ratio of energy used for hot water
Existing	550	Base Early Replacement Water Heating to Heat Pump Water Heater	home	unit	\$0.00	\$0.00	\$0.00	\$0.00	10	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	5	1	DNV KEMA Database
Existing	551	Early Replacement Water Heating to Heat Pump Water Heater	home	unit	\$1,374.36	\$0.00	\$0.00	\$1,374.36	10	1	1	\$1,374.36	1.00	1.00	1.00	1.00	1.00	5	1	KEMA Early Replacement Calc
Existing	600	Base Clotheswasher (MEF=1.26)	home	unit	\$0.00	\$0.00	\$0.00	\$0.00	11	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	6	2	DEER 2008
Existing	601	Energy Star CW CEE Tier 2 (MEF=2.0) (base CW)	home	unit	\$129.15	\$0.00	\$0.00	\$129.15	11	1	1	\$129.15	1.00	1.00	1.00	1.00	1.00	6	2	Incremental Costs from CT PSD, ratio of energy used for motor use
Existing	602	Tier 3 CW (MEF=2.20) (base CW)	home	unit	\$175.23	\$0.00	\$0.00	\$175.23	11	1	1	\$175.23	1.00	1.00	1.00	1.00	1.00	6	2	Incremental Costs from CT PSD, ratio of energy used for motor use
Existing	610	Base Clothes Dryer (EF=3.01)	home	unit	\$0.00	\$0.00	\$0.00	\$0.00	12	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	7	2	DEER 2008
Existing	611	Heat Pump Dryer	home	unit	\$1,680.98	\$0.00	\$0.00	\$1,680.98	12	1	1	\$1,680.98	1.00	1.00	1.00	1.00	1.00	7	2	TIAX 2006
Existing	612	High Efficiency CD (EF=3.01 w/moisture sensor)	home	unit	\$238.23	\$0.00	\$0.00	\$238.23	12	1	1	\$238.23	1.00	1.00	1.00	1.00	1.00	7	2	DEER 2008
Existing	700	Base Dishwasher (EF=0.65)	home	unit	\$292.65	\$0.00	\$0.00	\$292.65	11	1	1	\$292.65	1.00	1.00	1.00	1.00	1.00	8	2	DEER 2008, ratio of energy used for motors
Existing	701	Energy Star Dishwasher (EF=0.72) (base DW)	home	unit	\$93.00	\$0.00	\$0.00	\$93.00	13	1	1	\$93.00	1.00	1.00	1.00	1.00	1.00	8	2	DNV KEMA Database
Existing	800	Base Single Speed Pool Pump (RET)	home	unit	\$273.32	\$357.12	\$0.00	\$630.44	10	1	1	\$630.44	1.00	1.00	1.00	1.00	1.00	12	1	DEER 2008 Revised
Existing	801	Variable Speed Pool Pump (1.5 hp)	home	unit	\$434.41	\$357.12	\$0.00	\$791.53	10	1	1	\$791.53	1.00	1.00	1.00	1.00	1.00	12	1	DEER 2008 Revised
Existing	810	Base Two Speed Pool Pump (1.5 hp) (ROB)	home	unit	\$0.00	\$0.00	\$0.00	\$0.00	10	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	12	2	DEER 2008 Revised
Existing	811	Variable Speed Pool Pump (1.5 hp)	home	unit	\$394.47	\$357.12	\$0.00	\$751.59	10	1	1	\$751.59	1.00	1.00	1.00	1.00	1.00	12	2	DEER 2008 Revised
Existing	900	Base Plasma TV	home	unit	\$0.00	\$0.00	\$0.00	\$0.00	6	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	11	2	DNV KEMA Database
Existing	901	Energy Star Plasma TV	home	unit	\$1.00	\$0.00	\$0.00	\$1.00	6	1	1	\$1.00	1.00	1.00	1.00	1.00	1.00	11	2	Assumed very small incremental cost
Existing	910	Base LCD TV	home	unit	\$0.00	\$0.00	\$0.00	\$0.00	6	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	11	2	DNV KEMA Database
Existing	911	Energy Star LCD TV	home	unit	\$1.00	\$0.00	\$0.00	\$1.00	6	1	1	\$1.00	1.00	1.00	1.00	1.00	1.00	11	2	Assumed very small incremental cost
Existing	920	Base CRT TV	home	unit	\$0.00	\$0.00	\$0.00	\$0.00	6	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	11	2	DNV KEMA Database
Existing	921	Energy Star LCD TV	home	unit	\$1.00	\$0.00	\$0.00	\$1.00	6	1	1	\$1.00	1.00	1.00	1.00	1.00	1.00	11	2	Assumed very small incremental cost
Existing	930	Base Set-Top Box	home	unit	\$0.00	\$0.00	\$0.00	\$0.00	7	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	11	2	DNV KEMA Database
Existing	931	Energy Star Set-Top Box	home	unit	\$1.00	\$0.00	\$0.00	\$1.00	7	1	1	\$1.00	1.00	1.00	1.00	1.00	1.00	11	2	DNV KEMA Database
Existing	940	Base DVD Player	home	unit	\$0.00	\$0.00	\$0.00	\$0.00	7	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	11	2	DNV KEMA Database
Existing	941	Energy Star DVD Player	home	unit	\$1.00	\$0.00	\$0.00	\$1.00	7	1	1	\$1.00	1.00	1.00	1.00	1.00	1.00	11	2	DNV KEMA Database
Existing	950	Base Desktop PC	home	unit	\$0.00	\$0.00	\$0.00	\$0.00	4	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	14	2	DNV KEMA Database
Existing	951	Energy Star Desktop PC	home	unit	\$1.00	\$0.00	\$0.00	\$1.00	4	1	1	\$1.00	1.00	1.00	1.00	1.00	1.00	14	2	Assumed very small incremental cost
Existing	960	Base Laptop PC	home	unit	\$0.00	\$0.00	\$0.00	\$0.00	4	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	14	2	DNV KEMA Database
Existing	961	Energy Star Laptop PC	home	unit	\$1.00	\$0.00	\$0.00	\$1.00	4	1	1	\$1.00	1.00	1.00	1.00	1.00	1.00	14	2	Assumed very small incremental cost
Existing	970	Base Cooking	home	unit	\$0.00	\$0.00	\$0.00	\$0.00	15	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	10	2	DNV KEMA Database
Existing	980	Base Miscellaneous	home	unit	\$0.00	\$0.00	\$0.00	\$0.00	10	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	14	2	DNV KEMA Database
Existing	981	Plug Load Controls - Smart Power Strip	home	unit	\$25.00	\$0.00	\$0.00	\$25.00	5	1	1	\$25.00	1.00	1.00	1.00	1.00	1.00	14	1	Average cost on big box store websites
Existing	982	Energy Star Ventilating Fans	home	unit	\$100.00	\$0.00	\$0.00	\$100.00	10	1	1	\$100.00	1.00	1.00	1.00	1.00	1.00	14	2	DNV KEMA Database
Existing	990	Base House Practices	home	home	\$0.00	\$0.00	\$0.00	\$0.00	1	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	15	1	DNV KEMA Database
Existing	991	Indirect feedback	home	home	\$7.00	\$0.00	\$0.00	\$7.00	1	1	1	\$7.00	1.00	1.00	1.00	1.00	1.00	15	1	DNV KEMA Database
New	100	Base City of Austin Code Home	home	home	\$0.00	\$0.00	\$0.00	\$0.00	30	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	15	2	DNV KEMA Database
New	101	2011 Austin Green Building Home	home	home	\$376.00	\$0.00	\$0.00	\$376.00	30	1	1	\$376.00	1.00	1.00	1.00	1.00	1.00	15	2	DNV KEMA Database
New	104	Base 2015 City of Austin Code Home	home	home	\$0.00	\$0.00	\$0.00	\$0.00	30	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	15	2	DNV KEMA Database
New	105	3% savings over 2015 code home	home	home	\$296.00	\$0.00	\$0.00	\$296.00	30	1	1	\$296.00	1.00	1.00	1.00	1.00	1.00	15	2	DNV KEMA Database

Residential Electric Measure Inputs			Applicability Factor (percent)			Incomplete Factor (percent)			Feasibility Factor (percent)		
Segment	Measure #	Measure Description	Single Family	Multifamily	Low Income	Single Family	Multifamily	Low Income	Single Family	Multifamily	Low Income
Existing	100	Base Split-System Air Conditioner (13 SEER)	81.6%	79.9%	80.8%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	101	15 SEER (12.72 EER) Split-System Air Conditioner w/ quality install	81.6%	79.9%	80.8%	90.5%	90.5%	90.5%	100.0%	100.0%	100.0%
Existing	102	17 SEER (12.28 EER) Split-System Air Conditioner w/ quality install	81.6%	79.9%	80.8%	95.4%	95.4%	95.4%	100.0%	100.0%	100.0%
Existing	103	AC Maintenance (Indoor Coil Cleaning)	81.6%	79.9%	80.8%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%
Existing	104	AC Maintenance (Outdoor Coil Cleaning)	81.6%	79.9%	80.8%	60.0%	60.0%	60.0%	100.0%	100.0%	100.0%
Existing	105	AC Maintenance and/or tune-up	81.6%	79.9%	80.8%	67.0%	64.0%	68.0%	100.0%	100.0%	100.0%
Existing	107	Ceiling R-0 to R-38 Insulation (base split-system)	13.1%	12.9%	13.0%	100.0%	100.0%	100.0%	33.0%	33.0%	33.0%
Existing	108	Ceiling R-0 to R-49 Insulation (base split-system)	13.1%	12.9%	13.0%	100.0%	100.0%	100.0%	33.0%	33.0%	33.0%
Existing	109	Ceiling R-11 to R-38 Insulation (base split-system)	15.8%	15.5%	15.7%	100.0%	100.0%	100.0%	50.0%	50.0%	50.0%
Existing	110	Ceiling R-11 to R-49 Insulation (base split-system)	15.8%	15.5%	15.7%	100.0%	100.0%	100.0%	50.0%	50.0%	50.0%
Existing	111	Ceiling R-19 to R-38 Insulation (base split-system)	44.4%	43.5%	44.0%	100.0%	100.0%	100.0%	83.0%	83.0%	83.0%
Existing	112	Ceiling R-19 to R-49 Insulation (base split-system)	44.4%	43.5%	44.0%	100.0%	100.0%	100.0%	50.0%	50.0%	50.0%
Existing	113	Comprehensive Shell Air Sealing - Inf. Reduction (base split-system)	81.6%	79.9%	80.8%	51.4%	51.4%	51.4%	100.0%	100.0%	100.0%
Existing	114	Duct Insulation	81.6%	79.9%	80.8%	21.4%	21.4%	21.4%	100.0%	100.0%	100.0%
Existing	115	Duct Repair	81.6%	79.9%	80.8%	75.8%	75.8%	75.8%	100.0%	100.0%	100.0%
Existing	116	Programmable Thermostat (base split-system)	81.6%	79.9%	80.8%	44.0%	44.0%	44.0%	100.0%	100.0%	100.0%
Existing	117	Proper Refrigerant Charging and Air Flow	81.6%	79.9%	80.8%	67.0%	67.0%	67.0%	100.0%	100.0%	100.0%
Existing	118	Proper Sizing and Quality Install	81.6%	79.9%	80.8%	50.0%	50.0%	50.0%	100.0%	100.0%	100.0%
Existing	119	Sealed Attic w/Sprayed Foam Insulated Roof Deck (base split-system)	38.0%	37.2%	37.6%	97.2%	97.2%	97.2%	33.0%	30.0%	31.6%
Existing	120	Self Install Weatherization (base split-system)	13.1%	12.9%	13.0%	62.0%	62.0%	62.0%	100.0%	100.0%	100.0%
Existing	121	Wall Blow-in R-0 to R-13 Insulation (base split-system)	78.7%	79.9%	80.7%	100.0%	100.0%	100.0%	80.0%	40.0%	63.3%
Existing	122	Single Pane Windows to ENERGY STAR (base split-system)	50.7%	49.6%	50.1%	87.1%	87.1%	87.1%	100.0%	100.0%	100.0%
Existing	123	Double Pane Windows to ENERGY STAR (base split-system)	35.7%	35.0%	35.4%	87.1%	87.1%	87.1%	100.0%	100.0%	100.0%
Existing	130	Base Early Replacement Split-System Air Conditioner (13 SEER)	14.4%	14.1%	14.3%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	131	15 SEER (12.72 EER) Split-System Air Conditioner--early replacement	14.4%	14.1%	14.3%	99.0%	99.0%	99.0%	100.0%	100.0%	100.0%
Existing	140	Base Room Air Conditioner - EER 9.7	2.6%	5.1%	1.7%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	141	HE Room Air Conditioner - Energy star EER 10.8	2.6%	5.1%	1.7%	89.3%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	142	HE Room Air Conditioner - CEE Tier 1 EER 11.3	2.6%	5.1%	1.7%	99.0%	99.0%	99.0%	100.0%	100.0%	100.0%
Existing	143	Ceiling Fans (base RAC)	2.6%	5.1%	1.7%	21.6%	47.3%	34.7%	100.0%	100.0%	100.0%
Existing	144	Single Pane Windows to ENERGY STAR (base RAC)	1.6%	3.2%	1.1%	87.1%	87.1%	87.1%	100.0%	100.0%	100.0%
Existing	145	Double Pane with Glazing to Energy Star (base RAC)	1.1%	2.2%	0.7%	87.1%	87.1%	87.1%	100.0%	100.0%	100.0%
Existing	146	Ceiling R-0 to R-38 Insulation (base RAC)	0.4%	0.8%	0.3%	100.0%	100.0%	100.0%	33.0%	33.0%	33.0%
Existing	147	Ceiling R-0 to R-49 Insulation (base RAC)	0.4%	0.8%	0.3%	100.0%	100.0%	100.0%	33.0%	33.0%	33.0%
Existing	148	Ceiling R-11 to R-38 Insulation (base RAC)	0.5%	1.0%	0.3%	100.0%	100.0%	100.0%	50.0%	50.0%	50.0%
Existing	149	Ceiling R-11 to R-49 Insulation (base RAC)	0.5%	1.0%	0.3%	100.0%	100.0%	100.0%	50.0%	50.0%	50.0%
Existing	150	Ceiling R-19 to R-38 Insulation (base RAC)	1.4%	2.8%	0.9%	100.0%	100.0%	100.0%	83.0%	83.0%	83.0%
Existing	151	Ceiling R-19 to R-49 Insulation (base RAC)	1.4%	2.8%	0.9%	100.0%	100.0%	100.0%	50.0%	50.0%	50.0%
Existing	152	Wall 2x4 R-0 to Blow-In R-13 Insulation (base RAC)	2.5%	5.1%	1.7%	8.6%	11.8%	10.1%	80.0%	40.0%	63.3%
Existing	153	Self Install Weatherization (base RAC)	0.4%	0.8%	0.3%	62.0%	62.0%	62.0%	100.0%	100.0%	100.0%
Existing	154	Infiltration Reduction (base RAC)	2.6%	5.1%	1.7%	50.9%	51.8%	51.4%	100.0%	100.0%	100.0%
Existing	155	Ductless Split Heat Pump	0.2%	0.5%	0.1%	99.0%	99.0%	99.0%	100.0%	100.0%	100.0%
Existing	160	Base Early Replacement Room Air Conditioner- EER 9.7	0.5%	0.9%	0.3%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	161	EER 8.5 AC Early Replacement, CEE Tier 1 EER 11.3	0.5%	0.9%	0.3%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	170	Base Dehumidifier - New Federal Standard	8.6%	2.9%	3.4%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	171	Energy Star Dehumidifier (ROB)	8.6%	2.9%	3.4%	91.8%	93.6%	89.9%	100.0%	100.0%	100.0%
Existing	200	Base Resistance Space Heating (Primary)	6.0%	9.0%	5.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	201	Air Source Heat Pump	6.0%	9.0%	5.0%	86.0%	100.0%	93.0%	100.0%	100.0%	100.0%
Existing	202	Ceiling R-0 to R-38 Insulation (base space heating)	1.0%	1.4%	0.8%	100.0%	100.0%	100.0%	33.0%	33.0%	33.0%
Existing	203	Ceiling R-0 to R-49 Insulation (base space heating)	1.0%	1.4%	0.8%	100.0%	100.0%	100.0%	33.0%	33.0%	33.0%

Residential Electric Measure Inputs			Applicability Factor (percent)			Incomplete Factor (percent)			Feasibility Factor (percent)		
Segment	Measure #	Measure Description	Single Family	Multifamily	Low Income	Single Family	Multifamily	Low Income	Single Family	Multifamily	Low Income
Existing	204	Ceiling R-11 to R-38 Insulation (base space heating)	1.2%	1.7%	1.0%	100.0%	100.0%	100.0%	50.0%	50.0%	50.0%
Existing	205	Ceiling R-11 to R-49 Insulation (base space heating)	1.2%	1.7%	1.0%	100.0%	100.0%	100.0%	50.0%	50.0%	50.0%
Existing	206	Ceiling R-19 to R-38 Insulation (base space heating)	3.3%	4.9%	2.7%	100.0%	100.0%	100.0%	83.0%	83.0%	83.0%
Existing	207	Ceiling R-19 to R-49 Insulation (base space heating)	3.3%	4.9%	2.7%	100.0%	100.0%	100.0%	50.0%	50.0%	50.0%
Existing	208	Wall Blow-in R-0 to R-13 Insulation (base space heating)	5.2%	9.0%	4.5%	100.0%	100.0%	100.0%	75.0%	45.0%	60.5%
Existing	209	Basement insulation R-11 (base space heating)	1.2%	0.8%	0.8%	100.0%	100.0%	100.0%	65.0%	65.0%	65.0%
Existing	210	Floor R-0 to R-19 Insulation-Batts (base space heating)	4.8%	7.7%	4.1%	100.0%	100.0%	100.0%	50.0%	20.0%	37.5%
Existing	211	Comprehensive Shell Air Sealing - Inf. Reduction (base space heating)	6.0%	9.0%	5.0%	70.0%	70.0%	70.0%	100.0%	100.0%	100.0%
Existing	212	Self Install Weatherization (base space heating)	1.0%	1.4%	0.8%	62.0%	62.0%	62.0%	100.0%	100.0%	100.0%
Existing	213	Single Pane Windows to ENERGY STAR (base space heating)	3.7%	5.6%	3.1%	87.1%	87.1%	87.1%	100.0%	100.0%	100.0%
Existing	214	Double Pane Windows to ENERGY STAR (base space heating)	2.6%	3.9%	2.2%	87.1%	87.1%	87.1%	100.0%	100.0%	100.0%
Existing	217	Programmable Thermostat (base space heating)	6.0%	9.0%	5.0%	44.0%	44.0%	44.0%	100.0%	100.0%	100.0%
Existing	250	Base Air-Source Heat Pump, 13 SEER, 7.7 HSPF	14.0%	0.0%	7.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	251	High Efficiency Air Source Heat Pump, 15 SEER, 8.2 HSPF	14.0%	0.0%	7.0%	90.5%	90.5%	90.5%	100.0%	100.0%	100.0%
Existing	252	Ceiling R-0 to R-38 Insulation (base ASHP)	2.3%	0.0%	1.1%	100.0%	100.0%	100.0%	33.0%	33.0%	33.0%
Existing	253	Ceiling R-0 to R-49 Insulation (base ASHP)	2.3%	0.0%	1.1%	100.0%	100.0%	100.0%	33.0%	33.0%	33.0%
Existing	254	Ceiling R-11 to R-38 Insulation (base ASHP)	2.7%	0.0%	1.4%	100.0%	100.0%	100.0%	50.0%	50.0%	50.0%
Existing	255	Ceiling R-11 to R-49 Insulation (base ASHP)	2.7%	0.0%	1.4%	100.0%	100.0%	100.0%	50.0%	50.0%	50.0%
Existing	256	Ceiling R-19 to R-38 Insulation (base ASHP)	7.6%	0.0%	3.8%	100.0%	100.0%	100.0%	83.0%	83.0%	83.0%
Existing	257	Ceiling R-19 to R-49 Insulation (base ASHP)	7.6%	0.0%	3.8%	100.0%	100.0%	100.0%	50.0%	50.0%	50.0%
Existing	258	Wall Blow-in R-0 to R-13 Insulation (base ASHP)	12.1%	0.0%	6.3%	100.0%	100.0%	100.0%	75.0%	45.0%	60.5%
Existing	259	Basement insulation R-11 (base ASHP)	2.9%	0.0%	1.1%	100.0%	100.0%	100.0%	65.0%	65.0%	65.0%
Existing	260	Floor R-0 to R-19 Insulation-Batts (base ASHP)	11.2%	0.0%	5.8%	100.0%	100.0%	100.0%	50.0%	20.0%	37.5%
Existing	261	Comprehensive Shell Air Sealing - Inf. Reduction (base ASHP)	14.0%	0.0%	7.0%	70.0%	70.0%	70.0%	100.0%	100.0%	100.0%
Existing	262	Self Install Weatherization (base ASHP)	2.3%	0.0%	1.1%	62.0%	62.0%	62.0%	100.0%	100.0%	100.0%
Existing	263	Single Pane Windows to ENERGY STAR (base ASHP)	8.7%	0.0%	4.3%	87.1%	87.1%	87.1%	100.0%	100.0%	100.0%
Existing	264	Double Pane Windows to ENERGY STAR (base ASHP)	6.1%	0.0%	3.1%	87.1%	87.1%	87.1%	100.0%	100.0%	100.0%
Existing	265	Programmable Thermostat (base ASHP)	14.0%	0.0%	7.0%	44.0%	44.0%	44.0%	100.0%	100.0%	100.0%
Existing	300	Base High-Efficiency Incandescent Lighting,<1.15 hrs/day	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	301	CFL 15W (base HE incandescent<1.15 hrs/day)	90.0%	90.0%	90.0%	100.0%	100.0%	100.0%	90.0%	90.0%	90.0%
Existing	302	CFL 15W - Specialty (base HE incandescent<1.15 hrs/day)	10.0%	10.0%	10.0%	100.0%	100.0%	100.0%	90.0%	90.0%	90.0%
Existing	303	LEDs (base HE incandescent<1.15 hrs/day)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	310	Base High-Efficiency Incandescent Lighting,1.15-2.15 hrs/day	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	311	CFL 15W (base HE incandescent 1.15-2.15 hrs/day)	90.0%	90.0%	90.0%	100.0%	100.0%	100.0%	90.0%	90.0%	90.0%
Existing	312	CFL 15W - Specialty (base HE incandescent 1.15-2.15 hrs/day)	10.0%	10.0%	10.0%	100.0%	100.0%	100.0%	90.0%	90.0%	90.0%
Existing	313	LEDs (base HE incandescent 1.15-2.15 hrs/day)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	320	Base High-Efficiency Incandescent Lighting,2.15-5 hrs/day	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	321	CFL 15W (base HE incandescent 2.15-5 hrs/day)	90.0%	90.0%	90.0%	100.0%	100.0%	100.0%	90.0%	90.0%	90.0%
Existing	322	CFL 15W - Specialty (base HE incandescent 2.15-5 hrs/day)	10.0%	10.0%	10.0%	100.0%	100.0%	100.0%	90.0%	90.0%	90.0%
Existing	323	LEDs (base HE incandescent 2.15-5 hrs/day)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	330	Base High-Efficiency Incandescent Lighting,>5 hrs/day	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	331	CFL 15W (base HE incandescent >5 hrs/day)	90.0%	90.0%	90.0%	100.0%	100.0%	100.0%	90.0%	90.0%	90.0%
Existing	332	CFL 15W - Specialty (base HE incandescent >5 hrs/day)	10.0%	10.0%	10.0%	100.0%	100.0%	100.0%	90.0%	90.0%	90.0%
Existing	333	LEDs (base HE incandescent >5 hrs/day)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	340	Base Lighting 15 Watt CFL, <1.15 hrs/day	84.0%	85.0%	74.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	341	LEDs (base CFL < 1.15 hrs/day)	84.0%	85.0%	74.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	342	Photocell/timer/switch (outdoor) (base CFL < 1.15 hrs/day)	84.0%	85.0%	74.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	350	Base Lighting 15 Watt CFL, 1.15-2.15 hrs/day	84.0%	85.0%	74.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	351	LEDs (base CFL 1.15-2.15 hrs/day)	84.0%	85.0%	74.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Residential Electric Measure Inputs			Applicability Factor (percent)			Incomplete Factor (percent)			Feasibility Factor (percent)		
Segment	Measure #	Measure Description	Single Family	Multifamily	Low Income	Single Family	Multifamily	Low Income	Single Family	Multifamily	Low Income
Existing	352	Photocell/timerlock (outdoor) (base CFL 1.15-2.15 hrs/day)	84.0%	85.0%	74.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	360	Base Lighting 15 Watt CFL, 2.15-5 hrs/day	84.0%	85.0%	74.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	361	LEDs (base CFL 2.15-5 hrs/day)	84.0%	85.0%	74.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	362	Photocell/timerlock (outdoor) (base CFL 2.15-5 hrs/day)	84.0%	85.0%	74.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	370	Base Lighting 15 Watt CFL, >5 hrs/day	84.0%	85.0%	74.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	371	LEDs (base CFL >5 hrs/day)	84.0%	85.0%	74.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	372	Photocell/timerlock (outdoor) (base CFL >5 hrs/day)	84.0%	85.0%	74.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	380	Base Fluorescent Fixture, 2L4T8, 1.8 hrs/day	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	381	ROB 2L4' Premium T8	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	400	Base Refrigerator	81.6%	81.6%	79.9%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	401	HE Refrigerator (Energy Star)	81.6%	81.6%	79.9%	90.0%	87.0%	88.0%	100.0%	100.0%	100.0%
Existing	402	HE Refrigerator (CEE Tier 2)	81.6%	81.6%	79.9%	99.0%	99.0%	99.0%	100.0%	100.0%	100.0%
Existing	410	Base Early Replacement Refrigerator	14.4%	14.4%	14.1%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	411	Refrigerator - Early Replacement (Energy Star)	14.4%	14.4%	14.1%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	420	Base Second Refrigerator	18.0%	9.0%	18.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	421	Refrigerator Recycling - second refrigerator	18.0%	9.0%	18.0%	100.0%	100.0%	100.0%	90.0%	90.0%	90.0%
Existing	430	Base Freezer	21.3%	4.0%	4.3%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	431	Freezer (Energy Star)	21.3%	4.0%	4.3%	97.0%	94.0%	90.0%	100.0%	100.0%	100.0%
Existing	440	Base Early Replacement Freezer	3.8%	2.3%	0.8%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	441	Freezer - Early Replacement (Energy Star)	3.8%	2.3%	0.8%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	500	Base 40 gal. Water Heating (EF=0.88)	43.2%	43.2%	43.2%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	502	Faucet Aerators (1.5 GPM)	43.2%	43.2%	43.2%	76.0%	84.0%	81.0%	100.0%	100.0%	100.0%
Existing	503	HE Water Heater (EF=0.93)	43.2%	43.2%	43.2%	88.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	504	Heat Pump Water Heater - Energy Star	43.2%	43.2%	43.2%	99.0%	99.0%	99.0%	25.0%	25.0%	25.0%
Existing	505	Low Flow Showerhead 1.5 Gal/Min	43.2%	43.2%	43.2%	75.0%	91.0%	88.0%	100.0%	100.0%	100.0%
Existing	506	Pipe Wrap	43.2%	43.2%	43.2%	88.5%	89.4%	75.2%	85.0%	85.0%	85.0%
Existing	507	Solar Domestic Water Heating	43.2%	43.2%	43.2%	99.0%	99.0%	99.0%	100.0%	100.0%	100.0%
Existing	508	Tankless Water Heater	43.2%	43.2%	43.2%	99.0%	99.0%	99.0%	75.0%	75.0%	75.0%
Existing	509	Energy Star CW CEE Tier 2 (MEF=2.0) (base WH)	37.2%	32.8%	32.8%	79.0%	79.0%	79.0%	100.0%	100.0%	100.0%
Existing	510	Tier 3 CW (MEF=2.20) (base WH)	37.2%	32.8%	32.8%	99.0%	99.0%	99.0%	100.0%	100.0%	100.0%
Existing	511	Energy Star Dishwasher (EF=0.72) (base WH)	28.9%	24.6%	13.9%	56.2%	100.0%	70.2%	100.0%	100.0%	100.0%
Existing	550	Base Early Replacement Water Heating to Heat Pump Water Heater	4.8%	4.8%	4.8%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	551	Early Replacement Water Heating to Heat Pump Water Heater	4.8%	4.8%	4.8%	100.0%	100.0%	100.0%	10.0%	10.0%	10.0%
Existing	600	Base Clotheswasher (MEF=1.26)	86.0%	76.0%	76.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	601	Energy Star CW CEE Tier 2 (MEF=2.0) (base CW)	86.0%	76.0%	76.0%	79.0%	79.0%	79.0%	100.0%	100.0%	100.0%
Existing	602	Tier 3 CW (MEF=2.20) (base CW)	86.0%	76.0%	76.0%	99.0%	99.0%	99.0%	100.0%	100.0%	100.0%
Existing	610	Base Clothes Dryer (EF=3.01)	66.0%	66.0%	77.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	611	Heat Pump Dryer	66.0%	66.0%	77.0%	99.0%	99.0%	99.0%	100.0%	100.0%	100.0%
Existing	612	High Efficiency CD (EF=3.01 w/moisture sensor)	66.0%	66.0%	77.0%	79.0%	79.0%	79.0%	100.0%	100.0%	100.0%
Existing	700	Base Dishwasher (EF=0.65)	67.0%	57.0%	32.1%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	701	Energy Star Dishwasher (EF=0.72) (base DW)	67.0%	57.0%	32.1%	75.0%	75.0%	75.0%	100.0%	100.0%	100.0%
Existing	800	Base Single Speed Pool Pump (RET)	2.5%	2.5%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	801	Variable Speed Pool Pump (1.5 hp)	2.5%	2.5%	0.0%	86.8%	86.8%	86.8%	100.0%	100.0%	100.0%
Existing	810	Base Two Speed Pool Pump (1.5 hp) (ROB)	2.5%	2.5%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	811	Variable Speed Pool Pump (1.5 hp)	2.5%	2.5%	0.0%	86.8%	86.8%	86.8%	100.0%	100.0%	100.0%
Existing	900	Base Plasma TV	19.0%	23.0%	31.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	901	Energy Star Plasma TV	19.0%	23.0%	31.0%	80.0%	60.0%	82.0%	100.0%	100.0%	100.0%
Existing	910	Base LCD TV	48.0%	46.0%	24.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	911	Energy Star LCD TV	48.0%	46.0%	24.0%	47.0%	34.0%	46.0%	100.0%	100.0%	100.0%

Residential Electric Measure Inputs			Applicability Factor (percent)			Incomplete Factor (percent)			Feasibility Factor (percent)		
Segment	Measure #	Measure Description	Single Family	Multifamily	Low Income	Single Family	Multifamily	Low Income	Single Family	Multifamily	Low Income
Existing	920	Base CRT TV	72.0%	69.0%	81.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	921	Energy Star LCD TV	72.0%	69.0%	81.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	930	Base Set-Top Box	63.0%	63.0%	62.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	931	Energy Star Set-Top Box	63.0%	63.0%	62.0%	62.0%	50.0%	67.0%	100.0%	100.0%	100.0%
Existing	940	Base DVD Player	62.0%	57.0%	33.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	941	Energy Star DVD Player	62.0%	57.0%	33.0%	52.0%	50.0%	65.0%	100.0%	100.0%	100.0%
Existing	950	Base Desktop PC	76.0%	64.0%	60.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	951	Energy Star Desktop PC	76.0%	64.0%	60.0%	93.0%	82.0%	99.0%	100.0%	100.0%	100.0%
Existing	960	Base Laptop PC	73.0%	78.0%	58.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	961	Energy Star Laptop PC	73.0%	78.0%	58.0%	76.0%	69.0%	73.0%	100.0%	100.0%	100.0%
Existing	970	Base Cooking	73.5%	80.9%	72.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	980	Base Miscellaneous	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	981	Plug Load Controls - Smart Power Strip	100.0%	100.0%	100.0%	99.0%	99.0%	99.0%	100.0%	100.0%	100.0%
Existing	982	Energy Star Ventilating Fans	73.7%	46.8%	38.3%	70.0%	70.0%	70.0%	100.0%	100.0%	100.0%
Existing	990	Base House Practices	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	991	Indirect feedback	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New	100	Base City of Austin Code Home	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New	101	2011 Austin Green Building Home	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New	104	Base 2015 City of Austin Code Home	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New	105	3% savings over 2015 code home	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Residential Electric Measure Inputs			Energy Savings (percent)			Source
Segment	Measure #	Measure Description	Single Family	Multifamily	Low Income	
Existing	100	Base Split-System Air Conditioner (13 SEER)	0.00%	0.00%	0.00%	
Existing	101	15 SEER (12.72 EER) Split-System Air Conditioner w/ quality install	40.20%	40.20%	40.20%	Engineering calculation; Includes additional 31% savings for quality install
Existing	102	17 SEER (12.28 EER) Split-System Air Conditioner w/ quality install	47.24%	47.24%	47.24%	Engineering calculation; Includes additional 31% savings for quality install
Existing	103	AC Maintenance (Indoor Coil Cleaning)	6.30%	6.30%	6.30%	DNV KEMA Database
Existing	104	AC Maintenance (Outdoor Coil Cleaning)	6.30%	6.30%	6.30%	DNV KEMA Database
Existing	105	AC Maintenance and/or tune-up	4.00%	4.00%	4.00%	DNV KEMA Database
Existing	107	Ceiling R-0 to R-38 Insulation (base split-system)	32.69%	32.69%	32.69%	LBNL Home savers model, set at Austin Texas
Existing	108	Ceiling R-0 to R-49 Insulation (base split-system)	34.10%	34.10%	34.10%	LBNL Home savers model, set at Austin Texas
Existing	109	Ceiling R-11 to R-38 Insulation (base split-system)	13.08%	13.08%	13.08%	LBNL Home savers model, set at Austin Texas
Existing	110	Ceiling R-11 to R-49 Insulation (base split-system)	14.90%	14.90%	14.90%	LBNL Home savers model, set at Austin Texas
Existing	111	Ceiling R-19 to R-38 Insulation (base split-system)	6.08%	6.08%	6.08%	LBNL Home savers model, set at Austin Texas
Existing	112	Ceiling R-19 to R-49 Insulation (base split-system)	8.05%	8.05%	8.05%	LBNL Home savers model, set at Austin Texas
Existing	113	Comprehensive Shell Air Sealing - Inf. Reduction (base split-system)	1.85%	1.85%	1.85%	LBNL Home savers model, set at Austin Texas
Existing	114	Duct Insulation	16.32%	16.32%	16.32%	LBNL Home savers model, set at Austin Texas
Existing	115	Duct Repair	7.75%	7.75%	7.75%	DNV KEMA Database
Existing	116	Programmable Thermostat (base split-system)	15.99%	15.99%	15.99%	ENERGY STAR calculator
Existing	117	Proper Refrigerant Charging and Air Flow	12.60%	10.90%	11.78%	DNV KEMA Database
Existing	118	Proper Sizing and Quality Install	31.00%	31.00%	31.00%	DNV KEMA Database
Existing	119	Sealed Attic w/Sprayed Foam Insulated Roof Deck (base split-system)	9.00%	9.00%	9.00%	DNV KEMA Database
Existing	120	Self Install Weatherization (base split-system)	2.00%	2.00%	2.00%	DNV KEMA Database
Existing	121	Wall Blow-in R-0 to R-13 Insulation (base split-system)	15.51%	15.51%	15.51%	LBNL Home savers model, set at Austin Texas
Existing	122	Single Pane Windows to ENERGY STAR (base split-system)	4.48%	4.48%	4.48%	LBNL Home savers model, set at Austin Texas
Existing	123	Double Pane Windows to ENERGY STAR (base split-system)	2.72%	2.72%	2.72%	LBNL Home savers model, set at Austin Texas
Existing	130	Base Early Replacement Split-System Air Conditioner (13 SEER)	0.00%	0.00%	0.00%	
Existing	131	15 SEER (12.72 EER) Split-System Air Conditioner--early replacement	20.22%	20.22%	20.22%	DNV KEMA Database
Existing	140	Base Room Air Conditioner - EER 9.7	0.00%	0.00%	0.00%	
Existing	141	HE Room Air Conditioner - Energy star EER 10.8	9.26%	9.26%	9.26%	ENERGY STAR calculator
Existing	142	HE Room Air Conditioner - CEE Tier 1 EER 11.3	13.25%	13.25%	13.25%	ENERGY STAR calculator
Existing	143	Ceiling Fans (base RAC)	5.00%	5.00%	5.00%	DNV KEMA Database
Existing	144	Single Pane Windows to ENERGY STAR (base RAC)	4.48%	4.48%	4.48%	LBNL Home savers model, set at Austin Texas
Existing	145	Double Pane with Glazing to Energy Star (base RAC)	2.72%	2.72%	2.72%	LBNL Home savers model, set at Austin Texas
Existing	146	Ceiling R-0 to R-38 Insulation (base RAC)	32.69%	32.69%	32.69%	LBNL Home savers model, set at Austin Texas
Existing	147	Ceiling R-0 to R-49 Insulation (base RAC)	34.10%	34.10%	34.10%	LBNL Home savers model, set at Austin Texas
Existing	148	Ceiling R-11 to R-38 Insulation (base RAC)	13.08%	13.08%	13.08%	LBNL Home savers model, set at Austin Texas
Existing	149	Ceiling R-11 to R-49 Insulation (base RAC)	14.90%	14.90%	14.90%	LBNL Home savers model, set at Austin Texas
Existing	150	Ceiling R-19 to R-38 Insulation (base RAC)	6.08%	6.08%	6.08%	LBNL Home savers model, set at Austin Texas
Existing	151	Ceiling R-19 to R-49 Insulation (base RAC)	8.05%	8.05%	8.05%	LBNL Home savers model, set at Austin Texas
Existing	152	Wall 2x4 R-0 to Blow-In R-13 Insulation (base RAC)	15.51%	15.51%	15.51%	LBNL Home savers model, set at Austin Texas
Existing	153	Self Install Weatherization (base RAC)	2.00%	2.00%	2.00%	DNV KEMA Database
Existing	154	Infiltration Reduction (base RAC)	1.85%	1.85%	1.85%	LBNL Home savers model, set at Austin Texas
Existing	155	Ductless Split Heat Pump	31.67%	31.67%	31.67%	DNV KEMA Database
Existing	160	Base Early Replacement Room Air Conditioner- EER 9.7	0.00%	0.00%	0.00%	
Existing	161	EER 8.5 AC Early Replacement, CEE Tier 1 EER 11.3	18.20%	18.20%	18.20%	DNV KEMA Database
Existing	170	Base Dehumidifier - New Federal Standard	0.00%	0.00%	0.00%	
Existing	171	Energy Star Dehumidifier (ROB)	20.00%	20.00%	20.00%	DNV KEMA Database
Existing	200	Base Resistance Space Heating (Primary)	0.00%	0.00%	0.00%	
Existing	201	Air Source Heat Pump	41.08%	41.08%	41.08%	ENERGY STAR calculator; assumes used for heating only

Residential Electric Measure Inputs			Energy Savings (percent)			Source
Segment	Measure #	Measure Description	Single Family	Multifamily	Low Income	
Existing	202	Ceiling R-0 to R-38 Insulation (base space heating)	40.46%	40.46%	40.46%	LBNL Home savers model, set at Austin Texas
Existing	203	Ceiling R-0 to R-49 Insulation (base space heating)	41.53%	41.53%	41.53%	LBNL Home savers model, set at Austin Texas
Existing	204	Ceiling R-11 to R-38 Insulaton (base space heating)	16.32%	16.32%	16.32%	LBNL Home savers model, set at Austin Texas
Existing	205	Ceiling R-11 to R-49 Insulation (base space heating)	17.82%	17.82%	17.82%	LBNL Home savers model, set at Austin Texas
Existing	206	Ceiling R-19 to R-38 Insulation (base space heating)	7.97%	7.97%	7.97%	LBNL Home savers model, set at Austin Texas
Existing	207	Ceiling R-19 to R-49 Insulation (base space heating)	9.62%	9.62%	9.62%	LBNL Home savers model, set at Austin Texas
Existing	208	Wall Blow-in R-0 to R-13 Insulation (base space heating)	15.51%	15.51%	15.51%	LBNL Home savers model, set at Austin Texas
Existing	209	Basement insulation R-11 (base space heating)	2.92%	2.92%	2.92%	LBNL Home savers model, set at Austin Texas
Existing	210	Floor R-0 to R-19 Insulation-Batts (base space heating)	0.00%	0.00%	0.00%	LBNL Home savers model, set at Austin Texas
Existing	211	Comprehensive Shell Air Sealing - Inf. Reduction (base space heating)	14.69%	14.69%	14.69%	LBNL Home savers model, set at Austin Texas
Existing	212	Self Install Weatherization (base space heating)	2.00%	2.00%	2.00%	DNV KEMA Database
Existing	213	Single Pane Windows to ENERGY STAR(base space heating)	13.12%	13.12%	13.12%	LBNL Home savers model, set at Austin Texas
Existing	214	Double Pane Windows to ENERGY STAR (base space heating)	8.16%	8.16%	8.16%	LBNL Home savers model, set at Austin Texas
Existing	217	Programmable Thermostat (base space heating)	10.01%	10.01%	10.01%	LBNL Home savers model, set at Austin Texas
Existing	250	Base Air-Source Heat Pump, 13 SEER, 7.7 HSPF	0.00%	0.00%	0.00%	
Existing	251	High Efficiency Air Source Heat Pump, 15 SEER, 8.2 HSPF	6.10%	6.10%	6.10%	ENERGY STAR calculator; assumes used for heating only
Existing	252	Ceiling R-0 to R-38 Insulation (base ASHP)	40.46%	40.46%	40.46%	LBNL Home savers model, set at Austin Texas
Existing	253	Ceiling R-0 to R-49 Insulation (base ASHP)	41.53%	41.53%	41.53%	LBNL Home savers model, set at Austin Texas
Existing	254	Ceiling R-11 to R-38 Insulaton (base ASHP)	16.32%	16.32%	16.32%	LBNL Home savers model, set at Austin Texas
Existing	255	Ceiling R-11 to R-49 Insulation (base ASHP)	17.82%	17.82%	17.82%	LBNL Home savers model, set at Austin Texas
Existing	256	Ceiling R-19 to R-38 Insulation (base ASHP)	7.97%	7.97%	7.97%	LBNL Home savers model, set at Austin Texas
Existing	257	Ceiling R-19 to R-49 Insulation (base ASHP)	9.62%	9.62%	9.62%	LBNL Home savers model, set at Austin Texas
Existing	258	Wall Blow-in R-0 to R-13 Insulation (base ASHP)	15.51%	15.51%	15.51%	LBNL Home savers model, set at Austin Texas
Existing	259	Basement insulation R-11 (base ASHP)	2.92%	2.92%	2.92%	LBNL Home savers model, set at Austin Texas
Existing	260	Floor R-0 to R-19 Insulation-Batts (base ASHP)	0.00%	0.00%	0.00%	LBNL Home savers model, set at Austin Texas
Existing	261	Comprehensive Shell Air Sealing - Inf. Reduction (base ASHP)	14.69%	14.69%	14.69%	LBNL Home savers model, set at Austin Texas
Existing	262	Self Install Weatherization (base ASHP)	2.00%	2.00%	2.00%	DNV KEMA Database
Existing	263	Single Pane Windows to ENERGY STAR(base ASHP)	13.12%	13.12%	13.12%	LBNL Home savers model, set at Austin Texas
Existing	264	Double Pane Windows to ENERGY STAR (base ASHP)	8.16%	8.16%	8.16%	LBNL Home savers model, set at Austin Texas
Existing	265	Programmable Thermostat (base ASHP)	10.01%	10.01%	10.01%	LBNL Home savers model, set at Austin Texas
Existing	300	Base High-Efficiency Incandescent Lighting,<1.15 hrs/day	0.00%	0.00%	0.00%	
Existing	301	CFL 15W (base HE incandescent<1.15 hrs/day)	75.00%	75.00%	75.00%	DNV KEMA Database
Existing	302	CFL 15W - Specialty (base HE incandescent<1.15 hrs/day)	75.00%	75.00%	75.00%	DNV KEMA Database
Existing	303	LEDs (base HE incandescent<1.15 hrs/day)	90.00%	90.00%	90.00%	DNV KEMA Database
Existing	310	Base High-Efficiency Incandescent Lighting,1.15-2.15 hrs/day	0.00%	0.00%	0.00%	
Existing	311	CFL 15W (base HE incandescent 1.15-2.15 hrs/day)	75.00%	75.00%	75.00%	DNV KEMA Database
Existing	312	CFL 15W - Specialty (base HE incandescent 1.15-2.15 hrs/day)	75.00%	75.00%	75.00%	DNV KEMA Database
Existing	313	LEDs (base HE incandescent 1.15-2.15 hrs/day)	90.00%	90.00%	90.00%	DNV KEMA Database
Existing	320	Base High-Efficiency Incandescent Lighting,2.15-5 hrs/day	0.00%	0.00%	0.00%	
Existing	321	CFL 15W (base HE incandescent 2.15-5 hrs/day)	75.00%	75.00%	75.00%	DNV KEMA Database
Existing	322	CFL 15W - Specialty (base HE incandescent 2.15-5 hrs/day)	75.00%	75.00%	75.00%	DNV KEMA Database
Existing	323	LEDs (base HE incandescent 2.15-5 hrs/day)	90.00%	90.00%	90.00%	DNV KEMA Database
Existing	330	Base High-Efficiency Incandescent Lighting,>5 hrs/day	0.00%	0.00%	0.00%	
Existing	331	CFL 15W (base HE incandescent >5 hrs/day)	75.00%	75.00%	75.00%	DNV KEMA Database
Existing	332	CFL 15W - Specialty (base HE incandescent >5 hrs/day)	75.00%	75.00%	75.00%	DNV KEMA Database
Existing	333	LEDs (base HE incandescent >5 hrs/day)	90.00%	90.00%	90.00%	DNV KEMA Database
Existing	340	Base Lighting 15 Watt CFL, <1.15 hrs/day	0.00%	<0.00%	0.00%	

Residential Electric Measure Inputs			Energy Savings (percent)			Source
Segment	Measure #	Measure Description	Single Family	Multifamily	Low Income	
Existing	341	LEDs (base CFL < 1.15 hrs/day)	60.00%	60.00%	60.00%	DNV KEMA Database
Existing	342	Photocell/timeclock (outdoor) (base CFL < 1.15 hrs/day)	15.00%	15.00%	15.00%	DNV KEMA Database
Existing	350	Base Lighting 15 Watt CFL, 1.15-2.15 hrs/day	0.00%	0.00%	0.00%	
Existing	351	LEDs (base CFL 1.15-2.15 hrs/day)	60.00%	60.00%	60.00%	DNV KEMA Database
Existing	352	Photocell/timeclock (outdoor) (base CFL 1.15-2.15 hrs/day)	15.00%	15.00%	15.00%	DNV KEMA Database
Existing	360	Base Lighting 15 Watt CFL, 2.15-5 hrs/day	0.00%	0.00%	0.00%	
Existing	361	LEDs (base CFL 2.15-5 hrs/day)	60.00%	60.00%	60.00%	DNV KEMA Database
Existing	362	Photocell/timeclock (outdoor) (base CFL 2.15-5 hrs/day)	15.00%	15.00%	15.00%	DNV KEMA Database
Existing	370	Base Lighting 15 Watt CFL, >5 hrs/day	0.00%	0.00%	0.00%	
Existing	371	LEDs (base CFL >5 hrs/day)	60.00%	60.00%	60.00%	DNV KEMA Database
Existing	372	Photocell/timeclock (outdoor) (base CFL >5 hrs/day)	15.00%	15.00%	15.00%	DNV KEMA Database
Existing	380	Base Fluorescent Fixture, 2L4T8, 1.8 hrs/day	0.00%	0.00%	0.00%	
Existing	381	ROB 2L4' Premium T8	17.10%	17.10%	17.10%	DNV KEMA Database
Existing	400	Base Refrigerator	0.00%	0.00%	0.00%	
Existing	401	HE Refrigerator (Energy Star)	20.00%	20.00%	20.00%	CEE
Existing	402	HE Refrigerator (CEE Tier 2)	25.00%	25.00%	25.00%	CEE
Existing	410	Base Early Replacement Refrigerator	0.00%	0.00%	0.00%	
Existing	411	Refrigerator - Early Replacement (Energy Star)	27.63%	27.63%	27.63%	KEMA Early Replacement Calculator
Existing	420	Base Second Refrigerator	0.00%	0.00%	0.00%	
Existing	421	Refrigerator Recycling - second refrigerator	99.90%	99.90%	99.90%	Removal of all kwh for this refrigerator
Existing	430	Base Freezer	0.00%	0.00%	0.00%	
Existing	431	Freezer (Energy Star)	15.00%	15.00%	15.00%	Energy Star
Existing	440	Base Early Replacement Freezer	0.00%	0.00%	0.00%	
Existing	441	Freezer - Early Replacement (Energy Star)	15.20%	15.20%	15.20%	KEMA Early Replacement Calculator
Existing	500	Base 40 gal. Water Heating (EF=0.88)	0.00%	0.00%	0.00%	
Existing	502	Faucet Aerators (1.5 GPM)	3.78%	3.78%	3.78%	(8.6/21.1) from Res Indoor Water Cons for EBMUD, July 2003; 31.18% savings from MN Residential Quick Fix Efficiency Service.xlsx
Existing	503	HE Water Heater (EF=0.93)	5.40%	5.40%	5.40%	2001 DEER Update Study Table 5-21, consistent with Ohio TRM 5-10%
Existing	504	Heat Pump Water Heater - Energy Star	64.80%	64.80%	64.80%	(1/0.88-1/2.5)/(1/0.88) (6.9/21.1) from Res Indoor Water Cons for EBMUD, July 2003; 60.00% savings from MN Residential Quick Fix Efficiency Service.xlsx
Existing	505	Low Flow Showerhead 1.5 Gal/Min	7.22%	7.22%	7.22%	Ohio TRM was 5%, seems high
Existing	506	Pipe Wrap	3.00%	3.00%	3.00%	DNV KEMA Database
Existing	507	Solar Domestic Water Heating	50.00%	50.00%	50.00%	DNV KEMA Database
Existing	508	Tankless Water Heater	28.83%	28.83%	28.83%	MN Water Heating rebase.xlsx, assumed EF = 0.88 from Xcel worksheet. ENERGY STAR Calculator- Electric savings from water use as percent of all hot water EUI
Existing	509	Energy Star CW CEE Tier 2 (MEF=2.0) (base WH)	3.12%	4.09%	3.59%	ENERGY STAR Calculator- Electric savings from water use as percent of all hot water EUI
Existing	510	Tier 3 CW (MEF=2.20) (base WH)	3.26%	4.28%	3.75%	Calculated savings with assumption dishwashers use 6.6% of hot water, from California DHW end use study, N =35
Existing	511	Energy Star Dishwasher (EF=0.72) (base WH)	2.14%	2.14%	2.14%	
Existing	550	Base Early Replacement Water Heating to Heat Pump Water Heater	0.00%	0.00%	0.00%	
Existing	551	Early Replacement Water Heating to Heat Pump Water Heater	63.58%	63.58%	63.58%	KEMA Early Replacement Calculator
Existing	600	Base Clotheswasher (MEF=1.26)	0.00%	0.00%	0.00%	
Existing	601	Energy Star CW CEE Tier 2 (MEF=2.0) (base CW)	29.49%	29.49%	29.49%	ENERGY STAR Calculator, motor savings
Existing	602	Tier 3 CW (MEF=2.20) (base CW)	31.76%	31.76%	31.76%	Savings for MEF of 2.00 plus savings difference between 2.0 and 2.2
Existing	610	Base Clothes Dryer (EF=3.01)	0.00%	0.00%	0.00%	
Existing	611	Heat Pump Dryer	60.00%	60.00%	60.00%	DNV KEMA Database
Existing	612	High Efficiency CD (EF=3.01 w/moisture sensor)	15.00%	15.00%	15.00%	http://www.fypower.org/res/tools/products_results.html?id=100144

Residential Electric Measure Inputs			Energy Savings (percent)			Source
Segment	Measure #	Measure Description	Single Family	Multifamily	Low Income	
Existing	700	Base Dishwasher (EF=0.65)	0.00%	0.00%	0.00%	
Existing	701	Energy Star Dishwasher (EF=0.72) (base DW)	1.24%	1.24%	1.24%	DNV KEMA Database
Existing	800	Base Single Speed Pool Pump (RET)	0.00%	0.00%	0.00%	
Existing	801	Variable Speed Pool Pump (1.5 hp)	90.00%	90.00%	90.00%	http://www.pentairpool.com/pool-owner/resources/calculators/pool-pump-calc/index.htm
Existing	810	Base Two Speed Pool Pump (1.5 hp) (ROB)	0.00%	0.00%	0.00%	
Existing	811	Variable Speed Pool Pump (1.5 hp)	33.00%	33.00%	33.00%	DNV KEMA Database
Existing	900	Base Plasma TV	0.00%	0.00%	0.00%	
Existing	901	Energy Star Plasma TV	30.00%	30.00%	30.00%	Energy Star
Existing	910	Base LCD TV	0.00%	0.00%	0.00%	
Existing	911	Energy Star LCD TV	30.00%	30.00%	30.00%	Energy Star
Existing	920	Base CRT TV	0.00%	0.00%	0.00%	
Existing	921	Energy Star LCD TV	40.00%	40.00%	40.00%	DNV KEMA Database
Existing	930	Base Set-Top Box	0.00%	0.00%	0.00%	
Existing	931	Energy Star Set-Top Box	39.56%	39.56%	39.56%	DNV KEMA Database
Existing	940	Base DVD Player	0.00%	0.00%	0.00%	
Existing	941	Energy Star DVD Player	54.94%	54.94%	54.94%	DNV KEMA Database
Existing	950	Base Desktop PC	0.00%	0.00%	0.00%	
Existing	951	Energy Star Desktop PC	17.90%	17.90%	17.90%	TIAX 2007, Table 5-35, page 70
Existing	960	Base Laptop PC	0.00%	0.00%	0.00%	
Existing	961	Energy Star Laptop PC	13.40%	13.40%	13.40%	TIAX 2007, Table 5-35, page 70
Existing	970	Base Cooking	0.00%	0.00%	0.00%	
Existing	980	Base Miscellaneous	0.00%	0.00%	0.00%	
Existing	981	Plug Load Controls - Smart Power Strip	2.00%	2.00%	2.00%	DNV KEMA Database
Existing	982	Energy Star Ventilating Fans	1.40%	1.40%	1.40%	CO Potential study, reviewed and accepted by KEMA staff
Existing	990	Base House Practices	0.00%	0.00%	0.00%	
Existing	991	Indirect feedback	2.00%	2.00%	2.00%	Opower Estimate
New	100	Base City of Austin Code Home	0.0%	0.0%	0.0%	
New	101	2011 Austin Green Building Home	3.5%	3.5%	3.5%	DNV KEMA calculation based on Austin Energy Green Buildings data
New	104	Base 2015 City of Austin Code Home	0.0%	0.0%	0.0%	
New	105	3% savings over 2015 code home	3.0%	3.0%	3.0%	DNV KEMA calculation based on Austin Energy Green Buildings data

Residential Electric Measure Inputs			Standards Adjustment Factor (percent)			Technology Saturation (units/home)			Hour Adjustment for Lighting (hours/year)		
Segment	Measure #	Measure Description	Single Family	Multifamily	Low Income	Single Family	Multifamily	Low Income	Single Family	Multifamily	Low Income
Existing	100	Base Split-System Air Conditioner (13 SEER)	84.6%	84.6%	84.6%	1.0	0.8	0.8			
Existing	101	15 SEER (12.72 EER) Split-System Air Conditioner w/ quality install	84.6%	84.6%	84.6%	1.0	0.8	0.8			
Existing	102	17 SEER (12.28 EER) Split-System Air Conditioner w/ quality install	84.6%	84.6%	84.6%	1.0	0.8	0.8			
Existing	103	AC Maintenance (Indoor Coil Cleaning)	84.6%	84.6%	84.6%	1.0	1.0	1.0			
Existing	104	AC Maintenance (Outdoor Coil Cleaning)	84.6%	84.6%	84.6%	1.0	1.0	1.0			
Existing	105	AC Maintenance and/or tune-up	84.6%	84.6%	84.6%	1.0	1.0	1.0			
Existing	107	Ceiling R-0 to R-38 Insulation (base split-system)	84.6%	84.6%	84.6%	1,221	1,180	964			
Existing	108	Ceiling R-0 to R-49 Insulation (base split-system)	84.6%	84.6%	84.6%	1,221	1,180	964			
Existing	109	Ceiling R-11 to R-38 Insulation (base split-system)	84.6%	84.6%	84.6%	1,221	1,180	964			
Existing	110	Ceiling R-11 to R-49 Insulation (base split-system)	84.6%	84.6%	84.6%	1,221	1,180	964			
Existing	111	Ceiling R-19 to R-38 Insulation (base split-system)	84.6%	84.6%	84.6%	1,221	1,180	964			
Existing	112	Ceiling R-19 to R-49 Insulation (base split-system)	84.6%	84.6%	84.6%	1,221	1,180	964			
Existing	113	Comprehensive Shell Air Sealing - Inf. Reduction (base split-system)	84.6%	84.6%	84.6%	2,206	1,380	1,218			
Existing	114	Duct Insulation	84.6%	84.6%	84.6%	79	87	57			
Existing	115	Duct Repair	84.6%	84.6%	84.6%	1.0	1.0	1.0			
Existing	116	Programmable Thermostat (base split-system)	84.6%	84.6%	84.6%	1.0	1.0	1.0			
Existing	117	Proper Refrigerant Charging and Air Flow	84.6%	84.6%	84.6%	3.0	2.0	2.5			
Existing	118	Proper Sizing and Quality Install	84.6%	84.6%	84.6%	2.0	2.0	2.0			
Existing	119	Sealed Attic w/Sprayed Foam Insulated Roof Deck (base split-system)	84.6%	84.6%	84.6%	1,026	642	566			
Existing	120	Self Install Weatherization (base split-system)	84.6%	84.6%	84.6%	1.0000	1.0000	1.0000			
Existing	121	Wall Blow-in R-0 to R-13 Insulation (base split-system)	84.6%	84.6%	84.6%	1,875	870	972			
Existing	122	Single Pane Windows to ENERGY STAR (base split-system)	84.6%	84.6%	84.6%	161	94	42			
Existing	123	Double Pane Windows to ENERGY STAR (base split-system)	84.6%	84.6%	84.6%	228	139	121			
Existing	130	Base Early Replacement Split-System Air Conditioner (13 SEER)	100.0%	100.0%	100.0%	1.0	0.8	0.8			
Existing	131	15 SEER (12.72 EER) Split-System Air Conditioner--early replacement	100.0%	100.0%	100.0%	1.0	0.8	0.8			
Existing	140	Base Room Air Conditioner - EER 9.7	100.0%	100.0%	100.0%	1.4	1.3	1.2			
Existing	141	HE Room Air Conditioner - Energy star EER 10.8	100.0%	100.0%	100.0%	1.4	1.3	1.2			
Existing	142	HE Room Air Conditioner - CEE Tier 1 EER 11.3	100.0%	100.0%	100.0%	1.4	1.3	1.2			
Existing	143	Ceiling Fans (base RAC)	100.0%	100.0%	100.0%	2.5	1.7	1.9			
Existing	144	Single Pane Windows to ENERGY STAR (base RAC)	100.0%	100.0%	100.0%	88	96	55			
Existing	145	Double Pane with Glazing to Energy Star (base RAC)	100.0%	100.0%	100.0%	168	61	103			
Existing	146	Ceiling R-0 to R-38 Insulation (base RAC)	100.0%	100.0%	100.0%	1,007	729	909			
Existing	147	Ceiling R-0 to R-49 Insulation (base RAC)	100.0%	100.0%	100.0%	1,007	729	909			
Existing	148	Ceiling R-11 to R-38 Insulation (base RAC)	100.0%	100.0%	100.0%	1,007	729	909			
Existing	149	Ceiling R-11 to R-49 Insulation (base RAC)	100.0%	100.0%	100.0%	1,007	729	909			
Existing	150	Ceiling R-19 to R-38 Insulation (base RAC)	100.0%	100.0%	100.0%	1,007	729	909			
Existing	151	Ceiling R-19 to R-49 Insulation (base RAC)	100.0%	100.0%	100.0%	1,007	729	909			
Existing	152	Wall 2x4 R-0 to Blow-In R-13 Insulation (base RAC)	100.0%	100.0%	100.0%	1,581	681	736			
Existing	153	Self Install Weatherization (base RAC)	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	154	Infiltration Reduction (base RAC)	100.0%	100.0%	100.0%	1,624	949	1,063			
Existing	155	Ductless Split Heat Pump	100.0%	100.0%	100.0%	1.0	0.7	0.8			
Existing	160	Base Early Replacement Room Air Conditioner- EER 9.7	100.0%	100.0%	100.0%	1.4	1.3	1.2			
Existing	161	EER 8.5 AC Early Replacement, CEE Tier 1 EER 11.3	100.0%	100.0%	100.0%	1.4	1.3	1.2			
Existing	170	Base Dehumidifier - New Federal Standard	80.0%	80.0%	80.0%	1.0	1.0	1.0			
Existing	171	Energy Star Dehumidifier (ROB)	80.0%	80.0%	80.0%	1.0	1.0	1.0			
Existing	200	Base Resistance Space Heating (Primary)	100.0%	100.0%	100.0%	1.0	0.4	0.7			
Existing	201	Air Source Heat Pump	100.0%	100.0%	100.0%	1	1	1			
Existing	202	Ceiling R-0 to R-38 Insulation (base space heating)	100.0%	100.0%	100.0%	1,124	1,163	1,128			
Existing	203	Ceiling R-0 to R-49 Insulation (base space heating)	100.0%	100.0%	100.0%	1,124	1,163	1,128			
Existing	204	Ceiling R-11 to R-38 Insulation (base space heating)	100.0%	100.0%	100.0%	1,124	1,163	1,128			
Existing	205	Ceiling R-11 to R-49 Insulation (base space heating)	100.0%	100.0%	100.0%	1,124	1,163	1,128			

Residential Electric Measure Inputs			Standards Adjustment Factor			Technology Saturation			Hour Adjustment for Lighting		
Segment	Measure #	Measure Description	(percent)			(units/home)			(hours/year)		
			Single Family	Multifamily	Low Income	Single Family	Multifamily	Low Income	Single Family	Multifamily	Low Income
Existing	206	Ceiling R-19 to R-38 Insulation (base space heating)	100.0%	100.0%	100.0%	1,124	1,163	1,128			
Existing	207	Ceiling R-19 to R-49 Insulation (base space heating)	100.0%	100.0%	100.0%	1,124	1,163	1,128			
Existing	208	Wall Blow-in R-0 to R-13 Insulation (base space heating)	100.0%	100.0%	100.0%	2,096	400	805			
Existing	209	Basement insulation R-11 (base space heating)	100.0%	100.0%	100.0%	1,310	851	1,074			
Existing	210	Floor R-0 to R-19 Insulation-Batts (base space heating)	100.0%	100.0%	100.0%	1,676	707	1,127			
Existing	211	Comprehensive Shell Air Sealing - Inf. Reduction (base space heating)	100.0%	100.0%	100.0%	2087.8	827.0	1366.6			
Existing	212	Self Install Weatherization (base space heating)	100.0%	100.0%	100.0%	1	1	1			
Existing	213	Single Pane Windows to ENERGY STAR(base space heating)	100.0%	100.0%	100.0%	224	37	13			
Existing	214	Double Pane Windows to ENERGY STAR (base space heating)	100.0%	100.0%	100.0%	192.9	60.2	143.4			
Existing	217	Programmable Thermostat (base space heating)	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	250	Base Air-Source Heat Pump, 13 SEER, 7.7 HSPF	93.5%	93.5%	93.5%	1.0	0.8	0.8			
Existing	251	High Efficiency Air Source Heat Pump, 15 SEER, 8.2 HSPF	93.5%	93.5%	93.5%	1.0	0.8	0.8			
Existing	252	Ceiling R-0 to R-38 Insulation (base ASHP)	93.5%	93.5%	93.5%	1123.8	1163.4	1128.3			
Existing	253	Ceiling R-0 to R-49 Insulation (base ASHP)	93.5%	93.5%	93.5%	1123.8	1163.4	1128.3			
Existing	254	Ceiling R-11 to R-38 Insulation (base ASHP)	93.5%	93.5%	93.5%	1123.8	1163.4	1128.3			
Existing	255	Ceiling R-11 to R-49 Insulation (base ASHP)	93.5%	93.5%	93.5%	1123.8	1163.4	1128.3			
Existing	256	Ceiling R-19 to R-38 Insulation (base ASHP)	93.5%	93.5%	93.5%	1123.8	1163.4	1128.3			
Existing	257	Ceiling R-19 to R-49 Insulation (base ASHP)	93.5%	93.5%	93.5%	1123.8	1163.4	1128.3			
Existing	258	Wall Blow-in R-0 to R-13 Insulation (base ASHP)	93.5%	93.5%	93.5%	2096.4	400.0	805.0			
Existing	259	Basement insulation R-11 (base ASHP)	93.5%	93.5%	93.5%	1310.1	850.8	1074.3			
Existing	260	Floor R-0 to R-19 Insulation-Batts (base ASHP)	93.5%	93.5%	93.5%	1676.2	706.9	1127.0			
Existing	261	Comprehensive Shell Air Sealing - Inf. Reduction (base ASHP)	93.5%	93.5%	93.5%	2087.8	827.0	1366.6			
Existing	262	Self Install Weatherization (base ASHP)	93.5%	93.5%	93.5%	1.0	1.0	1.0			
Existing	263	Single Pane Windows to ENERGY STAR(base ASHP)	93.5%	93.5%	93.5%	224.2	36.6	12.6			
Existing	264	Double Pane Windows to ENERGY STAR (base ASHP)	93.5%	93.5%	93.5%	192.9	60.2	143.4			
Existing	265	Programmable Thermostat (base ASHP)	93.5%	93.5%	93.5%	1.0	1.0	1.0			
Existing	300	Base High-Efficiency Incandescent Lighting,<1.15 hrs/day	70.0%	70.0%	70.0%	9.4	5.3	4.9	219	219	219
Existing	301	CFL 15W (base HE incandescent<1.15 hrs/day)	70.0%	70.0%	70.0%	9.4	5.3	4.9	219	219	219
Existing	302	CFL 15W - Specialty (base HE incandescent<1.15 hrs/day)	70.0%	70.0%	70.0%	9.4	5.3	4.9	219	219	219
Existing	303	LEDs (base HE incandescent<1.15 hrs/day)	70.0%	70.0%	70.0%	9.4	5.3	4.9	219	219	219
Existing	310	Base High-Efficiency Incandescent Lighting,1.15-2.15 hrs/day	70.0%	70.0%	70.0%	14.8	8.3	7.7	602	602	602
Existing	311	CFL 15W (base HE incandescent 1.15-2.15 hrs/day)	70.0%	70.0%	70.0%	14.8	8.3	7.7	602	602	602
Existing	312	CFL 15W - Specialty (base HE incandescent 1.15-2.15 hrs/day)	70.0%	70.0%	70.0%	14.8	8.3	7.7	602	602	602
Existing	313	LEDs (base HE incandescent 1.15-2.15 hrs/day)	70.0%	70.0%	70.0%	14.8	8.3	7.7	602	602	602
Existing	320	Base High-Efficiency Incandescent Lighting,2.15-5 hrs/day	70.0%	70.0%	70.0%	3.0	1.7	1.6	1278	1278	1278
Existing	321	CFL 15W (base HE incandescent 2.15-5 hrs/day)	70.0%	70.0%	70.0%	3.0	1.7	1.6	1278	1278	1278
Existing	322	CFL 15W - Specialty (base HE incandescent 2.15-5 hrs/day)	70.0%	70.0%	70.0%	3.0	1.7	1.6	1278	1278	1278
Existing	323	LEDs (base HE incandescent 2.15-5 hrs/day)	70.0%	70.0%	70.0%	3.0	1.7	1.6	1278	1278	1278
Existing	330	Base High-Efficiency Incandescent Lighting,>5 hrs/day	70.0%	70.0%	70.0%	1.6	0.9	0.8	3650	3650	3650
Existing	331	CFL 15W (base HE incandescent >5 hrs/day)	70.0%	70.0%	70.0%	1.6	0.9	0.8	3650	3650	3650
Existing	332	CFL 15W - Specialty (base HE incandescent >5 hrs/day)	70.0%	70.0%	70.0%	1.6	0.9	0.8	3650	3650	3650
Existing	333	LEDs (base HE incandescent >5 hrs/day)	70.0%	70.0%	70.0%	1.6	0.9	0.8	3650	3650	3650
Existing	340	Base Lighting 15 Watt CFL, <1.15 hrs/day	100.0%	100.0%	100.0%	1.8	0.9	1.1	219	219	219
Existing	341	LEDs (base CFL < 1.15 hrs/day)	100.0%	100.0%	100.0%	1.8	0.9	1.1	219	219	219
Existing	342	Photocell/timerlock (outdoor) (base CFL < 1.15 hrs/day)	100.0%	100.0%	100.0%	1.8	0.9	1.1	219	219	219
Existing	350	Base Lighting 15 Watt CFL, 1.15-2.15 hrs/day	100.0%	100.0%	100.0%	5.3	2.6	3.2	602	602	602
Existing	351	LEDs (base CFL 1.15-2.15 hrs/day)	100.0%	100.0%	100.0%	5.3	2.6	3.2	602	602	602
Existing	352	Photocell/timerlock (outdoor) (base CFL 1.15-2.15 hrs/day)	100.0%	100.0%	100.0%	5.3	2.6	3.2	602	602	602
Existing	360	Base Lighting 15 Watt CFL, 2.15-5 hrs/day	100.0%	100.0%	100.0%	2.2	1.1	1.3	1278	1278	1278
Existing	361	LEDs (base CFL 2.15-5 hrs/day)	100.0%	100.0%	100.0%	2.2	1.1	1.3	1278	1278	1278
Existing	362	Photocell/timerlock (outdoor) (base CFL 2.15-5 hrs/day)	100.0%	100.0%	100.0%	2.2	1.1	1.3	1278	1278	1278
Existing	370	Base Lighting 15 Watt CFL, >5 hrs/day	100.0%	100.0%	100.0%	1.1	0.6	0.7	3650	3650	3650

Residential Electric Measure Inputs			Standards Adjustment Factor (percent)			Technology Saturation (units/home)			Hour Adjustment for Lighting (hours/year)		
Segment	Measure #	Measure Description	Single Family	Multifamily	Low Income	Single Family	Multifamily	Low Income	Single Family	Multifamily	Low Income
Existing	371	LEDs (base CFL >5 hrs/day)	100.0%	100.0%	100.0%	1.1	0.6	0.7	3650	3650	3650
Existing	372	Photocell/timerlock (outdoor) (base CFL >5 hrs/day)	100.0%	100.0%	100.0%	1.1	0.6	0.7	3650	3650	3650
Existing	380	Base Fluorescent Fixture, 2L4'T8, 1.8 hrs/day	96.0%	100.0%	100.0%	4.2	1.4	1.7	657	657	657
Existing	381	ROB 2L4' Premium T8	96.0%	100.0%	100.0%	4.2	1.4	1.7	657	657	657
Existing	400	Base Refrigerator	86.0%	86.0%	86.0%	1.2	1.3	1.3			
Existing	401	HE Refrigerator (Energy Star)	86.0%	86.0%	86.0%	1.2	1.3	1.3			
Existing	402	HE Refrigerator (CEE Tier 2)	86.0%	86.0%	86.0%	1.2	1.3	1.3			
Existing	410	Base Early Replacement Refrigerator	100.0%	100.0%	100.0%	1.2	1.3	1.3			
Existing	411	Refrigerator - Early Replacement (Energy Star)	100.0%	100.0%	100.0%	1.2	1.3	1.3			
Existing	420	Base Second Refrigerator	100.0%	100.0%	100.0%	1.3	1.0	1.1			
Existing	421	Refrigerator Recycling - second refrigerator	100.0%	100.0%	100.0%	1.3	1.0	1.1			
Existing	430	Base Freezer	100.0%	100.0%	100.0%	1.1	1.1	1.0			
Existing	431	Freezer (Energy Star)	100.0%	100.0%	100.0%	1.1	1.1	1.0			
Existing	440	Base Early Replacement Freezer	100.0%	100.0%	100.0%	1.1	1.1	1.0			
Existing	441	Freezer - Early Replacement (Energy Star)	100.0%	100.0%	100.0%	1.1	1.1	1.0			
Existing	500	Base 40 gal. Water Heating (EF=0.88)	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	502	Faucet Aerators (1.5 GPM)	100.0%	100.0%	100.0%	4.3	2.66	2.85			
Existing	503	HE Water Heater (EF=0.93)	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	504	Heat Pump Water Heater - Energy Star	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	505	Low Flow Showerhead 1.5 Gal/Min	100.0%	100.0%	100.0%	2.03	1.4	1.29			
Existing	506	Pipe Wrap	100.0%	100.0%	100.0%	8.0	8.0	8.0			
Existing	507	Solar Domestic Water Heating	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	508	Tankless Water Heater	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	509	Energy Star CW CEE Tier 2 (MEF=2.0) (base WH)	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	510	Tier 3 CW (MEF=2.20) (base WH)	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	511	Energy Star Dishwasher (EF=0.72) (base WH)	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	550	Base Early Replacement Water Heating to Heat Pump Water Heater	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	551	Early Replacement Water Heating to Heat Pump Water Heater	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	600	Base Clotheswasher (MEF=1.26)	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	601	Energy Star CW CEE Tier 2 (MEF=2.0) (base CW)	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	602	Tier 3 CW (MEF=2.20) (base CW)	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	610	Base Clothes Dryer (EF=3.01)	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	611	Heat Pump Dryer	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	612	High Efficiency CD (EF=3.01 w/moisture sensor)	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	700	Base Dishwasher (EF=0.65)	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	701	Energy Star Dishwasher (EF=0.72) (base DW)	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	800	Base Single Speed Pool Pump (RET)	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	801	Variable Speed Pool Pump (1.5 hp)	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	810	Base Two Speed Pool Pump (1.5 hp) (ROB)	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	811	Variable Speed Pool Pump (1.5 hp)	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	900	Base Plasma TV	100.0%	100.0%	100.0%	1.1	1.1	1.2			
Existing	901	Energy Star Plasma TV	100.0%	100.0%	100.0%	1.1	1.1	1.2			
Existing	910	Base LCD TV	100.0%	100.0%	100.0%	1.6	1.4	1.5			
Existing	911	Energy Star LCD TV	100.0%	100.0%	100.0%	1.6	1.4	1.5			
Existing	920	Base CRT TV	100.0%	100.0%	100.0%	2.2	1.4	2.2			
Existing	921	Energy Star LCD TV	100.0%	100.0%	100.0%	2.2	1.4	2.2			
Existing	930	Base Set-Top Box	100.0%	100.0%	100.0%	1.8	1.5	1.8			
Existing	931	Energy Star Set-Top Box	100.0%	100.0%	100.0%	1.8	1.5	1.8			
Existing	940	Base DVD Player	100.0%	100.0%	100.0%	1.7	1.4	1.8			
Existing	941	Energy Star DVD Player	100.0%	100.0%	100.0%	1.7	1.4	1.8			
Existing	950	Base Desktop PC	100.0%	100.0%	100.0%	1.3	1.1	1.2			
Existing	951	Energy Star Desktop PC	100.0%	100.0%	100.0%	1.3	1.1	1.2			

Residential Electric Measure Inputs			Standards Adjustment Factor (percent)			Technology Saturation (units/home)			Hour Adjustment for Lighting (hours/year)		
Segment	Measure #	Measure Description	Single Family	Multifamily	Low Income	Single Family	Multifamily	Low Income	Single Family	Multifamily	Low Income
Existing	960	Base Laptop PC	100.0%	100.0%	100.0%	1.6	1.7	1.4			
Existing	961	Energy Star Laptop PC	100.0%	100.0%	100.0%	1.6	1.7	1.4			
Existing	970	Base Cooking	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	980	Base Miscellaneous	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	981	Plug Load Controls - Smart Power Strip	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	982	Energy Star Ventilating Fans	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	990	Base House Practices	100.0%	100.0%	100.0%	1.0	1.0	1.0			
Existing	991	Indirect feedback	100.0%	100.0%	100.0%	1.0	1.0	1.0			
New	100	Base City of Austin Code Home	100.0%	100.0%	100.0%	1.0	0.53	0.58			
New	101	2011 Austin Green Building Home	100.0%	100.0%	100.0%	1.0	0.53	0.58			
New	104	Base 2015 City of Austin Code Home	100.0%	100.0%	100.0%	1.0	0.53	0.58			
New	105	3% savings over 2015 code home	100.0%	100.0%	100.0%	1.0	0.53	0.58			

Commercial Electric Measure Inputs			BASE TECHNOLOGY EUIs (kWh/square foot)										
Segment	Measure #	Measure Description	Office	Restau- rant	Retail	Food Store	Ware- house	School	College	Hospital	Lodging	City of Austin	Miscel- laneous
Existing	100	Base Fluorescent Fixture, 4L4'T8	7.99	6.79	3.72	7.50	1.55	3.24	8.53	5.64	1.78	5.31	2.63
Existing	110	Base Fluorescent Fixture, 2L4'T8, 1 EB	4.60	3.03	2.17	6.24	1.45	2.20	5.27	2.71	1.30	3.34	2.08
Existing	120	Base Other Fluorescent Fixture	3.65		1.03		2.12	0.42	2.21	2.12	0.57	2.08	0.51
Existing	130	Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacement	24.29	3.00	3.86	5.11		0.15	4.32	2.65	3.60	13.72	3.15
Existing	140	Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacement	24.29	3.00	3.86	5.11	2.83	0.15	4.32	2.65	3.60	13.72	3.15
Existing	150	Base CFL	1.40	0.77	0.62	6.30	0.70	1.33	1.30	0.86	0.63	0.98	0.57
Existing	160	Base High Bay Metal Halide, 400W		0.07		10.96	1.22	3.27	13.50		1.96	0.53	1.07
Existing	180	Base Parking Garage Metal Halide, 250 W							0.11	0.42			
Existing	185	Base Fluorescent Parking Garage Lighting	0.16								0.37	0.41	0.66
Existing	190	Base Exit Sign	0.01	0.06	0.01	0.01	0.00	0.01	0.02	0.03	0.02	0.01	0.00
Existing	200	Base Outdoor High Pressure Sodium 250W Lamp	1.04	3.60	1.21	0.43	0.56	0.78	0.74	0.38	0.37	0.72	0.39
Existing	300	Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	2.61	5.24	1.90	3.19	0.96	1.15	2.35	3.84	1.79	1.84	1.08
Existing	320	Base DX Packaged System, EER=10.3, 10 tons	4.52	9.08	3.29	5.32	1.66	2.00	4.07	6.66	3.10	3.20	1.87
Existing	340	Base PTAC, EER=8.3, 1 ton								2.27	3.30	1.60	3.20
Existing	400	Base Fan Motor, 5hp, 1800rpm, 87.5%	2.81	4.55	2.54	4.13	1.18	1.09	2.46	4.57	2.07	2.09	1.36
Existing	410	Base Fan Motor, 15hp, 1800rpm, 91.0%	2.61	4.21	2.35	3.82	1.09	1.01	2.28	4.23	1.92	1.93	1.26
Existing	420	Base Fan Motor, 40hp, 1800rpm, 93.0%	2.55	4.13	2.30	3.74	1.07	0.99	2.23	4.15	1.88	1.89	1.23
Existing	500	Base Built-Up Refrigeration System	0.48	4.94	1.15	22.42	2.35	0.51	0.51	0.50	0.91	0.69	0.90
Existing	520	Base Self-Contained Refrigeration	0.48	4.94	1.05	20.00	2.35	0.45	0.51	0.62	0.91	0.69	0.90
Existing	600	Base Desktop PC	1.16	0.26	0.07	0.05	0.19	0.24	0.08	0.69	0.04	0.62	0.08
Existing	610	Base Monitor, CRT	0.01	0.02	0.00	0.01	0.01	0.00	0.01	0.04	0.00	0.00	
Existing	620	Base Monitor, LCD	0.45	0.09	0.03	0.02	0.06	0.06	0.02	0.20	0.01	0.24	0.02
Existing	630	Base Copier	0.04	0.05	0.02	0.02	0.02	0.00	0.00	0.06	0.00	0.02	0.01
Existing	640	Base Laser Printer	0.16	0.02	0.03	0.01	0.03	0.01	0.01	0.08	0.01	0.09	0.01
Existing	650	Base Data Center/Server Room	236.00	265.82	282.22	407.48	25.90	94.65	75.18	118.33	194.85	176.10	116.19
Existing	660	Base Water Heating	0.31	2.22	0.25	0.51	0.07	0.21	0.24	0.36	1.00	0.33	0.35
Existing	670	Base Vending Machines	0.06	0.14	0.10	0.16	0.09	0.13	0.12	0.06	0.12	0.05	0.04
Existing	700	Base Cooking	0.12	10.44	0.26	2.17	0.02	0.18	0.32	0.44	0.72	0.21	0.30
Existing	800	Base Heating	0.58	0.34	0.36	0.55	0.36	0.20	0.96	0.98	0.49	0.49	0.39
Existing	900	Base Miscellaneous	0.76	1.39	0.80	1.02	0.44	0.26	0.50	2.54	1.12	0.92	1.08
New	100	Base Bldg Design - 15%	17.12	29.00	5.28	46.41	3.95	7.48	14.30	19.84	9.19	12.19	7.10
New	200	Base Bldg Design - 30%	17.12	29.00	5.28	46.41	3.95	7.48	14.30	19.84	9.19	12.19	7.10
New	300	Base Bldg Design - 50%	17.12	29.00	5.28	46.41	3.95	7.48	14.30	19.84	9.19	12.19	7.10
New	400	Base Bldg Design - 70%	17.12	29.00	5.28	46.41	3.95	7.48	14.30	19.84	9.19	12.19	7.10
New	500	Base 2015 Commercial Code Building--29% savings	13.13	25.18	4.17	40.38	3.07	5.78	10.36	15.19	7.07	9.31	5.44
New	600	Base 2015 Commercial Code Building--57% savings	13.13	25.18	4.17	40.38	3.07	5.78	10.36	15.19	7.07	9.31	5.44

MEASURE COSTS																				
Segment	Measure #	Measure Description	Savings Units	Cost Units	Unit Equipment Cost	Unit Labor Cost	NPV of Lifetime O & M Cost	Implementation Cost Factor	Service Life	Full = 1 Incr. = 0 Initial Cost	Replace Cost	Full Unit Cost	Relative Energy SON	Reduction SMID	Factors SOFF	WMID	WOFF	End Use	Implementation Type 1=1 time 2=ROB	Cost Source
Existing	100	Base Fluorescent Fixture, 4L4T8	sqft	fixture	\$0.00	\$0.00		\$0.00	18	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	1	2	DNV KEMA Database
Existing	101	ROB 4L4 Premium T8	sqft	fixture	\$16.00	\$0.00		\$16.00	25,000	1	1	\$16.00	1.00	1.00	1.00	1.00	1.00	1	2	DNV KEMA Database
Existing	102	Delamping 3L4 F32T8	sqft	fixture	\$62.00	\$0.00		\$62.00	18	1	1	\$62.00	1.00	1.00	1.00	1.00	1.00	1	2	DNV KEMA Database http://www.bulbtronics.com/Search-The-Warehouse/ProductDetail.aspx?sid=0081674&pid=LCR2440L40KS&utm_source=sitemap&utm_medium=sitemap&utm_campaign=ECBsitemap&AspxAutoDetectCookieSupport=1
Existing	103	LED Troffer (Base 4L4T8)	sqft	fixture	\$394.20	\$0.00		\$394.20	50,000	1	1	\$394.20	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	104	Lighting Control Tuneup	sqft	sqft	\$0.00	\$0.03		\$0.03	6	1	1	\$0.03	0.30	0.80	1.20	1.20	1.00	1	1	DNV KEMA Database
Existing	105	Occupancy Sensor, 4L4 Fluorescent Fixtures	sqft	sqft	\$0.14	\$0.00		\$0.14	18	1	1	\$0.14	0.30	0.80	1.20	1.20	1.00	1	1	FEMP technology profile or Occupancy Sensors ACEEE, 2006, Emerging Technologies Report: Integrated Daylighting Systems (Dimming Ballasts)
Existing	106	Continuous Dimming, 4L4 Fluorescent Fixtures	sqft	sqft	\$0.75	\$0.00		\$0.75	10	1	1	\$0.75	0.30	0.80	1.20	1.20	1.00	1	1	DNV KEMA Database
Existing	107	High Performance Lighting R/R - 25% Savings, Base 4L4T8	sqft	sqft	\$0.40	\$0.00		\$0.40	20	1	1	\$0.40	0.50	0.80	1.50	1.00	1.50	1	1	DNV KEMA Database
Existing	110	Base Fluorescent Fixture, 2L4T8, 1 EB	sqft	fixture	\$0.00	\$0.00		\$0.00	18	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	1	2	DNV KEMA Database
Existing	111	ROB 2L4 Premium T8	sqft	fixture	\$8.00	\$0.00		\$8.00	25,000	1	1	\$8.00	1.00	1.00	1.00	1.00	1.00	1	2	DNV KEMA Database
Existing	112	Delamping 1L4 F32T8	sqft	fixture	\$62.00	\$0.00		\$62.00	18	1	1	\$62.00	1.00	1.00	1.00	1.00	1.00	1	2	DNV KEMA Database
Existing	113	LED Troffer (Base 2L4T8)	sqft	fixture	\$250.00	\$0.00		\$250.00	50,000	1	1	\$250.00	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	114	Lighting Control Tuneup	sqft	sqft	\$0.00	\$0.01		\$0.01	6	1	1	\$0.01	0.30	0.80	1.20	1.20	1.00	1	1	DNV KEMA Database
Existing	115	Occupancy Sensor, 2L4 Fluorescent Fixtures	sqft	sqft	\$0.14	\$0.00		\$0.14	18	1	1	\$0.14	0.30	0.80	1.20	1.20	1.00	1	1	FEMP technology profile or Occupancy Sensors ACEEE, 2006, Emerging Technologies Report: Integrated Daylighting Systems (Dimming Ballasts)
Existing	116	Continuous Dimming, 2L4 Fluorescent Fixtures	sqft	sqft	\$0.75	\$0.00		\$0.75	10	1	1	\$0.75	0.30	0.80	1.20	1.20	1.00	1	1	DNV KEMA Database
Existing	117	High Performance Lighting R/R - 25% Savings, Base 2L4T8	sqft	sqft	\$0.40	\$0.00		\$0.40	20	1	1	\$0.40	0.50	0.80	1.50	1.00	1.50	1	1	DNV KEMA Database
Existing	120	Base Other Fluorescent Fixture	sqft	fixture	\$0.00	\$0.00		\$0.00	18	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	1	2	DNV KEMA Database
Existing	121	ROB Premium T8 (base other fluorescent)	sqft	fixture	\$8.00	\$0.00		\$8.00	25,000	1	1	\$8.00	1.00	1.00	1.00	1.00	1.00	1	2	DNV KEMA Database
Existing	122	Lighting Control Tuneup	sqft	sqft	\$0.00	\$0.03		\$0.03	6	1	1	\$0.03	0.30	0.80	1.20	1.20	1.00	1	1	DNV KEMA Database
Existing	123	Occupancy Sensor, 4L8 Fluorescent Fixtures	sqft	sqft	\$0.14	\$0.00		\$0.14	18	1	1	\$0.14	0.30	0.80	1.20	1.20	1.00	1	1	FEMP technology profile or Occupancy Sensors ACEEE, 2006, Emerging Technologies Report: Integrated Daylighting Systems (Dimming Ballasts)
Existing	124	Continuous Dimming, 4L8 Fluorescent Fixtures	sqft	sqft	\$0.75	\$0.00		\$0.75	10	1	1	\$0.75	0.30	0.80	1.20	1.20	1.00	1	1	DNV KEMA Database
Existing	125	High Performance Lighting R/R - 25% Savings, Base Other Fluorescer	sqft	sqft	\$0.40	\$0.00		\$0.40	20	1	1	\$0.40	0.50	0.80	1.50	1.00	1.50	1	1	DNV KEMA Database
Existing	130	Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacem	sqft	fixture	\$0.68	\$4.91		\$5.59	1,000	0	0	\$5.59	1.00	1.00	1.00	1.00	1.00	1	2	DEER 2008.2.05 measure NR-ILtg-Inc-75W, labor at DEER 2008.2.05 measure NR-ILtg-Inc-75W DEER 2008.2.05 measure NR-ILtg-CFL-Int18wCFLsMg18w, labor at DEER 2008.2.05 measure NR-ILtg-Inc-75W
Existing	131	CFL Screw-in 18W	sqft	fixture	\$7.97	\$4.91	(\$19.09)	\$6.59	10,000	0	0	\$6.59	1.00	1.00	1.00	1.00	1.00	1	2	Average price at lighting retailers, labor at DEER 2008.2.05 measure NR-ILtg-Inc-75W
Existing	132	Cold Cathode Lamps	sqft	fixture	\$22.00	\$4.91	(\$19.09)	\$7.82	25,000	0	0	\$7.82	1.00	1.00	1.00	1.00	1.00	1	2	Average price at lighting retailers, labor at DEER 2008.2.05 measure NR-ILtg-Inc-75W
Existing	133	LED screw-in PAR replacement (base incandescent)	sqft	fixture	\$75.00	\$4.91	(\$19.09)	\$60.82	50,000	0	0	\$60.82	1.00	1.00	1.00	1.00	1.00	1	2	Average price at lighting retailers, labor at DEER 2008.2.05 measure NR-ILtg-Inc-75W
Existing	140	Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacem	sqft	fixture	\$0.00	\$0.00		\$0.00	18	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	1	2	DNV KEMA Database
Existing	141	CFL Hardwired, Modular 18W	sqft	fixture	\$19.61	\$30.77		\$50.38	18	1	1	\$50.38	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	142	Ceramic Metal Halide	sqft	fixture	\$90.00	\$30.77		\$120.77	18	1	1	\$120.77	1.00	1.00	1.00	1.00	1.00	1	1	ACEEE 2004 emerging technologies report Average price at lighting retailers, O&M at cost of replacing LEDs
Existing	143	LED fixture replacement (base incandescent flood)	sqft	fixture	\$94.61	\$30.77	(\$11.42)	\$113.96	50,000	1	1	\$113.96	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	150	Base CFL to screw-in replacement	sqft	fixture	\$7.97	\$4.91		\$12.88	10,000	0	0	\$12.88	1.00	1.00	1.00	1.00	1.00	1	2	Average price at lighting retailers, O&M at cost of replacing LEDs
Existing	151	LED screw-in replacement (base CFL)	sqft	fixture	\$75.00	\$4.91		\$79.91	50,000	0	0	\$79.91	1.00	1.00	1.00	1.00	1.00	1	2	DNV KEMA Database
Existing	160	Base High Bay Metal Halide, 400W	sqft	fixture	\$200.00	\$60.00		\$260.00	18	1	1	\$260.00	1.00	1.00	1.00	1.00	1.00	1	2	DNV KEMA Database
Existing	161	High Bay T5	sqft	fixture	\$290.00	\$60.00		\$350.00	18	0	0	\$350.00	1.00	1.00	1.00	1.00	1.00	1	2	DNV KEMA Database
Existing	162	Induction High Bay Lighting	sqft	fixture	\$480.00	\$60.00		\$540.00	32	0	0	\$540.00	1.00	1.00	1.00	1.00	1.00	1	2	DNV KEMA Database
Existing	163	PSMH + electronic ballast	sqft	fixture	\$413.60	\$60.00		\$473.60	45,000	0	0	\$473.60	1.00	1.00	1.00	1.00	1.00	1	2	DNV KEMA Database
Existing	165	Occupancy Sensor, High Bay T5	sqft	sq ft	\$0.14	\$0.00		\$0.14	18	1	1	\$0.14	0.30	0.80	1.20	1.20	1.00	1	1	FEMP technology profile or Occupancy Sensors
Existing	180	Base Parking Garage Metal Halide, 250 W	sqft	fixture	\$0.00	\$0.00		\$0.00	18	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	181	High-efficiency fluorescent parking garage fixture (Base MH)	sqft	fixture	\$305.00	\$0.00		\$305.00	18	1	1	\$305.00	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	182	Bi-Level LED Parking Garage Fixtures (Base MH)	sqft	fixture	\$702.62		(\$126.21)	\$576.41	40,000	1	1	\$576.41	0.50	1.00	1.00	1.20	1.20	1	1	DNV KEMA Database
Existing	185	Base Fluorescent Parking Garage Lighting	sqft	fixture	\$0.00	\$0.00		\$0.00	18	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	186	Parking Garage Low Wattage T8 Lamps replacing 32W lamps	sqft	fixture	\$4.00	\$0.00		\$4.00	25000	1	1	\$4.00	1.00	1.00	1.00	1.00	1.00	1	1	DNV KEMA Database
Existing	187	Bi-Level LED Parking Garage Fixtures (Base Fluorescent)	sqft	fixture	\$702.62		(\$126.21)	\$576.41	40,000	1	1	\$576.41	0.50	1.00	1.00	1.20	1.20	1	1	Grainger catalog
Existing	190	Base Exit Sign	sqft	fixture	\$0.00	\$0.00		\$0.00	18	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	11	1	DNV KEMA Database
Existing	191	LED Exit Sign	sqft	fixture	\$50.00	\$0.00		\$50.00	18	1	1	\$50.00	1.00	1.00	1.00	1.00	1.00	11	1	DNV KEMA Database
Existing	200	Base Outdoor High Pressure Sodium 250W Lamp	sqft	fixture	\$89.00	\$60.00		\$149.00	18	1	1	\$149.00	1.00	1.00	1.00	1.00	1.00	2	1	DNV KEMA Database
Existing	201	Outdoor Lighting Controls (Photocell/Timeclock)	sqft	fixture	\$51.00	\$57.00		\$108.00	18	1	1	\$108.00	0.25	0.70	1.25	0.70	1.25	2	1	DNV KEMA Database Same equipment cost as LED streetlighting, labor from PG&E 2009 application assessment of Bi-Level LED parking Lot, O&M assumes \$20 per year spot replacement, \$11/year group
Existing	202	LED Outdoor Area Lighting	sqft	fixture	\$400.00	\$57.00	(\$126.21)	\$330.79	40,000	1	1	\$330.79	1.00	1.00	1.00	1.00	1.00	2	1	equipment and labor from PG&E 2009 application assessment of Bi-Level LED parking Lot, O&M assumes \$20 per year spot replacement, \$11/year group
Existing	203	Bi-Level LED Outdoor Lighting	sqft	fixture	\$1,300.00	\$57.00	(\$126.21)	\$1,230.79	40,000	1	1	\$1,230.79	1.00	0.80	1.17	1.17	0.80	2	1	DNV KEMA Database
Existing	300	Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	sqft	ton	\$600.00			\$600.00	20	1	1	\$600.00	1.00	1.00	1.00	1.00	1.00	3	2	DNV KEMA Database
Existing	301	Centrifugal Chiller, 0.51 kW/ton, 500 tons	sqft	ton	\$675.00			\$675.00	20	0	0	\$675.00	1.00	1.00	1.00	1.00	1.00	3	2	DNV KEMA Database
Existing	302	Window Film (Standard) - Chiller	sqft	sf-window	\$2.06	\$0.64	\$0.13	\$2.84	10	1	1	\$2.84	1.00	1.00	1.00	1.00	1.00	3	1	DEER 2005, O&M heating penalty, discounted lifetime \$/roof sq ft. DOE cool roof calculator, assumes white latex coating w/ average solar reflectance (Solar reflectance 56%, infrared emittance 90%). http://www.cml.gov/sci/roofs-walls/facts/CoolCalcEnergy.Htm
Existing	303	EMS - Chiller	sqft	ton	\$60.00	\$0.00		\$60.00	15	1	1	\$60.00	1.00	1.00	1.00	1.00	1.00	3	1	DNV KEMA Database
Existing	305	Chiller Tune Up/Diagnostics	sqft	sqft	\$0.00	\$0.00	\$0.10	\$0.10	10	1	1	\$0.10	0.60	0.90	2.20	0.90	2.20	3	1	DNV KEMA Database
Existing	306	VSD for Chiller Pumps and Towers	sqft	ton	\$32.00	\$10.00		\$42.00	15	1	1	\$42.00	1.00	1.00	1.00	1.00	1.00	3	1	Equipment: 0.2 kW/ton for pumps and towers X 1.34 HP/ton X \$120/HP for VSD. Labor: 0.2 kW/ton for pumps and towers X 1.34 HP/ton X \$37/HP for VSD labor.
Existing	307	EMS Optimization - Chiller	sqft	sqft	\$0.00	\$0.00	\$0.03	\$0.03	5	1	1	\$0.03	0.70	0.85	2.50	0.85	2.50	3	1	DNV KEMA Database
Existing	309	Ceiling/roof Insulation - Chiller	sqft	sf-ceiling	\$0.55	\$0.00		\$0.55	20	1	1	\$0.55	1.00	1.00	1.00	1.00	1.00	3	1	DNV KEMA Database
Existing	310	Duct/Pipe Insulation - Chiller	sqft	ft-insulati	\$3.08	\$0.00		\$3.08	10	1	1	\$3.08	1.00	1.00	1.00	1.00	1.00	3	1	DEER 2008 for 11 EER

MEASURE COSTS																			Implementation		
Segment	Measure #	Measure Description	Savings Units	Cost Units	Unit Equipment Cost	Unit Labor Cost	NPV of Lifetime O & M Cost	Implementation Cost Factor	Service Life	Full = 1 Incr. = 0 Initial Cost	Replace Cost	Full Unit Cost	Relative Energy SON	Reduction SMID	Factors SOFF	WIMD	WOFF	End Use	Type 1=1 time 2=ROB	Cost Source	
Existing	311	High Efficiency Chiller Motors	sqft	ton	\$19.49	\$0.00		\$19.49	20	1	1	\$19.49	1.00	1.00	1.00	1.00	1.00	3	1	Equip cost: DNV KEMA database, DEER 2008 for labor	
Existing	320	Base DX Packaged System, EER=10.3, 10 tons	sqft	ton	\$1,588.24			\$1,588.24	20	1	1	\$1,588.24	1.00	1.00	1.00	1.00	1.00	3	2	DNV KEMA Database	
Existing	321	DX Tune Up/ Advanced Diagnostics	sqft	sqft	\$0.00	\$0.00	\$0.13	\$0.13	10	1	1	\$0.13	0.70	0.90	2.00	0.90	2.00	3	1	DNV KEMA Database	
Existing	322	DX Packaged System, EER=10.3, 10 tons, with Automated Fault Detect	sqft	ton	\$50.00		(\$10.00)	\$40.00	20	1	1	\$40.00	1.00	1.00	1.00	1.00	1.00	3	2	ACEEE, 2009, Emerging Energy-Saving Technologies and Practices for the Buildings Sector (2009)	
Existing	323	DX Packaged System, EER=10.9, 10 tons	sqft	ton	\$1,738.24			\$1,738.24	20	0	0	\$1,738.24	1.00	1.00	1.00	1.00	1.00	3	2	DNV KEMA Database	
Existing	324	DX Packaged System, EER=13.4, 10 tons	sqft	ton	\$1,500.00	\$308.85		\$1,808.85	20	0	0	\$1,808.85	1.00	1.00	1.00	1.00	1.00	3	2	ACEEE 2004 Emerging Technologies, DEER 2008 for labor	
Existing	325	Window Film (Standard) - DX	sqft	sf-window	\$2.06	\$0.64	\$0.13	\$2.84	10	1	1	\$2.84	1.00	1.00	1.00	1.00	1.00	3	1	DEER 2005	
Existing	326	Prog. Thermostat - DX	sqft	ton	\$5.50	\$15.00		\$20.50	8	1	1	\$20.50	0.60	0.80	3.00	0.80	3.00	3	1	DNV KEMA Database	
Existing	330	Optimize Controls - DX	sqft	sqft	\$0.00	\$0.00	\$0.04	\$0.04	5	1	1	\$0.04	0.60	0.80	3.00	0.80	3.00	3	1	DNV KEMA Database	
Existing	331	Economizer - DX	sqft	ton	\$126.76	\$43.34		\$170.10	15	1	1	\$170.10	0.60	0.80	3.00	0.80	3.00	3	1	DEER 2005	
Existing	332	Aerosol Duct Sealing - DX	sqft	ton	\$16.67	\$91.24	(\$90.05)	\$117.86	15	1	1	\$117.86	1.00	1.00	1.00	1.00	1.00	3	1	DEER 2005	
Existing	333	Ceiling/roof Insulation - DX	sqft	sf-ceiling	\$0.15	\$0.09		\$0.24	20	1	1	\$0.24	1.00	1.00	1.00	1.00	1.00	3	1	DEER 2005	
Existing	334	Duct/Pipe Insulation - DX	sqft	ft-insulat	\$0.68	\$2.40	(\$0.48)	\$2.60	10	1	1	\$2.60	1.00	1.00	1.00	1.00	1.00	3	1	DEER 2005	
Existing	335	DX Coil Cleaning	sqft	ton	\$13.16	\$0.00		\$13.16	5	1	1	\$13.16	1.00	1.00	1.00	1.00	1.00	3	1	DNV KEMA Database	
Existing	337	Geothermal Heat Pump, EER=13, 10 tons - DX	sqft	ton	\$800.00	\$0.00		\$800.00	15	1	1	\$800.00	1.00	1.00	1.00	1.00	1.00	3	2	DNV KEMA Database	
Existing	340	Base PTAC, EER=8.3, 1 ton	sqft	ton	\$1,125.00	\$0.00		\$1,125.00	20	1	1	\$1,125.00	1.00	1.00	1.00	1.00	1.00	3	2	DNV KEMA Database	
Existing	341	HE PTAC, EER=9.6, 1 ton	sqft	ton	\$1,313.00	\$0.00		\$1,313.00	20	0	0	\$1,313.00	1.00	1.00	1.00	1.00	1.00	3	2	DNV KEMA Database	
Existing	342	Hotel Room Controllers	sqft	\$/room	\$300.00	\$0.00		\$300.00	10	1	1	\$300.00	1.00	1.00	1.00	1.00	1.00	3	1	DNV KEMA Database	
Existing	400	Base Fan Motor, 5hp, 1800rpm, 87.5%	sqft	HP	\$52.00			\$52.00	20	1	1	\$52.00	1.00	1.00	1.00	1.00	1.00	4	2	PG&E 2006-2008 Motor Work Papers	
Existing	401	Fan Motor, 5hp, 1800rpm, 89.5%	sqft	HP	\$72.00			\$72.00	20	0	0	\$72.00	1.00	1.00	1.00	1.00	1.00	4	2	PG&E 2006-2008 Motor Work Papers	
Existing	402	Variable Speed Drive Control, 5 HP	sqft	HP	\$214.00	\$171.00		\$385.00	15	1	1	\$385.00	0.60	0.80	1.80	0.80	1.80	4	1	Based off DEER 2005. DEER 2005 does not specify HP size, so estimated based off assumption DEER represented all sizes.	
Existing	410	Base Fan Motor, 15hp, 1800rpm, 91.0%	sqft	HP	\$43.00			\$43.00	20	1	1	\$43.00	1.00	1.00	1.00	1.00	1.00	4	1	PG&E 2006-2008 Motor Work Papers	
Existing	411	Fan Motor, 15hp, 1800rpm, 92.4%	sqft	HP	\$54.00			\$54.00	20	0	0	\$54.00	1.00	1.00	1.00	1.00	1.00	4	2	PG&E 2006-2008 Motor Work Papers	
Existing	412	Variable Speed Drive Control, 15 HP	sqft	HP	\$129.00	\$102.00		\$231.00	20	1	1	\$231.00	0.60	0.80	1.80	0.80	1.80	4	1	DNV KEMA Database	
Existing	413	Electronically Commutated Motors (ECM) on an Air Handler Unit	sqft	ton	\$27.76	\$0.00		\$27.76	15	1	1	\$27.76	0.60	0.80	1.80	0.80	1.80	4	2	PG&E 2006-2008 Motor Work Papers	
Existing	414	Energy Recovery Ventilation (ERV)	sqft	ton	\$130.95	\$0.00		\$130.95	20	1	1	\$130.95	1.00	1.00	1.00	1.00	1.00	4	1	DNV KEMA Database	
Existing	415	Separate Makeup Air / Exhaust Hoods AC	sqft	HP	\$3.00	\$0.00		\$3.00	15	1	1	\$3.00	1.00	1.00	1.00	1.00	1.00	4	1	DNV KEMA Database	
Existing	420	Base Fan Motor, 40hp, 1800rpm, 93.0%	sqft	HP	\$37.00			\$37.00	20	1	1	\$37.00	1.00	1.00	1.00	1.00	1.00	4	1	PG&E 2006-2008 Motor Work Papers	
Existing	421	Fan Motor, 40hp, 1800rpm, 94.1%	sqft	HP	\$47.00			\$47.00	20	0	0	\$47.00	1.00	1.00	1.00	1.00	1.00	4	2	PG&E 2006-2008 Motor Work Papers	
Existing	422	Variable Speed Drive Control, 40 HP	sqft	HP	\$120.00	\$37.00		\$157.00	20	1	1	\$157.00	0.60	0.80	1.80	0.80	1.80	4	1	DNV KEMA Database	
Existing	423	Air Handler Tuneups	sqft	sqft	\$0.00	\$0.00	\$0.05	\$0.05	8	1	1	\$0.05	1.00	1.00	1.00	1.00	1.00	4	1	DNV KEMA Database	
Existing	424	Demand Controlled Ventilation	sqft	sqft	\$0.48	\$0.00	(\$0.36)	\$0.12	15	1	1	\$0.12	0.60	0.80	1.80	0.80	1.80	4	1	DNV KEMA Database	
Existing	500	Base Built-Up Refrigeration System	sqft	sqft	\$0.00	\$0.00		\$0.00	10	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	5	1	DNV KEMA Database	
Existing	501	High-efficiency fan motors	sqft	100 sqft s	\$46,429.20	\$0.00		\$46,429.20	20	1	1	\$46,429.20	1.00	1.00	1.00	1.00	1.00	5	2	DNV KEMA Database	
Existing	502	Strip curtains for walk-ins	sqft	100 sqft s	\$1,995.00	\$0.00		\$1,995.00	4	1	1	\$1,995.00	1.00	1.00	1.00	1.00	1.00	5	1	DNV KEMA Database	
Existing	503	Night covers for display cases (built-up systems)	sqft	sq ft, disp	\$9.25	\$0.00		\$9.25	4.8	1	1	\$9.25	0.00	0.50	2.30	0.50	2.30	5	1	DNV KEMA Database	
Existing	504	Efficient compressor motor retrofit	sqft	100 sqft s	\$3,510.00	\$0.00		\$3,510.00	10	1	1	\$3,510.00	1.00	1.00	1.00	1.00	1.00	5	2	DNV KEMA Database	
Existing	505	Compressor VSD retrofit	sqft	100 sqft s	\$16,200.00	\$0.00		\$16,200.00	13	1	1	\$16,200.00	0.50	0.70	1.70	0.70	1.70	5	1	DNV KEMA Database	
Existing	506	Floating head pressure controls	sqft	100 sqft s	\$4,995.00	\$0.00		\$4,995.00	14	1	1	\$4,995.00	0.25	2.60	0.25	2.60	5	1	DNV KEMA Database		
Existing	507	Refrigeration Commissioning	sqft	on of Loa	\$113.00	\$0.00		\$113.00	3	1	1	\$113.00	1.00	1.00	1.00	1.00	1.00	5	1	DNV KEMA Database	
Existing	508	Demand Hot Gas Defrost	sqft	HP	\$25.00	\$0.00		\$25.00	10	1	1	\$25.00	1.00	1.00	1.00	1.00	1.00	5	1	DNV KEMA Database	
Existing	509	Demand Defrost Electric	sqft	HP	\$25.00	\$0.00		\$25.00	10	1	1	\$25.00	1.00	1.00	1.00	1.00	1.00	5	1	DNV KEMA Database	
Existing	510	Anti-sweat (humidistat) controls	sqft	100 sqft s	\$6,450.40	\$0.00		\$6,450.40	12	1	1	\$6,450.40	0.50	0.50	1.14	1.14	1.14	5	1	DNV KEMA Database	
Existing	511	Freezer-Cooler Replacement Gaskets (built-up systems)	sqft	in ft doors	\$5.00	\$0.00		\$5.00	4	1	1	\$5.00	1.00	1.00	1.00	1.00	1.00	5	1	DNV KEMA Database	
Existing	512	High R-Value Glass Doors	sqft	t glass dc	\$100.28	\$0.00		\$100.28	10	1	1	\$100.28	1.00	1.00	1.00	1.00	1.00	5	1	DNV KEMA Database	
Existing	513	Bi-level LED Case Lighting (built-up systems)	sqft	t glass dc	\$100.00	\$0.00		\$100.00	10	1	1	\$100.00	0.76	0.76	1.50	0.76	1.50	5	1	Case study results from Fullerton, CA. Costs backed out of payback (4.2 yrs) and savings (535 kWh/door) w/ the elec price from the report (11 cents/kWh). A case is approx 2 ft wide. I'm assuming the reported payback included installation.	
Existing	514	Fiber Optic Case Lighting (built-up systems)	sqft	t glass dc	\$114.08	\$0.00		\$114.08	10	1	1	\$114.08	1.00	1.00	1.00	1.00	1.00	5	1	DNV KEMA Database	
Existing	516	Multiplex Compressor System	sqft	tons	\$1,750.00	\$0.00		\$1,750.00	14	1	1	\$1,750.00	1.00	1.00	1.00	1.00	1.00	5	2	DNV KEMA Database	
Existing	517	Oversized Air Cooled Condenser	sqft	tons	\$400.00	\$0.00		\$400.00	16	1	1	\$400.00	1.00	1.00	1.00	1.00	1.00	5	1	DNV KEMA Database	
Existing	520	Base Self-Contained Refrigeration	sqft	sqft	\$0.00	\$0.00		\$0.00	10	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	5	1	DNV KEMA Database	
Existing	521	Strip curtains for walk-ins	sqft	100 sqft s	\$1,995.00	\$0.00		\$1,995.00	4	1	1	\$1,995.00	1.00	1.00	1.00	1.00	1.00	5	1	DNV KEMA Database	
Existing	522	Night covers for display cases (self-contained)	sqft	sq ft, disp	\$9.25	\$0.00		\$9.25	5	1	1	\$9.25	0.00	0.30	2.60	0.30	2.60	5	1	DNV KEMA Database	
Existing	523	Freezer-Cooler Replacement Gaskets (self-contained)	sqft	in ft doors	\$5.00	\$0.00		\$5.00	4	1	1	\$5.00	1.00	1.00	1.00	1.00	1.00	5	1	DNV KEMA Database	
Existing	524	Bi-level LED Case Lighting (self-contained units)	sqft	t glass dc	\$100.00	\$0.00		\$100.00	10	1	1	\$100.00	0.76	0.76	1.50	0.76	1.50	5	1	DNV KEMA Database	
Existing	526	Energy-Star Refrigerator, solid door	sqft	efrigerato	\$60.00	\$0.00	\$0.00	\$60.00	10	1	1	\$60.00	1.00	1.00	1.00	1.00	1.00	5	2	Energy Star Calculator, http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CRF	
Existing	527	Energy-Star Freezer, solid door	sqft	freezer	\$250.00	\$0.00	\$0.00	\$250.00	10	1	1	\$250.00	1.00	1.00	1.00	1.00	1.00	5	2	Energy Star Calculator, http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CRF	
Existing	528	Energy-Star Refrigerator, glass door	sqft	efrigerato	\$1.00	\$0.00	\$0.00	\$1.00	10	1	1	\$1.00	1.00	1.00	1.00	1.00	1.00	5	2	Energy Star Calculator, http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CRF	
Existing	529	Energy-Star Freezer, glass door	sqft	freezer	\$30.00	\$0.00	\$0.00	\$30.00	10	1	1	\$30.00	1.00	1.00	1.00	1.00	1.00	5	2	Energy Star Calculator, http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CRF	
Existing	530	Energy Star Ice Machines	sqft	machine	\$10.00	\$0.00	\$0.00	\$10.00	10	1	1	\$10.00	1.00	1.00	1.00	1.00	1.00	5	2	Energy Star Calculator, http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CRF	
Existing	600	Base Desktop PC	sqft	PC	\$0.00	\$0.00		\$0.00	4	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	6	2	DNV KEMA Database	
Existing	601	PC Manual Power Management Enabling	sqft	PC	\$15.00	\$0.00		\$15.00	4	1	1	\$15.00	0.66	0.80	1.71	0.80	1.71	6	1	DNV KEMA Database	
Existing	602	PC Network Power Management Enabling	sqft	PC	\$15.00	\$0.00		\$15.00	4	1	1	\$15.00	0.66	0.80	1.71	0.80	1.71	6	1	DNV KEMA Database	
Existing	603	Energy Star or Better PC	sqft	PC	\$9.00	\$0.00		\$9.00	4	1	1	\$9.00	0.75	0.90	1.50	0.80	1.50	6	2	DNV KEMA Database	
Existing	610	Base Monitor, CRT	sqft	Monitor	\$0.00	\$0.00		\$0.00	4	1	1	\$0.00	1.00	1.00	1.00	1.00					

MEASURE COSTS																			Implementation	
Segment	Measure #	Measure Description	Savings Units	Cost Units	Unit Equipment Cost	Unit Labor Cost	NPV of Lifetime O & M Cost	Implementation Cost Factor	Service Life	Full = 1 Incr. = 0 Initial Cost	Replace Cost	Full Unit Cost	Relative Energy SON	Reduction SMID	Factors SOFF	WIMD	WOFF	End Use	Type 1=1 time 2=ROB	Cost Source
Existing	620	Base Monitor, LCD	sft	Monitor	-	\$0.00		\$0.00	4	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	6	2	Energy Star calculator, assumes zero incremental cost for
Existing	621	Energy Star or Better Monitor-LCD	sft	Monitor	\$9.00		\$9.00	4	1	1	1	\$9.00	0.75	0.90	1.50	0.80	1.50	6	2	Energy Star copiers
Existing	622	Monitor Power Management Enabling-LCD	sft	Monitor		15.00	\$15.00	4	1	1	1	\$15.00	0.66	0.80	1.71	0.80	1.71	6	1	Assume same as PCs
Existing	630	Base Copier	sft	Copier	\$0.00	\$0.00	\$0.00	6	1	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	6	1	DNV KEMA Database
Existing	631	Energy Star or Better Copier	sft	Copier	\$9.00		\$9.00	6	1	1	1	\$9.00	0.75	0.90	1.50	0.80	1.50	6	2	Assume same as PCs
Existing	632	Copier Power Management Enabling	sft	Copier		\$45.00	\$45.00	6	1	1	1	\$45.00	0.66	0.80	1.71	0.80	1.71	6	1	DNV KEMA Database
Existing	640	Base Laser Printer	sft	Printer	\$0.00	\$0.00	\$0.00	5	1	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	6	1	DNV KEMA Database
Existing	641	Printer Power Management Enabling	sft	Printer		\$45.00	\$45.00	5	1	1	1	\$45.00	0.66	0.80	1.71	0.80	1.71	6	1	DNV KEMA Database
Existing	650	Base Data Center/Server Room	sft	sft	\$0.00	\$0.00	\$0.00	10	1	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	6	2	DNV KEMA Database
Existing	651	Data Center Improved Operations	sft	sft	\$0.50		\$0.50	10	1	1	1	\$0.50	0.66	0.80	1.71	0.80	1.71	6	1	DNV KEMA Database
Existing	652	Data Center Best Practices	sft	sft	\$2.50		\$2.50	10	1	1	1	\$2.50	0.75	0.85	1.50	0.85	1.50	6	1	DNV KEMA Database
Existing	653	Data Center State of the Art practices	sft	sft	\$5.00		\$5.00	10	1	1	1	\$5.00	1.00	1.00	1.00	1.00	1.00	6	1	DNV KEMA Database
Existing	660	Base Water Heating	sft	kBtu/hr	\$0.00	\$0.00	\$0.00	15	1	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	7	1	DNV KEMA Database
Existing	661	Demand controlled circulating systems	sft	unit	\$65.79	\$165.00		\$230.79	15	1	1	\$230.79	0.40	0.50	2.40	0.50	2.40	7	1	DEER 2008 for measure cost, 2004-2005 for labor
Existing	662	High Efficiency Water Heater (electric)	sft	kBtu/hr	\$1.31			\$1.31	15	1	1	\$1.31	1.00	1.00	1.00	1.00	1.00	7	2	DEER 2.01, transformed to per kBtu assuming average 55 gal rated volume and 1 kBtu/gal heating capacity
Existing	663	Hot Water Pipe Insulation	sft	.In Ft Pip	\$1.59	\$3.63		\$5.22	15	1	1	\$5.22	1.00	1.00	1.00	1.00	1.00	7	1	DEER 2008
Existing	664	Tankless Water Heater	sft	kBtu/hr	\$6.73	\$4.54		\$11.27	20	1	1	\$11.27	1.00	1.00	1.00	1.00	1.00	7	2	DEER 2.01, transformed to per kBtu assuming average 55 gal rated volume and 1 kBtu/gal heating capacity
Existing	665	Heat Pump Water Heater (air source)	sft	kBtu/hr	\$30.22			\$30.22	15	1	1	\$30.22	1.00	1.00	1.00	1.00	1.00	7	2	DNV KEMA Database
Existing	666	Heat Recovery Unit	sft	sft	\$0.08			\$0.08	10	1	1	\$0.08	1.00	1.00	1.00	1.00	1.00	7	1	DNV KEMA Database
Existing	667	Heat Trap	sft	kBtu/hr	\$0.36	\$2.00		\$2.36	10	1	1	\$2.36	1.00	1.00	1.00	1.00	1.00	7	1	DNV KEMA Database
Existing	668	Solar Water Heater	sft	kBtu/hr	\$94.50			\$94.50	20	1	1	\$94.50	1.00	1.00	1.00	1.00	1.00	7	1	DNV KEMA Database
Existing	670	Base Vending Machines	sft	machine	\$0.00	\$0.00		\$0.00	10	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	8	1	DNV KEMA Database
Existing	671	Vending Meters	sft	machine	\$179.00	\$35.50		\$214.50	5	1	1	\$214.50	0.66	0.80	1.85	0.80	1.85	8	1	DEER 2.01
Existing	700	Base Cooking	sft		\$0.00	\$0.00		\$0.00	10	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	9	1	DNV KEMA Database
Existing	701	Convection Oven	sft	single over	\$750.00			\$750.00	10	1	1	\$750.00	1.00	1.00	1.00	1.00	1.00	9	2	DNV KEMA Database
Existing	702	Efficient Fryer	sft	unit	\$260.00			\$260.00	10	1	1	\$260.00	1.00	1.00	1.00	1.00	1.00	9	2	Energy Star Calculator
Existing	703	Efficient Steamer	sft	unit	\$1,500.00			\$1,500.00	10	1	1	\$1,500.00	1.00	1.00	1.00	1.00	1.00	9	2	Energy Star Calculator
Existing	704	Energy Star Hot Food Holding Cabinets	sft	unit	\$1,200.00			\$1,200.00	10	1	1	\$1,200.00	1.00	1.00	1.00	1.00	1.00	9	2	Energy Star Calculator
Existing	800	Base Heating	sft	sft	\$0.00	\$0.00		\$0.00	10	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	10	1	
Existing	900	Base Miscellaneous	sft	sft	\$0.00	\$0.00		\$0.00	10	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	11	1	
New	100	Base Bldg Design - 15%	sft	sft	\$0.00		\$0.00	\$0.00	20	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	12	2	
New	102	High Performance Building/Int Design - Tier 1 15% - Office	sft	sft	\$1.57		\$0.00	\$1.57	20	1	1	\$1.57	1.00	1.00	1.00	1.00	1.00	12	2	% incremental cots: Hunt, W.D. 2008. Literature Review of
New	103	High Performance Building/Int Design - Tier 1 15% - Restaurant	sft	sft	\$1.92		\$0.00	\$1.92	20	1	1	\$1.92	1.00	1.00	1.00	1.00	1.00	12	2	Data on the Incremental Costs to Design and Build Low-
New	105	High Performance Building/Int Design - Tier 1 15% - Retail	sft	sft	\$1.14		\$0.00	\$1.14	20	1	1	\$1.14	1.00	1.00	1.00	1.00	1.00	12	2	Energy Buildings, PNNL-17502. Allocation to electricity vs.
New	106	High Performance Building/Int Design - Tier 1 15% - Grocery	sft	sft	\$1.00		\$0.00	\$1.00	20	1	1	\$1.00	1.00	1.00	1.00	1.00	1.00	12	2	gas: DNV KEMA database. Base building cost per square
New	107	High Performance Building/Int Design - Tier 1 15% - Warehouse	sft	sft	\$0.85		\$0.00	\$0.85	20	1	1	\$0.85	1.00	1.00	1.00	1.00	1.00	12	2	foot: RSMean Square Foot Construction Costs 2011, with
New	108	High Performance Building/Int Design - Tier 1 15% - School	sft	sft	\$1.53		\$0.00	\$1.53	20	1	1	\$1.53	1.00	1.00	1.00	1.00	1.00	12	2	Austin cost adjustment factor
New	109	High Performance Building/Int Design - Tier 1 15% - College	sft	sft	\$1.69		\$0.00	\$1.69	20	1	1	\$1.69	1.00	1.00	1.00	1.00	1.00	12	2	
New	110	High Performance Building/Int Design - Tier 1 15% - Health	sft	sft	\$2.78		\$0.00	\$2.78	20	1	1	\$2.78	1.00	1.00	1.00	1.00	1.00	12	2	
New	111	High Performance Building/Int Design - Tier 1 15% - Lodging	sft	sft	\$1.55		\$0.00	\$1.55	20	1	1	\$1.55	1.00	1.00	1.00	1.00	1.00	12	2	
New	112	High Performance Building/Int Design - Tier 1 15% - City of Austin	sft	sft	\$1.56		\$0.00	\$1.56	20	1	1	\$1.56	1.00	1.00	1.00	1.00	1.00	12	2	
New	113	High Performance Building/Int Design - Tier 1 15% - Miscellaneous	sft	sft	\$1.56		\$0.00	\$1.56	20	1	1	\$1.56	1.00	1.00	1.00	1.00	1.00	12	2	
New	200	Base Bldg Design - 30%	sft	sft	\$0.00		\$0.00	\$0.00	20	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	12	2	
New	202	High Performance Building/Int Design - Tier 2 30% - Office	sft	sft	\$2.24		\$0.00	\$2.24	20	1	1	\$2.24	1.00	1.00	1.00	1.00	1.00	12	2	% incremental cots: Hunt, W.D. 2008. Literature Review of
New	203	High Performance Building/Int Design - Tier 2 30% - Restaurant	sft	sft	\$2.74		\$0.00	\$2.74	20	1	1	\$2.74	1.00	1.00	1.00	1.00	1.00	12	2	Data on the Incremental Costs to Design and Build Low-
New	205	High Performance Building/Int Design - Tier 2 30% - Retail	sft	sft	\$1.63		\$0.00	\$1.63	20	1	1	\$1.63	1.00	1.00	1.00	1.00	1.00	12	2	Energy Buildings, PNNL-17502. Allocation to electricity vs.
New	206	High Performance Building/Int Design - Tier 2 30% - Grocery	sft	sft	\$1.42		\$0.00	\$1.42	20	1	1	\$1.42	1.00	1.00	1.00	1.00	1.00	12	2	gas: DNV KEMA database. Base building cost per square
New	207	High Performance Building/Int Design - Tier 2 30% - Warehouse	sft	sft	\$1.22		\$0.00	\$1.22	20	1	1	\$1.22	1.00	1.00	1.00	1.00	1.00	12	2	foot: RSMean Square Foot Construction Costs 2011, with
New	208	High Performance Building/Int Design - Tier 2 30% - School	sft	sft	\$2.19		\$0.00	\$2.19	20	1	1	\$2.19	1.00	1.00	1.00	1.00	1.00	12	2	Austin cost adjustment factor
New	209	High Performance Building/Int Design - Tier 2 30% - College	sft	sft	\$2.42		\$0.00	\$2.42	20	1	1	\$2.42	1.00	1.00	1.00	1.00	1.00	12	2	
New	210	High Performance Building/Int Design - Tier 2 30% - Health	sft	sft	\$3.97		\$0.00	\$3.97	20	1	1	\$3.97	1.00	1.00	1.00	1.00	1.00	12	2	
New	211	High Performance Building/Int Design - Tier 2 30% - Lodging	sft	sft	\$2.21		\$0.00	\$2.21	20	1	1	\$2.21	1.00	1.00	1.00	1.00	1.00	12	2	
New	212	High Performance Building/Int Design - Tier 2 30% - City of Austin	sft	sft	\$2.23		\$0.00	\$2.23	20	1	1	\$2.23	1.00	1.00	1.00	1.00	1.00	12	2	
New	213	High Performance Building/Int Design - Tier 2 30% - Miscellaneous	sft	sft	\$2.23		\$0.00	\$2.23	20	1	1	\$2.23	1.00	1.00	1.00	1.00	1.00	12	2	
New	300	Base Bldg Design - 50%	sft	sft	\$0.00		\$0.00	\$0.00	20	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	12	2	
New	302	High Performance Building/Int Design - Tier 3 50% - Office	sft	sft	\$3.92		\$0.00	\$3.92	20	1	1	\$3.92	1.00	1.00	1.00	1.00	1.00	12	2	% incremental cots: Hunt, W.D. 2008. Literature Review of
New	303	High Performance Building/Int Design - Tier 3 50% - Restaurant	sft	sft	\$4.80		\$0.00	\$4.80	20	1	1	\$4.80	1.00	1.00	1.00	1.00	1.00	12	2	Data on the Incremental Costs to Design and Build Low-
New	305	High Performance Building/Int Design - Tier 3 50% - Retail	sft	sft	\$2.85		\$0.00	\$2.85	20	1	1	\$2.85	1.00	1.00	1.00	1.00	1.00	12	2	Energy Buildings, PNNL-17502. Allocation to electricity vs.
New	306	High Performance Building/Int Design - Tier 3 50% - Grocery	sft	sft	\$2.49		\$0.00	\$2.49	20	1	1	\$2.49	1.00	1.00	1.00	1.00	1.00	12	2	gas: DNV KEMA database. Base building cost per square
New	307	High Performance Building/Int Design - Tier 3 50% - Warehouse	sft	sft	\$2.13		\$0.00	\$2.13	20	1	1	\$2.13	1.00	1.00	1.00	1.00	1.00	12	2	foot: RSMean Square Foot Construction Costs 2011, with
New	308	High Performance Building/Int Design - Tier 3 50% - School	sft	sft	\$3.83		\$0.00	\$3.83	20	1	1	\$3.83	1.00	1.00	1.00	1.00	1.00	12	2	Austin cost adjustment factor
New	309	High Performance Building/Int Design - Tier 3 50% - College	sft	sft	\$4.23		\$0.00	\$4.23	20	1	1	\$4.23	1.00	1.00	1.00	1.00	1.00	12	2	
New	310	High Performance Building/Int Design - Tier 3 50% - Health	sft	sft	\$6.95		\$0.00	\$6.95	20	1	1	\$6.95	1.00	1.00	1.00	1.00	1.00	12	2	
New	311	High Performance Building/Int Design - Tier 3 50% - Lodging	sft	sft	\$3.88		\$0.00	\$3.88	20	1	1	\$3.88	1.00	1.00	1.00	1.00	1.00	12	2	
New	312	High Performance Building/Int Design - Tier 3 50% - City of Austin	sft	sft	\$3.91		\$0.00	\$3.91	20	1	1	\$3.91	1.00	1.00	1.00	1.00	1.00	12	2	
New	313	High Performance Building/Int Design - Tier 3 50% - Miscellaneous	sft	sft	\$3.90		\$0.00	\$3.90	20	1	1	\$3.90	1.00	1.00	1.00	1.00	1.00	12	2	
New	400	Base Bldg Design - 70%	sft	sft	\$0.00		\$0.00	\$0.00	20	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	12	2	
New	402	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-72)	sft	sft	\$6.15		\$0.00	\$6.15	20	1	1	\$6.15	1.00	1.00	1.00	1.00	1.00	12	2	% incremental cots: Hunt, W.D. 2008. Literature Review of
New	403	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-72)	sft	sft																

MEASURE COSTS																						
Segment	Measure #	Measure Description	Savings Units	Cost Units	Unit Equipment Cost	Unit Labor Cost	NPV of Lifetime O & M Cost	Implementation Cost Factor	Service Life	Full = 1 Incr. = 0 Initial Cost	Replace Cost	Full Unit Cost	Relative Energy Reduction Factors			WMID	WOFI	End Use	Implementation Type 1=1 time 2=ROB	Cost Source		
New	503	High Performance Building/Int Design - Tier 1 29% - Restaurant	sqft	sqft	\$2.06		\$0.00	\$2.06	20	1	1	\$2.06	1.00	1.00	1.00	1.00	1.00	12	2	costs to go from 30% savings case (new 2015 code base) to 50% savings.		
New	505	High Performance Building/Int Design - Tier 1 29% - Retail	sqft	sqft	\$1.22		\$0.00	\$1.22	20	1	1	\$1.22	1.00	1.00	1.00	1.00	1.00	12	2			
New	506	High Performance Building/Int Design - Tier 1 29% - Grocery	sqft	sqft	\$1.07		\$0.00	\$1.07	20	1	1	\$1.07	1.00	1.00	1.00	1.00	1.00	12	2			
New	507	High Performance Building/Int Design - Tier 1 29% - Warehouse	sqft	sqft	\$0.91		\$0.00	\$0.91	20	1	1	\$0.91	1.00	1.00	1.00	1.00	1.00	12	2			
New	508	High Performance Building/Int Design - Tier 1 29% - School	sqft	sqft	\$1.64		\$0.00	\$1.64	20	1	1	\$1.64	1.00	1.00	1.00	1.00	1.00	12	2			
New	509	High Performance Building/Int Design - Tier 1 29% - College	sqft	sqft	\$1.81		\$0.00	\$1.81	20	1	1	\$1.81	1.00	1.00	1.00	1.00	1.00	12	2			
New	510	High Performance Building/Int Design - Tier 1 29% - Health	sqft	sqft	\$2.98		\$0.00	\$2.98	20	1	1	\$2.98	1.00	1.00	1.00	1.00	1.00	12	2			
New	511	High Performance Building/Int Design - Tier 1 29% - Lodging	sqft	sqft	\$1.66		\$0.00	\$1.66	20	1	1	\$1.66	1.00	1.00	1.00	1.00	1.00	12	2			
New	512	High Performance Building/Int Design - Tier 1 29% - City of Austin	sqft	sqft	\$1.67		\$0.00	\$1.67	20	1	1	\$1.67	1.00	1.00	1.00	1.00	1.00	12	2			
New	513	High Performance Building/Int Design - Tier 1 29% - Miscellaneous	sqft	sqft	\$1.67		\$0.00	\$1.67	20	1	1	\$1.67	1.00	1.00	1.00	1.00	1.00	12	2			
New	600	Base 2015 Commercial Code Building--57% savings	sqft	sqft	\$0.00		\$0.00	\$0.00	20	1	1	\$0.00	1.00	1.00	1.00	1.00	1.00	12	2			
New	602	High Performance Building/Int Design - Tier 2 57% - Office	sqft	sqft	\$3.92		\$0.00	\$3.92	20	1	1	\$3.92	1.00	1.00	1.00	1.00	1.00	12	2	Used data for 2012 code case. Calculated incremental costs to go from 30% savings case (new 2015 code base) to 70% savings.		
New	603	High Performance Building/Int Design - Tier 2 57% - Restaurant	sqft	sqft	\$4.80		\$0.00	\$4.80	20	1	1	\$4.80	1.00	1.00	1.00	1.00	1.00	12	2			
New	605	High Performance Building/Int Design - Tier 2 57% - Retail	sqft	sqft	\$2.85		\$0.00	\$2.85	20	1	1	\$2.85	1.00	1.00	1.00	1.00	1.00	12	2			
New	606	High Performance Building/Int Design - Tier 2 57% - Grocery	sqft	sqft	\$2.49		\$0.00	\$2.49	20	1	1	\$2.49	1.00	1.00	1.00	1.00	1.00	12	2			
New	607	High Performance Building/Int Design - Tier 2 57% - Warehouse	sqft	sqft	\$2.13		\$0.00	\$2.13	20	1	1	\$2.13	1.00	1.00	1.00	1.00	1.00	12	2			
New	608	High Performance Building/Int Design - Tier 2 57% - School	sqft	sqft	\$3.83		\$0.00	\$3.83	20	1	1	\$3.83	1.00	1.00	1.00	1.00	1.00	12	2			
New	609	High Performance Building/Int Design - Tier 2 57% - College	sqft	sqft	\$4.23		\$0.00	\$4.23	20	1	1	\$4.23	1.00	1.00	1.00	1.00	1.00	12	2			
New	610	High Performance Building/Int Design - Tier 2 57% - Health	sqft	sqft	\$6.95		\$0.00	\$6.95	20	1	1	\$6.95	1.00	1.00	1.00	1.00	1.00	12	2			
New	611	High Performance Building/Int Design - Tier 2 57% - Lodging	sqft	sqft	\$3.88		\$0.00	\$3.88	20	1	1	\$3.88	1.00	1.00	1.00	1.00	1.00	12	2			
New	612	High Performance Building/Int Design - Tier 2 57% - City of Austin	sqft	sqft	\$3.91		\$0.00	\$3.91	20	1	1	\$3.91	1.00	1.00	1.00	1.00	1.00	12	2			
New	613	High Performance Building/Int Design - Tier 2 57% - Miscellaneous	sqft	sqft	\$3.90		\$0.00	\$3.90	20	1	1	\$3.90	1.00	1.00	1.00	1.00	1.00	12	2			

Commercial Elec Measure Inputs			APPLICABILITY FACTOR (percent)										
Segment	Measure #	Measure Description	Office	Restau-rant	Retail	Food Store	Ware-house	School	College	Hospital	Lodging	City of Austin	Miscel-laneous
Existing	100	Base Fluorescent Fixture, 4L4'T8	50.00%	4.42%	18.93%	85.97%	40.00%	79.52%	33.51%	65.28%	7.14%	43.45%	36.89%
Existing	101	ROB 4L4' Premium T8, 1EB	50.00%	4.42%	18.93%	85.97%	40.00%	79.52%	33.51%	65.28%	7.14%	43.45%	36.89%
Existing	102	Delamping 3L4' F32T8	50.00%	4.42%	18.93%	85.97%	40.00%	79.52%	33.51%	65.28%	7.14%	43.45%	36.89%
Existing	103	LED Troffer (Base 4L4'T8)	50.00%	4.42%	18.93%	85.97%	40.00%	79.52%	33.51%	65.28%	7.14%	43.45%	36.89%
Existing	104	Lighting Control Tuneup	50.00%	4.42%	18.93%	85.97%	40.00%	79.52%	33.51%	65.28%	7.14%	43.45%	36.89%
Existing	105	Occupancy Sensor, 4L4' Fluorescent Fixtures	50.00%	4.42%	18.93%	85.97%	40.00%	79.52%	33.51%	65.28%	7.14%	43.45%	36.89%
Existing	106	Continuous Dimming, 4L4' Fluorescent Fixtures	50.00%	4.42%	18.93%	85.97%	40.00%	79.52%	33.51%	65.28%	7.14%	43.45%	36.89%
Existing	107	High Performance Lighting R/R - 25% Savings, Base 4L4'T8	50.00%	4.42%	18.93%	85.97%	40.00%	79.52%	33.51%	65.28%	7.14%	43.45%	36.89%
Existing	110	Base Fluorescent Fixture, 2L4'T8, 1 EB	32.00%	40.00%	6.45%	0.36%	0.39%	7.34%	50.61%	16.61%	40.33%	33.37%	34.74%
Existing	111	ROB 2L4' Premium T8, 1EB	32.00%	40.00%	6.45%	0.36%	0.39%	7.34%	50.61%	16.61%	40.33%	33.37%	34.74%
Existing	112	Delamping 1L4' F32T8	32.00%	40.00%	6.45%	0.36%	0.39%	7.34%	50.61%	16.61%	40.33%	33.37%	34.74%
Existing	113	LED Troffer (Base 2L4'T8)	32.00%	40.00%	6.45%	0.36%	0.39%	7.34%	50.61%	16.61%	40.33%	33.37%	34.74%
Existing	114	Lighting Control Tuneup	32.00%	40.00%	6.45%	0.36%	0.39%	7.34%	50.61%	16.61%	40.33%	33.37%	34.74%
Existing	115	Occupancy Sensor, 2L4' Fluorescent Fixtures	32.00%	40.00%	6.45%	0.36%	0.39%	7.34%	50.61%	16.61%	40.33%	33.37%	34.74%
Existing	116	Continuous Dimming, 2L4' Fluorescent Fixtures	32.00%	40.00%	6.45%	0.36%	0.39%	7.34%	50.61%	16.61%	40.33%	33.37%	34.74%
Existing	117	High Performance Lighting R/R - 25% Savings, Base 2L4'T8	32.00%	40.00%	6.45%	0.36%	0.39%	7.34%	50.61%	16.61%	40.33%	33.37%	34.74%
Existing	120	Base Other Fluorescent Fixture	6.26%	15.00%	6.00%	0.00%	0.04%	3.02%	5.96%	5.60%	1.77%	4.03%	1.81%
Existing	121	ROB Premium T8, 1EB	6.26%	15.00%	6.00%	0.00%	0.04%	3.02%	5.96%	5.60%	1.77%	4.03%	1.81%
Existing	122	Lighting Control Tuneup	6.26%	15.00%	6.00%	0.00%	0.04%	3.02%	5.96%	5.60%	1.77%	4.03%	1.81%
Existing	123	Occupancy Sensor, 4L8' Fluorescent Fixtures	6.26%	15.00%	6.00%	0.00%	0.04%	3.02%	5.96%	5.60%	1.77%	4.03%	1.81%
Existing	124	Continuous Dimming, 4L8' Fluorescent Fixtures	6.26%	15.00%	6.00%	0.00%	0.04%	3.02%	5.96%	5.60%	1.77%	4.03%	1.81%
Existing	125	High Performance Lighting R/R - 25% Savings, Base Other Fluorescent	6.26%	15.00%	6.00%	0.00%	0.04%	3.02%	5.96%	5.60%	1.77%	4.03%	1.81%
Existing	130	Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacement	3.21%	17.24%	4.37%	3.26%	3.91%	2.36%	2.30%	3.24%	21.16%	4.75%	6.28%
Existing	131	CFL Screw-in 18W	3.05%	16.38%	4.16%	3.10%	3.72%	2.24%	2.19%	3.08%	20.10%	4.51%	5.97%
Existing	132	Cold Cathode Lamps	0.16%	0.86%	0.22%	0.16%	0.20%	0.12%	0.12%	0.16%	1.06%	0.24%	0.31%
Existing	133	LED screw-in PAR replacement (base incandescent)	3.21%	17.24%	4.37%	3.26%	3.91%	2.36%	2.30%	3.24%	21.16%	4.75%	6.28%
Existing	140	Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacement	3.21%	17.24%	4.37%	3.26%	3.91%	2.36%	2.30%	3.24%	21.16%	4.75%	6.28%
Existing	141	CFL Hardwired, Modular 18W	3.21%	17.24%	4.37%	3.26%	3.91%	2.36%	2.30%	3.24%	21.16%	4.75%	6.28%
Existing	142	Cermaic Metal Halide	3.21%	17.24%	4.37%	3.26%	3.91%	2.36%	2.30%	3.24%	21.16%	4.75%	6.28%
Existing	143	LED fixture replacement (base incandescent flood)	3.21%	17.24%	4.37%	3.26%	3.91%	2.36%	2.30%	3.24%	21.16%	4.75%	6.28%
Existing	150	Base CFL to screw-in replacement	7.27%	10.07%	1.87%	1.93%	4.47%	2.28%	4.98%	10.59%	18.06%	6.26%	5.26%
Existing	151	LED screw-in replacement (base CFL)	7.27%	10.07%	1.87%	1.93%	4.47%	2.28%	4.98%	10.59%	18.06%	6.26%	5.26%
Existing	160	Base High Bay Metal Halide, 400W	2.18%	0.78%	1.50%	16.79%	24.18%	2.95%	1.96%	2.28%	0.76%	3.92%	5.67%
Existing	161	High Bay T5	2.18%	0.78%	1.50%	16.79%	24.18%	2.95%	1.96%	2.28%	0.76%	3.92%	5.67%
Existing	162	Induction High Bay Lighting	2.18%	0.78%	1.50%	16.79%	24.18%	2.95%	1.96%	2.28%	0.76%	3.92%	5.67%
Existing	163	PSMH + electronic ballast	2.18%	0.78%	1.50%	16.79%	24.18%	2.95%	1.96%	2.28%	0.76%	3.92%	5.67%
Existing	165	Occupancy Sensor, High Bay T5	2.18%	0.78%	1.50%	16.79%	24.18%	2.95%	1.96%	2.28%	0.76%	3.92%	5.67%
Existing	180	Base Parking Garage Metal Halide, 250 W	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	18.28%	6.92%	0.00%	0.00%	0.00%
Existing	181	High-efficiency fluorescent parking garage fixture (Base MH)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	18.28%	6.92%	0.00%	0.00%	0.00%
Existing	182	Bi-Level LED Parking Garage Fixtures (Base MH)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	18.28%	6.92%	0.00%	0.00%	0.00%
Existing	185	Base Fluorescent Parking Garage Lighting	10.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.03%	8.39%	6.53%
Existing	186	Parking Garage Low Wattage T8 Lamps replacing 32W lamps	10.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.03%	8.39%	6.53%
Existing	187	Bi-Level LED Parking Garage Fixtures (Base Fluorescent)	10.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.03%	8.39%	6.53%
Existing	190	Base Exit Sign	82.46%	79.17%	42.31%	98.72%	100.00%	100.00%	100.00%	99.85%	100.00%	90.39%	98.32%
Existing	191	LED Exit Sign	82.46%	79.17%	42.31%	98.72%	100.00%	100.00%	100.00%	99.85%	100.00%	90.39%	98.32%
Existing	200	Base Outdoor High Pressure Sodium 250W Lamp	41.75%	100.00%	44.58%	98.65%	42.94%	93.40%	51.50%	92.69%	73.51%	64.13%	86.52%
Existing	201	Outdoor Lighting Controls (Photocell/Timeclock)	41.75%	100.00%	44.58%	98.65%	42.94%	93.40%	51.50%	92.69%	73.51%	64.13%	86.52%
Existing	202	LED Outdoor Area Lighting	41.75%	100.00%	44.58%	98.65%	42.94%	93.40%	51.50%	92.69%	73.51%	64.13%	86.52%
Existing	203	Bi-Level LED Outdoor Lighting	41.75%	100.00%	44.58%	98.65%	42.94%	93.40%	51.50%	92.69%	73.51%	64.13%	86.52%

Commercial Elec Measure Inputs			APPLICABILITY FACTOR (percent)										
Segment	Measure #	Measure Description	Office	Restau-rant	Retail	Food Store	Ware-house	School	College	Hospital	Lodging	City of Austin	Miscel-laneous
Existing	300	Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	42.07%	0.80%	4.34%	0.00%	0.00%	24.84%	73.88%	82.40%	30.00%	26.82%	11.57%
Existing	301	Centrifugal Chiller, 0.51 kW/ton, 500 tons	42.07%	0.80%	4.34%	0.00%	0.00%	24.84%	73.88%	82.40%	30.00%	26.82%	11.57%
Existing	302	Window Film (Standard) - Chiller	42.07%	0.80%	4.34%	0.00%	0.00%	24.84%	73.88%	82.40%	30.00%	26.82%	11.57%
Existing	303	EMS - Chiller	42.07%	0.80%	4.34%	0.00%	0.00%	24.84%	73.88%	82.40%	30.00%	26.82%	11.57%
Existing	305	Chiller Tune Up/Diagnostics	42.07%	0.80%	4.34%	0.00%	0.00%	24.84%	73.88%	82.40%	30.00%	26.82%	11.57%
Existing	306	VSD for Chiller Pumps and Towers	42.07%	0.80%	4.34%	0.00%	0.00%	24.84%	73.88%	82.40%	30.00%	26.82%	11.57%
Existing	307	EMS Optimization - Chiller	42.07%	0.80%	4.34%	0.00%	0.00%	24.84%	73.88%	82.40%	30.00%	26.82%	11.57%
Existing	309	Ceiling/roof Insulation - Chiller	42.07%	0.80%	4.34%	0.00%	0.00%	24.84%	73.88%	82.40%	30.00%	26.82%	11.57%
Existing	310	Duct/Pipe Insulation - Chiller	42.07%	0.80%	4.34%	0.00%	0.00%	24.84%	73.88%	82.40%	30.00%	26.82%	11.57%
Existing	311	High Efficiency Chiller Motors	42.07%	0.80%	4.34%	0.00%	0.00%	24.84%	73.88%	82.40%	30.00%	26.82%	11.57%
Existing	320	Base DX Packaged System, EER=10.3, 10 tons	42.69%	77.37%	28.19%	68.61%	78.08%	51.71%	0.07%	17.76%	25.00%	51.14%	59.60%
Existing	321	DX Tune Up/ Advanced Diagnostics	42.69%	77.37%	28.19%	68.61%	78.08%	51.71%	0.07%	17.76%	25.00%	51.14%	59.60%
Existing	322	Automated Fault Detection and Diagnostics	42.69%	77.37%	28.19%	68.61%	78.08%	51.71%	0.07%	17.76%	25.00%	51.14%	59.60%
Existing	323	DX Packaged System, EER=10.9, 10 tons	42.69%	77.37%	28.19%	68.61%	78.08%	51.71%	0.07%	17.76%	25.00%	51.14%	59.60%
Existing	324	DX Packaged System, EER=13.4, 10 tons	42.69%	77.37%	28.19%	68.61%	78.08%	51.71%	0.07%	17.76%	25.00%	51.14%	59.60%
Existing	325	Window Film (Standard) - DX	42.69%	77.37%	28.19%	68.61%	78.08%	51.71%	0.07%	17.76%	25.00%	51.14%	59.60%
Existing	326	Prog. Thermostat - DX	42.69%	77.37%	28.19%	68.61%	78.08%	51.71%	0.07%	17.76%	25.00%	51.14%	59.60%
Existing	330	Optimize Controls - DX	42.69%	77.37%	28.19%	68.61%	78.08%	51.71%	0.07%	17.76%	25.00%	51.14%	59.60%
Existing	331	Economizer - DX	42.69%	77.37%	28.19%	68.61%	78.08%	51.71%	0.07%	17.76%	25.00%	51.14%	59.60%
Existing	332	Aerosol Duct Sealing - DX	42.69%	77.37%	28.19%	68.61%	78.08%	51.71%	0.07%	17.76%	25.00%	51.14%	59.60%
Existing	333	Ceiling/roof Insulation - DX	42.69%	77.37%	28.19%	68.61%	78.08%	51.71%	0.07%	17.76%	25.00%	51.14%	59.60%
Existing	334	Duct/Pipe Insulation - DX	42.69%	77.37%	28.19%	68.61%	78.08%	51.71%	0.07%	17.76%	25.00%	51.14%	59.60%
Existing	335	DX Coil Cleaning	42.69%	77.37%	28.19%	68.61%	78.08%	51.71%	0.07%	17.76%	25.00%	51.14%	59.60%
Existing	337	Geothermal Heat Pump, EER=13, 10 tons - DX	42.69%	77.37%	28.19%	68.61%	78.08%	51.71%	0.07%	17.76%	25.00%	51.14%	59.60%
Existing	340	Base PTAC, EER=8.3, 1 ton	0.92%	7.81%	0.76%	11.83%	3.76%	11.35%	0.00%	2.60%	50.00%	4.45%	7.97%
Existing	341	HE PTAC, EER=9.6, 1 ton	0.92%	7.81%	0.76%	11.83%	3.76%	11.35%	0.00%	2.60%	50.00%	4.45%	7.97%
Existing	342	Hotel Room Controllers	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%	0.00%
Existing	400	Base Fan Motor, 5hp, 1800rpm, 87.5%	42.48%	50.41%	43.33%	96.66%	30.15%	33.42%	81.73%	18.81%	65.42%	48.04%	53.59%
Existing	401	Fan Motor, 5hp, 1800rpm, 89.5%	42.48%	50.41%	43.33%	96.66%	30.15%	33.42%	81.73%	18.81%	65.42%	48.04%	53.59%
Existing	402	Variable Speed Drive Control, 5 HP	42.48%	50.41%	43.33%	96.66%	30.15%	33.42%	81.73%	18.81%	65.42%	48.04%	53.59%
Existing	410	Base Fan Motor, 15hp, 1800rpm, 91.0%	40.00%	0.00%	1.51%	0.00%	0.00%	60.00%	68.91%	65.38%	0.00%	41.36%	42.72%
Existing	411	Fan Motor, 15hp, 1800rpm, 92.4%	40.00%	0.00%	1.51%	0.00%	0.00%	60.00%	68.91%	65.38%	0.00%	41.36%	42.72%
Existing	412	Variable Speed Drive Control, 15 HP	40.00%	0.00%	1.51%	0.00%	0.00%	60.00%	68.91%	65.38%	0.00%	41.36%	42.72%
Existing	413	Electronically Commutated Motors (ECM) on an Air Handler Unit	40.00%	0.00%	1.51%	0.00%	0.00%	60.00%	68.91%	65.38%	0.00%	41.36%	42.72%
Existing	414	Energy Recovery Ventilation (ERV)	40.00%	0.00%	1.51%	0.00%	0.00%	60.00%	68.91%	65.38%	0.00%	41.36%	42.72%
Existing	415	Separate Makeup Air / Exhaust Hoods AC	40.00%	0.00%	1.51%	0.00%	0.00%	60.00%	68.91%	65.38%	0.00%	41.36%	42.72%
Existing	420	Base Fan Motor, 40hp, 1800rpm, 93.0%	4.64%	0.00%	1.51%	95.57%	10.00%	37.29%	68.91%	69.47%	11.31%	19.27%	33.90%
Existing	421	Fan Motor, 40hp, 1800rpm, 94.1%	4.64%	0.00%	1.51%	95.57%	10.00%	37.29%	68.91%	69.47%	11.31%	19.27%	33.90%
Existing	422	Variable Speed Drive Control, 40 HP	4.64%	0.00%	1.51%	95.57%	10.00%	37.29%	68.91%	69.47%	11.31%	19.27%	33.90%
Existing	423	Air Handler Tuneups	4.64%	0.00%	1.51%	95.57%	10.00%	37.29%	68.91%	69.47%	11.31%	19.27%	33.90%
Existing	424	Demand Controlled Ventilation	4.64%	0.00%	1.51%	95.57%	10.00%	37.29%	68.91%	69.47%	11.31%	19.27%	33.90%
Existing	500	Base Built-Up Refrigeration System	0.11%	38.30%	0.49%	10.66%	2.96%	7.69%	0.87%	1.10%	2.17%	0.09%	0.06%
Existing	501	High-efficiency fan motors	0.11%	38.30%	0.49%	10.66%	2.96%	7.69%	0.87%	1.10%	2.17%	0.09%	0.06%
Existing	502	Strip curtains for walk-ins	0.11%	38.30%	0.49%	10.66%	2.96%	7.69%	0.87%	1.10%	2.17%	0.09%	0.06%
Existing	503	Night covers for display cases (built-up systems)	0.11%	38.30%	0.49%	10.66%	2.96%	7.69%	0.87%	1.10%	2.17%	0.09%	0.06%
Existing	504	Efficient compressor motor retrofit	0.11%	38.30%	0.49%	10.66%	2.96%	7.69%	0.87%	1.10%	2.17%	0.09%	0.06%
Existing	505	Compressor VSD retrofit	0.11%	38.30%	0.49%	10.66%	2.96%	7.69%	0.87%	1.10%	2.17%	0.09%	0.06%
Existing	506	Floating head pressure controls	0.11%	38.30%	0.49%	10.66%	2.96%	7.69%	0.87%	1.10%	2.17%	0.09%	0.06%
Existing	507	Refrigeration Commissioning	0.11%	38.30%	0.49%	10.66%	2.96%	7.69%	0.87%	1.10%	2.17%	0.09%	0.06%

Commercial Elec Measure Inputs			APPLICABILITY FACTOR (percent)										
Segment	Measure #	Measure Description	Office	Restau-rant	Retail	Food Store	Ware-house	School	College	Hospital	Lodging	City of Austin	Miscel-laneous
Existing	508	Demand Hot Gas Defrost	0.11%	38.30%	0.49%	10.66%	2.96%	7.69%	0.87%	1.10%	2.17%	0.09%	0.06%
Existing	509	Demand Defrost Electric	0.11%	38.30%	0.49%	10.66%	2.96%	7.69%	0.87%	1.10%	2.17%	0.09%	0.06%
Existing	510	Anti-sweat (humidistat) controls	0.11%	38.30%	0.49%	10.66%	2.96%	7.69%	0.87%	1.10%	2.17%	0.09%	0.06%
Existing	511	Freezer-Cooler Replacement Gaskets (built-up systems)	0.11%	38.30%	0.49%	10.66%	2.96%	7.69%	0.87%	1.10%	2.17%	0.09%	0.06%
Existing	512	High R-Value Glass Doors	0.11%	38.30%	0.49%	10.66%	2.96%	7.69%	0.87%	1.10%	2.17%	0.09%	0.06%
Existing	513	Bi-level LED Case Lighting (built-up systems)	0.11%	38.30%	0.49%	10.66%	2.96%	7.69%	0.87%	1.10%	2.17%	0.09%	0.06%
Existing	514	Fiber Optic Case Lighting (built-up systems)	0.11%	38.30%	0.49%	10.66%	2.96%	7.69%	0.87%	1.10%	2.17%	0.09%	0.06%
Existing	516	Multiplex Compressor System	0.11%	38.30%	0.49%	10.66%	2.96%	7.69%	0.87%	1.10%	2.17%	0.09%	0.06%
Existing	517	Oversized Air Cooled Condenser	0.11%	38.30%	0.49%	10.66%	2.96%	7.69%	0.87%	1.10%	2.17%	0.09%	0.06%
Existing	520	Base Self-Contained Refrigeration	2.25%	40.18%	5.35%	99.69%	0.00%	57.36%	0.00%	5.24%	41.36%	1.61%	0.96%
Existing	521	Strip curtains for walk-ins	2.25%	40.18%	5.35%	99.69%	0.00%	57.36%	0.00%	5.24%	41.36%	1.61%	0.96%
Existing	522	Night covers for display cases (self-contained)	2.25%	40.18%	5.35%	99.69%	0.00%	57.36%	0.00%	5.24%	41.36%	1.61%	0.96%
Existing	523	Freezer-Cooler Replacement Gaskets (self-contained)	2.25%	40.18%	5.35%	99.69%	0.00%	57.36%	0.00%	5.24%	41.36%	1.61%	0.96%
Existing	524	Bi-level LED Case Lighting (self-contained units)	2.25%	40.18%	5.35%	99.69%	0.00%	57.36%	0.00%	5.24%	41.36%	1.61%	0.96%
Existing	526	Energy-Star Refrigerator, solid door	2.25%	40.18%	5.35%	99.69%	0.00%	57.36%	0.00%	5.24%	41.36%	1.61%	0.96%
Existing	527	Energy-Star Freezer, solid door	2.25%	40.18%	5.35%	99.69%	0.00%	57.36%	0.00%	5.24%	41.36%	1.61%	0.96%
Existing	528	Energy-Star Refrigerator, glass door	2.25%	40.18%	5.35%	99.69%	0.00%	57.36%	0.00%	5.24%	41.36%	1.61%	0.96%
Existing	529	Energy-Star Freezer, glass door	2.25%	40.18%	5.35%	99.69%	0.00%	57.36%	0.00%	5.24%	41.36%	1.61%	0.96%
Existing	530	Energy Star Ice Machines	2.25%	40.18%	5.35%	99.69%	0.00%	57.36%	0.00%	5.24%	41.36%	1.61%	0.96%
Existing	600	Base Desktop PC	100.00%	75.18%	33.24%	87.80%	81.08%	94.68%	100.00%	100.00%	90.32%	87.60%	75.21%
Existing	601	PC Manual Power Management Enabling	100.00%	75.18%	33.24%	87.80%	81.08%	94.68%	100.00%	100.00%	90.32%	87.60%	75.21%
Existing	602	PC Network Power Management Enabling	100.00%	75.18%	33.24%	87.80%	81.08%	94.68%	100.00%	100.00%	90.32%	87.60%	75.21%
Existing	603	Energy Star or Better PC	100.00%	75.18%	33.24%	87.80%	81.08%	94.68%	100.00%	100.00%	90.32%	87.60%	75.21%
Existing	610	Base Monitor, CRT	23.94%	27.13%	29.09%	1.98%	91.84%	74.76%	36.09%	66.53%	26.51%	30.95%	37.95%
Existing	611	Energy Star or Better Monitor-CRT	23.94%	27.13%	29.09%	1.98%	91.84%	74.76%	36.09%	66.53%	26.51%	30.95%	37.95%
Existing	612	Monitor Power Management Enabling--CRT	23.94%	27.13%	29.09%	1.98%	91.84%	74.76%	36.09%	66.53%	26.51%	30.95%	37.95%
Existing	620	Base Monitor, LCD	100.00%	94.79%	61.72%	96.58%	100.00%	92.94%	99.27%	91.94%	100.00%	99.93%	99.85%
Existing	621	Energy Star or Better Monitor--LCD	100.00%	94.79%	61.72%	96.58%	100.00%	92.94%	99.27%	91.94%	100.00%	99.93%	99.85%
Existing	622	Monitor Power Management Enabling--LCD	100.00%	94.79%	61.72%	96.58%	100.00%	92.94%	99.27%	91.94%	100.00%	99.93%	99.85%
Existing	630	Base Copier	94.36%	13.80%	19.85%	43.38%	71.87%	81.57%	100.00%	100.00%	51.07%	77.59%	60.81%
Existing	631	Energy Star or Better Copier	94.36%	13.80%	19.85%	43.38%	71.87%	81.57%	100.00%	100.00%	51.07%	77.59%	60.81%
Existing	632	Copier Power Management Enabling	94.36%	13.80%	19.85%	43.38%	71.87%	81.57%	100.00%	100.00%	51.07%	77.59%	60.81%
Existing	640	Base Laser Printer	100.00%	100.00%	98.14%	100.00%	99.27%	100.00%	100.00%	100.00%	96.69%	99.58%	99.17%
Existing	641	Printer Power Management Enabling	100.00%	100.00%	98.14%	100.00%	99.27%	100.00%	100.00%	100.00%	96.69%	99.58%	99.17%
Existing	650	Base Data Center/Server Room	0.33%	0.02%	0.02%	0.07%	0.02%	0.01%	0.07%	0.21%	0.02%	0.17%	0.00%
Existing	651	Data Center Improved Operations	0.33%	0.02%	0.02%	0.07%	0.02%	0.01%	0.07%	0.21%	0.02%	0.17%	0.00%
Existing	652	Data Center Best Practices	0.33%	0.02%	0.02%	0.07%	0.02%	0.01%	0.07%	0.21%	0.02%	0.17%	0.00%
Existing	653	Data Center State of the Art practices	0.33%	0.02%	0.02%	0.07%	0.02%	0.01%	0.07%	0.21%	0.02%	0.17%	0.00%
Existing	660	Base Water Heating	51.00%	30.00%	34.00%	5.00%	50.00%	30.00%	3.00%	0.00%	0.00%	41.50%	32.00%
Existing	661	Demand controlled circulating systems	51.00%	30.00%	34.00%	5.00%	50.00%	30.00%	3.00%	0.00%	0.00%	41.50%	32.00%
Existing	662	High Efficiency Water Heater (electric)	51.00%	30.00%	34.00%	5.00%	50.00%	30.00%	3.00%	0.00%	0.00%	41.50%	32.00%
Existing	663	Hot Water Pipe Insulation	51.00%	30.00%	34.00%	5.00%	50.00%	30.00%	3.00%	0.00%	0.00%	41.50%	32.00%
Existing	664	Tankless Water Heater	51.00%	30.00%	34.00%	5.00%	50.00%	30.00%	3.00%	0.00%	0.00%	41.50%	32.00%
Existing	665	Heat Pump Water Heater (air source)	51.00%	30.00%	34.00%	5.00%	50.00%	30.00%	3.00%	0.00%	0.00%	41.50%	32.00%
Existing	666	Heat Recovery Unit	51.00%	30.00%	34.00%	5.00%	50.00%	30.00%	3.00%	0.00%	0.00%	41.50%	32.00%
Existing	667	Heat Trap	51.00%	30.00%	34.00%	5.00%	50.00%	30.00%	3.00%	0.00%	0.00%	41.50%	32.00%
Existing	668	Solar Water Heater	51.00%	30.00%	34.00%	5.00%	50.00%	30.00%	3.00%	0.00%	0.00%	41.50%	32.00%
Existing	670	Base Vending Machines	99.90%	23.87%	99.81%	99.90%	73.32%	82.57%	37.12%	88.15%	17.63%	84.52%	69.13%
Existing	671	Vending Misers	99.90%	23.87%	99.81%	99.90%	73.32%	82.57%	37.12%	88.15%	17.63%	84.52%	69.13%

Commercial Elec Measure Inputs			APPLICABILITY FACTOR (percent)										
Segment	Measure #	Measure Description	Office	Restau-rant	Retail	Food Store	Ware-house	School	College	Hospital	Lodging	City of Austin	Miscel-laneous
Existing	700	Base Cooking	2.25%	67.26%	7.41%	96.58%	0.00%	89.85%	30.30%	21.58%	33.08%	3.91%	5.56%
Existing	701	Convection Oven	2.25%	67.26%	7.41%	96.58%	0.00%	89.85%	30.30%	21.58%	33.08%	3.91%	5.56%
Existing	702	Efficient Fryer	2.25%	67.26%	7.41%	96.58%	0.00%	89.85%	30.30%	21.58%	33.08%	3.91%	5.56%
Existing	703	Efficient Steamer	2.25%	67.26%	7.41%	96.58%	0.00%	89.85%	30.30%	21.58%	33.08%	3.91%	5.56%
Existing	704	Energy Star Hot Food Holding Cabinets	2.25%	67.26%	7.41%	96.58%	0.00%	89.85%	30.30%	21.58%	33.08%	3.91%	5.56%
Existing	800	Base Heating	55.25%	7.12%	30.00%	0.00%	0.37%	0.00%	0.23%	0.00%	32.51%	27.89%	0.53%
Existing	900	Base Miscellaneous	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
New	100	Base Bldg Design - 15%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%
New	102	High Performance Building/Int Design - Tier 1 15% - Office	50.00%										
New	103	High Performance Building/Int Design - Tier 1 15% - Restaurant		50.00%									
New	105	High Performance Building/Int Design - Tier 1 15% - Retail			50.00%								
New	106	High Performance Building/Int Design - Tier 1 15% - Grocery				50.00%							
New	107	High Performance Building/Int Design - Tier 1 15% - Warehouse					50.00%						
New	108	High Performance Building/Int Design - Tier 1 15% - School						50.00%					
New	109	High Performance Building/Int Design - Tier 1 15% - College							50.00%				
New	110	High Performance Building/Int Design - Tier 1 15% - Health								50.00%			
New	111	High Performance Building/Int Design - Tier 1 15% - Lodging									50.00%		
New	112	High Performance Building/Int Design - Tier 1 15% - City of Austin										50.00%	
New	113	High Performance Building/Int Design - Tier 1 15% - Miscellaneous											50.00%
New	200	Base Bldg Design - 30%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%
New	202	High Performance Building/Int Design - Tier 2 30% - Office	40.00%										
New	203	High Performance Building/Int Design - Tier 2 30% - Restaurant		40.00%									
New	205	High Performance Building/Int Design - Tier 2 30% - Retail			40.00%								
New	206	High Performance Building/Int Design - Tier 2 30% - Grocery				40.00%							
New	207	High Performance Building/Int Design - Tier 2 30% - Warehouse					40.00%						
New	208	High Performance Building/Int Design - Tier 2 30% - School						40.00%					
New	209	High Performance Building/Int Design - Tier 2 30% - College							40.00%				
New	210	High Performance Building/Int Design - Tier 2 30% - Health								40.00%			
New	211	High Performance Building/Int Design - Tier 2 30% - Lodging									40.00%		
New	212	High Performance Building/Int Design - Tier 2 30% - City of Austin										40.00%	
New	213	High Performance Building/Int Design - Tier 2 30% - Miscellaneous											40.00%
New	300	Base Bldg Design - 50%	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%
New	302	High Performance Building/Int Design - Tier 3 50% - Office	9.00%										
New	303	High Performance Building/Int Design - Tier 3 50% - Restaurant		9.00%									
New	305	High Performance Building/Int Design - Tier 3 50% - Retail			9.00%								
New	306	High Performance Building/Int Design - Tier 3 50% - Grocery				9.00%							
New	307	High Performance Building/Int Design - Tier 3 50% - Warehouse					9.00%						
New	308	High Performance Building/Int Design - Tier 3 50% - School						9.00%					
New	309	High Performance Building/Int Design - Tier 3 50% - College							9.00%				
New	310	High Performance Building/Int Design - Tier 3 50% - Health								9.00%			
New	311	High Performance Building/Int Design - Tier 3 50% - Lodging									9.00%		
New	312	High Performance Building/Int Design - Tier 3 50% - City of Austin										9.00%	
New	313	High Performance Building/Int Design - Tier 3 50% - Miscellaneous											9.00%
New	400	Base Bldg Design - 70%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
New	402	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Office	1.00%										
New	403	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Restaurant		1.00%									
New	405	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Retail			1.00%								
New	406	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Grocery				1.00%							
New	407	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Warehouse					1.00%						

Commercial Elec Measure Inputs			APPLICABILITY FACTOR (percent)										
Segment	Measure #	Measure Description	Office	Restau-rant	Retail	Food Store	Ware-house	School	College	Hospital	Lodging	City of Austin	Miscel-laneous
New	408	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - School						1.00%					
New	409	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - College							1.00%				
New	410	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Health								1.00%			
New	411	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Lodging									1.00%		
New	412	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - City of Austin										1.00%	
New	413	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Miscellaneous											1.00%
New	500	Base 2015 Commercial Code Building--29% savings	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%
New	502	High Performance Building/Int Design - Tier 1 29% - Office	80.00%										
New	503	High Performance Building/Int Design - Tier 1 29% - Restaurant		80.00%									
New	505	High Performance Building/Int Design - Tier 1 29% - Retail			80.00%								
New	506	High Performance Building/Int Design - Tier 1 29% - Grocery				80.00%							
New	507	High Performance Building/Int Design - Tier 1 29% - Warehouse					80.00%						
New	508	High Performance Building/Int Design - Tier 1 29% - School						80.00%					
New	509	High Performance Building/Int Design - Tier 1 29% - College							80.00%				
New	510	High Performance Building/Int Design - Tier 1 29% - Health								80.00%			
New	511	High Performance Building/Int Design - Tier 1 29% - Lodging									80.00%		
New	512	High Performance Building/Int Design - Tier 1 29% - City of Austin										80.00%	
New	513	High Performance Building/Int Design - Tier 1 29% - Miscellaneous											80.00%
New	600	Base 2015 Commercial Code Building--57% savings	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
New	602	High Performance Building/Int Design - Tier 2 57% - Office	20.00%										
New	603	High Performance Building/Int Design - Tier 2 57% - Restaurant		20.00%									
New	605	High Performance Building/Int Design - Tier 2 57% - Retail			20.00%								
New	606	High Performance Building/Int Design - Tier 2 57% - Grocery				20.00%							
New	607	High Performance Building/Int Design - Tier 2 57% - Warehouse					20.00%						
New	608	High Performance Building/Int Design - Tier 2 57% - School						20.00%					
New	609	High Performance Building/Int Design - Tier 2 57% - College							20.00%				
New	610	High Performance Building/Int Design - Tier 2 57% - Health								20.00%			
New	611	High Performance Building/Int Design - Tier 2 57% - Lodging									20.00%		
New	612	High Performance Building/Int Design - Tier 2 57% - City of Austin										20.00%	
New	613	High Performance Building/Int Design - Tier 2 57% - Miscellaneous											20.00%

Commercial Elec Measure Inputs			ENERGY SAVINGS (percent)											Savings Source
Segment	Measure #	Measure Description	Office	Restau- rant	Retail	Food Store	Ware- house	School	College	Hospital	Lodging	City of Austin	Miscel- laneous	
Existing	100	Base Fluorescent Fixture, 4L4'T8	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Existing	101	ROB 4L4' Premium T8	17.14%	17.14%	17.14%	17.14%	17.14%	17.14%	17.14%	17.14%	17.14%	17.14%	17.14%	DNV KEMA database
Existing	102	Delamping 3L4' F32T8	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	DNV KEMA database
Existing	103	LED Troffer (Base 4L4'T8)	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	Cree Cost effectiveness example
Existing	104	Lighting Control Tuneup	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	DNV KEMA database
Existing	105	Occupancy Sensor, 4L4' Fluorescent Fixtures	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	DNV KEMA database
Existing	106	Continuous Dimming, 4L4' Fluorescent Fixtures	52.00%	52.00%	52.00%	52.00%	52.00%	52.00%	52.00%	52.00%	52.00%	52.00%	52.00%	ACEEE, 2006, Emerging Technologies Report: Integrated Daylighting Systems (Dimming Ballasts)
Existing	107	High Performance Lighting R/R - 25% Savings, Base 4L4'T8	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	Measure assumption
Existing	110	Base Fluorescent Fixture, 2L4'T8, 1 EB	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Existing	111	ROB 2L4' Premium T8	17.14%	17.14%	17.14%	17.14%	17.14%	17.14%	17.14%	17.14%	17.14%	17.14%	17.14%	DNV KEMA database
Existing	112	Delamping 1L4' F32T8	47.92%	47.92%	47.92%	47.92%	47.92%	47.92%	47.92%	47.92%	47.92%	47.92%	47.92%	DNV KEMA database
Existing	113	LED Troffer (Base 2L4'T8)	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	Cree Cost effectiveness example
Existing	114	Lighting Control Tuneup	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	DNV KEMA database
Existing	115	Occupancy Sensor, 2L4' Fluorescent Fixtures	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	DNV KEMA database
Existing	116	Continuous Dimming, 2L4' Fluorescent Fixtures	52.00%	52.00%	52.00%	52.00%	52.00%	52.00%	52.00%	52.00%	52.00%	52.00%	52.00%	ACEEE, 2006, Emerging Technologies Report: Integrated Daylighting Systems (Dimming Ballasts)
Existing	117	High Performance Lighting R/R - 25% Savings, Base 2L4'T8	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	By definition
Existing	120	Base Other Fluorescent Fixture	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Existing	121	ROB Premium T8 (base other fluorescent)	17.14%	17.14%	17.14%	17.14%	17.14%	17.14%	17.14%	17.14%	17.14%	17.14%	17.14%	DNV KEMA database
Existing	122	Lighting Control Tuneup	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	KEMA internal estimate
Existing	123	Occupancy Sensor, 4L8' Fluorescent Fixtures	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	KEMA internal estimate
Existing	124	Continuous Dimming, 4L8' Fluorescent Fixtures	52.00%	52.00%	52.00%	52.00%	52.00%	52.00%	52.00%	52.00%	52.00%	52.00%	52.00%	ACEEE, 2006, Emerging Technologies Report: Integrated Daylighting Systems (Dimming Ballasts)
Existing	125	High Performance Lighting R/R - 25% Savings, Base Other Fluorescent	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	By definition
Existing	130	Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacement	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Existing	131	CFL Screw-in 18W	66.04%	66.04%	66.04%	66.04%	66.04%	66.04%	66.04%	66.04%	66.04%	66.04%	66.04%	Based on wattage
Existing	132	Cold Cathode Lamps	66.04%	66.04%	66.04%	66.04%	66.04%	66.04%	66.04%	66.04%	66.04%	66.04%	66.04%	Based on wattage
Existing	133	LED screw-in PAR replacement (base incandescent)	89.50%	89.50%	89.50%	89.50%	89.50%	89.50%	89.50%	89.50%	89.50%	89.50%	89.50%	Assumes 21 lumens/watt for inc, 200 lumens per watt for LED
Existing	140	Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacement	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Existing	141	CFL Hardwired, Modular 18W	66.04%	66.04%	66.04%	66.04%	66.04%	66.04%	66.04%	66.04%	66.04%	66.04%	66.04%	Based on wattage
Existing	142	Cermaic Metal Halide	37.14%	37.14%	37.14%	37.14%	37.14%	37.14%	37.14%	37.14%	37.14%	37.14%	37.14%	ACEEE, 2004, Emerging Technologies & Practices
Existing	143	LED fixture replacement (base incandescent flood)	89.50%	89.50%	89.50%	89.50%	89.50%	89.50%	89.50%	89.50%	89.50%	89.50%	89.50%	Assumes 21 lumens/watt for inc, 200 lumens per watt for LED
Existing	150	Base CFL to screw-in replacement	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Existing	151	LED screw-in replacement (base CFL)	67.50%	67.50%	67.50%	67.50%	67.50%	67.50%	67.50%	67.50%	67.50%	67.50%	67.50%	Assumes 65 lumens/watt for CFL, 200 lumens per watt for LED
Existing	160	Base High Bay Metal Halide, 400W	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Existing	161	High Bay T5	48.57%	48.57%	48.57%	48.57%	48.57%	48.57%	48.57%	48.57%	48.57%	48.57%	48.57%	DEER 2008.2.05 measure SUN-w10-vEx-bCA-eMS-mNE-ILtg-Othr-Prim-Rpl-400wMVMgC455w-46in54wT5HO2PSEI234w
Existing	162	Induction High Bay Lighting	37.36%	37.36%	37.36%	37.36%	37.36%	37.36%	37.36%	37.36%	37.36%	37.36%	37.36%	DNV KEMA database
Existing	163	PSMH + electronic ballast	36.70%	36.70%	36.70%	36.70%	36.70%	36.70%	36.70%	36.70%	36.70%	36.70%	36.70%	DEER 2008.2.05 measure SUN-w10-vEx-bCA-eMS-mNE-ILtg-Othr-Prim-Rtr-1kwInc1000w-350wPSMHMgC400w
Existing	165	Occupancy Sensor, High Bay T5	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	DNV KEMA database
Existing	180	Base Parking Garage Metal Halide, 250 W	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Existing	181	High-efficiency fluorescent parking garage fixture (Base MH)	62.46%	62.46%	62.46%	62.46%	62.46%	62.46%	62.46%	62.46%	62.46%	62.46%	62.46%	DNV KEMA database
Existing	182	Bi-Level LED Parking Garage Fixtures (Base MH)	62.90%	62.90%	62.90%	62.90%	62.90%	62.90%	62.90%	62.90%	62.90%	62.90%	62.90%	DNV KEMA database
Existing	185	Base Fluorescent Parking Garage Lighting	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Existing	186	Parking Garage Low Wattage T8 Lamps replacing 32W lamps	14.81%	14.81%	14.81%	14.81%	14.81%	14.81%	14.81%	14.81%	14.81%	14.81%	14.81%	DNV KEMA database
Existing	187	Bi-Level LED Parking Garage Fixtures (Base Fluorescent)	2.37%	2.37%	2.37%	2.37%	2.37%	2.37%	2.37%	2.37%	2.37%	2.37%	2.37%	Recalculated based on fluorescent and LED savings
Existing	190	Base Exit Sign	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Existing	191	LED Exit Sign	80.77%	80.77%	80.77%	80.77%	80.77%	80.77%	80.77%	80.77%	80.77%	80.77%	80.77%	Assumes 2.5 W LED replaces 13 W sign

Commercial Elec Measure Inputs			ENERGY SAVINGS (percent)											Savings Source
Segment	Measure #	Measure Description	Office	Restau- rant	Retail	Food Store	Ware- house	School	College	Hospital	Lodging	City of Austin	Miscel- laneous	
Existing	200	Base Outdoor High Pressure Sodium 250W Lamp	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	DNV KEMA database Same as LED streetlighting Pacific Gas and Electric, 2009, Application Assessment of Bi-Level LED Parking Lot Lighting, Host Site: Raley's Supermarket, West Sacramento, California. Prepared for the US DOE.
Existing	201	Outdoor Lighting Controls (Photocell/Timeclock)	22.20%	22.20%	22.20%	22.20%	22.20%	22.20%	22.20%	22.20%	22.20%	22.20%	22.20%	
Existing	202	LED Outdoor Area Lighting	51.88%	51.88%	51.88%	51.88%	51.88%	51.88%	51.88%	51.88%	51.88%	51.88%	51.88%	
Existing	203	Bi-Level LED Outdoor Lighting	69.57%	69.57%	69.57%	69.57%	69.57%	69.57%	69.57%	69.57%	69.57%	69.57%	69.57%	
Existing	300	Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	DNV KEMA database Used calculator to estimate savings for large commercial (http://www.vista-films.com/en/commercial-energy-savings-calculator.aspx; uses DOE2 for calculations, which takes into account heating effects); used new value to ratio down previous values, which varied by bldg type.
Existing	301	Centrifugal Chiller, 0.51 kW/ton, 500 tons	12.07%	12.07%	12.07%	12.07%	12.07%	12.07%	12.07%	12.07%	12.07%	12.07%	12.07%	
Existing	302	Window Film (Standard) - Chiller	4.18%	4.66%	1.11%	1.11%	4.18%	1.76%	1.11%	1.11%	3.17%	2.65%	1.11%	
Existing	303	EMS - Chiller	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	
Existing	305	Chiller Tune Up/Diagnostics	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	DNV KEMA database
Existing	306	VSD for Chiller Pumps and Towers	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	Conservative estimate base on DEER
Existing	307	EMS Optimization - Chiller	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	DNV KEMA database
Existing	309	Ceiling/roof Insulation - Chiller	12.10%	12.10%	12.10%	12.10%	12.10%	12.10%	12.10%	12.10%	12.10%	12.10%	12.10%	DNV KEMA database
Existing	310	Duct/Pipe Insulation - Chiller	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	DNV KEMA database
Existing	311	High Efficiency Chiller Motors	3.16%	3.16%	3.16%	3.16%	3.16%	3.16%	3.16%	3.16%	3.16%	3.16%	3.16%	DNV KEMA database
Existing	320	Base DX Packaged System, EER=10.3, 10 tons	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	DNV KEMA database ACEEE, 2009, Emerging Energy-Saving Technologies and Practices for the Buildings Sector (2009) Calculated based on EERs ACEEE, 2004, Emerging Energy-Saving Technologies and Practices for the Buildings Sector as of 2004 Used calculator to estimate savings for large commercial (http://www.vista-films.com/en/commercial-energy-savings-calculator.aspx; uses DOE2 for calculations, which takes into account heating effects); used new value to ratio down previous values, which varied by bldg type.
Existing	321	DX Tune Up/ Advanced Diagnostics	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	
Existing	322	DX Packaged System, EER=10.3, 10 tons, with Automated Fault Detection and Diagnostics	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	
Existing	323	DX Packaged System, EER=10.9, 10 tons	5.50%	5.50%	5.50%	5.50%	5.50%	5.50%	5.50%	5.50%	5.50%	5.50%	5.50%	
Existing	324	DX Packaged System, EER=13.4, 10 tons	23.00%	23.00%	23.00%	23.00%	23.00%	23.00%	23.00%	23.00%	23.00%	23.00%	23.00%	Used calculator to estimate savings for large commercial (http://www.vista-films.com/en/commercial-energy-savings-calculator.aspx; uses DOE2 for calculations, which takes into account heating effects); used new value to ratio down previous values, which varied by bldg type.
Existing	325	Window Film (Standard) - DX	4.18%	4.66%	1.11%	1.11%	4.18%	1.76%	1.11%	1.11%	3.17%	2.65%	1.11%	
Existing	326	Prog. Thermostat - DX	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	DNV KEMA database
Existing	330	Optimize Controls - DX	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	DNV KEMA database
Existing	331	Economizer - DX	21.00%	8.00%	17.00%	1.00%	0.00%	10.00%	10.00%	10.00%	8.00%	14.50%	8.00%	DEER 2005
Existing	332	Aerosol Duct Sealing - DX	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	DEER 2005
Existing	333	Ceiling/roof Insulation - DX	12.10%	12.10%	12.10%	12.10%	12.10%	12.10%	12.10%	12.10%	12.10%	12.10%	12.10%	DNV KEMA database
Existing	334	Duct/Pipe Insulation - DX	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	DNV KEMA database
Existing	335	DX Coil Cleaning	4.85%	4.85%	4.85%	4.85%	4.85%	4.85%	4.85%	4.85%	4.85%	4.85%	4.85%	DNV KEMA database
Existing	337	Geothermal Heat Pump, EER=13, 10 tons - DX	37.00%	37.00%	37.00%	37.00%	37.00%	37.00%	37.00%	37.00%	37.00%	37.00%	37.00%	DNV KEMA database
Existing	340	Base PTAC, EER=8.3, 1 ton	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	DNV KEMA database DNV KEMA database
Existing	341	HE PTAC, EER=9.6, 1 ton	13.54%	13.54%	13.54%	13.54%	13.54%	13.54%	13.54%	13.54%	13.54%	13.54%	13.54%	
Existing	342	Hotel Room Controllers	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	
Existing	400	Base Fan Motor, 5hp, 1800rpm, 87.5%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Existing	401	Fan Motor, 5hp, 1800rpm, 89.5%	2.23%	2.23%	2.23%	2.23%	2.23%	2.23%	2.23%	2.23%	2.23%	2.23%	2.23%	DNV KEMA database
Existing	402	Variable Speed Drive Control, 5 HP	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	DNV KEMA database
Existing	410	Base Fan Motor, 15hp, 1800rpm, 91.0%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	DNV KEMA database DNV KEMA database DNV KEMA database DNV KEMA database DNV KEMA database
Existing	411	Fan Motor, 15hp, 1800rpm, 92.4%	1.52%	1.52%	1.52%	1.52%	1.52%	1.52%	1.52%	1.52%	1.52%	1.52%	1.52%	
Existing	412	Variable Speed Drive Control, 15 HP	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	
Existing	413	Electronically Commutated Motors (ECM) on an Air Handler Unit	14.47%	14.47%	14.47%	14.47%	14.47%	14.47%	14.47%	14.47%	14.47%	14.47%	14.47%	
Existing	414	Energy Recovery Ventilation (ERV)	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	DNV KEMA database
Existing	415	Separate Makeup Air / Exhaust Hoods AC	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	DNV KEMA database
Existing	420	Base Fan Motor, 40hp, 1800rpm, 93.0%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	DNV KEMA database
Existing	421	Fan Motor, 40hp, 1800rpm, 94.1%	1.17%	1.17%	1.17%	1.17%	1.17%	1.17%	1.17%	1.17%	1.17%	1.17%	1.17%	

Commercial Elec Measure Inputs			ENERGY SAVINGS (percent)											Savings Source
Segment	Measure #	Measure Description	Office	Restau- rant	Retail	Food Store	Ware- house	School	College	Hospital	Lodging	City of Austin	Miscel- laneous	
Existing	422	Variable Speed Drive Control, 40 HP	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	DNV KEMA database
Existing	423	Air Handler Tuneups	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	DNV KEMA database
Existing	424	Demand Controlled Ventilation	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%	DNV KEMA database
Existing	500	Base Built-Up Refrigeration System	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Existing	501	High-efficiency fan motors	11.98%	11.98%	11.98%	11.98%	11.98%	11.98%	11.98%	11.98%	11.98%	11.98%	11.98%	DNV KEMA database
Existing	502	Strip curtains for walk-ins	4.02%	4.02%	4.02%	4.02%	4.02%	4.02%	4.02%	4.02%	4.02%	4.02%	4.02%	DNV KEMA database
Existing	503	Night covers for display cases (built-up systems)	5.80%	5.80%	5.80%	5.80%	5.80%	5.80%	5.80%	5.80%	5.80%	5.80%	5.80%	DNV KEMA database
Existing	504	Efficient compressor motor retrofit	6.83%	6.83%	6.83%	6.83%	6.83%	6.83%	6.83%	6.83%	6.83%	6.83%	6.83%	DNV KEMA database
Existing	505	Compressor VSD retrofit	6.20%	6.20%	6.20%	6.20%	6.20%	6.20%	6.20%	6.20%	6.20%	6.20%	6.20%	DNV KEMA database
Existing	506	Floating head pressure controls	6.83%	6.83%	6.83%	6.83%	6.83%	6.83%	6.83%	6.83%	6.83%	6.83%	6.83%	DNV KEMA database
Existing	507	Refrigeration Commissioning	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	DNV KEMA database
Existing	508	Demand Hot Gas Defrost	2.51%	2.51%	2.51%	2.51%	2.51%	2.51%	2.51%	2.51%	2.51%	2.51%	2.51%	DNV KEMA database
Existing	509	Demand Defrost Electric	7.76%	7.76%	7.76%	7.76%	7.76%	7.76%	7.76%	7.76%	7.76%	7.76%	7.76%	DNV KEMA database
Existing	510	Anti-sweat (humidistat) controls	4.99%	4.99%	4.99%	4.99%	4.99%	4.99%	4.99%	4.99%	4.99%	4.99%	4.99%	DNV KEMA database
Existing	511	Freezer-Cooler Replacement Gaskets (built-up systems)	6.60%	6.60%	6.60%	6.60%	6.60%	6.60%	6.60%	6.60%	6.60%	6.60%	6.60%	DNV KEMA database
Existing	512	High R-Value Glass Doors	1.63%	1.63%	1.63%	1.63%	1.63%	1.63%	1.63%	1.63%	1.63%	1.63%	1.63%	DNV KEMA database
Existing	513	Bi-level LED Case Lighting (built-up systems)	0.83%	0.83%	0.83%	0.83%	0.83%	0.83%	0.83%	0.83%	0.83%	0.83%	0.83%	DNV KEMA database
Existing	514	Fiber Optic Case Lighting (built-up systems)	24.50%	24.50%	24.50%	24.50%	24.50%	24.50%	24.50%	24.50%	24.50%	24.50%	24.50%	DNV KEMA database
Existing	516	Multiplex Compressor System	14.26%	14.26%	14.26%	14.26%	14.26%	14.26%	14.26%	14.26%	14.26%	14.26%	14.26%	DNV KEMA database
Existing	517	Oversized Air Cooled Condenser	8.08%	8.08%	8.08%	8.08%	8.08%	8.08%	8.08%	8.08%	8.08%	8.08%	8.08%	DNV KEMA database
Existing	520	Base Self-Contained Refrigeration	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Existing	521	Strip curtains for walk-ins	0.39%	0.65%	0.51%	1.63%	4.02%	0.74%	0.00%	0.00%	1.19%	0.19%	0.00%	DNV KEMA database
Existing	522	Night covers for display cases (self-contained)	1.06%	1.17%	0.60%	0.03%	0.00%	0.95%	2.14%	1.83%	0.62%	1.51%	1.95%	DNV KEMA database
Existing	523	Freezer-Cooler Replacement Gaskets (self-contained)	3.60%	2.76%	4.21%	2.61%	0.00%	2.97%	2.44%	3.06%	2.54%	3.21%	2.81%	DNV KEMA database
Existing	524	Bi-level LED Case Lighting (self-contained units)	0.83%	0.83%	0.83%	0.83%	0.83%	0.83%	0.83%	0.83%	0.83%	0.83%	0.83%	DNV KEMA database
Existing	526	Energy-Star Refrigerator, solid door	3.09%	3.41%	1.76%	0.08%	0.00%	2.76%	6.23%	5.31%	1.79%	4.39%	5.68%	Energy Star Calculator, http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CRF
Existing	527	Energy-Star Freezer, solid door	0.82%	1.38%	1.07%	3.45%	0.00%	1.57%	0.00%	0.00%	2.51%	0.41%	0.00%	Energy Star Calculator, http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CRF
Existing	528	Energy-Star Refrigerator, glass door	6.81%	1.58%	10.39%	0.20%	0.00%	2.83%	0.00%	3.73%	0.00%	4.52%	2.22%	Energy Star Calculator, http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CRF
Existing	529	Energy-Star Freezer, glass door	2.00%	3.35%	2.61%	8.40%	0.00%	3.82%	0.00%	0.00%	6.12%	1.00%	0.00%	Energy Star Calculator, http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CRF
Existing	530	Energy Star Ice Machines	2.19%	2.41%	1.24%	0.06%	0.00%	1.95%	4.41%	3.75%	1.27%	3.10%	4.02%	Energy Star Calculator, http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CRF
Existing	600	Base Desktop PC	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Existing	601	PC Manual Power Management Enabling	68.00%	68.00%	68.00%	68.00%	68.00%	68.00%	68.00%	68.00%	68.00%	68.00%	68.00%	Energy Star calculator, assuming 100% enabling
Existing	602	PC Network Power Management Enabling	68.00%	68.00%	68.00%	68.00%	68.00%	68.00%	68.00%	68.00%	68.00%	68.00%	68.00%	Energy Star calculator, assuming 100% enabling
Existing	603	Energy Star or Better PC	33.00%	33.00%	33.00%	33.00%	33.00%	33.00%	33.00%	33.00%	33.00%	33.00%	33.00%	DNV KEMA database
Existing	610	Base Monitor, CRT	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Existing	611	Energy Star or Better Monitor-CRT	56.14%	56.14%	56.14%	56.14%	56.14%	56.14%	56.14%	56.14%	56.14%	56.14%	56.14%	Energy Star calculator, assuming not PM-enabled,
Existing	612	Monitor Power Management Enabling--CRT	53.38%	53.38%	53.38%	53.38%	53.38%	53.38%	53.38%	53.38%	53.38%	53.38%	53.38%	Energy Star calculator, assuming 100% enabling,
Existing	620	Base Monitor, LCD	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Existing	621	Energy Star or Better Monitor--LCD	56.14%	56.14%	56.14%	56.14%	56.14%	56.14%	56.14%	56.14%	56.14%	56.14%	56.14%	Energy Star calculator, assuming not PM-enabled,
Existing	622	Monitor Power Management Enabling--LCD	56.14%	56.14%	56.14%	56.14%	56.14%	56.14%	56.14%	56.14%	56.14%	56.14%	56.14%	Energy Star calculator, assuming not PM-enabled,
Existing	630	Base Copier	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Existing	631	Energy Star or Better Copier	20.51%	20.51%	20.51%	20.51%	20.51%	20.51%	20.51%	20.51%	20.51%	20.51%	20.51%	Energy Star calculator, assuming not PM-enabled,
Existing	632	Copier Power Management Enabling	19.42%	19.42%	19.42%	19.42%	19.42%	19.42%	19.42%	19.42%	19.42%	19.42%	19.42%	Energy Star calculator, assuming 100% enabling,
Existing	640	Base Laser Printer	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Existing	641	Printer Power Management Enabling	49.18%	49.18%	49.18%	49.18%	49.18%	49.18%	49.18%	49.18%	49.18%	49.18%	49.18%	Energy Star calculator, assuming 100% enabling
Existing	650	Base Data Center/Server Room	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Existing	651	Data Center Improved Operations	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	US EPA, 2007, Report to Congress on Server and Data
Existing	652	Data Center Best Practices	45.00%	45.00%	45.00%	45.00%	45.00%	45.00%	45.00%	45.00%	45.00%	45.00%	45.00%	US EPA, 2007, Report to Congress on Server and Data
Existing	653	Data Center State of the Art practices	56.00%	56.00%	56.00%	56.00%	56.00%	56.00%	56.00%	56.00%	56.00%	56.00%	56.00%	US EPA, 2007, Report to Congress on Server and Data

Commercial Elec Measure Inputs			ENERGY SAVINGS (percent)											Savings Source
Segment	Measure #	Measure Description	Office	Restau- rant	Retail	Food Store	Ware- house	School	College	Hospital	Lodging	City of Austin	Miscel- laneous	
Existing	660	Base Water Heating	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Existing	661	Demand controlled circulating systems	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	DNV KEMA database
Existing	662	High Efficiency Water Heater (electric)	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	DNV KEMA database
Existing	663	Hot Water Pipe Insulation	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	DNV KEMA database
Existing	664	Tankless Water Heater	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	DNV KEMA database
Existing	665	Heat Pump Water Heater (air source)	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	DNV KEMA database
Existing	666	Heat Recovery Unit	65.00%	65.00%	65.00%	65.00%	65.00%	65.00%	65.00%	65.00%	65.00%	65.00%	65.00%	DNV KEMA database
Existing	667	Heat Trap	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%	DNV KEMA database
Existing	668	Solar Water Heater	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	DNV KEMA database
Existing	670	Base Vending Machines	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Existing	671	Vending Misers	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	DNV KEMA database
Existing	700	Base Cooking	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Existing	701	Convection Oven	0.00%	0.26%	3.44%	0.75%	0.26%	4.73%	0.26%	0.00%	4.75%	0.32%	0.64%	% savings from Food Service Tech Center
Existing	702	Efficient Fryer	3.70%	4.57%	0.00%	4.13%	4.57%	0.00%	4.57%	0.00%	0.00%	3.62%	3.55%	% savings from Food Service Tech Center
Existing	703	Efficient Steamer	30.86%	21.42%	0.00%	21.55%	21.42%	0.00%	21.42%	72.94%	0.00%	30.22%	29.57%	% savings from Food Service Tech Center
Existing	704	Energy Star Hot Food Holding Cabinets	3.59%	0.38%	13.89%	0.62%	0.00%	14.22%	0.00%	0.00%	13.13%	1.79%	0.00%	% savings from Food Service Tech Center
Existing	800	Base Heating	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Existing	900	Base Miscellaneous	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
New	100	Base Bldg Design - 15%												
New	102	High Performance Building/Int Design - Tier 1 15% - Office	15.00%											By definition
New	103	High Performance Building/Int Design - Tier 1 15% - Restaurant		15.00%										By definition
New	105	High Performance Building/Int Design - Tier 1 15% - Retail			15.00%									By definition
New	106	High Performance Building/Int Design - Tier 1 15% - Grocery				15.00%								By definition
New	107	High Performance Building/Int Design - Tier 1 15% - Warehouse					15.00%							By definition
New	108	High Performance Building/Int Design - Tier 1 15% - School						15.00%						By definition
New	109	High Performance Building/Int Design - Tier 1 15% - College							15.00%					By definition
New	110	High Performance Building/Int Design - Tier 1 15% - Health								15.00%				By definition
New	111	High Performance Building/Int Design - Tier 1 15% - Lodging									15.00%			By definition
New	112	High Performance Building/Int Design - Tier 1 15% - City of Austin										15.00%		By definition
New	113	High Performance Building/Int Design - Tier 1 15% - Miscellaneous											15.00%	By definition
New	200	Base Bldg Design - 30%												
New	202	High Performance Building/Int Design - Tier 2 30% - Office	30.00%											By definition
New	203	High Performance Building/Int Design - Tier 2 30% - Restaurant		30.00%										By definition
New	205	High Performance Building/Int Design - Tier 2 30% - Retail			30.00%									By definition
New	206	High Performance Building/Int Design - Tier 2 30% - Grocery				30.00%								By definition
New	207	High Performance Building/Int Design - Tier 2 30% - Warehouse					30.00%							By definition
New	208	High Performance Building/Int Design - Tier 2 30% - School						30.00%						By definition
New	209	High Performance Building/Int Design - Tier 2 30% - College							30.00%					By definition
New	210	High Performance Building/Int Design - Tier 2 30% - Health								30.00%				By definition
New	211	High Performance Building/Int Design - Tier 2 30% - Lodging									30.00%			By definition
New	212	High Performance Building/Int Design - Tier 2 30% - City of Austin										30.00%		By definition
New	213	High Performance Building/Int Design - Tier 2 30% - Miscellaneous											30.00%	By definition
New	300	Base Bldg Design - 50%												
New	302	High Performance Building/Int Design - Tier 3 50% - Office	50.00%											By definition
New	303	High Performance Building/Int Design - Tier 3 50% - Restaurant		50.00%										By definition
New	305	High Performance Building/Int Design - Tier 3 50% - Retail			50.00%									By definition
New	306	High Performance Building/Int Design - Tier 3 50% - Grocery				50.00%								By definition
New	307	High Performance Building/Int Design - Tier 3 50% - Warehouse					50.00%							By definition
New	308	High Performance Building/Int Design - Tier 3 50% - School						50.00%						By definition
New	309	High Performance Building/Int Design - Tier 3 50% - College							50.00%					By definition
New	310	High Performance Building/Int Design - Tier 3 50% - Health								50.00%				By definition
New	311	High Performance Building/Int Design - Tier 3 50% - Lodging									50.00%			By definition
New	312	High Performance Building/Int Design - Tier 3 50% - City of Austin										50.00%		By definition
New	313	High Performance Building/Int Design - Tier 3 50% - Miscellaneous											50.00%	By definition
New	400	Base Bldg Design - 70%												
New	402	High Performance Building/Int Design - Tier 4 Near Zero Energy	70.00%											By definition
New	403	High Performance Building/Int Design - Tier 4 Near Zero Energy		70.00%										By definition
New	405	High Performance Building/Int Design - Tier 4 Near Zero Energy			70.00%									By definition
New	406	High Performance Building/Int Design - Tier 4 Near Zero Energy				70.00%								By definition
New	407	High Performance Building/Int Design - Tier 4 Near Zero Energy					70.00%							By definition
New	408	High Performance Building/Int Design - Tier 4 Near Zero Energy						70.00%						By definition

Commercial Elec Measure Inputs			ENERGY SAVINGS (percent)											Savings Source
Segment	Measure #	Measure Description	Office	Restau- rant	Retail	Food Store	Ware- house	School	College	Hospital	Lodging	City of Austin	Miscel- laneous	
New	409	High Performance Building/Int Design - Tier 4 Near Zero Energy							70.00%					By definition
New	410	High Performance Building/Int Design - Tier 4 Near Zero Energy								70.00%				By definition
New	411	High Performance Building/Int Design - Tier 4 Near Zero Energy									70.00%			By definition
New	412	High Performance Building/Int Design - Tier 4 Near Zero Energy										70.00%		By definition
New	413	High Performance Building/Int Design - Tier 4 Near Zero Energy											70.00%	By definition
New	500	Base 2015 Commercial Code Building--29% savings												
New	502	High Performance Building/Int Design - Tier 1 29% - Office	29.00%											Incremental savings from code to prev 50% level
New	503	High Performance Building/Int Design - Tier 1 29% - Restaurant		29.00%										Incremental savings from code to prev 50% level
New	505	High Performance Building/Int Design - Tier 1 29% - Retail			29.00%									Incremental savings from code to prev 50% level
New	506	High Performance Building/Int Design - Tier 1 29% - Grocery				29.00%								Incremental savings from code to prev 50% level
New	507	High Performance Building/Int Design - Tier 1 29% - Warehouse					29.00%							Incremental savings from code to prev 50% level
New	508	High Performance Building/Int Design - Tier 1 29% - School						29.00%						Incremental savings from code to prev 50% level
New	509	High Performance Building/Int Design - Tier 1 29% - College							29.00%					Incremental savings from code to prev 50% level
New	510	High Performance Building/Int Design - Tier 1 29% - Health								29.00%				Incremental savings from code to prev 50% level
New	511	High Performance Building/Int Design - Tier 1 29% - Lodging									29.00%			Incremental savings from code to prev 50% level
New	512	High Performance Building/Int Design - Tier 1 29% - City of Austin										29.00%		Incremental savings from code to prev 50% level
New	513	High Performance Building/Int Design - Tier 1 29% - Miscellaneous											29.00%	Incremental savings from code to prev 50% level
New	600	Base 2015 Commercial Code Building--57% savings												
New	602	High Performance Building/Int Design - Tier 2 57% - Office	57.00%											Incremental savings from code to prev 70% level
New	603	High Performance Building/Int Design - Tier 2 57% - Restaurant		57.00%										Incremental savings from code to prev 70% level
New	605	High Performance Building/Int Design - Tier 2 57% - Retail			57.00%									Incremental savings from code to prev 70% level
New	606	High Performance Building/Int Design - Tier 2 57% - Grocery				57.00%								Incremental savings from code to prev 70% level
New	607	High Performance Building/Int Design - Tier 2 57% - Warehouse					57.00%							Incremental savings from code to prev 70% level
New	608	High Performance Building/Int Design - Tier 2 57% - School						57.00%						Incremental savings from code to prev 70% level
New	609	High Performance Building/Int Design - Tier 2 57% - College							57.00%					Incremental savings from code to prev 70% level
New	610	High Performance Building/Int Design - Tier 2 57% - Health								57.00%				Incremental savings from code to prev 70% level
New	611	High Performance Building/Int Design - Tier 2 57% - Lodging									57.00%			Incremental savings from code to prev 70% level
New	612	High Performance Building/Int Design - Tier 2 57% - City of Austin										57.00%		Incremental savings from code to prev 70% level
New	613	High Performance Building/Int Design - Tier 2 57% - Miscellaneous											57.00%	Incremental savings from code to prev 70% level

Commercial Elec Measure Inputs			Standards Adjustment Factor (percent)										
Segment	Measure #	Measure Description	Office	Restau- rant	Retail	Food Store	Ware- house	School	College	Hospital	Lodging	City of Austin	Miscel- laneous
Existing	100	Base Fluorescent Fixture, 4L4'T8	94.81%	91.21%	92.17%	100.04%	90.23%	99.60%	97.27%	99.91%	100.00%	95.38%	95.95%
Existing	101	ROB 4L4' Premium T8	94.81%	91.21%	92.17%	100.04%	90.23%	99.60%	97.27%	99.91%	100.00%	95.38%	95.95%
Existing	102	Delamping 3L4' F32T8	94.81%	91.21%	92.17%	100.04%	90.23%	99.60%	97.27%	99.91%	100.00%	95.38%	95.95%
Existing	103	LED Troffer (Base 4L4'T8)	94.81%	91.21%	92.17%	100.04%	90.23%	99.60%	97.27%	99.91%	100.00%	95.38%	95.95%
Existing	104	Lighting Control Tuneup	94.81%	91.21%	92.17%	100.04%	90.23%	99.60%	97.27%	99.91%	100.00%	95.38%	95.95%
Existing	105	Occupancy Sensor, 4L4' Fluorescent Fixtures	94.81%	91.21%	92.17%	100.04%	90.23%	99.60%	97.27%	99.91%	100.00%	95.38%	95.95%
Existing	106	Continuous Dimming, 4L4' Fluorescent Fixtures	94.81%	91.21%	92.17%	100.04%	90.23%	99.60%	97.27%	99.91%	100.00%	95.38%	95.95%
Existing	107	High Performance Lighting R/R - 25% Savings, Base 4L4'T8	94.81%	91.21%	92.17%	100.04%	90.23%	99.60%	97.27%	99.91%	100.00%	95.38%	95.95%
Existing	110	Base Fluorescent Fixture, 2L4'T8, 1 EB	95.88%	97.99%	92.38%	100.51%	93.22%	99.90%	101.01%	98.48%	98.42%	97.26%	98.64%
Existing	111	ROB 2L4' Premium T8	95.88%	97.99%	92.38%	100.51%	93.22%	99.90%	101.01%	98.48%	98.42%	97.26%	98.64%
Existing	112	Delamping 1L4' F32T8	95.88%	97.99%	92.38%	100.51%	93.22%	99.90%	101.01%	98.48%	98.42%	97.26%	98.64%
Existing	113	LED Troffer (Base 2L4'T8)	95.88%	97.99%	92.38%	100.51%	93.22%	99.90%	101.01%	98.48%	98.42%	97.26%	98.64%
Existing	114	Lighting Control Tuneup	95.88%	97.99%	92.38%	100.51%	93.22%	99.90%	101.01%	98.48%	98.42%	97.26%	98.64%
Existing	115	Occupancy Sensor, 2L4' Fluorescent Fixtures	95.88%	97.99%	92.38%	100.51%	93.22%	99.90%	101.01%	98.48%	98.42%	97.26%	98.64%
Existing	116	Continuous Dimming, 2L4' Fluorescent Fixtures	95.88%	97.99%	92.38%	100.51%	93.22%	99.90%	101.01%	98.48%	98.42%	97.26%	98.64%
Existing	117	High Performance Lighting R/R - 25% Savings, Base 2L4'T8	95.88%	97.99%	92.38%	100.51%	93.22%	99.90%	101.01%	98.48%	98.42%	97.26%	98.64%
Existing	120	Base Other Fluorescent Fixture	97.39%	100.00%	100.00%	100.00%	100.00%	97.14%	118.82%	100.00%	100.00%	98.69%	100.00%
Existing	121	ROB Premium T8 (base other fluorescent)	97.39%	100.00%	100.00%	100.00%	100.00%	97.14%	118.82%	100.00%	100.00%	98.69%	100.00%
Existing	122	Lighting Control Tuneup	97.39%	100.00%	100.00%	100.00%	100.00%	97.14%	118.82%	100.00%	100.00%	98.69%	100.00%
Existing	123	Occupancy Sensor, 4L8' Fluorescent Fixtures	97.39%	100.00%	100.00%	100.00%	100.00%	97.14%	118.82%	100.00%	100.00%	98.69%	100.00%
Existing	124	Continuous Dimming, 4L8' Fluorescent Fixtures	97.39%	100.00%	100.00%	100.00%	100.00%	97.14%	118.82%	100.00%	100.00%	98.69%	100.00%
Existing	125	High Performance Lighting R/R - 25% Savings, Base Other Fluorescent	97.39%	100.00%	100.00%	100.00%	100.00%	97.14%	118.82%	100.00%	100.00%	98.69%	100.00%
Existing	130	Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacement	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%
Existing	131	CFL Screw-in 18W	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%
Existing	132	Cold Cathode Lamps	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%
Existing	133	LED screw-in PAR replacement (base incandescent)	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%
Existing	140	Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacement	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%
Existing	141	CFL Hardwired, Modular 18W	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%
Existing	142	Ceramic Metal Halide	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%
Existing	143	LED fixture replacement (base incandescent flood)	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%
Existing	150	Base CFL to screw-in replacement	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	151	LED screw-in replacement (base CFL)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	160	Base High Bay Metal Halide, 400W	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	161	High Bay T5	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	162	Induction High Bay Lighting	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	163	PSMH + electronic ballast	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	165	Occupancy Sensor, High Bay T5	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	180	Base Parking Garage Metal Halide, 250 W	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	181	High-efficiency fluorescent parking garage fixture (Base MH)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	182	Bi-Level LED Parking Garage Fixtures (Base MH)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	185	Base Fluorescent Parking Garage Lighting	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	186	Parking Garage Low Wattage T8 Lamps replacing 32W lamps	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	187	Bi-Level LED Parking Garage Fixtures (Base Fluorescent)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	190	Base Exit Sign	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	191	LED Exit Sign	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	200	Base Outdoor High Pressure Sodium 250W Lamp	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	201	Outdoor Lighting Controls (Photocell/Timeclock)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	202	LED Outdoor Area Lighting	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	203	Bi-Level LED Outdoor Lighting	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	300	Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	301	Centrifugal Chiller, 0.51 kW/ton, 500 tons	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	302	Window Film (Standard) - Chiller	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Commercial Elec Measure Inputs			Standards Adjustment Factor (percent)										
Segment	Measure #	Measure Description	Office	Restau- rant	Retail	Food Store	Ware- house	School	College	Hospital	Lodging	City of Austin	Miscel- laneous
Existing	303	EMS - Chiller	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	305	Chiller Tune Up/Diagnostics	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	306	VSD for Chiller Pumps and Towers	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	307	EMS Optimization - Chiller	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	309	Ceiling/roof Insulation - Chiller	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	310	Duct/Pipe Insulation - Chiller	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	311	High Efficiency Chiller Motors	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	320	Base DX Packaged System, EER=10.3, 10 tons	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	321	DX Tune Up/ Advanced Diagnostics	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	322	DX Packaged System, EER=10.3, 10 tons, with Automated Fault Detection and Diagnostics	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	323	DX Packaged System, EER=10.9, 10 tons	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	324	DX Packaged System, EER=13.4, 10 tons	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	325	Window Film (Standard) - DX	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	326	Prog. Thermostat - DX	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	330	Optimize Controls - DX	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	331	Economizer - DX	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	332	Aerosol Duct Sealing - DX	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	333	Ceiling/roof Insulation - DX	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	334	Duct/Pipe Insulation - DX	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	335	DX Coil Cleaning	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	337	Geothermal Heat Pump, EER=13, 10 tons - DX	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	340	Base PTAC, EER=8.3, 1 ton	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	341	HE PTAC, EER=9.6, 1 ton	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	342	Hotel Room Controllers	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	400	Base Fan Motor, 5hp, 1800rpm, 87.5%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	401	Fan Motor, 5hp, 1800rpm, 89.5%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	402	Variable Speed Drive Control, 5 HP	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	410	Base Fan Motor, 15hp, 1800rpm, 91.0%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	411	Fan Motor, 15hp, 1800rpm, 92.4%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	412	Variable Speed Drive Control, 15 HP	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	413	Electronically Commutated Motors (ECM) on an Air Handler Unit	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	414	Energy Recovery Ventilation (ERV)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	415	Separate Makeup Air / Exhaust Hoods AC	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	420	Base Fan Motor, 40hp, 1800rpm, 93.0%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	421	Fan Motor, 40hp, 1800rpm, 94.1%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	422	Variable Speed Drive Control, 40 HP	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	423	Air Handler Tuneups	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	424	Demand Controlled Ventilation	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	500	Base Built-Up Refrigeration System	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	501	High-efficiency fan motors	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	502	Strip curtains for walk-ins	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	503	Night covers for display cases (built-up systems)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	504	Efficient compressor motor retrofit	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	505	Compressor VSD retrofit	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	506	Floating head pressure controls	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	507	Refrigeration Commissioning	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	508	Demand Hot Gas Defrost	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	509	Demand Defrost Electric	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	510	Anti-sweat (humidistat) controls	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	511	Freezer-Cooler Replacement Gaskets (built-up systems)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	512	High R-Value Glass Doors	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	513	Bi-level LED Case Lighting (built-up systems)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Commercial Elec Measure Inputs			Standards Adjustment Factor (percent)										
Segment	Measure #	Measure Description	Office	Restau- rant	Retail	Food Store	Ware- house	School	College	Hospital	Lodging	City of Austin	Miscel- laneous
Existing	514	Fiber Optic Case Lighting (built-up systems)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	516	Multiplex Compressor System	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	517	Oversized Air Cooled Condenser	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	520	Base Self-Contained Refrigeration	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	521	Strip curtains for walk-ins	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	522	Night covers for display cases (self-contained)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	523	Freezer-Cooler Replacement Gaskets (self-contained)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	524	Bi-level LED Case Lighting (self-contained units)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	526	Energy-Star Refrigerator, solid door	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	527	Energy-Star Freezer, solid door	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	528	Energy-Star Refrigerator, glass door	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	529	Energy-Star Freezer, glass door	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	530	Energy Star Ice Machines	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	600	Base Desktop PC	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	601	PC Manual Power Management Enabling	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	602	PC Network Power Management Enabling	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	603	Energy Star or Better PC	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	610	Base Monitor, CRT	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	611	Energy Star or Better Monitor-CRT	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	612	Monitor Power Management Enabling--CRT	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	620	Base Monitor, LCD	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	621	Energy Star or Better Monitor--LCD	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	622	Monitor Power Management Enabling--LCD	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	630	Base Copier	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	631	Energy Star or Better Copier	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	632	Copier Power Management Enabling	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	640	Base Laser Printer	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	641	Printer Power Management Enabling	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	650	Base Data Center/Server Room	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	651	Data Center Improved Operations	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	652	Data Center Best Practices	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	653	Data Center State of the Art practices	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	660	Base Water Heating	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	661	Demand controlled circulating systems	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	662	High Efficiency Water Heater (electric)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	663	Hot Water Pipe Insulation	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	664	Tankless Water Heater	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	665	Heat Pump Water Heater (air source)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	666	Heat Recovery Unit	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	667	Heat Trap	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	668	Solar Water Heater	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	670	Base Vending Machines	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	671	Vending Misers	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	700	Base Cooking	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	701	Convection Oven	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	702	Efficient Fryer	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	703	Efficient Steamer	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	704	Energy Star Hot Food Holding Cabinets	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	800	Base Heating	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Existing	900	Base Miscellaneous	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
New	100	Base Bldg Design - 15%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
New	102	High Performance Building/Int Design - Tier 1 15% - Office	100.00%										

Commercial Elec Measure Inputs			Standards Adjustment Factor (percent)										
Segment	Measure #	Measure Description	Office	Restau- rant	Retail	Food Store	Ware- house	School	College	Hospital	Lodging	City of Austin	Miscel- laneous
New	103	High Performance Building/Int Design - Tier 1 15% - Restaurant		100.00%									
New	105	High Performance Building/Int Design - Tier 1 15% - Retail			100.00%								
New	106	High Performance Building/Int Design - Tier 1 15% - Grocery				100.00%							
New	107	High Performance Building/Int Design - Tier 1 15% - Warehouse					100.00%						
New	108	High Performance Building/Int Design - Tier 1 15% - School						100.00%					
New	109	High Performance Building/Int Design - Tier 1 15% - College							100.00%				
New	110	High Performance Building/Int Design - Tier 1 15% - Health								100.00%			
New	111	High Performance Building/Int Design - Tier 1 15% - Lodging									100.00%		
New	112	High Performance Building/Int Design - Tier 1 15% - City of Austin										100.00%	
New	113	High Performance Building/Int Design - Tier 1 15% - Miscellaneous											100.00%
New	200	Base Bldg Design - 30%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
New	202	High Performance Building/Int Design - Tier 2 30% - Office	100.00%										
New	203	High Performance Building/Int Design - Tier 2 30% - Restaurant		100.00%									
New	205	High Performance Building/Int Design - Tier 2 30% - Retail			100.00%								
New	206	High Performance Building/Int Design - Tier 2 30% - Grocery				100.00%							
New	207	High Performance Building/Int Design - Tier 2 30% - Warehouse					100.00%						
New	208	High Performance Building/Int Design - Tier 2 30% - School						100.00%					
New	209	High Performance Building/Int Design - Tier 2 30% - College							100.00%				
New	210	High Performance Building/Int Design - Tier 2 30% - Health								100.00%			
New	211	High Performance Building/Int Design - Tier 2 30% - Lodging									100.00%		
New	212	High Performance Building/Int Design - Tier 2 30% - City of Austin										100.00%	
New	213	High Performance Building/Int Design - Tier 2 30% - Miscellaneous											100.00%
New	300	Base Bldg Design - 50%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
New	302	High Performance Building/Int Design - Tier 3 50% - Office	100.00%										
New	303	High Performance Building/Int Design - Tier 3 50% - Restaurant		100.00%									
New	305	High Performance Building/Int Design - Tier 3 50% - Retail			100.00%								
New	306	High Performance Building/Int Design - Tier 3 50% - Grocery				100.00%							
New	307	High Performance Building/Int Design - Tier 3 50% - Warehouse					100.00%						
New	308	High Performance Building/Int Design - Tier 3 50% - School						100.00%					
New	309	High Performance Building/Int Design - Tier 3 50% - College							100.00%				
New	310	High Performance Building/Int Design - Tier 3 50% - Health								100.00%			
New	311	High Performance Building/Int Design - Tier 3 50% - Lodging									100.00%		
New	312	High Performance Building/Int Design - Tier 3 50% - City of Austin										100.00%	
New	313	High Performance Building/Int Design - Tier 3 50% - Miscellaneous											100.00%
New	400	Base Bldg Design - 70%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
New	402	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Office	100.00%										
New	403	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Restaurant		100.00%									
New	405	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Retail			100.00%								
New	406	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Grocery				100.00%							
New	407	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Warehouse					100.00%						
New	408	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - School						100.00%					
New	409	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - College							100.00%				
New	410	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Health								100.00%			
New	411	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Lodging									100.00%		
New	412	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - City of Austin										100.00%	
New	413	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Miscellaneous											100.00%
New	500	Base 2015 Commercial Code Building--29% savings	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
New	502	High Performance Building/Int Design - Tier 1 29% - Office	100.00%										
New	503	High Performance Building/Int Design - Tier 1 29% - Restaurant		100.00%									
New	505	High Performance Building/Int Design - Tier 1 29% - Retail			100.00%								
New	506	High Performance Building/Int Design - Tier 1 29% - Grocery				100.00%							
New	507	High Performance Building/Int Design - Tier 1 29% - Warehouse					100.00%						

Commercial Elec Measure Inputs			Standards Adjustment Factor (percent)										
Segment	Measure #	Measure Description	Office	Restau- rant	Retail	Food Store	Ware- house	School	College	Hospital	Lodging	City of Austin	Miscel- laneous
New	508	High Performance Building/Int Design - Tier 1 29% - School						100.00%					
New	509	High Performance Building/Int Design - Tier 1 29% - College							100.00%				
New	510	High Performance Building/Int Design - Tier 1 29% - Health								100.00%			
New	511	High Performance Building/Int Design - Tier 1 29% - Lodging									100.00%		
New	512	High Performance Building/Int Design - Tier 1 29% - City of Austin										100.00%	
New	513	High Performance Building/Int Design - Tier 1 29% - Miscellaneous											100.00%
New	600	Base 2015 Commercial Code Building--57% savings	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
New	602	High Performance Building/Int Design - Tier 2 57% - Office	100.00%										
New	603	High Performance Building/Int Design - Tier 2 57% - Restaurant		100.00%									
New	605	High Performance Building/Int Design - Tier 2 57% - Retail			100.00%								
New	606	High Performance Building/Int Design - Tier 2 57% - Grocery				100.00%							
New	607	High Performance Building/Int Design - Tier 2 57% - Warehouse					100.00%						
New	608	High Performance Building/Int Design - Tier 2 57% - School						100.00%					
New	609	High Performance Building/Int Design - Tier 2 57% - College							100.00%				
New	610	High Performance Building/Int Design - Tier 2 57% - Health								100.00%			
New	611	High Performance Building/Int Design - Tier 2 57% - Lodging									100.00%		
New	612	High Performance Building/Int Design - Tier 2 57% - City of Austin										100.00%	
New	613	High Performance Building/Int Design - Tier 2 57% - Miscellaneous											100.00%

Commercial Elec Measure Inputs			FEASIBILITY FACTOR (percent)										
Segment	Measure #	Measure Description	Office	Restau- rant	Retail	Food Store	Ware- house	School	College	Hospital	Lodging	City of Austin	Miscel- laneous
Existing	100	Base Fluorescent Fixture, 4L4'T8	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	101	ROB 4L4' Premium T8	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	102	Delamping 3L4' F32T8	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%
Existing	103	LED Troffer (Base 4L4'T8)	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Existing	104	Lighting Control Tuneup	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Existing	105	Occupancy Sensor, 4L4' Fluorescent Fixtures	28.0%	7.0%	7.0%	7.0%	14.0%	35.0%	35.0%	35.0%	14.0%	21.0%	14.0%
Existing	106	Continuous Dimming, 4L4' Fluorescent Fixtures	28.0%	35.0%	8.4%	18.2%	28.0%	21.0%	21.0%	7.0%	21.0%	24.5%	21.0%
Existing	107	High Performance Lighting R/R - 25% Savings, Base 4L4'T8	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Existing	110	Base Fluorescent Fixture, 2L4'T8, 1 EB	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	111	ROB 2L4' Premium T8	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	112	Delamping 1L4' F32T8	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%
Existing	113	LED Troffer (Base 2L4'T8)	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Existing	114	Lighting Control Tuneup	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Existing	115	Occupancy Sensor, 2L4' Fluorescent Fixtures	28.0%	7.0%	7.0%	7.0%	14.0%	35.0%	35.0%	35.0%	14.0%	21.0%	14.0%
Existing	116	Continuous Dimming, 2L4' Fluorescent Fixtures	28.0%	35.0%	8.4%	18.2%	28.0%	21.0%	21.0%	7.0%	21.0%	24.5%	21.0%
Existing	117	High Performance Lighting R/R - 25% Savings, Base 2L4'T8	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Existing	120	Base Other Fluorescent Fixture	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	121	ROB Premium T8 (base other fluorescent)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	122	Lighting Control Tuneup	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Existing	123	Occupancy Sensor, 4L8' Fluorescent Fixtures	28.0%	7.0%	7.0%	7.0%	14.0%	35.0%	35.0%	35.0%	14.0%	21.0%	14.0%
Existing	124	Continuous Dimming, 4L8' Fluorescent Fixtures	28.0%	35.0%	8.4%	18.2%	28.0%	21.0%	21.0%	7.0%	21.0%	24.5%	21.0%
Existing	125	High Performance Lighting R/R - 25% Savings, Base Other Fluorescent	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Existing	130	Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacement	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	131	CFL Screw-in 18W	90.0%	50.0%	50.0%	90.0%	90.0%	90.0%	90.0%	90.0%	70.0%	90.0%	90.0%
Existing	132	Cold Cathode Lamps	90.0%	50.0%	50.0%	90.0%	90.0%	90.0%	90.0%	90.0%	70.0%	90.0%	90.0%
Existing	133	LED screw-in PAR replacement (base incandescent)	90.0%	50.0%	50.0%	90.0%	90.0%	90.0%	90.0%	90.0%	70.0%	90.0%	90.0%
Existing	140	Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacement	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	141	CFL Hardwired, Modular 18W	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	142	Ceramic Metal Halide	50.0%	50.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	5.0%	50.0%	50.0%
Existing	143	LED fixture replacement (base incandescent flood)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	150	Base CFL to screw-in replacement	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	151	LED screw-in replacement (base CFL)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	160	Base High Bay Metal Halide, 400W	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	161	High Bay T5	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Existing	162	Induction High Bay Lighting	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Existing	163	PSMH + electronic ballast	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Existing	165	Occupancy Sensor, High Bay T5	18.5%	18.5%	18.5%	18.5%	18.5%	18.5%	18.5%	18.5%	18.5%	18.5%	18.5%
Existing	180	Base Parking Garage Metal Halide, 250 W	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	181	High-efficiency fluorescent parking garage fixture (Base MH)	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	182	Bi-Level LED Parking Garage Fixtures (Base MH)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Existing	185	Base Fluorescent Parking Garage Lighting	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	186	Parking Garage Low Wattage T8 Lamps replacing 32W lamps	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	187	Bi-Level LED Parking Garage Fixtures (Base Fluorescent)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Existing	190	Base Exit Sign	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	191	LED Exit Sign	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	200	Base Outdoor High Pressure Sodium 250W Lamp	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	201	Outdoor Lighting Controls (Photocell/Timeclock)	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%
Existing	202	LED Outdoor Area Lighting	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	203	Bi-Level LED Outdoor Lighting	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%

Commercial Elec Measure Inputs			FEASIBILITY FACTOR (percent)										
Segment	Measure #	Measure Description	Office	Restau- rant	Retail	Food Store	Ware- house	School	College	Hospital	Lodging	City of Austin	Miscel- laneous
Existing	300	Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	301	Centrifugal Chiller, 0.51 kW/ton, 500 tons	100.0%	0.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%
Existing	302	Window Film (Standard) - Chiller	75.0%	75.0%	50.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	303	EMS - Chiller	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	305	Chiller Tune Up/Diagnostics	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	306	VSD for Chiller Pumps and Towers	0.0%	0.0%	0.0%	100.0%	0.0%	33.1%	0.0%	14.7%	3.8%	30.8%	61.6%
Existing	307	EMS Optimization - Chiller	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	309	Ceiling/roof Insulation - Chiller	22.0%	100.0%	43.0%	100.0%	3.0%	100.0%	100.0%	100.0%	100.0%	35.5%	49.0%
Existing	310	Duct/Pipe Insulation - Chiller	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	311	High Efficiency Chiller Motors	0.0%	0.0%	0.0%	100.0%	0.0%	12.8%	0.0%	18.6%	3.8%	2.2%	4.3%
Existing	320	Base DX Packaged System, EER=10.3, 10 tons	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	321	DX Tune Up/ Advanced Diagnostics	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	322	DX Packaged System, EER=10.3, 10 tons, with Automated Fault Detection and Diagnostics	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Existing	323	DX Packaged System, EER=10.9, 10 tons	86.2%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	92.4%	98.7%
Existing	324	DX Packaged System, EER=13.4, 10 tons	86.2%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	92.4%	98.7%
Existing	325	Window Film (Standard) - DX	75.0%	75.0%	50.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	326	Prog. Thermostat - DX	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	330	Optimize Controls - DX	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	331	Economizer - DX	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	94.7%	89.5%
Existing	332	Aerosol Duct Sealing - DX	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%	32.0%
Existing	333	Ceiling/roof Insulation - DX	22.0%	43.0%	100.0%	100.0%	100.0%	3.0%	100.0%	100.0%	100.0%	61.0%	100.0%
Existing	334	Duct/Pipe Insulation - DX	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	335	DX Coil Cleaning	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	337	Geothermal Heat Pump, EER=13, 10 tons - DX	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Existing	340	Base PTAC, EER=8.3, 1 ton	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	341	HE PTAC, EER=9.6, 1 ton	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	342	Hotel Room Controllers	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	75.0%	0.0%	0.0%
Existing	400	Base Fan Motor, 5hp, 1800rpm, 87.5%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	401	Fan Motor, 5hp, 1800rpm, 89.5%	94.4%	100.0%	91.8%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.2%	100.0%
Existing	402	Variable Speed Drive Control, 5 HP	82.6%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%	91.3%	100.0%
Existing	410	Base Fan Motor, 15hp, 1800rpm, 91.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	411	Fan Motor, 15hp, 1800rpm, 92.4%	94.4%	100.0%	91.8%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.2%	100.0%
Existing	412	Variable Speed Drive Control, 15 HP	82.6%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%	91.3%	100.0%
Existing	413	Electronically Commutated Motors (ECM) on an Air Handler Unit	100.0%	100.0%	100.0%	100.0%	100.0%	81.8%	0.0%	100.0%	100.0%	90.7%	81.4%
Existing	414	Energy Recovery Ventilation (ERV)	55.2%	100.0%	100.0%	100.0%	100.0%	69.3%	100.0%	100.0%	100.0%	71.4%	87.6%
Existing	415	Separate Makeup Air / Exhaust Hoods AC	0.0%	100.0%	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Existing	420	Base Fan Motor, 40hp, 1800rpm, 93.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	421	Fan Motor, 40hp, 1800rpm, 94.1%	94.4%	100.0%	91.8%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.2%	100.0%
Existing	422	Variable Speed Drive Control, 40 HP	82.6%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%	91.3%	100.0%
Existing	423	Air Handler Tuneups	51.0%	24.2%	37.2%	17.7%	24.4%	65.7%	37.1%	27.9%	58.8%	71.2%	91.4%
Existing	424	Demand Controlled Ventilation	78.6%	92.2%	70.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	84.9%	91.2%
Existing	500	Base Built-Up Refrigeration System	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	501	High-efficiency fan motors	64.0%	56.0%	59.0%	49.0%	50.0%	0.0%	100.0%	100.0%	0.0%	49.0%	34.0%
Existing	502	Strip curtains for walk-ins	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	50.0%	100.0%
Existing	503	Night covers for display cases (built-up systems)	0.0%	0.0%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Existing	504	Efficient compressor motor retrofit	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	0.0%	0.0%	100.0%	100.0%	100.0%
Existing	505	Compressor VSD retrofit	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%
Existing	506	Floating head pressure controls	100.0%	100.0%	77.0%	94.5%	0.0%	100.0%	0.0%	0.0%	100.0%	100.0%	100.0%
Existing	507	Refrigeration Commissioning	20.0%	20.0%	100.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%

Commercial Elec Measure Inputs			FEASIBILITY FACTOR (percent)										
Segment	Measure #	Measure Description	Office	Restau- rant	Retail	Food Store	Ware- house	School	College	Hospital	Lodging	City of Austin	Miscel- laneous
Existing	508	Demand Hot Gas Defrost	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%
Existing	509	Demand Defrost Electric	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%
Existing	510	Anti-sweat (humidistat) controls	100.0%	100.0%	100.0%	62.3%	0.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%
Existing	511	Freezer-Cooler Replacement Gaskets (built-up systems)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	512	High R-Value Glass Doors	0.0%	0.0%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	50.0%	100.0%
Existing	513	Bi-level LED Case Lighting (built-up systems)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	514	Fiber Optic Case Lighting (built-up systems)	75.0%	75.0%	75.0%	39.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	516	Multiplex Compressor System	100.0%	100.0%	68.5%	86.6%	0.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%
Existing	517	Oversized Air Cooled Condenser	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	520	Base Self-Contained Refrigeration	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	521	Strip curtains for walk-ins	0.0%	100.0%	100.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	50.0%	100.0%
Existing	522	Night covers for display cases (self-contained)	0.0%	100.0%	100.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	50.0%	100.0%
Existing	523	Freezer-Cooler Replacement Gaskets (self-contained)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	524	Bi-level LED Case Lighting (self-contained units)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Existing	526	Energy-Star Refrigerator, solid door	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	527	Energy-Star Freezer, solid door	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	528	Energy-Star Refrigerator, glass door	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	529	Energy-Star Freezer, glass door	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	530	Energy Star Ice Machines	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	600	Base Desktop PC	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	601	PC Manual Power Management Enabling	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	602	PC Network Power Management Enabling	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	603	Energy Star or Better PC	75.0%	100.0%	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	87.5%	100.0%
Existing	610	Base Monitor, CRT	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	611	Energy Star or Better Monitor-CRT	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	612	Monitor Power Management Enabling--CRT	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	620	Base Monitor, LCD	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	621	Energy Star or Better Monitor--LCD	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	622	Monitor Power Management Enabling--LCD	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	630	Base Copier	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	631	Energy Star or Better Copier	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	632	Copier Power Management Enabling	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	640	Base Laser Printer	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	641	Printer Power Management Enabling	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	650	Base Data Center/Server Room	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	651	Data Center Improved Operations	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
Existing	652	Data Center Best Practices	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Existing	653	Data Center State of the Art practices	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Existing	660	Base Water Heating	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	661	Demand controlled circulating systems	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	662	High Efficiency Water Heater (electric)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	663	Hot Water Pipe Insulation	70.0%	100.0%	64.3%	100.0%	99.3%	9.1%	100.0%	100.0%	100.0%	84.8%	99.6%
Existing	664	Tankless Water Heater	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	665	Heat Pump Water Heater (air source)	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%
Existing	666	Heat Recovery Unit	10.0%	80.0%	5.0%	80.0%	10.0%	15.0%	15.0%	80.0%	20.0%	7.5%	5.0%
Existing	667	Heat Trap	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	668	Solar Water Heater	76.0%	20.0%	4.0%	20.0%	49.0%	20.0%	0.0%	20.0%	20.0%	38.0%	0.0%
Existing	670	Base Vending Machines	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	671	Vending Misers	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%

Commercial Elec Measure Inputs			FEASIBILITY FACTOR (percent)										
Segment	Measure #	Measure Description	Office	Restau- rant	Retail	Food Store	Ware- house	School	College	Hospital	Lodging	City of Austin	Miscel- laneous
Existing	700	Base Cooking	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	701	Convection Oven	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	702	Efficient Fryer	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	703	Efficient Steamer	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	704	Energy Star Hot Food Holding Cabinets	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	800	Base Heating	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	900	Base Miscellaneous	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New	100	Base Bldg Design - 15%											
New	102	High Performance Building/Int Design - Tier 1 15% - Office	15.0%										
New	103	High Performance Building/Int Design - Tier 1 15% - Restaurant		15.0%									
New	105	High Performance Building/Int Design - Tier 1 15% - Retail			15.0%								
New	106	High Performance Building/Int Design - Tier 1 15% - Grocery				15.0%							
New	107	High Performance Building/Int Design - Tier 1 15% - Warehouse					15.0%						
New	108	High Performance Building/Int Design - Tier 1 15% - School						15.0%					
New	109	High Performance Building/Int Design - Tier 1 15% - College							15.0%				
New	110	High Performance Building/Int Design - Tier 1 15% - Health								15.0%			
New	111	High Performance Building/Int Design - Tier 1 15% - Lodging									15.0%		
New	112	High Performance Building/Int Design - Tier 1 15% - City of Austin										15.0%	
New	113	High Performance Building/Int Design - Tier 1 15% - Miscellaneous											15.0%
New	200	Base Bldg Design - 30%											
New	202	High Performance Building/Int Design - Tier 2 30% - Office	30.0%										
New	203	High Performance Building/Int Design - Tier 2 30% - Restaurant		30.0%									
New	205	High Performance Building/Int Design - Tier 2 30% - Retail			30.0%								
New	206	High Performance Building/Int Design - Tier 2 30% - Grocery				30.0%							
New	207	High Performance Building/Int Design - Tier 2 30% - Warehouse					30.0%						
New	208	High Performance Building/Int Design - Tier 2 30% - School						30.0%					
New	209	High Performance Building/Int Design - Tier 2 30% - College							30.0%				
New	210	High Performance Building/Int Design - Tier 2 30% - Health								30.0%			
New	211	High Performance Building/Int Design - Tier 2 30% - Lodging									30.0%		
New	212	High Performance Building/Int Design - Tier 2 30% - City of Austin										30.0%	
New	213	High Performance Building/Int Design - Tier 2 30% - Miscellaneous											30.0%
New	300	Base Bldg Design - 50%											
New	302	High Performance Building/Int Design - Tier 3 50% - Office	50.0%										
New	303	High Performance Building/Int Design - Tier 3 50% - Restaurant		50.0%									
New	305	High Performance Building/Int Design - Tier 3 50% - Retail			50.0%								
New	306	High Performance Building/Int Design - Tier 3 50% - Grocery				50.0%							
New	307	High Performance Building/Int Design - Tier 3 50% - Warehouse					50.0%						
New	308	High Performance Building/Int Design - Tier 3 50% - School						50.0%					
New	309	High Performance Building/Int Design - Tier 3 50% - College							50.0%				
New	310	High Performance Building/Int Design - Tier 3 50% - Health								50.0%			
New	311	High Performance Building/Int Design - Tier 3 50% - Lodging									50.0%		
New	312	High Performance Building/Int Design - Tier 3 50% - City of Austin										50.0%	
New	313	High Performance Building/Int Design - Tier 3 50% - Miscellaneous											50.0%
New	400	Base Bldg Design - 70%											
New	402	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Office	70.0%										
New	403	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Restaurant		70.0%									
New	405	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Retail			70.0%								
New	406	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Grocery				70.0%							
New	407	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Warehouse					70.0%						

Commercial Elec Measure Inputs			FEASIBILITY FACTOR (percent)										
Segment	Measure #	Measure Description	Office	Restau- rant	Retail	Food Store	Ware- house	School	College	Hospital	Lodging	City of Austin	Miscel- laneous
New	408	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - School						70.0%					
New	409	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - College							70.0%				
New	410	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Health								70.0%			
New	411	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Lodging									70.0%		
New	412	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - City of Austin										70.0%	
New	413	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Miscellaneous											70.0%
New	500	Base 2015 Commercial Code Building--29% savings	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New	502	High Performance Building/Int Design - Tier 1 29% - Office	100.0%										
New	503	High Performance Building/Int Design - Tier 1 29% - Restaurant		100.0%									
New	505	High Performance Building/Int Design - Tier 1 29% - Retail			100.0%								
New	506	High Performance Building/Int Design - Tier 1 29% - Grocery				100.0%							
New	507	High Performance Building/Int Design - Tier 1 29% - Warehouse					100.0%						
New	508	High Performance Building/Int Design - Tier 1 29% - School						100.0%					
New	509	High Performance Building/Int Design - Tier 1 29% - College							100.0%				
New	510	High Performance Building/Int Design - Tier 1 29% - Health								100.0%			
New	511	High Performance Building/Int Design - Tier 1 29% - Lodging									100.0%		
New	512	High Performance Building/Int Design - Tier 1 29% - City of Austin										100.0%	
New	513	High Performance Building/Int Design - Tier 1 29% - Miscellaneous											100.0%
New	600	Base 2015 Commercial Code Building--57% savings	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New	602	High Performance Building/Int Design - Tier 2 57% - Office	100.0%										
New	603	High Performance Building/Int Design - Tier 2 57% - Restaurant		100.0%									
New	605	High Performance Building/Int Design - Tier 2 57% - Retail			100.0%								
New	606	High Performance Building/Int Design - Tier 2 57% - Grocery				100.0%							
New	607	High Performance Building/Int Design - Tier 2 57% - Warehouse					100.0%						
New	608	High Performance Building/Int Design - Tier 2 57% - School						100.0%					
New	609	High Performance Building/Int Design - Tier 2 57% - College							100.0%				
New	610	High Performance Building/Int Design - Tier 2 57% - Health								100.0%			
New	611	High Performance Building/Int Design - Tier 2 57% - Lodging									100.0%		
New	612	High Performance Building/Int Design - Tier 2 57% - City of Austin										100.0%	
New	613	High Performance Building/Int Design - Tier 2 57% - Miscellaneous											100.0%

Commercial Elec Measure Inputs			INCOMPLETE FACTOR (percent)										
Segment	Measure #	Measure Description	Office	Restau-rant	Retail	Food Store	Ware-house	School	College	Hospital	Lodging	City of Austin	Miscel-laneous
Existing	100	Base Fluorescent Fixture, 4L4'T8	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	101	ROB 4L4' Premium T8	96.0%	100.0%	100.0%	98.3%	78.2%	98.2%	100.0%	100.0%	100.0%	97.8%	99.6%
Existing	102	Delamping 3L4' F32T8	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	103	LED Troffer (Base 4L4'T8)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	104	Lighting Control Tuneup	100.0%	92.6%	100.0%	98.4%	100.0%	81.8%	99.0%	99.4%	100.0%	99.6%	99.2%
Existing	105	Occupancy Sensor, 4L4' Fluorescent Fixtures	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	106	Continuous Dimming, 4L4' Fluorescent Fixtures	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	107	High Performance Lighting R/R - 25% Savings, Base 4L4'T8	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	110	Base Fluorescent Fixture, 2L4'T8, 1 EB	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	111	ROB 2L4' Premium T8	100.0%	100.0%	100.0%	94.6%	99.1%	100.0%	92.2%	100.0%	100.0%	94.9%	89.9%
Existing	112	Delamping 1L4' F32T8	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	113	LED Troffer (Base 2L4'T8)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	114	Lighting Control Tuneup	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	115	Occupancy Sensor, 2L4' Fluorescent Fixtures	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	116	Continuous Dimming, 2L4' Fluorescent Fixtures	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	117	High Performance Lighting R/R - 25% Savings, Base 2L4'T8	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	120	Base Other Fluorescent Fixture	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	121	ROB Premium T8 (base other fluorescent)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	21.8%	100.0%	100.0%	85.3%	70.6%
Existing	122	Lighting Control Tuneup	100.0%	100.0%	100.0%	100.0%	100.0%	66.7%	97.6%	49.6%	100.0%	100.0%	100.0%
Existing	123	Occupancy Sensor, 4L8' Fluorescent Fixtures	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	124	Continuous Dimming, 4L8' Fluorescent Fixtures	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	125	High Performance Lighting R/R - 25% Savings, Base Other Fluorescent	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	130	Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacement	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	131	CFL Screw-in 18W	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	132	Cold Cathode Lamps	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	133	LED screw-in PAR replacement (base incandescent)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	140	Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacement	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	141	CFL Hardwired, Modular 18W	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	142	Cermaic Metal Halide	99.0%	99.0%	99.0%	99.0%	99.0%	99.0%	99.0%	99.0%	99.0%	99.0%	99.0%
Existing	143	LED fixture replacement (base incandescent flood)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	150	Base CFL to screw-in replacement	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	151	LED screw-in replacement (base CFL)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	160	Base High Bay Metal Halide, 400W	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	161	High Bay T5	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	162	Induction High Bay Lighting	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	163	PSMH + electronic ballast	100.0%	100.0%	100.0%	97.0%	100.0%	33.8%	100.0%	100.0%	99.1%	99.6%	99.2%
Existing	165	Occupancy Sensor, High Bay T5	82.0%	82.0%	82.0%	82.0%	82.0%	82.0%	82.0%	82.0%	82.0%	82.0%	82.0%
Existing	180	Base Parking Garage Metal Halide, 250 W	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	181	High-efficiency fluorescent parking garage fixture (Base MH)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	182	Bi-Level LED Parking Garage Fixtures (Base MH)	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%
Existing	185	Base Fluorescent Parking Garage Lighting	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	186	Parking Garage Low Wattage T8 Lamps replacing 32W lamps	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%
Existing	187	Bi-Level LED Parking Garage Fixtures (Base Fluorescent)	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%
Existing	190	Base Exit Sign	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	191	LED Exit Sign	51.0%	64.0%	64.0%	1.0%	100.0%	59.0%	45.0%	6.0%	35.0%	45.0%	39.0%
Existing	200	Base Outdoor High Pressure Sodium 250W Lamp	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	201	Outdoor Lighting Controls (Photocell/Timeclock)	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
Existing	202	LED Outdoor Area Lighting	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	203	Bi-Level LED Outdoor Lighting	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Commercial Elec Measure Inputs			INCOMPLETE FACTOR (percent)											
Segment	Measure #	Measure Description	Office	Restau-rant	Retail	Food Store	Ware-house	School	College	Hospital	Lodging	City of Austin	Miscel-laneous	
Existing	300	Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	301	Centrifugal Chiller, 0.51 kW/ton, 500 tons	68.0%	68.0%	68.0%	68.0%	68.0%	68.0%	68.0%	68.0%	68.0%	68.0%	68.0%	
Existing	302	Window Film (Standard) - Chiller	0.0%	0.0%	0.0%	99.0%	0.0%	22.0%	0.0%	17.0%	67.0%	42.5%	85.0%	
Existing	303	EMS - Chiller	0.0%	0.0%	0.0%	2.5%	0.0%	23.0%	100.0%	6.9%	68.2%	4.7%	9.3%	
Existing	305	Chiller Tune Up/Diagnostics	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	2.8%	30.3%	60.5%	
Existing	306	VSD for Chiller Pumps and Towers	0.0%	0.0%	0.0%	100.0%	0.0%	13.8%	0.0%	13.4%	100.0%	30.9%	61.8%	
Existing	307	EMS Optimization - Chiller	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Existing	309	Ceiling/roof Insulation - Chiller	15.0%	57.0%	15.0%	0.0%	33.0%	0.0%	0.0%	0.0%	0.0%	17.0%	19.0%	
Existing	310	Duct/Pipe Insulation - Chiller	0.0%	0.0%	0.0%	100.0%	0.0%	52.0%	0.0%	75.0%	33.0%	44.5%	89.0%	
Existing	311	High Efficiency Chiller Motors	0.0%	0.0%	0.0%	100.0%	0.0%	65.1%	0.0%	54.9%	3.8%	30.9%	61.8%	
Existing	320	Base DX Packaged System, EER=10.3, 10 tons	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	321	DX Tune Up/ Advanced Diagnostics	12.8%	13.9%	48.3%	0.2%	33.7%	26.4%	9.0%	19.0%	12.7%	22.4%	32.0%	
Existing	322	DX Packaged System, EER=10.3, 10 tons, with Automated Fault Detection and Diagnostics	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	323	DX Packaged System, EER=10.9, 10 tons	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	324	DX Packaged System, EER=13.4, 10 tons	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	325	Window Film (Standard) - DX	48.0%	93.0%	30.0%	99.0%	43.0%	16.0%	75.0%	61.0%	97.0%	46.0%	44.0%	
Existing	326	Prog. Thermostat - DX	22.5%	31.3%	78.3%	2.8%	63.6%	75.4%	12.7%	27.3%	33.0%	15.5%	8.5%	
Existing	330	Optimize Controls - DX	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	33.0%	
Existing	331	Economizer - DX	55.3%	30.5%	73.4%	1.0%	34.5%	20.7%	31.8%	86.5%	75.9%	52.4%	49.6%	
Existing	332	Aerosol Duct Sealing - DX	100.0%	91.6%	100.0%	100.0%	97.4%	100.0%	37.1%	100.0%	100.0%	98.0%	96.0%	
Existing	333	Ceiling/roof Insulation - DX	0.0%	0.5%	0.0%	0.9%	35.0%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
Existing	334	Duct/Pipe Insulation - DX	1.0%	81.0%	61.0%	100.0%	13.0%	96.0%	27.0%	73.0%	72.0%	21.5%	42.0%	
Existing	335	DX Coil Cleaning	79.0%	47.3%	51.9%	10.6%	92.9%	55.1%	29.8%	0.0%	37.5%	68.2%	57.4%	
Existing	337	Geothermal Heat Pump, EER=13, 10 tons - DX	99.0%	99.0%	99.0%	99.0%	99.0%	99.0%	99.0%	99.0%	99.0%	99.0%	99.0%	
Existing	340	Base PTAC, EER=8.3, 1 ton	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	341	HE PTAC, EER=9.6, 1 ton	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	342	Hotel Room Controllers	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	400	Base Fan Motor, 5hp, 1800rpm, 87.5%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	401	Fan Motor, 5hp, 1800rpm, 89.5%	78.0%	78.0%	78.0%	78.0%	78.0%	78.0%	78.0%	78.0%	78.0%	78.0%	78.0%	
Existing	402	Variable Speed Drive Control, 5 HP	69.4%	100.0%	100.0%	100.0%	34.5%	76.9%	90.1%	100.0%	100.0%	74.8%	80.2%	
Existing	410	Base Fan Motor, 15hp, 1800rpm, 91.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	411	Fan Motor, 15hp, 1800rpm, 92.4%	0.0%	100.0%	0.0%	100.0%	100.0%	84.7%	0.0%	15.3%	100.0%	49.8%	99.5%	
Existing	412	Variable Speed Drive Control, 15 HP	0.0%	100.0%	100.0%	100.0%	100.0%	90.3%	0.0%	21.3%	100.0%	35.5%	70.9%	
Existing	413	Electronically Commutated Motors (ECM) on an Air Handler Unit	0.0%	100.0%	100.0%	100.0%	100.0%	98.2%	96.6%	100.0%	100.0%	50.0%	100.0%	
Existing	414	Energy Recovery Ventilation (ERV)	58.7%	100.0%	97.8%	100.0%	100.0%	100.0%	26.2%	100.0%	100.0%	39.3%	19.9%	
Existing	415	Separate Makeup Air / Exhaust Hoods AC	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	420	Base Fan Motor, 40hp, 1800rpm, 93.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	421	Fan Motor, 40hp, 1800rpm, 94.1%	0.0%	100.0%	0.0%	100.0%	0.0%	16.4%	28.6%	0.0%	0.0%	17.9%	35.8%	
Existing	422	Variable Speed Drive Control, 40 HP	0.0%	100.0%	100.0%	100.0%	7.1%	81.5%	0.0%	0.0%	100.0%	0.8%	1.6%	
Existing	423	Air Handler Tuneups	91.6%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	78.8%	66.0%	
Existing	424	Demand Controlled Ventilation	0.0%	100.0%	100.0%	100.0%	7.1%	90.2%	100.0%	65.2%	100.0%	6.3%	12.6%	
Existing	500	Base Built-Up Refrigeration System	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	501	High-efficiency fan motors	64.0%	100.0%	48.0%	57.0%	48.0%	100.0%	100.0%	100.0%	100.0%	82.0%	100.0%	
Existing	502	Strip curtains for walk-ins	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Existing	503	Night covers for display cases (built-up systems)	0.0%	0.0%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Existing	504	Efficient compressor motor retrofit	0.0%	0.0%	0.0%	2.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Existing	505	Compressor VSD retrofit	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	
Existing	506	Floating head pressure controls	0.0%	0.0%	0.0%	3.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Existing	507	Refrigeration Commissioning	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	

Commercial Elec Measure Inputs			INCOMPLETE FACTOR (percent)											
Segment	Measure #	Measure Description	Office	Restau-rant	Retail	Food Store	Ware-house	School	College	Hospital	Lodging	City of Austin	Miscel-laneous	
Existing	508	Demand Hot Gas Defrost	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	
Existing	509	Demand Defrost Electric	0.0%	0.0%	15.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Existing	510	Anti-sweat (humidistat) controls	0.0%	0.0%	0.0%	27.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Existing	511	Freezer-Cooler Replacement Gaskets (built-up systems)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	
Existing	512	High R-Value Glass Doors	0.0%	0.0%	100.0%	94.8%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	100.0%	
Existing	513	Bi-level LED Case Lighting (built-up systems)	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	
Existing	514	Fiber Optic Case Lighting (built-up systems)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	516	Multiplex Compressor System	0.0%	0.0%	0.0%	10.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Existing	517	Oversized Air Cooled Condenser	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	
Existing	520	Base Self-Contained Refrigeration	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	521	Strip curtains for walk-ins	0.0%	100.0%	100.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	50.0%	100.0%	
Existing	522	Night covers for display cases (self-contained)	0.0%	100.0%	100.0%	100.0%	0.0%	100.0%	0.0%	100.0%	0.0%	50.0%	100.0%	
Existing	523	Freezer-Cooler Replacement Gaskets (self-contained)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	
Existing	524	Bi-level LED Case Lighting (self-contained units)	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	
Existing	526	Energy-Star Refrigerator, solid door	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	
Existing	527	Energy-Star Freezer, solid door	66.0%	66.0%	66.0%	66.0%	66.0%	66.0%	66.0%	66.0%	66.0%	66.0%	66.0%	
Existing	528	Energy-Star Refrigerator, glass door	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	
Existing	529	Energy-Star Freezer, glass door	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	
Existing	530	Energy Star Ice Machines	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	64.0%	
Existing	600	Base Desktop PC	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	601	PC Manual Power Management Enabling	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	
Existing	602	PC Network Power Management Enabling	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	
Existing	603	Energy Star or Better PC	85.5%	99.0%	45.7%	97.9%	99.1%	84.1%	79.7%	94.3%	53.9%	88.7%	91.9%	
Existing	610	Base Monitor, CRT	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	611	Energy Star or Better Monitor-CRT	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	95.4%	100.0%	99.9%	99.8%	
Existing	612	Monitor Power Management Enabling--CRT	32.7%	44.4%	31.4%	100.0%	69.7%	38.5%	100.0%	66.1%	40.9%	39.5%	46.3%	
Existing	620	Base Monitor, LCD	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	621	Energy Star or Better Monitor--LCD	46.2%	97.3%	65.5%	97.9%	98.6%	84.5%	80.8%	94.3%	43.0%	65.5%	84.9%	
Existing	622	Monitor Power Management Enabling--LCD	35.1%	55.4%	29.3%	94.9%	6.7%	11.3%	22.8%	29.5%	74.0%	27.8%	20.5%	
Existing	630	Base Copier	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	631	Energy Star or Better Copier	29.1%	67.0%	81.4%	98.9%	52.6%	17.0%	43.9%	78.4%	41.6%	44.5%	59.9%	
Existing	632	Copier Power Management Enabling	8.6%	60.0%	36.3%	95.8%	20.6%	21.0%	35.7%	38.4%	23.7%	19.3%	29.9%	
Existing	640	Base Laser Printer	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	641	Printer Power Management Enabling	20.4%	100.0%	31.3%	63.1%	16.7%	23.8%	70.2%	24.8%	33.3%	25.1%	29.9%	
Existing	650	Base Data Center/Server Room	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	651	Data Center Improved Operations	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	
Existing	652	Data Center Best Practices	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	
Existing	653	Data Center State of the Art practices	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	660	Base Water Heating	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	661	Demand controlled circulating systems	100.0%	100.0%	24.3%	97.1%	50.6%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	662	High Efficiency Water Heater (electric)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	88.5%	100.0%	100.0%	100.0%	100.0%	
Existing	663	Hot Water Pipe Insulation	48.0%	0.0%	100.0%	97.1%	99.0%	9.1%	94.6%	100.0%	100.0%	63.6%	79.1%	
Existing	664	Tankless Water Heater	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	665	Heat Pump Water Heater (air source)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	666	Heat Recovery Unit	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	667	Heat Trap	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	
Existing	668	Solar Water Heater	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	670	Base Vending Machines	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	671	Vending Misers	83.0%	0.0%	0.0%	100.0%	75.0%	53.0%	0.0%	50.0%	0.0%	91.5%	100.0%	

Commercial Elec Measure Inputs			INCOMPLETE FACTOR (percent)											
Segment	Measure #	Measure Description	Office	Restau-rant	Retail	Food Store	Ware-house	School	College	Hospital	Lodging	City of Austin	Miscel-laneous	
Existing	700	Base Cooking	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	701	Convection Oven	0.0%	100.0%	100.0%	0.0%	0.0%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	
Existing	702	Efficient Fryer	0.0%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	50.0%	100.0%	
Existing	703	Efficient Steamer	0.0%	100.0%	100.0%	100.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Existing	704	Energy Star Hot Food Holding Cabinets	0.0%	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	50.0%	100.0%	
Existing	800	Base Heating	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Existing	900	Base Miscellaneous	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
New	100	Base Bldg Design - 15%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
New	102	High Performance Building/Int Design - Tier 1 15% - Office	100.0%											
New	103	High Performance Building/Int Design - Tier 1 15% - Restaurant		100.0%										
New	105	High Performance Building/Int Design - Tier 1 15% - Retail			100.0%									
New	106	High Performance Building/Int Design - Tier 1 15% - Grocery				100.0%								
New	107	High Performance Building/Int Design - Tier 1 15% - Warehouse					100.0%							
New	108	High Performance Building/Int Design - Tier 1 15% - School						100.0%						
New	109	High Performance Building/Int Design - Tier 1 15% - College							100.0%					
New	110	High Performance Building/Int Design - Tier 1 15% - Health								100.0%				
New	111	High Performance Building/Int Design - Tier 1 15% - Lodging									100.0%			
New	112	High Performance Building/Int Design - Tier 1 15% - City of Austin										100.0%		
New	113	High Performance Building/Int Design - Tier 1 15% - Miscellaneous											100.0%	
New	200	Base Bldg Design - 30%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
New	202	High Performance Building/Int Design - Tier 2 30% - Office	100.0%											
New	203	High Performance Building/Int Design - Tier 2 30% - Restaurant		100.0%										
New	205	High Performance Building/Int Design - Tier 2 30% - Retail			100.0%									
New	206	High Performance Building/Int Design - Tier 2 30% - Grocery				100.0%								
New	207	High Performance Building/Int Design - Tier 2 30% - Warehouse					100.0%							
New	208	High Performance Building/Int Design - Tier 2 30% - School						100.0%						
New	209	High Performance Building/Int Design - Tier 2 30% - College							100.0%					
New	210	High Performance Building/Int Design - Tier 2 30% - Health								100.0%				
New	211	High Performance Building/Int Design - Tier 2 30% - Lodging									100.0%			
New	212	High Performance Building/Int Design - Tier 2 30% - City of Austin										100.0%		
New	213	High Performance Building/Int Design - Tier 2 30% - Miscellaneous											100.0%	
New	300	Base Bldg Design - 50%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
New	302	High Performance Building/Int Design - Tier 3 50% - Office	100.0%											
New	303	High Performance Building/Int Design - Tier 3 50% - Restaurant		100.0%										
New	305	High Performance Building/Int Design - Tier 3 50% - Retail			100.0%									
New	306	High Performance Building/Int Design - Tier 3 50% - Grocery				100.0%								
New	307	High Performance Building/Int Design - Tier 3 50% - Warehouse					100.0%							
New	308	High Performance Building/Int Design - Tier 3 50% - School						100.0%						
New	309	High Performance Building/Int Design - Tier 3 50% - College							100.0%					
New	310	High Performance Building/Int Design - Tier 3 50% - Health								100.0%				
New	311	High Performance Building/Int Design - Tier 3 50% - Lodging									100.0%			
New	312	High Performance Building/Int Design - Tier 3 50% - City of Austin										100.0%		
New	313	High Performance Building/Int Design - Tier 3 50% - Miscellaneous											100.0%	
New	400	Base Bldg Design - 70%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
New	402	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Office	100.0%											
New	403	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Restaurant		100.0%										
New	405	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Retail			100.0%									
New	406	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Grocery				100.0%								
New	407	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Warehouse					100.0%							

Commercial Elec Measure Inputs			INCOMPLETE FACTOR (percent)										
Segment	Measure #	Measure Description	Office	Restau-rant	Retail	Food Store	Ware-house	School	College	Hospital	Lodging	City of Austin	Miscel-laneous
New	408	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - School						100.0%					
New	409	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - College							100.0%				
New	410	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Health								100.0%			
New	411	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Lodging									100.0%		
New	412	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - City of Austin										100.0%	
New	413	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Miscellaneous											100.0%
New	500	Base 2015 Commercial Code Building--29% savings	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New	502	High Performance Building/Int Design - Tier 1 29% - Office	100.0%										
New	503	High Performance Building/Int Design - Tier 1 29% - Restaurant		100.0%									
New	505	High Performance Building/Int Design - Tier 1 29% - Retail			100.0%								
New	506	High Performance Building/Int Design - Tier 1 29% - Grocery				100.0%							
New	507	High Performance Building/Int Design - Tier 1 29% - Warehouse					100.0%						
New	508	High Performance Building/Int Design - Tier 1 29% - School						100.0%					
New	509	High Performance Building/Int Design - Tier 1 29% - College							100.0%				
New	510	High Performance Building/Int Design - Tier 1 29% - Health								100.0%			
New	511	High Performance Building/Int Design - Tier 1 29% - Lodging									100.0%		
New	512	High Performance Building/Int Design - Tier 1 29% - City of Austin										100.0%	
New	513	High Performance Building/Int Design - Tier 1 29% - Miscellaneous											100.0%
New	600	Base 2015 Commercial Code Building--57% savings	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New	602	High Performance Building/Int Design - Tier 2 57% - Office	100.0%										
New	603	High Performance Building/Int Design - Tier 2 57% - Restaurant		100.0%									
New	605	High Performance Building/Int Design - Tier 2 57% - Retail			100.0%								
New	606	High Performance Building/Int Design - Tier 2 57% - Grocery				100.0%							
New	607	High Performance Building/Int Design - Tier 2 57% - Warehouse					100.0%						
New	608	High Performance Building/Int Design - Tier 2 57% - School						100.0%					
New	609	High Performance Building/Int Design - Tier 2 57% - College							100.0%				
New	610	High Performance Building/Int Design - Tier 2 57% - Health								100.0%			
New	611	High Performance Building/Int Design - Tier 2 57% - Lodging									100.0%		
New	612	High Performance Building/Int Design - Tier 2 57% - City of Austin										100.0%	
New	613	High Performance Building/Int Design - Tier 2 57% - Miscellaneous											100.0%

Commercial Elec Measure Inputs			TECHNOLOGY SATURATION (units/square foot)										
Segment	Measure #	Measure Description	Office	Restau- rant	Retail	Food Store	Ware- house	School	College	Hospital	Lodging	City of Austin	Miscel- laneous
Existing	100	Base Fluorescent Fixture, 4L4'T8	0.01144	0.01787	0.00936	0.01233	0.00358	0.00928	0.01718	0.00714	0.00464	0.00904	0.00664
Existing	101	ROB 4L4' Premium T8	0.01144	0.01787	0.00936	0.01233	0.00358	0.00928	0.01718	0.00714	0.00464	0.00904	0.00664
Existing	102	Delamping 3L4' F32T8	0.01144	0.01787	0.00936	0.01233	0.00358	0.00928	0.01718	0.00714	0.00464	0.00904	0.00664
Existing	103	LED Troffer (Base 4L4'T8)	0.01144	0.01787	0.00936	0.01233	0.00358	0.00928	0.01718	0.00714	0.00464	0.00904	0.00664
Existing	104	Lighting Control Tuneup	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	105	Occupancy Sensor, 4L4' Fluorescent Fixtures	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	106	Continuous Dimming, 4L4' Fluorescent Fixtures	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	107	High Performance Lighting R/R - 25% Savings, Base 4L4'T8	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	110	Base Fluorescent Fixture, 2L4'T8, 1 EB	0.01179	0.01516	0.00972	0.01828	0.00611	0.01118	0.01955	0.00599	0.00590	0.01068	0.00958
Existing	111	ROB 2L4' Premium T8	0.01179	0.01516	0.00972	0.01828	0.00611	0.01118	0.01955	0.00599	0.00590	0.01068	0.00958
Existing	112	Delamping 1L4' F32T8	0.01179	0.01516	0.00972	0.01828	0.00611	0.01118	0.01955	0.00599	0.00590	0.01068	0.00958
Existing	113	LED Troffer (Base 2L4'T8)	0.01179	0.01516	0.00972	0.01828	0.00611	0.01118	0.01955	0.00599	0.00590	0.01068	0.00958
Existing	114	Lighting Control Tuneup	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	115	Occupancy Sensor, 2L4' Fluorescent Fixtures	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	116	Continuous Dimming, 2L4' Fluorescent Fixtures	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	117	High Performance Lighting R/R - 25% Savings, Base 2L4'T8	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	120	Base Other Fluorescent Fixture	0.01901	0.00000	0.01000	0.00000	0.01917	0.00421	0.01929	0.00954	0.00523	0.01202	0.00503
Existing	121	ROB Premium T8 (base other fluorescent)	0.01901	0.00000	0.01000	0.00000	0.01917	0.00421	0.01929	0.00954	0.00523	0.01202	0.00503
Existing	122	Lighting Control Tuneup	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	123	Occupancy Sensor, 4L8' Fluorescent Fixtures	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	124	Continuous Dimming, 4L8' Fluorescent Fixtures	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	125	High Performance Lighting R/R - 25% Savings, Base Other Fluorescent	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	130	Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacement	0.06844	0.01617	0.01970	0.01569	0.00000	0.00081	0.01671	0.00627	0.01751	0.04195	0.01546
Existing	131	CFL Screw-in 18W	0.06844	0.01617	0.01970	0.01569	0.00000	0.00081	0.01671	0.00627	0.01751	0.04195	0.01546
Existing	132	Cold Cathode Lamps	0.06844	0.01617	0.01970	0.01569	0.00000	0.00081	0.01671	0.00627	0.01751	0.04195	0.01546
Existing	133	LED screw-in PAR replacement (base incandescent)	0.06844	0.01617	0.01970	0.01569	0.00000	0.00081	0.01671	0.00627	0.01751	0.04195	0.01546
Existing	140	Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacement	0.06844	0.01617	0.01970	0.01569	0.01346	0.00081	0.01671	0.00627	0.01751	0.04195	0.01546
Existing	141	CFL Hardwired, Modular 18W	0.06844	0.01617	0.01970	0.01569	0.01346	0.00081	0.01671	0.00627	0.01751	0.04195	0.01546
Existing	142	Ceramic Metal Halide	0.06844	0.01617	0.01970	0.01569	0.01346	0.00081	0.01671	0.00627	0.01751	0.04195	0.01546
Existing	143	LED fixture replacement (base incandescent flood)	0.06844	0.01617	0.01970	0.01569	0.01346	0.00081	0.01671	0.00627	0.01751	0.04195	0.01546
Existing	150	Base CFL to screw-in replacement	0.01575	0.01655	0.01273	0.07736	0.01325	0.02858	0.02016	0.00814	0.01233	0.01343	0.01110
Existing	151	LED screw-in replacement (base CFL)	0.01575	0.01655	0.01273	0.07736	0.01325	0.02858	0.02016	0.00814	0.01233	0.01343	0.01110
Existing	160	Base High Bay Metal Halide, 400W	0.00333	0.00009	0.00422	0.00855	0.00148	0.00447	0.01327	0.00000	0.00242	0.00233	0.00133
Existing	161	High Bay T5	0.00333	0.00009	0.00422	0.00855	0.00148	0.00447	0.01327	0.00000	0.00242	0.00233	0.00133
Existing	162	Induction High Bay Lighting	0.00333	0.00009	0.00422	0.00855	0.00148	0.00447	0.01327	0.00000	0.00242	0.00233	0.00133
Existing	163	PSMH + electronic ballast	0.00333	0.00009	0.00422	0.00855	0.00148	0.00447	0.01327	0.00000	0.00242	0.00233	0.00133
Existing	165	Occupancy Sensor, High Bay T5	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	180	Base Parking Garage Metal Halide, 250 W	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00005	0.00019	0.00000	0.00000	0.00000
Existing	181	High-efficiency fluorescent parking garage fixture (Base MH)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00005	0.00019	0.00000	0.00000	0.00000
Existing	182	Bi-Level LED Parking Garage Fixtures (Base MH)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00005	0.00019	0.00000	0.00000	0.00000
Existing	185	Base Fluorescent Parking Garage Lighting	0.00022	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00053	0.00058	0.00094
Existing	186	Parking Garage Low Wattage T8 Lamps replacing 32W lamps	0.00022	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00053	0.00058	0.00094
Existing	187	Bi-Level LED Parking Garage Fixtures (Base Fluorescent)	0.00022	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00053	0.00058	0.00094
Existing	190	Base Exit Sign	0.00035	0.00048	0.00016	0.00007	0.00036	0.00012	0.00018	0.00048	0.00027	0.00025	0.00015
Existing	191	LED Exit Sign	0.00035	0.00048	0.00016	0.00007	0.00036	0.00012	0.00018	0.00048	0.00027	0.00025	0.00015
Existing	200	Base Outdoor High Pressure Sodium 250W Lamp	0.00081	0.00279	0.00094	0.00034	0.00043	0.00061	0.00057	0.00029	0.00028	0.00056	0.00030
Existing	201	Outdoor Lighting Controls (Photocell/Timeclock)	0.00026	0.00066	0.00021	0.00034	0.00039	0.00021	0.00004	0.00006	0.00011	0.00022	0.00018
Existing	202	LED Outdoor Area Lighting	0.00105	0.00265	0.00085	0.00136	0.00154	0.00083	0.00016	0.00025	0.00043	0.00090	0.00074

Commercial Elec Measure Inputs			TECHNOLOGY SATURATION (units/square foot)										
Segment	Measure #	Measure Description	Office	Restau- rant	Retail	Food Store	Ware- house	School	College	Hospital	Lodging	City of Austin	Miscel- laneous
Existing	203	Bi-Level LED Outdoor Lighting	0.00105	0.00265	0.00085	0.00136	0.00154	0.00083	0.00016	0.00025	0.00043	0.00090	0.00074
Existing	300	Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	0.00300	0.00300	0.00300	0.00245	0.01894	0.00250	0.00265	0.00250	0.00350	0.00250	0.00200
Existing	301	Centrifugal Chiller, 0.51 kW/ton, 500 tons	0.00300	0.00300	0.00300	0.00245	0.01894	0.00250	0.00265	0.00250	0.00350	0.00250	0.00200
Existing	302	Window Film (Standard) - Chiller	0.08770	0.02844	0.04090	0.04600	1.01722	0.02423	0.06252	0.01707	0.01707	0.05807	0.02844
Existing	303	EMS - Chiller	0.00300	0.00300	0.00300	0.00245	0.01894	0.00250	0.00265	0.00250	0.00350	0.00250	0.00200
Existing	305	Chiller Tune Up/Diagnostics	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	306	VSD for Chiller Pumps and Towers	0.00300	0.00300	0.00300	0.00245	0.01894	0.00250	0.00265	0.00250	0.00350	0.00250	0.00200
Existing	307	EMS Optimization - Chiller	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	309	Ceiling/roof Insulation - Chiller	0.50000	1.00000	1.00000	1.00000	1.00000	0.50000	0.43333	0.25000	0.25000	0.50000	0.50000
Existing	310	Duct/Pipe Insulation - Chiller	0.25000	0.25000	0.25000	0.25000	0.25000	0.25000	0.25000	0.25000	0.25000	0.25000	0.25000
Existing	311	High Efficiency Chiller Motors	0.00237	0.00344	0.00206	0.00245	0.00176	0.00330	0.00265	0.00346	0.00278	0.00311	0.00385
Existing	320	Base DX Packaged System, EER=10.3, 10 tons	0.00300	0.00300	0.00300	0.00245	0.01894	0.00250	0.00265	0.00250	0.00350	0.00250	0.00200
Existing	321	DX Tune Up/ Advanced Diagnostics	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	322	DX Packaged System, EER=10.3, 10 tons, with Automated Fault Detection and Diagnostics	0.00300	0.00300	0.00300	0.00245	0.01894	0.00250	0.00265	0.00250	0.00350	0.00250	0.00200
Existing	323	DX Packaged System, EER=10.9, 10 tons	0.00300	0.00300	0.00300	0.00245	0.01894	0.00250	0.00265	0.00250	0.00350	0.00250	0.00200
Existing	324	DX Packaged System, EER=13.4, 10 tons	0.00300	0.00300	0.00300	0.00245	0.01894	0.00250	0.00265	0.00250	0.00350	0.00250	0.00200
Existing	325	Window Film (Standard) - DX	0.08770	0.02844	0.04090	0.04600	1.01722	0.02423	0.06252	0.01707	0.01707	0.05807	0.02844
Existing	326	Prog. Thermostat - DX	0.00300	0.00300	0.00300	0.00245	0.01894	0.00250	0.00265	0.00250	0.00350	0.00250	0.00200
Existing	330	Optimize Controls - DX	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	331	Economizer - DX	0.00300	0.00300	0.00300	0.00245	0.01894	0.00250	0.00265	0.00250	0.00350	0.00250	0.00200
Existing	332	Aerosol Duct Sealing - DX	0.00300	0.00300	0.00300	0.00245	0.01894	0.00250	0.00265	0.00250	0.00350	0.00250	0.00200
Existing	333	Ceiling/roof Insulation - DX	0.50000	1.00000	1.00000	1.00000	1.00000	0.50000	0.43333	0.25000	0.25000	0.50000	0.50000
Existing	334	Duct/Pipe Insulation - DX	0.25000	0.25000	0.25000	0.25000	0.25000	0.25000	0.25000	0.25000	0.25000	0.25000	0.25000
Existing	335	DX Coil Cleaning	0.00300	0.00300	0.00300	0.00245	0.01894	0.00250	0.00265	0.00250	0.00350	0.00250	0.00200
Existing	337	Geothermal Heat Pump, EER=13, 10 tons - DX	0.00237	0.00344	0.00206	0.00245	0.00176	0.00330	0.00265	0.00346	0.00278	0.00311	0.00385
Existing	340	Base PTAC, EER=8.3, 1 ton	0.00000	0.00000	0.00000	0.00000	0.00000	0.00202	0.00373	0.00000	0.00236	0.00092	0.00184
Existing	341	HE PTAC, EER=9.6, 1 ton	0.00237	0.00344	0.00206	0.00245	0.00176	0.00330	0.00265	0.00346	0.00278	0.00311	0.00385
Existing	342	Hotel Room Controllers	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00333	0.00000	0.00000
Existing	400	Base Fan Motor, 5hp, 1800rpm, 87.5%	0.00035	0.00182	0.00028	0.00050	0.00027	0.00037	0.00014	0.00030	0.00033	0.00042	0.00049
Existing	401	Fan Motor, 5hp, 1800rpm, 89.5%	0.00035	0.00182	0.00028	0.00050	0.00027	0.00037	0.00014	0.00030	0.00033	0.00042	0.00049
Existing	402	Variable Speed Drive Control, 5 HP	0.00035	0.00182	0.00028	0.00050	0.00027	0.00037	0.00014	0.00030	0.00033	0.00042	0.00049
Existing	410	Base Fan Motor, 15hp, 1800rpm, 91.0%	0.00016	0.00100	0.00133	0.00000	0.00000	0.00073	0.00034	0.00017	0.00000	0.00053	0.00090
Existing	411	Fan Motor, 15hp, 1800rpm, 92.4%	0.00016	0.00100	0.00133	0.00000	0.00000	0.00073	0.00034	0.00017	0.00000	0.00053	0.00090
Existing	412	Variable Speed Drive Control, 15 HP	0.00016	0.00100	0.00133	0.00000	0.00000	0.00073	0.00034	0.00017	0.00000	0.00053	0.00090
Existing	413	Electronically Commutated Motors (ECM) on an Air Handler Unit	0.00240	0.00370	0.00158	0.00351	0.00036	0.00263	0.00196	0.00415	0.00171	0.00190	0.00140
Existing	414	Energy Recovery Ventilation (ERV)	0.00240	0.00370	0.00158	0.00351	0.00036	0.00263	0.00196	0.00415	0.00171	0.00190	0.00140
Existing	415	Separate Makeup Air / Exhaust Hoods AC	0.00016	0.00100	0.00133	0.00000	0.00000	0.00073	0.00034	0.00017	0.00000	0.00053	0.00090
Existing	420	Base Fan Motor, 40hp, 1800rpm, 93.0%	0.00119	0.00000	0.00192	0.00000	0.00035	0.00000	0.00055	0.00000	0.00000	0.00179	0.00240
Existing	421	Fan Motor, 40hp, 1800rpm, 94.1%	0.00119	0.00000	0.00192	0.00000	0.00035	0.00000	0.00055	0.00000	0.00000	0.00179	0.00240
Existing	422	Variable Speed Drive Control, 40 HP	0.00119	0.00000	0.00192	0.00000	0.00035	0.00000	0.00055	0.00000	0.00000	0.00179	0.00240
Existing	423	Air Handler Tuneups	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	424	Demand Controlled Ventilation	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	500	Base Built-Up Refrigeration System	0.00004	0.00093	0.01311	0.01454	0.00000	0.00009	0.00000	0.00005	0.00018	0.00005	0.00007
Existing	501	High-efficiency fan motors	0.00000	0.00001	0.00000	0.00003	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Existing	502	Strip curtains for walk-ins	0.00000	0.00001	0.00000	0.00003	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Existing	503	Night covers for display cases (built-up systems)	0.00124	0.00274	0.00056	0.01454	0.00000	0.00016	0.00026	0.00026	0.00020	0.00074	0.00024
Existing	504	Efficient compressor motor retrofit	0.00000	0.00001	0.00000	0.00003	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Existing	505	Compressor VSD retrofit	0.00000	0.00001	0.00000	0.00003	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Commercial Elec Measure Inputs			TECHNOLOGY SATURATION (units/square foot)										
Segment	Measure #	Measure Description	Office	Restau- rant	Retail	Food Store	Ware- house	School	College	Hospital	Lodging	City of Austin	Miscel- laneous
Existing	506	Floating head pressure controls	0.00000	0.00001	0.00000	0.00003	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Existing	507	Refrigeration Commissioning	0.00002	0.00078	0.00016	0.00155	0.00016	0.00016	0.00002	0.00003	0.00002	0.00009	0.00016
Existing	508	Demand Hot Gas Defrost	0.00002	0.00065	0.00013	0.00130	0.00013	0.00013	0.00002	0.00002	0.00002	0.00007	0.00013
Existing	509	Demand Defrost Electric	0.00002	0.00065	0.00013	0.00130	0.00013	0.00013	0.00002	0.00002	0.00002	0.00007	0.00013
Existing	510	Anti-sweat (humidistat) controls	0.00000	0.00001	0.00000	0.00003	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Existing	511	Freezer-Cooler Replacement Gaskets (built-up systems)	0.00124	0.00274	0.00056	0.01454	0.00000	0.00016	0.00026	0.00026	0.00020	0.00074	0.00024
Existing	512	High R-Value Glass Doors	0.00124	0.00274	0.00056	0.01454	0.00000	0.00016	0.00026	0.00026	0.00020	0.00074	0.00024
Existing	513	Bi-level LED Case Lighting (built-up systems)	0.00124	0.00274	0.00056	0.01454	0.00000	0.00016	0.00026	0.00026	0.00020	0.00074	0.00024
Existing	514	Fiber Optic Case Lighting (built-up systems)	0.00124	0.00274	0.00056	0.01454	0.00000	0.00016	0.00026	0.00026	0.00020	0.00074	0.00024
Existing	516	Multiplex Compressor System	0.00002	0.00078	0.00016	0.00155	0.00016	0.00016	0.00002	0.00003	0.00002	0.00009	0.00016
Existing	517	Oversized Air Cooled Condenser	0.00002	0.00078	0.00016	0.00155	0.00016	0.00016	0.00002	0.00003	0.00002	0.00009	0.00016
Existing	520	Base Self-Contained Refrigeration	0.00004	0.00110	0.00091	0.00031	0.00001	0.00004	0.00006	0.00007	0.00004	0.00004	0.00005
Existing	521	Strip curtains for walk-ins	0.00000	0.00007	0.00004	0.00010	0.00001	0.00000	0.00000	0.00000	0.00001	0.00000	0.00000
Existing	522	Night covers for display cases (self-contained)	0.00001	0.00025	0.00009	0.00000	0.00000	0.00001	0.00002	0.00002	0.00001	0.00001	0.00001
Existing	523	Freezer-Cooler Replacement Gaskets (self-contained)	0.00003	0.00052	0.00069	0.00017	0.00000	0.00002	0.00002	0.00003	0.00002	0.00002	0.00002
Existing	524	Bi-level LED Case Lighting (self-contained units)	0.00002	0.00044	0.00065	0.00015	0.00000	0.00002	0.00002	0.00003	0.00001	0.00002	0.00002
Existing	526	Energy-Star Refrigerator, solid door	0.00001	0.00025	0.00009	0.00000	0.00000	0.00001	0.00002	0.00002	0.00001	0.00001	0.00001
Existing	527	Energy-Star Freezer, solid door	0.00000	0.00007	0.00004	0.00010	0.00000	0.00000	0.00000	0.00000	0.00001	0.00000	0.00000
Existing	528	Energy-Star Refrigerator, glass door	0.00002	0.00011	0.00052	0.00001	0.00000	0.00001	0.00000	0.00001	0.00000	0.00001	0.00001
Existing	529	Energy-Star Freezer, glass door	0.00000	0.00007	0.00004	0.00010	0.00000	0.00000	0.00000	0.00000	0.00001	0.00000	0.00000
Existing	530	Energy Star Ice Machines	0.00001	0.00025	0.00009	0.00000	0.00000	0.00001	0.00002	0.00002	0.00001	0.00001	0.00001
Existing	600	Base Desktop PC	0.00216	0.00048	0.00013	0.00010	0.00035	0.00045	0.00015	0.00125	0.00008	0.00115	0.00015
Existing	601	PC Manual Power Management Enabling	0.00216	0.00048	0.00013	0.00010	0.00035	0.00045	0.00015	0.00125	0.00008	0.00115	0.00015
Existing	602	PC Network Power Management Enabling	0.00216	0.00048	0.00013	0.00010	0.00035	0.00045	0.00015	0.00125	0.00008	0.00115	0.00015
Existing	603	Energy Star or Better PC	0.00216	0.00048	0.00013	0.00010	0.00035	0.00045	0.00015	0.00125	0.00008	0.00115	0.00015
Existing	610	Base Monitor, CRT	0.00002	0.00010	0.00005	0.00003	0.00003	0.00003	0.00001	0.00005	0.00000	0.00002	0.00001
Existing	611	Energy Star or Better Monitor-CRT	0.00002	0.00010	0.00005	0.00003	0.00003	0.00003	0.00001	0.00005	0.00000	0.00002	0.00001
Existing	612	Monitor Power Management Enabling--CRT	0.00002	0.00010	0.00005	0.00003	0.00003	0.00003	0.00001	0.00005	0.00000	0.00002	0.00001
Existing	620	Base Monitor, LCD	0.00298	0.00057	0.00021	0.00010	0.00037	0.00042	0.00015	0.00127	0.00008	0.00156	0.00014
Existing	621	Energy Star or Better Monitor--LCD	0.00298	0.00057	0.00021	0.00010	0.00037	0.00042	0.00015	0.00127	0.00008	0.00156	0.00014
Existing	622	Monitor Power Management Enabling--LCD	0.00298	0.00057	0.00021	0.00010	0.00037	0.00042	0.00015	0.00127	0.00008	0.00156	0.00014
Existing	630	Base Copier	0.00008	0.00010	0.00004	0.00003	0.00004	0.00001	0.00001	0.00009	0.00001	0.00005	0.00001
Existing	631	Energy Star or Better Copier	0.00008	0.00010	0.00004	0.00003	0.00004	0.00001	0.00001	0.00009	0.00001	0.00005	0.00001
Existing	632	Copier Power Management Enabling	0.00008	0.00010	0.00004	0.00003	0.00004	0.00001	0.00001	0.00009	0.00001	0.00005	0.00001
Existing	640	Base Laser Printer	0.00042	0.00006	0.00007	0.00002	0.00007	0.00003	0.00002	0.00018	0.00002	0.00022	0.00003
Existing	641	Printer Power Management Enabling	0.00042	0.00006	0.00007	0.00002	0.00007	0.00003	0.00002	0.00018	0.00002	0.00022	0.00003
Existing	650	Base Data Center/Server Room	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	651	Data Center Improved Operations	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	652	Data Center Best Practices	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	653	Data Center State of the Art practices	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	660	Base Water Heating	0.00146	0.00271	0.00131	0.00212	0.00797	0.00254	0.00254	0.00265	0.00378	0.00152	0.00157
Existing	661	Demand controlled circulating systems	0.00010	0.00020	0.00005	0.00005	0.00022	0.00005	0.00002	0.00002	0.00005	0.00010	0.00010
Existing	662	High Efficiency Water Heater (electric)	0.00146	0.00271	0.00131	0.00212	0.00797	0.00254	0.00254	0.00265	0.00378	0.00152	0.00157
Existing	663	Hot Water Pipe Insulation	0.00112	0.00207	0.00100	0.00163	0.00610	0.00195	0.00195	0.00203	0.00290	0.00116	0.00121
Existing	664	Tankless Water Heater	0.00146	0.00271	0.00131	0.00212	0.00797	0.00254	0.00254	0.00265	0.00378	0.00152	0.00157
Existing	665	Heat Pump Water Heater (air source)	0.00146	0.00271	0.00131	0.00212	0.00797	0.00254	0.00254	0.00265	0.00378	0.00152	0.00157
Existing	666	Heat Recovery Unit	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Existing	667	Heat Trap	0.00146	0.00271	0.00131	0.00212	0.00797	0.00254	0.00254	0.00265	0.00378	0.00152	0.00157

Commercial Elec Measure Inputs			TECHNOLOGY SATURATION (units/square foot)										
Segment	Measure #	Measure Description	Office	Restau- rant	Retail	Food Store	Ware- house	School	College	Hospital	Lodging	City of Austin	Miscel- laneous
Existing	668	Solar Water Heater	0.00146	0.00271	0.00131	0.00212	0.00797	0.00254	0.00254	0.00265	0.00378	0.00152	0.00157
Existing	670	Base Vending Machines	0.00002	0.00004	0.00003	0.00005	0.00003	0.00004	0.00003	0.00002	0.00003	0.00001	0.00001
Existing	671	Vending Misers	0.00002	0.00004	0.00003	0.00005	0.00003	0.00004	0.00003	0.00002	0.00003	0.00001	0.00001
Existing	700	Base Cooking	0.00024	0.00057	0.00051	0.00246	0.00081	0.00011	0.00019	0.00021	0.00038	0.00039	0.00054
Existing	701	Convection Oven	0.00006	0.00008	0.00007	0.00009	0.00045	0.00003	0.00007	0.00004	0.00004	0.00007	0.00008
Existing	702	Efficient Fryer	0.00006	0.00014	0.00015	0.00021	0.00009	0.00002	0.00002	0.00005	0.00007	0.00009	0.00013
Existing	703	Efficient Steamer	0.00003	0.00009	0.00007	0.00013	0.00009	0.00002	0.00002	0.00005	0.00004	0.00007	0.00012
Existing	704	Energy Star Hot Food Holding Cabinets	0.00006	0.00008	0.00007	0.00009	0.00045	0.00003	0.00007	0.00004	0.00004	0.00007	0.00008
Existing	800	Base Heating	0.00002	0.00004	0.00003	0.00005	0.00003	0.00004	0.00003	0.00002	0.00003	0.00001	0.00001
Existing	900	Base Miscellaneous	0.00002	0.00004	0.00003	0.00005	0.00003	0.00004	0.00003	0.00002	0.00003	0.00001	0.00001
New	100	Base Bldg Design - 15%	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
New	102	High Performance Building/Int Design - Tier 1 15% - Office	1.00000										
New	103	High Performance Building/Int Design - Tier 1 15% - Restaurant		1.00000									
New	105	High Performance Building/Int Design - Tier 1 15% - Retail			1.00000								
New	106	High Performance Building/Int Design - Tier 1 15% - Grocery				1.00000							
New	107	High Performance Building/Int Design - Tier 1 15% - Warehouse					1.00000						
New	108	High Performance Building/Int Design - Tier 1 15% - School						1.00000					
New	109	High Performance Building/Int Design - Tier 1 15% - College							1.00000				
New	110	High Performance Building/Int Design - Tier 1 15% - Health								1.00000			
New	111	High Performance Building/Int Design - Tier 1 15% - Lodging									1.00000		
New	112	High Performance Building/Int Design - Tier 1 15% - City of Austin										1.00000	
New	113	High Performance Building/Int Design - Tier 1 15% - Miscellaneous											1.00000
New	200	Base Bldg Design - 30%	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
New	202	High Performance Building/Int Design - Tier 2 30% - Office	1.00000										
New	203	High Performance Building/Int Design - Tier 2 30% - Restaurant		1.00000									
New	205	High Performance Building/Int Design - Tier 2 30% - Retail			1.00000								
New	206	High Performance Building/Int Design - Tier 2 30% - Grocery				1.00000							
New	207	High Performance Building/Int Design - Tier 2 30% - Warehouse					1.00000						
New	208	High Performance Building/Int Design - Tier 2 30% - School						1.00000					
New	209	High Performance Building/Int Design - Tier 2 30% - College							1.00000				
New	210	High Performance Building/Int Design - Tier 2 30% - Health								1.00000			
New	211	High Performance Building/Int Design - Tier 2 30% - Lodging									1.00000		
New	212	High Performance Building/Int Design - Tier 2 30% - City of Austin										1.00000	
New	213	High Performance Building/Int Design - Tier 2 30% - Miscellaneous											1.00000
New	300	Base Bldg Design - 50%	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
New	302	High Performance Building/Int Design - Tier 3 50% - Office	1.00000										
New	303	High Performance Building/Int Design - Tier 3 50% - Restaurant		1.00000									
New	305	High Performance Building/Int Design - Tier 3 50% - Retail			1.00000								
New	306	High Performance Building/Int Design - Tier 3 50% - Grocery				1.00000							
New	307	High Performance Building/Int Design - Tier 3 50% - Warehouse					1.00000						
New	308	High Performance Building/Int Design - Tier 3 50% - School						1.00000					
New	309	High Performance Building/Int Design - Tier 3 50% - College							1.00000				
New	310	High Performance Building/Int Design - Tier 3 50% - Health								1.00000			
New	311	High Performance Building/Int Design - Tier 3 50% - Lodging									1.00000		
New	312	High Performance Building/Int Design - Tier 3 50% - City of Austin										1.00000	
New	313	High Performance Building/Int Design - Tier 3 50% - Miscellaneous											1.00000
New	400	Base Bldg Design - 70%	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
New	402	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Office	1.00000										

Commercial Elec Measure Inputs			TECHNOLOGY SATURATION (units/square foot)										
Segment	Measure #	Measure Description	Office	Restau- rant	Retail	Food Store	Ware- house	School	College	Hospital	Lodging	City of Austin	Miscel- laneous
New	403	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Restaurant		1.00000									
New	405	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Retail			1.00000								
New	406	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Grocery				1.00000							
New	407	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Warehouse					1.00000						
New	408	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - School						1.00000					
New	409	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - College							1.00000				
New	410	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Health								1.00000			
New	411	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Lodging									1.00000		
New	412	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - City of Austin										1.00000	
New	413	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Miscellaneous											1.00000
New	500	Base 2015 Commercial Code Building--29% savings	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
New	502	High Performance Building/Int Design - Tier 1 29% - Office	1.00000										
New	503	High Performance Building/Int Design - Tier 1 29% - Restaurant		1.00000									
New	505	High Performance Building/Int Design - Tier 1 29% - Retail			1.00000								
New	506	High Performance Building/Int Design - Tier 1 29% - Grocery				1.00000							
New	507	High Performance Building/Int Design - Tier 1 29% - Warehouse					1.00000						
New	508	High Performance Building/Int Design - Tier 1 29% - School						1.00000					
New	509	High Performance Building/Int Design - Tier 1 29% - College							1.00000				
New	510	High Performance Building/Int Design - Tier 1 29% - Health								1.00000			
New	511	High Performance Building/Int Design - Tier 1 29% - Lodging									1.00000		
New	512	High Performance Building/Int Design - Tier 1 29% - City of Austin										1.00000	
New	513	High Performance Building/Int Design - Tier 1 29% - Miscellaneous											1.00000
New	600	Base 2015 Commercial Code Building--57% savings	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
New	602	High Performance Building/Int Design - Tier 2 57% - Office	1.00000										
New	603	High Performance Building/Int Design - Tier 2 57% - Restaurant		1.00000									
New	605	High Performance Building/Int Design - Tier 2 57% - Retail			1.00000								
New	606	High Performance Building/Int Design - Tier 2 57% - Grocery				1.00000							
New	607	High Performance Building/Int Design - Tier 2 57% - Warehouse					1.00000						
New	608	High Performance Building/Int Design - Tier 2 57% - School						1.00000					
New	609	High Performance Building/Int Design - Tier 2 57% - College							1.00000				
New	610	High Performance Building/Int Design - Tier 2 57% - Health								1.00000			
New	611	High Performance Building/Int Design - Tier 2 57% - Lodging									1.00000		
New	612	High Performance Building/Int Design - Tier 2 57% - City of Austin										1.00000	
New	613	High Performance Building/Int Design - Tier 2 57% - Miscellaneous											1.00000

Commercial Elec Measure Inputs			Hour Adjustment For Lighting (Hours/year)										
Segment	Measure #	Measure Description	Office	Restau- rant	Retail	Food Store	Ware- house	School	College	Hospital	Lodging	City of Austin	Miscel- laneous
Existing	100	Base Fluorescent Fixture, 4L4'T8	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	101	ROB 4L4' Premium T8	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	102	Delamping 3L4' F32T8	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	103	LED Troffer (Base 4L4'T8)	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	104	Lighting Control Tuneup	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	105	Occupancy Sensor, 4L4' Fluorescent Fixtures	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	106	Continuous Dimming, 4L4' Fluorescent Fixtures	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	107	High Performance Lighting R/R - 25% Savings, Base 4L4'T8	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	110	Base Fluorescent Fixture, 2L4'T8, 1 EB	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	111	ROB 2L4' Premium T8	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	112	Delamping 1L4' F32T8	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	113	LED Troffer (Base 2L4'T8)	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	114	Lighting Control Tuneup	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	115	Occupancy Sensor, 2L4' Fluorescent Fixtures	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	116	Continuous Dimming, 2L4' Fluorescent Fixtures	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	117	High Performance Lighting R/R - 25% Savings, Base 2L4'T8	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	120	Base Other Fluorescent Fixture	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	121	ROB Premium T8 (base other fluorescent)	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	122	Lighting Control Tuneup	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	123	Occupancy Sensor, 4L8' Fluorescent Fixtures	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	124	Continuous Dimming, 4L8' Fluorescent Fixtures	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	125	High Performance Lighting R/R - 25% Savings, Base Other Fluorescent	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	130	Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacement	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	131	CFL Screw-in 18W	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	132	Cold Cathode Lamps	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	133	LED screw-in PAR replacement (base incandescent)	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	140	Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacement	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	141	CFL Hardwired, Modular 18W	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	142	Ceramic Metal Halide	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	143	LED fixture replacement (base incandescent flood)	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	150	Base CFL to screw-in replacement	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	151	LED screw-in replacement (base CFL)	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	160	Base High Bay Metal Halide, 400W	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	161	High Bay T5	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	162	Induction High Bay Lighting	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	163	PSMH + electronic ballast	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	165	Occupancy Sensor, High Bay T5	4,732	2,477	2,615	4,346	2,799	2,484	3,449	5,638	2,743	3,724	2,716
Existing	180	Base Parking Garage Metal Halide, 250 W	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760
Existing	181	High-efficiency fluorescent parking garage fixture (Base MH)	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760
Existing	182	Bi-Level LED Parking Garage Fixtures (Base MH)	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760
Existing	185	Base Fluorescent Parking Garage Lighting	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760
Existing	186	Parking Garage Low Wattage T8 Lamps replacing 32W lamps	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760
Existing	187	Bi-Level LED Parking Garage Fixtures (Base Fluorescent)	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760
Existing	190	Base Exit Sign	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760

Commercial Elec Measure Inputs			Hour Adjustment For Lighting (Hours/year)										
Segment	Measure #	Measure Description	Office	Restau- rant	Retail	Food Store	Ware- house	School	College	Hospital	Lodging	City of Austin	Miscel- laneous
Existing	191	LED Exit Sign	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760
Existing	200	Base Outdoor High Pressure Sodium 250W Lamp	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380
Existing	201	Outdoor Lighting Controls (Photocell/Timeclock)	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380
Existing	202	LED Outdoor Area Lighting	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380
Existing	203	Bi-Level LED Outdoor Lighting	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380

BASE TECHNOLOGY EUIs (kWh/square foot)																		
Segment	Measure #	Measure Description	Food	Textiles, Apparel	Lumber, Furniture	Paper	Printing	Chemicals	Petroleum	Rubber, Plastic	Stone, Clay, Glass	Prim Metals	Fab Metals	Ind Mach	Electronics	Transp Equip	Misc.	Water/WW
			Building Type 1	Building Type 2	Building Type 3	Building Type 4	Building Type 5	Building Type 6	Building Type 7	Building Type 8	Building Type 9	Building Type 10	Building Type 11	Building Type 12	Building Type 13	Building Type 14	Building Type 15	Building Type 16
Existing	100	Base Compressed Air	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Existing	200	Base Fans	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Existing	300	Base Pumps	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Existing	400	Base Drives	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Existing	500	Base Process Heating	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Existing	550	Base Process Cooling	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Existing	600	Base Other Process	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Existing	700	Base Space Cooling Chiller	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Existing	710	Base Space Cooling DX	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Existing	800	Base Lighting	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Existing	900	Base Other	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
New	100	Base Industrial Building	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
New	104	Base 2015 Code Industrial f	0.95	0.93	0.95	0.98	0.91	0.97	0.98	0.94	0.97	0.00	0.94	0.89	0.89	0.90	0.88	0.98

Industrial Elec Measure Inputs			MEASURE COSTS				NPV of		Implementation		Full = 1		Full		Relative Energy		Reduction Factors		Implementation		Type		Cost Source
Segment	Measure #	Measure Description	Savings Units	Cost Units	Unit Equipment Cost	Unit Labor Cost	Lifetime O & M Cost	Cost Factor	Service Life	Incr. = 0 Initial Cost	Replace Cost	Unit Cost	SON	SMID	SOFF	WMD	WOFF	End Use	1=1 time	2=ROB			
Existing	100	Base Compressed Air	\$/kWh	\$/kWh	\$0.00	\$0.00	\$0.00	\$0.00	14.5	1	\$1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1	1	Derived from LBNL Industrial Study 2005, LBNL gives \$/kwh saved, derived to get \$/base kwh		
Existing	101	Compressed Air-O&M	\$/kWh	\$/kWh	\$0.01	\$0.0011	\$0.00	\$0.01	2	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	1	1	LBNL Industrial Study 2005		
Existing	102	Compressed Air - Controls	\$/kWh	\$/kWh	\$0.02	\$0.0018	\$0.00	\$0.02	10	1	\$1.00	0.02	1.00	1.00	1.00	1.00	1.00	1.00	1	2	LBNL Industrial Study 2005		
Existing	103	Compressed Air - System Optimization	\$/kWh	\$/kWh	\$0.01	\$0.0017	\$0.00	\$0.02	10	1	\$1.00	0.02	1.00	1.00	1.00	1.00	1.00	1.00	1	1	LBNL Industrial Study 2005; refer to appendix B.3 for measure description		
Existing	104	Compressed Air- Sizing	\$/kWh	\$/kWh	\$0.00	\$0.0005	\$0.00	\$0.00	10	1	\$1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1	2	LBNL Industrial Study 2005		
Existing	105	Comp Air - Replace 1-5 HP motor	\$/kWh	\$/kWh	\$0.05	\$0.0056	\$0.00	\$0.05	17	1	\$1.00	0.05	1.00	1.00	1.00	1.00	1.00	1.00	1	2	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	106	Comp Air - ASD (1-5 hp)	\$/kWh	\$/kWh	\$0.07	\$0.0081	\$0.00	\$0.08	17	1	\$1.00	0.08	0.09	1.00	1.00	1.00	1.00	1.00	1	1	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	107	Comp Air - Motor practices-1 (1-5 HP)	\$/kWh	\$/kWh	\$0.02	\$0.0022	\$0.00	\$0.02	17	1	\$1.00	0.02	1.00	1.00	1.00	1.00	1.00	1.00	1	1	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	108	Comp Air - Replace 6-100 HP motor	\$/kWh	\$/kWh	\$0.03	\$0.0031	\$0.00	\$0.03	20	1	\$1.00	0.03	1.00	1.00	1.00	1.00	1.00	1.00	1	2	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	109	Comp Air - ASD (6-100 hp)	\$/kWh	\$/kWh	\$0.00	\$0.0003	\$0.00	\$0.00	20	1	\$1.00	0.00	0.09	1.00	1.00	1.00	1.00	1.00	1	2	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	110	Comp Air - Motor practices-1 (6-100 HP)	\$/kWh	\$/kWh	\$0.00	\$0.0006	\$0.00	\$0.01	20	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	1	1	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	111	Comp Air - Replace 100+ HP motor	\$/kWh	\$/kWh	\$0.01	\$0.0009	\$0.00	\$0.01	20	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	1	2	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	112	Comp Air - ASD (100+ hp)	\$/kWh	\$/kWh	\$0.01	\$0.0006	\$0.00	\$0.01	20	1	\$1.00	0.01	0.09	1.00	1.00	1.00	1.00	1.00	1	1	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	113	Comp Air - Motor practices-1 (100+ HP)	\$/kWh	\$/kWh	\$0.00	\$0.0002	\$0.00	\$0.00	20	1	\$1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1	1	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	115	Compressed Air Conversion to Low Pressur	\$/kWh	\$/kWh	\$0.00	\$0.0002	\$0.00	\$0.00	6	1	\$1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1	1	This measure does not exist in MoPo or Xcel CO, where were these numbers found?		
Existing	114	Power recovery	\$/kWh	\$/kWh	\$0.00	\$0.0003	\$0.00	\$0.00	10	1	\$1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1	1	LBNL Industrial Study 2005		
Existing	200	Base Fans	\$/kWh	\$/kWh	\$0.00	\$0.0000	\$0.00	\$0.00	14.5	1	\$1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	2	1	LBNL Industrial Study 2005		
Existing	201	Fans - O&M	\$/kWh	\$/kWh	\$0.001	\$0.0001	\$0.00	\$0.00	2	1	\$1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	2	1	LBNL Industrial Study 2005		
Existing	202	Fans - Controls	\$/kWh	\$/kWh	\$0.004	\$0.0097	\$0.00	\$0.09	10	1	\$1.00	0.09	1.00	1.00	1.00	1.00	1.00	1.00	2	2	LBNL Industrial Study 2005		
Existing	203	Fans - System Optimization	\$/kWh	\$/kWh	\$0.055	\$0.0063	\$0.00	\$0.06	10	1	\$1.00	0.06	0.47	1.00	1.00	1.00	1.00	1.00	2	1	LBNL Industrial Study 2005; refer to appendix B.3 for measure description		
Existing	204	Fans- Improve components	\$/kWh	\$/kWh	\$0.005	\$0.0005	\$0.00	\$0.01	10	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	2	2	LBNL Industrial Study 2005		
Existing	205	Fans - Replace 1-5 HP motor	\$/kWh	\$/kWh	\$0.05	\$0.0056	\$0.00	\$0.05	17	1	\$1.00	0.05	1.00	1.00	1.00	1.00	1.00	1.00	2	2	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	206	Fans - ASD (1-5 hp)	\$/kWh	\$/kWh	\$0.07	\$0.0081	\$0.00	\$0.08	17	1	\$1.00	0.08	0.09	1.00	1.00	1.00	1.00	1.00	2	1	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	207	Fans - Motor practices-1 (1-5 HP)	\$/kWh	\$/kWh	\$0.02	\$0.0022	\$0.00	\$0.02	17	1	\$1.00	0.02	1.00	1.00	1.00	1.00	1.00	1.00	2	1	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	208	Fans - Replace 6-100 HP motor	\$/kWh	\$/kWh	\$0.03	\$0.0031	\$0.00	\$0.03	20	1	\$1.00	0.03	1.00	1.00	0.50	1.00	1.00	1.00	2	2	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	209	Fans - ASD (6-100 hp)	\$/kWh	\$/kWh	\$0.00	\$0.0003	\$0.00	\$0.00	20	1	\$1.00	0.00	0.09	0.50	0.00	1.00	0.75	2	2	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002			
Existing	210	Fans - Motor practices-1 (6-100 HP)	\$/kWh	\$/kWh	\$0.00	\$0.0006	\$0.00	\$0.01	20	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	2	1	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	211	Fans - Replace 100+ HP motor	\$/kWh	\$/kWh	\$0.01	\$0.0009	\$0.00	\$0.01	20	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	2	2	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	212	Fans - ASD (100+ hp)	\$/kWh	\$/kWh	\$0.01	\$0.0006	\$0.00	\$0.01	20	1	\$1.00	0.01	0.09	1.00	0.50	1.00	1.00	1.00	2	1	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	213	Fans - Motor practices-1 (100+ HP)	\$/kWh	\$/kWh	\$0.00	\$0.0002	\$0.00	\$0.00	20	1	\$1.00	0.00	1.00	0.50	0.00	1.00	0.75	2	1	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002			
Existing	214	Optimize drying process	\$/kWh	\$/kWh	\$0.05	\$0.0053	\$0.00	\$0.05	10	1	\$1.00	0.05	1.00	1.00	1.00	1.00	1.00	1.00	2	1	LBNL Industrial Study 2005		
Existing	300	Base Pumps	\$/kWh	\$/kWh	\$0.00	\$0.0000	\$0.00	\$0.00	14.5	1	\$1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	3	1	LBNL Industrial Study 2005		
Existing	301	Pumps - O&M	\$/kWh	\$/kWh	\$0.00	\$0.0005	\$0.00	\$0.01	2	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	3	1	LBNL Industrial Study 2005		
Existing	302	Pumps - Controls	\$/kWh	\$/kWh	\$0.02	\$0.0028	\$0.00	\$0.03	10	1	\$1.00	0.03	1.00	1.00	1.00	1.00	1.00	1.00	3	2	LBNL Industrial Study 2005		
Existing	303	Pumps - System Optimization	\$/kWh	\$/kWh	\$0.06	\$0.0070	\$0.00	\$0.07	10	1	\$1.00	0.07	1.00	1.00	1.00	1.00	1.00	1.00	3	1	LBNL Industrial Study 2005; refer to appendix B.3 for measure description		
Existing	304	Pumps - Sizing	\$/kWh	\$/kWh	\$0.02	\$0.0021	\$0.00	\$0.02	10	1	\$1.00	0.02	1.00	1.00	1.00	1.00	1.00	1.00	3	2	LBNL Industrial Study 2005		
Existing	305	Pumps - Replace 1-5 HP motor	\$/kWh	\$/kWh	\$0.05	\$0.0056	\$0.00	\$0.05	17	1	\$1.00	0.05	1.00	1.00	1.00	1.00	1.00	1.00	3	2	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	306	Pumps - ASD (1-5 hp)	\$/kWh	\$/kWh	\$0.07	\$0.0081	\$0.00	\$0.08	17	1	\$1.00	0.08	0.09	1.00	1.00	1.00	1.00	1.00	3	1	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	307	Pumps - Motor practices-1 (1-5 HP)	\$/kWh	\$/kWh	\$0.02	\$0.0022	\$0.00	\$0.02	17	1	\$1.00	0.02	1.00	1.00	1.00	1.00	1.00	1.00	3	1	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	308	Pumps - Replace 6-100 HP motor	\$/kWh	\$/kWh	\$0.03	\$0.0031	\$0.00	\$0.03	20	1	\$1.00	0.03	1.00	1.00	1.00	1.00	1.00	1.00	3	2	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	309	Pumps - ASD (6-100 hp)	\$/kWh	\$/kWh	\$0.00	\$0.0003	\$0.00	\$0.00	20	1	\$1.00	0.00	0.09	1.00	1.00	1.00	1.00	1.00	3	1	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	310	Pumps - Motor practices-1 (6-100 HP)	\$/kWh	\$/kWh	\$0.00	\$0.0006	\$0.00	\$0.01	20	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	3	1	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	311	Pumps - Replace 100+ HP motor	\$/kWh	\$/kWh	\$0.01	\$0.0009	\$0.00	\$0.01	20	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	3	2	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	312	Pumps - ASD (100+ hp)	\$/kWh	\$/kWh	\$0.01	\$0.0006	\$0.00	\$0.01	20	1	\$1.00	0.01	0.09	1.00	1.00	1.00	1.00	1.00	3	1	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	313	Pumps - Motor practices-1 (100+ HP)	\$/kWh	\$/kWh	\$0.00	\$0.0002	\$0.00	\$0.00	20	1	\$1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	3	1	Energy-Efficient Motor Systems.; A handbook on Technology, Program, and Policy Opportunities. Steven Nadel, R. Neal Elliot, et al. ACEEE. 2002		
Existing	400	Base Drives	\$/kWh	\$/kWh	\$0.00	\$0.0000	\$0.00	\$0.00	20	1	\$1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	4	1	LBNL Industrial Study 2005		
Existing	401	Bakery - Process (Mixing) - O&M	\$/kWh	\$/kWh	\$0.00	\$0.0005	\$0.00	\$0.01	10	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	4	1	LBNL Industrial Study 2005		
Existing	402	O&M/drives spinning machines	\$/kWh	\$/kWh	\$0.03	\$0.0034	\$0.00	\$0.03	10	1	\$1.00	0.03	1.00	1.00	1.00	1.00	1.00	1.00	4	1	LBNL Industrial Study 2005		
Existing	403	Air conveying systems	\$/kWh	\$/kWh	\$0.03	\$0.0040	\$0.00	\$0.04	14	1	\$1.00	0.04	0.24	1.00	1.00	1.00	1.00	1.00	4	2	LBNL Industrial Study 2005		

Industrial Elec Measure Inputs			MEASURE COSTS				NPV of		Implementation		Full = 0		Full		Relative Energy Reduction Factors		Implementation				
Segment	Measure #	Measure Description	Savings	Cost	Unit	Unit	Lifetime	Implementation	Service	Initial	Replace	Unit	Relative	SON	SMD	SOFF	WMD	WOFF	End	Type	Cost Source
			Units	Units	Equipment	Labor	O & M	Cost												Life	
Existing	405	Drives - EE motor	\$/kWh	\$/kWh	\$0.01	\$0.0007	\$0.00	\$0.01	10	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	4	2	LBNL Industrial Study 2005
Existing	406	Gap Forming papermachine	\$/kWh	\$/kWh	\$0.01	\$0.0008	\$0.00	\$0.01	20	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	4	2	LBNL Industrial Study 2005
Existing	407	High Consistency forming	\$/kWh	\$/kWh	\$0.01	\$0.0008	\$0.00	\$0.01	20	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	4	2	LBNL Industrial Study 2005
Existing	408	Optimization control PM	\$/kWh	\$/kWh	\$0.01	\$0.0013	\$0.00	\$0.01	10	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	4	1	LBNL Industrial Study 2005
Existing	409	Efficient practices printing press	\$/kWh	\$/kWh	\$0.01	\$0.0011	\$0.00	\$0.01	20	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	4	1	LBNL Industrial Study 2005
Existing	410	Efficient Printing press (fewer cylinders)	\$/kWh	\$/kWh	\$0.05	\$0.0063	\$0.00	\$0.06	10	1	\$1.00	0.06	1.00	1.00	1.00	1.00	1.00	1.00	4	2	LBNL Industrial Study 2005
Existing	411	Light cylinders	\$/kWh	\$/kWh	\$0.06	\$0.0074	\$0.00	\$0.07	10	1	\$1.00	0.07	1.00	1.00	1.00	1.00	1.00	1.00	4	2	LBNL Industrial Study 2005
Existing	412	Efficient drives	\$/kWh	\$/kWh	\$0.01	\$0.0006	\$0.00	\$0.01	10	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	4	2	LBNL Industrial Study 2005
Existing	413	Clean Room - Controls	\$/kWh	\$/kWh	\$0.02	\$0.0023	\$0.00	\$0.02	10	1	\$1.00	0.02	1.00	1.00	1.00	1.00	1.00	1.00	4	2	LBNL Industrial Study 2005
Existing	414	Clean Room - New Designs	\$/kWh	\$/kWh	\$0.12	\$0.0139	\$0.00	\$0.13	10	1	\$1.00	0.13	1.00	1.00	1.00	1.00	1.00	1.00	4	2	LBNL Industrial Study 2005
Existing	415	Drives - Process Controls (batch + site)	\$/kWh	\$/kWh	\$0.02	\$0.0025	\$0.00	\$0.02	10	1	\$1.00	0.02	1.00	1.00	1.00	1.00	1.00	1.00	4	2	LBNL Industrial Study 2005
Existing	416	Process Drives - ASD	\$/kWh	\$/kWh	\$0.00	\$0.0002	\$0.00	\$0.00	10	1	\$1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	4	1	LBNL Industrial Study 2005
Existing	417	O&M - Extruders/Injection Moulding	\$/kWh	\$/kWh	\$0.00	\$0.0005	\$0.00	\$0.01	12	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	4	2	LBNL Industrial Study 2005
Existing	418	Extruders/injection Moulding-multipump	\$/kWh	\$/kWh	\$0.09	\$0.0104	\$0.00	\$0.10	12	1	\$1.00	0.10	1.00	1.00	1.00	1.00	1.00	1.00	4	2	LBNL Industrial Study 2005
Existing	419	Direct drive Extruders	\$/kWh	\$/kWh	\$0.28	\$0.0325	\$0.00	\$0.31	12	1	\$1.00	0.31	1.00	1.00	1.00	1.00	1.00	1.00	4	2	LBNL Industrial Study 2005
Existing	420	Injection Moulding - Impulse Cooling	\$/kWh	\$/kWh	\$0.06	\$0.0073	\$0.00	\$0.07	12	1	\$1.00	0.07	1.00	1.00	1.00	1.00	1.00	1.00	4	2	LBNL Industrial Study 2005
Existing	421	Injection Moulding - Direct drive	\$/kWh	\$/kWh	\$0.09	\$0.0102	\$0.00	\$0.10	12	1	\$1.00	0.10	1.00	1.00	1.00	1.00	1.00	1.00	4	2	LBNL Industrial Study 2005
Existing	422	Efficient grinding	\$/kWh	\$/kWh	\$0.21	\$0.0244	\$0.00	\$0.23	15	1	\$1.00	0.23	1.00	1.00	1.00	1.00	1.00	1.00	4	2	LBNL Industrial Study 2005
Existing	423	Process control	\$/kWh	\$/kWh	\$0.00	\$0.0002	\$0.00	\$0.00	10	1	\$1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	4	2	LBNL Industrial Study 2005
Existing	424	Process optimization	\$/kWh	\$/kWh	\$0.03	\$0.0032	\$0.00	\$0.03	10	1	\$1.00	0.03	1.00	1.00	1.00	1.00	1.00	1.00	4	1	LBNL Industrial Study 2005
Existing	425	Drives - Process Control	\$/kWh	\$/kWh	\$0.01	\$0.0016	\$0.00	\$0.02	15	1	\$1.00	0.02	1.00	1.00	1.00	1.00	1.00	1.00	4	2	LBNL Industrial Study 2005
Existing	426	Efficient drives - rolling	\$/kWh	\$/kWh	\$0.01	\$0.0010	\$0.00	\$0.01	10	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	4	2	LBNL Industrial Study 2005
Existing	427	Drives - Optimization process (M&T)	\$/kWh	\$/kWh	\$0.01	\$0.0008	\$0.00	\$0.01	10	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	4	1	LBNL Industrial Study 2005
Existing	428	Drives - Scheduling	\$/kWh	\$/kWh	\$0.01	\$0.0011	\$0.00	\$0.01	10	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	4	1	LBNL Industrial Study 2005
Existing	429	Machinery	\$/kWh	\$/kWh	\$0.01	\$0.0013	\$0.00	\$0.01	10	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	4	2	LBNL Industrial Study 2005
Existing	430	Efficient Machinery	\$/kWh	\$/kWh	\$0.01	\$0.0007	\$0.00	\$0.01	10	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	4	2	LBNL Industrial Study 2005
Existing	431	Custom Measures--Drives	\$/kWh	\$/kWh	\$0.01	\$0.0000	\$0.00	\$0.01	15	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	4	1	
Existing	500	Base Process Heating	\$/kWh	\$/kWh	\$0.00	\$0.0000	\$0.00	\$0.00	20	1	\$1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	5	1	LBNL Industrial Study 2005
Existing	501	Bakery - Process	\$/kWh	\$/kWh	\$0.05	\$0.0053	\$0.00	\$0.05	15	1	\$1.00	0.05	1.00	1.00	1.00	1.00	1.00	1.00	5	2	LBNL Industrial Study 2005
Existing	502	Drying (UV/IR)	\$/kWh	\$/kWh	\$0.07	\$0.0079	\$0.00	\$0.08	8	1	\$1.00	0.08	0.57	1.00	1.00	1.00	1.00	1.00	5	2	LBNL Industrial Study 2005
Existing	503	Heat Pumps - Drying	\$/kWh	\$/kWh	\$0.16	\$0.0186	\$0.00	\$0.18	15	1	\$1.00	0.18	1.00	1.00	1.00	1.00	1.00	1.00	5	2	LBNL Industrial Study 2005
Existing	504	Top-heating (glass)	\$/kWh	\$/kWh	\$0.00	\$0.0004	\$0.00	\$0.00	8	1	\$1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	5	2	LBNL Industrial Study 2005
Existing	505	Efficient electric melting	\$/kWh	\$/kWh	\$0.03	\$0.0035	\$0.00	\$0.03	20	1	\$1.00	0.03	1.00	1.00	1.00	1.00	1.00	1.00	5	2	LBNL Industrial Study 2005
Existing	506	Intelligent extruder (DOE)	\$/kWh	\$/kWh	\$0.01	\$0.0017	\$0.00	\$0.02	10	1	\$1.00	0.02	1.00	1.00	1.00	1.00	1.00	1.00	5	2	LBNL Industrial Study 2005
Existing	507	Near Net Shape Casting	\$/kWh	\$/kWh	\$0.01	\$0.0013	\$0.00	\$0.01	15	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	5	2	LBNL Industrial Study 2005
Existing	508	Heating - Process Control	\$/kWh	\$/kWh	\$0.01	\$0.0016	\$0.00	\$0.02	15	1	\$1.00	0.02	1.00	1.00	1.00	1.00	1.00	1.00	5	2	LBNL Industrial Study 2005
Existing	509	Efficient Curing ovens	\$/kWh	\$/kWh	\$0.07	\$0.0084	\$0.00	\$0.08	15	1	\$1.00	0.08	1.00	1.00	1.00	1.00	1.00	1.00	5	2	LBNL Industrial Study 2005
Existing	510	Heating - Optimization process (M&T)	\$/kWh	\$/kWh	\$0.01	\$0.0008	\$0.00	\$0.01	10	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	5	1	LBNL Industrial Study 2005
Existing	511	Heating - Scheduling	\$/kWh	\$/kWh	\$0.01	\$0.0011	\$0.00	\$0.01	10	1	\$1.00	0.01	0.18	1.00	1.00	1.00	1.00	1.00	5	1	LBNL Industrial Study 2005
Existing	512	Custom Measures--Process Heating	\$/kWh	\$/kWh	\$0.01	\$0.0000	\$0.00	\$0.01	15	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	5	1	
Existing	550	Base Process Cooling	\$/kWh	\$/kWh	\$0.00	\$0.0000	\$0.00	\$0.00	20	1	\$1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	6	1	LBNL Industrial Study 2005
Existing	551	Efficient Refrigeration - Operations	\$/kWh	\$/kWh	\$0.01	\$0.0008	\$0.00	\$0.01	10	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	6	2	LBNL Industrial Study 2005
Existing	552	Optimization Refrigeration	\$/kWh	\$/kWh	\$0.10	\$0.0115	\$0.00	\$0.11	15	1	\$1.00	0.11	1.00	1.00	1.00	1.00	1.00	1.00	6	1	LBNL Industrial Study 2005
Existing	553	Custom Measures--Process Cooling	\$/kWh	\$/kWh	\$0.01	\$0.0000	\$0.00	\$0.01	15	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	6	1	
Existing	600	Base Other Process	\$/kWh	\$/kWh	\$0.00	\$0.0000	\$0.00	\$0.00	15	1	\$1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	7	1	LBNL Industrial Study 2005
Existing	601	Other Process Controls (batch + site)	\$/kWh	\$/kWh	\$0.02	\$0.0025	\$0.00	\$0.02	10	1	\$1.00	0.02	1.00	1.00	1.00	1.00	1.00	1.00	7	2	LBNL Industrial Study 2005
Existing	602	Efficient desalter	\$/kWh	\$/kWh	\$0.04	\$0.0042	\$0.00	\$0.04	10	1	\$1.00	0.04	1.00	1.00	1.00	1.00	1.00	1.00	7	2	LBNL Industrial Study 2005
Existing	603	New transformers welding	\$/kWh	\$/kWh	\$0.05	\$0.0053	\$0.00	\$0.05	15	1	\$1.00	0.05	1.00	1.00	1.00	1.00	1.00	1.00	7	2	LBNL Industrial Study 2005
Existing	604	Efficient processes (welding, etc.)	\$/kWh	\$/kWh	\$0.05	\$0.0053	\$0.00	\$0.05	15	1	\$1.00	0.05	1.00	1.00	1.00	1.00	1.00	1.00	7	2	LBNL Industrial Study 2005
Existing	605	Custom Measures--Other Process	\$/kWh	\$/kWh	\$0.01	\$0.0000	\$0.00	\$0.01	15	1	\$1.00	0.01	1.00	1.00	1.00	1.00	1.00	1.00	7	1	
Existing	700	Base Space Cooling Centrifugal Chiller, 0.5E	\$/kWh	\$/ton	\$0.00	\$0.0000	\$0.00	\$0.00	20	1	\$1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	8	2	LBNL Industrial Study 2005
Existing	701	Centrifugal Chiller, 0.51 kW/ton, 500 tons	\$/kWh	\$/ton	\$21.14	\$2.4502	\$0.00	\$23.59	20	1	\$1.00	23.59	1.00	1.00	1.00	1.00	1.00	1.00	8	2	LBNL Industrial Study 2005
Existing	702	Window Film - Chiller	\$/kWh	\$/sf-wind	\$3.07	\$0.3558	\$0.00	\$3.43	10	1	\$1.00	3.43	1.00	1.00	1						

Industrial Elec Measure Inputs			APPLICABILITY FACTOR (percent)															
Segment	Measure #	Measure Description	Food	Textiles,Apprelumber,Furnitur	Paper	Printing	Chemicals	Petroleum	Rubber,Plasticstone,Clay,Glas	Prim Metals	Fab Metals	Ind Mach	Electronics	Transp Equip	Misc.	Water/WW		
Existing	100	Base Compressed Air	7.6%	3.5%	4.5%	3.6%	3.6%	2.5%	12.3%	3.5%	5.9%	0.0%	11.8%	14.4%	10.1%	12.3%	8.9%	0.3%
Existing	101	Compressed Air-O&M	8%	4%	5%	4%	4%	3%	12%	4%	6%	0%	12%	14%	10%	12%	9%	0%
Existing	102	Compressed Air - Controls	8%	4%	5%	4%	4%	3%	12%	4%	6%	0%	12%	14%	10%	12%	9%	0%
Existing	103	Compressed Air - System Optimization	8%	4%	5%	4%	4%	3%	12%	4%	6%	0%	12%	14%	10%	12%	9%	0%
Existing	104	Compressed Air- Sizing	8%	4%	5%	4%	4%	3%	12%	4%	6%	0%	12%	14%	10%	12%	9%	0%
Existing	105	Comp Air - Replace 1-5 HP motor	8%	4%	5%	4%	4%	3%	12%	4%	6%	0%	12%	14%	10%	12%	9%	0%
Existing	106	Comp Air - ASD (1-5 hp)	8%	4%	5%	4%	4%	3%	12%	4%	6%	0%	12%	14%	10%	12%	9%	0%
Existing	107	Comp Air - Motor practices-1 (1-5 HP)	8%	4%	5%	4%	4%	3%	12%	4%	6%	0%	12%	14%	10%	12%	9%	0%
Existing	108	Comp Air - Replace 6-100 HP motor	8%	4%	5%	4%	4%	3%	12%	4%	6%	0%	12%	14%	10%	12%	9%	0%
Existing	109	Comp Air - ASD (6-100 hp)	8%	4%	5%	4%	4%	3%	12%	4%	6%	0%	12%	14%	10%	12%	9%	0%
Existing	110	Comp Air - Motor practices-1 (6-100 HP)	8%	4%	5%	4%	4%	3%	12%	4%	6%	0%	12%	14%	10%	12%	9%	0%
Existing	111	Comp Air - Replace 100+ HP motor	8%	4%	5%	4%	4%	3%	12%	4%	6%	0%	12%	14%	10%	12%	9%	0%
Existing	112	Comp Air - ASD (100+ hp)	8%	4%	5%	4%	4%	3%	12%	4%	6%	0%	12%	14%	10%	12%	9%	0%
Existing	113	Comp Air - Motor practices-1 (100+ HP)	8%	4%	5%	4%	4%	3%	12%	4%	6%	0%	12%	14%	10%	12%	9%	0%
Existing	115	Compressed Air Conversion to Low Pressure Bl	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	114	Power recovery	0%	0%	0%	0%	0%	12%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	200	Base Fans	8.3%	6.6%	8.6%	14.6%	6.9%	6.5%	7.4%	6.6%	13.9%	0.0%	6.6%	5.2%	3.1%	5.5%	3.3%	30.0%
Existing	201	Fans - O&M	8%	7%	9%	15%	7%	6%	7%	7%	14%	0%	7%	5%	3%	5%	3%	30%
Existing	202	Fans - Controls	8%	7%	9%	15%	7%	6%	7%	7%	14%	0%	7%	5%	3%	5%	3%	30%
Existing	203	Fans - System Optimization	8%	7%	9%	15%	7%	6%	7%	7%	14%	0%	7%	5%	3%	5%	3%	30%
Existing	204	Fans- Improve components	8%	7%	9%	15%	7%	6%	7%	7%	14%	0%	7%	5%	3%	5%	3%	30%
Existing	205	Fans - Replace 1-5 HP motor	8%	7%	9%	15%	7%	6%	7%	7%	14%	0%	7%	5%	3%	5%	3%	30%
Existing	206	Fans - ASD (1-5 hp)	8%	7%	9%	15%	7%	6%	7%	7%	14%	0%	7%	5%	3%	5%	3%	30%
Existing	207	Fans - Motor practices-1 (1-5 HP)	8%	7%	9%	15%	7%	6%	7%	7%	14%	0%	7%	5%	3%	5%	3%	30%
Existing	208	Fans - Replace 6-100 HP motor	8%	7%	9%	15%	7%	6%	7%	7%	14%	0%	7%	5%	3%	5%	3%	30%
Existing	209	Fans - ASD (6-100 hp)	8%	7%	9%	15%	7%	6%	7%	7%	14%	0%	7%	5%	3%	5%	3%	30%
Existing	210	Fans - Motor practices-1 (6-100 HP)	8%	7%	9%	15%	7%	6%	7%	7%	14%	0%	7%	5%	3%	5%	3%	30%
Existing	211	Fans - Replace 100+ HP motor	8%	7%	9%	15%	7%	6%	7%	7%	14%	0%	7%	5%	3%	5%	3%	30%
Existing	212	Fans - ASD (100+ hp)	8%	7%	9%	15%	7%	6%	7%	7%	14%	0%	7%	5%	3%	5%	3%	30%
Existing	213	Fans - Motor practices-1 (100+ HP)	8%	7%	9%	15%	7%	6%	7%	7%	14%	0%	7%	5%	3%	5%	3%	30%
Existing	214	Optimize drying process	0%	0%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	300	Base Pumps	14.7%	8.9%	11.3%	24.2%	9.0%	26.2%	49.2%	8.7%	17.7%	0.0%	8.7%	6.8%	4.0%	7.2%	4.3%	62.1%
Existing	301	Pumps - O&M	15%	9%	11%	24%	9%	26%	49%	9%	18%	0%	9%	7%	4%	7%	4%	62%
Existing	302	Pumps - Controls	15%	9%	11%	24%	9%	26%	49%	9%	18%	0%	9%	7%	4%	7%	4%	62%
Existing	303	Pumps - System Optimization	15%	9%	11%	24%	9%	26%	49%	9%	18%	0%	9%	7%	4%	7%	4%	62%
Existing	304	Pumps - Sizing	15%	9%	11%	24%	9%	26%	49%	9%	18%	0%	9%	7%	4%	7%	4%	62%
Existing	305	Pumps - Replace 1-5 HP motor	15%	9%	11%	24%	9%	26%	49%	9%	18%	0%	9%	7%	4%	7%	4%	62%
Existing	306	Pumps - ASD (1-5 hp)	15%	9%	11%	24%	9%	26%	49%	9%	18%	0%	9%	7%	4%	7%	4%	62%
Existing	307	Pumps - Motor practices-1 (1-5 HP)	15%	9%	11%	24%	9%	26%	49%	9%	18%	0%	9%	7%	4%	7%	4%	62%
Existing	308	Pumps - Replace 6-100 HP motor	15%	9%	11%	24%	9%	26%	49%	9%	18%	0%	9%	7%	4%	7%	4%	62%
Existing	309	Pumps - ASD (6-100 hp)	15%	9%	11%	24%	9%	26%	49%	9%	18%	0%	9%	7%	4%	7%	4%	62%
Existing	310	Pumps - Motor practices-1 (6-100 HP)	15%	9%	11%	24%	9%	26%	49%	9%	18%	0%	9%	7%	4%	7%	4%	62%
Existing	311	Pumps - Replace 100+ HP motor	15%	9%	11%	24%	9%	26%	49%	9%	18%	0%	9%	7%	4%	7%	4%	62%
Existing	312	Pumps - ASD (100+ hp)	15%	9%	11%	24%	9%	26%	49%	9%	18%	0%	9%	7%	4%	7%	4%	62%
Existing	313	Pumps - Motor practices-1 (100+ HP)	15%	9%	11%	24%	9%	26%	49%	9%	18%	0%	9%	7%	4%	7%	4%	62%
Existing	400	Base Drives	14.1%	30.4%	40.5%	31.8%	32.3%	21.0%	13.1%	31.4%	20.1%	0.0%	21.9%	18.3%	8.6%	11.8%	16.2%	0.0%
Existing	401	Bakery - Process (Mixing) - O&M	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	402	O&M/drives spinning machines	0%	30%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	403	Air conveying systems	0%	0%	41%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	405	Drives - EE motor	0%	0%	41%	32%	0%	0%	0%	0%	20%	0%	0%	0%	0%	0%	0%	0%
Existing	406	Gap Forming papermachine	0%	0%	0%	32%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	407	High Consistency forming	0%	0%	0%	32%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	408	Optimization control PM	0%	0%	0%	32%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	409	Efficient practices printing press	0%	0%	0%	0%	32%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	410	Efficient Printing press (fewer cylinders)	0%	0%	0%	0%	32%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	411	Light cylinders	0%	0%	0%	0%	32%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	412	Efficient drives	0%	0%	0%	0%	32%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	413	Clean Room - Controls	0%	0%	0%	0%	0%	21%	0%	0%	0%	0%	0%	9%	0%	0%	0%	0%
Existing	414	Clean Room - New Designs	0%	0%	0%	0%	0%	21%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	415	Drives - Process Controls (batch + site)	0%	0%	0%	0%	0%	21%	0%	0%	20%	0%	0%	6%	0%	0%	0%	0%
Existing	416	Process Drives - ASD	0%	0%	0%	0%	0%	21%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	417	O&M - Extruders/Injection Moulding	0%	0%	0%	0%	0%	0%	0%	31%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	418	Extruders/injection Moulding-multipump	0%	0%	0%	0%	0%	0%	0%	31%	0%	0%	0%	0%	0%	0%	0%	0%

Industrial Elec Measure Inputs			APPLICABILITY FACTOR (percent)																
Segment	Measure #	Measure Description	Food	Textiles,Apprelumber,Furnitur	Paper	Printing	Chemicals	Petroleum	Rubber,Plastics,tone,Clay,Glas	Prim Metals	Fab Metals	Ind Mach	Electronics	Transp Equip	Misc.	Water/WW			
Existing	419	Direct drive Extruders	0%	0%	0%	0%	0%	0%	31%	0%	0%	0%	0%	0%	0%	0%			
Existing	420	Injection Moulding - Impulse Cooling	0%	0%	0%	0%	0%	0%	31%	0%	0%	0%	0%	0%	0%	0%			
Existing	421	Injection Moulding - Direct drive	0%	0%	0%	0%	0%	0%	31%	0%	0%	0%	0%	0%	0%	0%			
Existing	422	Efficient grinding	0%	0%	0%	0%	0%	0%	0%	20%	0%	0%	0%	0%	0%	0%			
Existing	423	Process control	0%	0%	0%	0%	0%	0%	0%	20%	0%	0%	0%	0%	0%	0%			
Existing	424	Process optimization	0%	0%	0%	0%	0%	0%	0%	20%	0%	0%	0%	0%	0%	0%			
Existing	425	Drives - Process Control	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
Existing	426	Efficient drives - rolling	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
Existing	427	Drives - Optimization process (M&T)	0%	0%	0%	0%	0%	0%	0%	0%	0%	22%	18%	0%	12%	16%			
Existing	428	Drives - Scheduling	0%	0%	0%	0%	0%	0%	0%	0%	0%	22%	18%	9%	12%	16%			
Existing	429	Machinery	0%	0%	0%	0%	0%	0%	0%	0%	0%	22%	18%	9%	12%	16%			
Existing	430	Efficient Machinery	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	16%			
Existing	431	Custom Measures--Drives	18%	30%	43%	32%	33%	21%	18%	31%	21%	10%	18%	15%	8%	10%	42%		
Existing	500	Base Process Heating	8.2%	10.5%	9.3%	11.6%	3.6%	9.3%	5.0%	16.0%	21.9%	0.0%	20.0%	7.0%	15.3%	14.5%	10.2%		1.3%
Existing	501	Bakery - Process	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%
Existing	502	Drying (UV/IR)	0%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%
Existing	503	Heat Pumps - Drying	0%	0%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%
Existing	504	Top-heating (glass)	0%	0%	0%	0%	0%	0%	0%	22%	0%	0%	0%	0%	0%	0%	0%		0%
Existing	505	Efficient electric melting	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%
Existing	506	Intelligent extruder (DOE)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%
Existing	507	Near Net Shape Casting	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%
Existing	508	Heating - Process Control	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%
Existing	509	Efficient Curing ovens	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	7%	15%	14%	10%	0%		0%
Existing	510	Heating - Optimization process (M&T)	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	7%	0%	14%	0%	0%		0%
Existing	511	Heating - Scheduling	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	7%	0%	0%	0%	0%		0%
Existing	512	Custom Measures--Process Heating	8%	11%	8%	10%	4%	10%	6%	16%	18%	27%	17%	6%	15%	13%	9%		1%
Existing	550	Base Process Cooling	26.0%	11.6%	1.3%	1.6%	5.9%	8.0%	5.4%	9.0%	2.7%	0.0%	3.5%	2.8%	8.7%	6.2%	5.9%		0.3%
Existing	551	Efficient Refrigeration - Operations	26%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%
Existing	552	Optimization Refrigeration	26%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%
Existing	553	Custom Measures--Process Cooling	20%	10%	1%	1%	5%	7%	5%	7%	2%	1%	2%	7%	5%	6%	0%		0%
Existing	600	Base Other Process	1.0%	1.5%	0.8%	2.1%	0.8%	14.4%	0.6%	1.7%	3.3%	0.0%	4.8%	2.5%	7.8%	3.4%	1.5%		0.0%
Existing	601	Other Process Controls (batch + site)	0%	0%	0%	0%	0%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%
Existing	602	Efficient desalter	0%	0%	0%	0%	0%	0%	0.6%	0%	0%	0%	0%	0%	0%	0%	0%		0%
Existing	603	New transformers welding	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	2%	0%	3%	1.5%	0%		0%
Existing	604	Efficient processes (welding, etc.)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	0%	0%	0%	0%		0%
Existing	605	Custom Measures--Other Process	1%	2%	1%	2%	1%	15%	1%	2%	3%	31%	4%	2%	8%	3%	0%		0%
Existing	700	Base Space Cooling Centrifugal Chiller, 0.58 kW	0.0%	0.8%	0.0%	0.0%	1.1%	0.3%	0.0%	0.6%	0.0%	0.6%	1.3%	17.8%	1.1%	0.7%		0.3%	
Existing	701	Centrifugal Chiller, 0.51 kW/ton, 500 tons	0.0%	0.8%	0.0%	0.0%	1.1%	0.3%	0.0%	0.6%	0.0%	0.6%	1.3%	17.8%	1.1%	0.7%		0.3%	
Existing	702	Window Film - Chiller	0.0%	0.8%	0.0%	0.0%	1.1%	0.3%	0.0%	0.6%	0.0%	0.6%	1.3%	17.8%	1.1%	0.7%		0.3%	
Existing	703	EMS - Chiller	0.0%	0.8%	0.0%	0.0%	1.1%	0.3%	0.0%	0.6%	0.0%	0.6%	1.3%	17.8%	1.1%	0.7%		0.3%	
Existing	704	Cool Roof - Chiller	0.0%	0.8%	0.0%	0.0%	1.1%	0.3%	0.0%	0.6%	0.0%	0.6%	1.3%	17.8%	1.1%	0.7%		0.3%	
Existing	705	Chiller Tune Up/Diagnostics	0.0%	0.8%	0.0%	0.0%	1.1%	0.3%	0.0%	0.6%	0.0%	0.6%	1.3%	17.8%	1.1%	0.7%		0.3%	
Existing	706	Cooling Circ. Pumps - VSD	0.0%	0.8%	0.0%	0.0%	1.1%	0.3%	0.0%	0.6%	0.0%	0.6%	1.3%	17.8%	1.1%	0.7%		0.3%	
Existing	710	Base Space Cooling DX Packaged System, EEI	8.5%	12.8%	6.7%	4.3%	17.6%	5.5%	3.6%	10.1%	6.3%	0.0%	9.4%	20.9%	5.9%	18.0%	24.0%		2.0%
Existing	711	DX Tune Up/ Advanced Diagnostics	8.5%	12.8%	6.7%	4.3%	17.6%	5.5%	3.6%	10.1%	6.3%	0.0%	9.4%	20.9%	5.9%	18.0%	24.0%		2.0%
Existing	712	DX Packaged System, EER=10.9, 10 tons	8.5%	12.8%	6.7%	4.3%	17.6%	5.5%	3.6%	10.1%	6.3%	0.0%	9.4%	20.9%	5.9%	18.0%	24.0%		2.0%
Existing	713	Window Film - DX	8.5%	12.8%	6.7%	4.3%	17.6%	5.5%	3.6%	10.1%	6.3%	0.0%	9.4%	20.9%	5.9%	18.0%	24.0%		2.0%
Existing	715	Prog. Thermostat - DX	8.5%	12.8%	6.7%	4.3%	17.6%	5.5%	3.6%	10.1%	6.3%	0.0%	9.4%	20.9%	5.9%	18.0%	24.0%		2.0%
Existing	716	Cool Roof - DX	8.5%	12.8%	6.7%	4.3%	17.6%	5.5%	3.6%	10.1%	6.3%	0.0%	9.4%	20.9%	5.9%	18.0%	24.0%		2.0%
Existing	800	Base Lighting	7.4%	10.4%	8.4%	3.9%	12.1%	3.7%	2.3%	8.6%	5.2%	0.0%	9.4%	14.5%	11.6%	14.6%	16.7%		4.0%
Existing	801	RET 2L4' Premium T8, 1EB	4%	5%	4%	2%	6%	2%	1%	4%	3%	0%	5%	8%	6%	8%	9%		2%
Existing	802	CFL Hardwired, Modular 36W	0.05%	0.07%	0.06%	0.03%	0.08%	0.03%	0.02%	0.06%	0.04%	0.00%	0.07%	0.10%	0.08%	0.10%	0.12%		0.03%
Existing	803	Metal Halide, 50W	3%	4%	3%	2%	5%	1%	1%	3%	2%	0%	4%	6%	5%	6%	7%		2%
Existing	804	Occupancy Sensor, 4L4' Fluorescent Fixtures	4%	6%	5%	2%	7%	2%	1%	5%	3%	0%	5%	8%	6%	8%	9%		2%
Existing	900	Base Other	4.2%	3.0%	8.6%	2.3%	7.1%	2.6%	1.1%	3.8%	3.0%	0.0%	3.3%	6.2%	7.2%	5.3%	8.2%		0.0%
Existing	901	Replace V-belts	4%	3%	9%	2%	7%	3%	1%	4%	3%	0%	3%	6%	7%	5%	8%		0%
Existing	902	Membranes for wastewater	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%
New	100	Base Industrial Building	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		100.0%
New	101	High Performance Building/Efficient Processes	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		100%
New	104	Base 2015 Code Industrial Building	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		100.0%
New	105	High Performance Building/Efficient Processes (100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		100%

Industrial Elec Measure Inputs			ENERGY SAVINGS (percent)																							
Segment	Measure #	Measure Description	Food	Textiles	Apparel	Lumber	Furniture	Paper	Printing	Chemicals	Petroleum	Rubber	Plastic	Stone	Clay	Glass	Prim Metals	Fab Metals	Ind Mach	Electronics	Transp Equip	Misc.	Water/WW	Energy Savings Source		
Existing	508	Heating - Process Control	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%	0%	LBNL Industrial Study 2005	
Existing	509	Efficient Curing ovens	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	20%	20%	20%	20%	20%	0%	0%	LBNL Industrial Study 2005	
Existing	510	Heating - Optimization process (M&T)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	10%	0%	10%	0%	0%	0%	0%	LBNL Industrial Study 2005	
Existing	511	Heating - Scheduling	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	5%	0%	0%	0%	0%	0%	0%	LBNL Industrial Study 2005	
Existing	512	Custom Measures--Process Heating	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	DNV KEMA Database	
Existing	550	Base Process Cooling	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	LBNL Industrial Study 2005	
Existing	551	Efficient Refrigeration - Operations	12%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	LBNL Industrial Study 2005	
Existing	552	Optimization Refrigeration	26%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	LBNL Industrial Study 2005	
Existing	553	Custom Measures--Process Cooling	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	DNV KEMA Database	
Existing	600	Base Other Process	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	LBNL Industrial Study 2005	
Existing	601	Other Process Controls (batch + site)	0%	0%	0%	0%	0%	0%	8%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	LBNL Industrial Study 2005	
Existing	602	Efficient desalter	0%	0%	0%	0%	0%	0%	0%	0%	20.0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	LBNL Industrial Study 2005	
Existing	603	New transformers welding	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	25%	0%	25%	0%	0%	0%	0%	LBNL Industrial Study 2005	
Existing	604	Efficient processes (welding, etc.)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	0%	LBNL Industrial Study 2005	
Existing	605	Custom Measures--Other Process	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	DNV KEMA Database	
Existing	700	Base Space Cooling Centrifugal Chiller, 0.58 kW/ton, 500 ton	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	LBNL Industrial Study 2005	
Existing	701	Centrifugal Chiller, 0.51 kW/ton, 500 tons	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	LBNL Industrial Study 2005	
Existing	702	Window Film - Chiller	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	LBNL Industrial Study 2005	
Existing	703	EMS - Chiller	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	LBNL Industrial Study 2005	
Existing	704	Cool Roof - Chiller	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	LBNL Industrial Study 2005	
Existing	705	Chiller Tune Up/Diagnostics	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	LBNL Industrial Study 2005	
Existing	706	Cooling Circ. Pumps - VSD	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	LBNL Industrial Study 2005	
Existing	710	Base Space Cooling DX Packaged System, EER=10.3, 10 tons	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	LBNL Industrial Study 2005	
Existing	711	DX Tune Up/ Advanced Diagnostics	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	LBNL Industrial Study 2005
Existing	712	DX Packaged System, EER=10.9, 10 tons	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	LBNL Industrial Study 2005	
Existing	713	Window Film - DX	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	10.3%	LBNL Industrial Study 2005
Existing	715	Prog. Thermostat - DX	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	LBNL Industrial Study 2005
Existing	716	Cool Roof - DX	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	LBNL Industrial Study 2005	
Existing	800	Base Lighting	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	LBNL Industrial Study 2005	
Existing	801	RET 2L4' Premium T8, 1EB	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%	LBNL Industrial Study 2005	
Existing	802	CFL Hardwired, Modular 36W	72.00%	72.00%	72.00%	72.00%	72.00%	72.00%	72.00%	72.00%	72.00%	72.00%	72.00%	72.00%	72.00%	72.00%	72.00%	72.00%	72.00%	72						

Industrial Elec Measure Inputs			Standards Adjustment Factor (percent)																				
Segment	Measure #	Measure Description	Food	Textiles	Appre	lumber	Furnitur	Paper	Printing	Chemicals	Petroleum	Rubber	Plastic	stone	Clay	Glas	Prim Metals	Fab Metals	Ind Mach	Electronics	Transp Equip	Misc.	Water/WW
Existing	100	Base Compressed Air	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	101	Compressed Air-O&M	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	102	Compressed Air - Controls	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	103	Compressed Air - System Optimization	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	104	Compressed Air- Sizing	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	105	Comp Air - Replace 1-5 HP motor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	106	Comp Air - ASD (1-5 hp)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	107	Comp Air - Motor practices-1 (1-5 HP)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	108	Comp Air - Replace 6-100 HP motor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	109	Comp Air - ASD (6-100 hp)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	110	Comp Air - Motor practices-1 (6-100 HP)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	111	Comp Air - Replace 100+ HP motor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	112	Comp Air - ASD (100+ hp)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	113	Comp Air - Motor practices-1 (100+ HP)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	115	Compressed Air Conversion to Low Pressu	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	114	Power recovery	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	200	Base Fans	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	201	Fans - O&M	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	202	Fans - Controls	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	203	Fans - System Optimization	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	204	Fans- Improve components	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	205	Fans - Replace 1-5 HP motor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	206	Fans - ASD (1-5 hp)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	207	Fans - Motor practices-1 (1-5 HP)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	208	Fans - Replace 6-100 HP motor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	209	Fans - ASD (6-100 hp)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	210	Fans - Motor practices-1 (6-100 HP)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	211	Fans - Replace 100+ HP motor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	212	Fans - ASD (100+ hp)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	213	Fans - Motor practices-1 (100+ HP)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	214	Optimize drying process	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	300	Base Pumps	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	301	Pumps - O&M	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	302	Pumps - Controls	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	303	Pumps - System Optimization	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	304	Pumps - Sizing	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	305	Pumps - Replace 1-5 HP motor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	306	Pumps - ASD (1-5 hp)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	307	Pumps - Motor practices-1 (1-5 HP)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	308	Pumps - Replace 6-100 HP motor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	309	Pumps - ASD (6-100 hp)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	310	Pumps - Motor practices-1 (6-100 HP)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	311	Pumps - Replace 100+ HP motor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%										

Industrial Elec Measure Inputs			Standards Adjustment Factor (percent)															
Segment	Measure #	Measure Description	Food	Textiles,Appre	lumber,Furnitur	Paper	Printing	Chemicals	Petroleum	Rubber,Plastic	stone,Clay,Gla	Prim Metals	Fab Metals	Ind Mach	Electronics	Transp Equip	Misc.	Water/WW
Existing	428	Drives - Scheduling	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	429	Machinery	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	430	Efficient Machinery	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	431	Custom Measures--Drives	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	500	Base Process Heating	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	501	Bakery - Process	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	502	Drying (UV/IR)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	503	Heat Pumps - Drying	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	504	Top-heating (glass)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	505	Efficient electric melting	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	506	Intelligent extruder (DOE)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	507	Near Net Shape Casting	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	508	Heating - Process Control	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	509	Efficient Curing ovens	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	510	Heating - Optimization process (M&T)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	511	Heating - Scheduling	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	512	Custom Measures--Process Heating	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	550	Base Process Cooling	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	551	Efficient Refrigeration - Operations	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	552	Optimization Refrigeration	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	553	Custom Measures--Process Cooling	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	600	Base Other Process	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	601	Other Process Controls (batch + site)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	602	Efficient desalter	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	603	New transformers welding	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	604	Efficient processes (welding, etc.)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	605	Custom Measures--Other Process	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	700	Base Space Cooling Centrifugal Chiller, 0.5	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	701	Centrifugal Chiller, 0.51 kW/ton, 500 tons	89%	89%	89%	89%	89%	89%	89%	89%	89%	89%	89%	89%	89%	89%	89%	89%
Existing	702	Window Film - Chiller	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	703	EMS - Chiller	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	704	Cool Roof - Chiller	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	705	Chiller Tune Up/Diagnostics	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	706	Cooling Circ. Pumps - VSD	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	710	Base Space Cooling DX Packaged System,	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	711	DX Tune Up/ Advanced Diagnostics	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	712	DX Packaged System, EER=10.9, 10 tons	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%
Existing	713	Window Film - DX	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	715	Prog. Thermostat - DX	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	716	Cool Roof - DX	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	800	Base Lighting	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	801	RET 2L4' Premium T8, 1EB	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	802	CFL Hardwired, Modular 36W	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	803	Metal Halide, 50W	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	804	Occupancy Sensor, 4L4' Fluorescent Fixtur	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	900	Base Other	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	901	Replace V-belts	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	902	Membranes for wastewater	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
New	100	Base Industrial Building	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
New	101	High Performance Building/Efficient Proces:	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
New	104	Base 2015 Code Industrial Building	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
New	105	High Performance Building/Efficient Proces:	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Industrial Elec Measure Inputs			FEASIBILITY FACTOR (percent)																				
Segment	Measure #	Measure Description	Food	Textiles	Apparel	Lumber	Furniture	Paper	Printing	Chemicals	Petroleum	Rubber	Plastic	Stone	Clay	Glass	Prim Metals	Fab Metals	Ind Mach	Electronics	Transp Equip	Misc.	Water/WW
Existing	100	Base Compressed Air	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	101	Compressed Air-O&M	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	102	Compressed Air - Controls	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	103	Compressed Air - System Optimization	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	104	Compressed Air- Sizing	56%	47%	47%	56%	56%	56%	56%	56%	56%	56%	56%	56%	56%	56%	56%	56%	56%	56%	56%	56%	56%
Existing	105	Comp Air - Replace 1-5 HP motor	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Existing	106	Comp Air - ASD (1-5 hp)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Existing	107	Comp Air - Motor practices-1 (1-5 HP)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Existing	108	Comp Air - Replace 6-100 HP motor	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%
Existing	109	Comp Air - ASD (6-100 hp)	96%	36%	36%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%
Existing	110	Comp Air - Motor practices-1 (6-100 HP)	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%
Existing	111	Comp Air - Replace 100+ HP motor	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%
Existing	112	Comp Air - ASD (100+ hp)	87%	100%	100%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	100%	100%	100%	100%	100%	59%
Existing	113	Comp Air - Motor practices-1 (100+ HP)	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%
Existing	115	Compressed Air Conversion to Low Pressure	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	114	Power recovery	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	200	Base Fans	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	201	Fans - O&M	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	202	Fans - Controls	83%	89%	89%	83%	83%	83%	83%	83%	83%	83%	83%	83%	83%	83%	83%	89%	89%	89%	89%	89%	100%
Existing	203	Fans - System Optimization	83%	87%	87%	83%	83%	83%	83%	83%	83%	83%	83%	83%	83%	83%	87%	87%	87%	87%	87%	87%	100%
Existing	204	Fans - Improve components	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	205	Fans - Replace 1-5 HP motor	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Existing	206	Fans - ASD (1-5 hp)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Existing	207	Fans - Motor practices-1 (1-5 HP)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Existing	208	Fans - Replace 6-100 HP motor	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%
Existing	209	Fans - ASD (6-100 hp)	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%
Existing	210	Fans - Motor practices-1 (6-100 HP)	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%
Existing	211	Fans - Replace 100+ HP motor	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%
Existing	212	Fans - ASD (100+ hp)	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%
Existing	213	Fans - Motor practices-1 (100+ HP)	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%
Existing	214	Optimize drying process	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	300	Base Pumps	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	301	Pumps - O&M	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	302	Pumps - Controls	100%	79%	79%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	79%	79%	79%	79%	79%	100%
Existing	303	Pumps - System Optimization	99%	77%	77%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	77%	77%	77%	77%	77%	100%
Existing	304	Pumps - Sizing	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	305	Pumps - Replace 1-5 HP motor	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Existing	306	Pumps - ASD (1-5 hp)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Existing	307	Pumps - Motor practices-1 (1-5 HP)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Existing	308	Pumps - Replace 6-100 HP motor	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%
Existing	309	Pumps - ASD (6-100 hp)	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%
Existing	310	Pumps - Motor practices-1 (6-100 HP)	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%	36%
Existing	311	Pumps - Replace 100+ HP motor	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%
Existing	312	Pumps - ASD (100+ hp)	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%
Existing	313	Pumps - Motor practices-1 (100+ HP)	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%
Existing	400	Base Drives	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	401	Bakery - Process (Mixing) - O&M	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	402	O&M/drives spinning machines	0%	60%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	403	Air conveying systems	0%	0%	30%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	405	Drives - EE motor	73%	27%	27%	73%	73%	73%	73%	73%	73%	73%	73%	73%	73%	73%	27%	27%	27%	27%	27%	27%	0%
Existing	406	Gap Forming papermachine	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	407	High Consistency forming	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	408	Optimization control PM	82%	47%	47%	82%	82%	82%	82%	82%	82%	82%	82%	82%	82%	82%	47%	47%	47%	47%	47%	47%	0%
Existing	409	Efficient practices printing press	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	410	Efficient Printing press (fewer cylinders)	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	411	Light cylinders	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	412	Efficient drives	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	413	Clean Room - Controls	0%	0%	0%	0%	0%	0%	0%	30%	0%	0%	0%	0%	0%	0%	0%	0%	60%	0%	0%	0%	0%
Existing	414	Clean Room - New Designs	0%	0%	0%	0%	0%	0%	0%														

Industrial Elec Measure Inputs			FEASIBILITY FACTOR (percent)																				
Segment	Measure #	Measure Description	Food	Textiles	Apparel	Lumber	Furniture	Paper	Printing	Chemicals	Petroleum	Rubber	Plastic	Stone	Clay	Glass	Prim Metals	Fab Metals	Ind Mach	Electronics	Transp Equip	Misc.	Water/WW
Existing	422	Efficient grinding	100%	85%		85%		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	85%	85%	85%	85%	0%	0%
Existing	423	Process control	0%	0%		0%		0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	424	Process optimization	0%	0%		0%		0%	0%	0%	0%	0%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	425	Drives - Process Control	0%	0%		0%		0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	426	Efficient drives - rolling	95%	0%		0%		95%	95%	95%	95%	95%	95%	95%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	427	Drives - Optimization process (M&T)	0%	0%		0%		0%	0%	0%	0%	0%	0%	0%	0%	40%	40%	0%	40%	0%	40%	0%	0%
Existing	428	Drives - Scheduling	0%	0%		0%		0%	0%	0%	0%	0%	0%	0%	0%	40%	40%	40%	40%	40%	40%	40%	0%
Existing	429	Machinery	0%	0%		0%		0%	0%	0%	0%	0%	0%	0%	0%	50%	50%	50%	50%	50%	0%	0%	0%
Existing	430	Efficient Machinery	0%	0%		0%		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	50%	50%
Existing	431	Custom Measures--Drives	100%	100%		100%		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	500	Base Process Heating	100.0%	100.0%		100.0%		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	501	Bakery - Process	100%	0%		0%		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	502	Drying (UV/IR)	0%	100%		0%		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	503	Heat Pumps - Drying	0%	0%		100%		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	504	Top-heating (glass)	84%	0%		0%		84%	84%	84%	84%	84%	84%	84%	84%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	505	Efficient electric melting	0%	0%		0%		0%	0%	0%	0%	0%	90%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	506	Intelligent extruder (DOE)	0%	0%		0%		0%	0%	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	507	Near Net Shape Casting	0%	0%		0%		0%	0%	0%	0%	0%	0%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	508	Heating - Process Control	0%	0%		0%		0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	509	Efficient Curing ovens	84%	0%		0%		84%	84%	84%	84%	84%	84%	84%	70%	50%	50%	50%	50%	50%	50%	50%	50%
Existing	510	Heating - Optimization process (M&T)	0%	0%		0%		0%	0%	0%	0%	0%	0%	0%	0%	40%	40%	0%	40%	0%	40%	0%	0%
Existing	511	Heating - Scheduling	14%	0%		0%		14%	14%	14%	14%	14%	14%	14%	14%	40%	40%	0%	0%	0%	0%	0%	0%
Existing	512	Custom Measures--Process Heating	100%	100%		100%		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	550	Base Process Cooling	100.0%	100.0%		100.0%		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	551	Efficient Refrigeration - Operations	100%	0%		0%		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	552	Optimization Refrigeration	100%	0%		0%		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	553	Custom Measures--Process Cooling	100%	100%		100%		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	600	Base Other Process	100.0%	100.0%		100.0%		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	601	Other Process Controls (batch + site)	0%	0%		0%		0%	0%	86%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	602	Efficient desalter	0%	0%		0%		0%	0%	0%	100.0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Existing	603	New transformers welding	0%	0%		0%		0%	0%	0%	0%	0%	0%	0%	0%	100%	50%	0%	100%	0%	100%	0.0%	0%
Existing	604	Efficient processes (welding, etc.)	0%	0%		0%		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	100%	0%	0%
Existing	605	Custom Measures--Other Process	100%	100%		100%		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	700	Base Space Cooling Centrifugal Chiller, 0.5	100.0%	100.0%		100.0%		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	701	Centrifugal Chiller, 0.51 kW/ton, 500 tons	100.0%	100.0%		100.0%		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	702	Window Film - Chiller	75.0%	75.0%		75.0%		75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	703	EMS - Chiller	100.0%	100.0%		100.0%		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	704	Cool Roof - Chiller	50.0%	50.0%		50.0%		50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Existing	705	Chiller Tune Up/Diagnostics	25.0%	25.0%		25.0%		25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Existing	706	Cooling Circ. Pumps - VSD	75.0%	75.0%		75.0%		75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	710	Base Space Cooling DX Packaged System,	100.0%	100.0%		100.0%		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	711	DX Tune Up/ Advanced Diagnostics	75.0%	75.0%		75.0%		75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	712	DX Packaged System, EER=10.9, 10 tons	100.0%	100.0%		100.0%		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	713	Window Film - DX	75.0%	75.0%		75.0%		75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	715	Prog. Thermostat - DX	75.0%	75.0%		75.0%		75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	716	Cool Roof - DX	50.0%	50.0%		50.0%		50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Existing	800	Base Lighting	100.0%	100.0%		100.0%		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	801	RET 2L4' Premium T8, 1EB	76%	86%		87%		80%	96%	77%	77%	80%	62%	62%	85%	87%	90%	89%	93%	93%	93%	93%	93%
Existing	802	CFL Hardwired, Modular 36W	47.52%	47.52%		47.52%		47.52%	47.52%	47.52%	47.52%	47.52%	47.52%	47.52%	47.52%	47.52%	47.52%	47.52%	47.52%	47.52%	47.52%	47.52%	6.13%
Existing	803	Metal Halide, 50W	100%	100%		100%		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%
Existing	804	Occupancy Sensor, 4L4' Fluorescent Fixtur	20%	20%		20%		20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Existing	900	Base Other	100.0%	100.0%		100.0%		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	901	Replace V-belts	73%	71%		80%		79%	39%	0%	7%	53%	70%	20%	53%	40%	33%	55%	55%	55%	55%	55%	55%
Existing	902	Membranes for wastewater	0%	100%		0%		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	29%
New	100	Base Industrial Building	100.0%	100.0%		100.0%		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New	101	High Performance Building/Efficient Proces	100%	100%		100%		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
New	104	Base 2015 Code Industrial Building	100.0%	100.0%		100.0%		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New	105	High Performance Building/Efficient Proces	100%	100%		100%		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Industrial Elec Measure Inputs			INCOMPLETE FACTOR (percent)															
Segment	Measure #	Measure Description	Food	Textiles,App	Lumber,Fur	Paper	Printing	Chemicals	Petroleum	Rubber,Pla	Stone,Clay	Prim Metals	Fab Metals	Ind Mach	Electronics	Transp	Equ Misc.	Water/WW
Existing	100	Base Compressed Air	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	101	Compressed Air-O&M	31%	22%	22%	31%	31%	31%	31%	31%	31%	31%	22%	22%	22%	22%	22%	31%
Existing	102	Compressed Air - Controls	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
Existing	103	Compressed Air - System Optimization	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Existing	104	Compressed Air- Sizing	18%	99%	99%	18%	18%	18%	18%	18%	18%	99%	99%	99%	99%	99%	99%	18%
Existing	105	Comp Air - Replace 1-5 HP motor	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%	87%
Existing	106	Comp Air - ASD (1-5 hp)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	107	Comp Air - Motor practices-1 (1-5 HP)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	108	Comp Air - Replace 6-100 HP motor	64%	21%	21%	64%	64%	64%	64%	64%	64%	64%	21%	21%	21%	21%	21%	64%
Existing	109	Comp Air - ASD (6-100 hp)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	110	Comp Air - Motor practices-1 (6-100 HP)	14%	100%	100%	14%	14%	14%	14%	14%	14%	14%	100%	100%	100%	100%	100%	14%
Existing	111	Comp Air - Replace 100+ HP motor	26%	38%	38%	26%	26%	26%	26%	26%	26%	26%	38%	38%	38%	38%	38%	26%
Existing	112	Comp Air - ASD (100+ hp)	68%	100%	100%	68%	68%	68%	68%	68%	68%	68%	100%	100%	100%	100%	100%	68%
Existing	113	Comp Air - Motor practices-1 (100+ HP)	64%	40%	40%	64%	64%	64%	64%	64%	64%	64%	40%	40%	40%	40%	40%	64%
Existing	115	Compressed Air Conversion to Low Pressu																
Existing	114	Power recovery	86%	20%	20%	86%	86%	86%	86%	86%	86%	86%	20%	20%	20%	20%	20%	86%
Existing	200	Base Fans	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	201	Fans - O&M	84%	13%	13%	84%	84%	84%	84%	84%	84%	84%	13%	13%	13%	13%	13%	84%
Existing	202	Fans - Controls	72%	21%	21%	72%	72%	72%	72%	72%	72%	72%	21%	21%	21%	21%	21%	72%
Existing	203	Fans - System Optimization	86%	22%	22%	86%	86%	86%	86%	86%	86%	86%	22%	22%	22%	22%	22%	86%
Existing	204	Fans- Improve components	68%	36%	36%	68%	68%	68%	68%	68%	68%	68%	36%	36%	36%	36%	36%	68%
Existing	205	Fans - Replace 1-5 HP motor	98%	87%	87%	98%	98%	98%	98%	98%	98%	98%	87%	87%	87%	87%	87%	98%
Existing	206	Fans - ASD (1-5 hp)	100%	82%	82%	100%	100%	100%	100%	100%	100%	100%	82%	82%	82%	82%	82%	100%
Existing	207	Fans - Motor practices-1 (1-5 HP)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	208	Fans - Replace 6-100 HP motor	90%	47%	47%	90%	90%	90%	90%	90%	90%	90%	47%	47%	47%	47%	47%	90%
Existing	209	Fans - ASD (6-100 hp)	93%	92%	92%	93%	93%	93%	93%	93%	93%	93%	92%	92%	92%	92%	92%	93%
Existing	210	Fans - Motor practices-1 (6-100 HP)	89%	41%	41%	89%	89%	89%	89%	89%	89%	89%	41%	41%	41%	41%	41%	89%
Existing	211	Fans - Replace 100+ HP motor	94%	90%	90%	94%	94%	94%	94%	94%	94%	94%	90%	90%	90%	90%	90%	94%
Existing	212	Fans - ASD (100+ hp)	94%	11%	11%	94%	94%	94%	94%	94%	94%	94%	11%	11%	11%	11%	11%	94%
Existing	213	Fans - Motor practices-1 (100+ HP)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	214	Optimize drying process	100%	80%	80%	100%	100%	100%	100%	100%	100%	100%	80%	80%	80%	80%	80%	100%
Existing	300	Base Pumps	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	301	Pumps - O&M	18%	55%	55%	18%	18%	18%	18%	18%	18%	18%	55%	55%	55%	55%	55%	18%
Existing	302	Pumps - Controls	14%	24%	24%	14%	14%	14%	14%	14%	14%	14%	24%	24%	24%	24%	24%	14%
Existing	303	Pumps - System Optimization	15%	79%	79%	15%	15%	15%	15%	15%	15%	15%	79%	79%	79%	79%	79%	15%
Existing	304	Pumps - Sizing	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Existing	305	Pumps - Replace 1-5 HP motor	89%	93%	93%	89%	89%	89%	89%	89%	89%	89%	93%	93%	93%	93%	93%	89%
Existing	306	Pumps - ASD (1-5 hp)	100%	80%	80%	100%	100%	100%	100%	100%	100%	100%	80%	80%	80%	80%	80%	100%
Existing	307	Pumps - Motor practices-1 (1-5 HP)	40%	54%	54%	40%	40%	40%	40%	40%	40%	40%	54%	54%	54%	54%	54%	40%
Existing	308	Pumps - Replace 6-100 HP motor	97%	89%	89%	97%	97%	97%	97%	97%	97%	97%	89%	89%	89%	89%	89%	97%
Existing	309	Pumps - ASD (6-100 hp)	98%	47%	47%	98%	98%	98%	98%	98%	98%	98%	47%	47%	47%	47%	47%	98%
Existing	310	Pumps - Motor practices-1 (6-100 HP)	63%	81%	81%	63%	63%	63%	63%	63%	63%	63%	81%	81%	81%	81%	81%	63%
Existing	311	Pumps - Replace 100+ HP motor	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%
Existing	312	Pumps - ASD (100+ hp)	100%	98%	98%	100%	100%	100%	100%	100%	100%	100%	98%	98%	98%	98%	98%	100%
Existing	313	Pumps - Motor practices-1 (100+ HP)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	400	Base Drives	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	401	Bakery - Process (Mixing) - O&M	70%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	402	O&M/drives spinning machines	100%	40%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	403	Air conveying systems	100%	100%	25%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	405	Drives - EE motor	63%	14%	14%	63%	63%	63%	63%	63%	63%	63%	14%	14%	14%	14%	14%	63%
Existing	406	Gap Forming papermachine	100%	100%	100%	10%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	407	High Consistency forming	100%	100%	100%	10%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	408	Optimization control PM	57%	98%	98%	57%	57%	57%	57%	57%	57%	57%	98%	98%	98%	98%	98%	57%
Existing	409	Efficient practices printing press	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Industrial Elec Measure Inputs			INCOMPLETE FACTOR (percent)																
Segment	Measure #	Measure Description	Food	Textiles,Apparel	Lumber,Furniture	Paper	Printing	Chemicals	Petroleum	Rubber,Plastics	Stone,Clay,Brick	Prim Metals	Fab Metals	Ind Mach	Electronics	Transp	Equ	Misc.	Water/WW
Existing	410	Efficient Printing press (fewer cylinders)	100%	100%	100%	100%	20%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	411	Light cylinders	100%	100%	100%	100%	20%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	412	Efficient drives	100%	100%	100%	100%	30%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	413	Clean Room - Controls	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%
Existing	414	Clean Room - New Designs	100%	100%	100%	100%	100%	20%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	415	Drives - Process Controls (batch + site)	100%	100%	100%	100%	100%	50%	100%	100%	50%	50%	100%	100%	100%	100%	100%	100%	100%
Existing	416	Process Drives - ASD	98%	65%	65%	98%	98%	98%	98%	98%	98%	65%	65%	65%	65%	65%	65%	65%	98%
Existing	417	O&M - Extruders/Injection Moulding	57%	38%	38%	57%	57%	57%	57%	57%	57%	38%	38%	38%	38%	38%	38%	38%	57%
Existing	418	Extruders/injection Moulding-multipump	79%	100%	100%	79%	79%	79%	79%	79%	79%	100%	100%	100%	100%	100%	100%	100%	79%
Existing	419	Direct drive Extruders	90%	100%	100%	90%	90%	90%	90%	90%	90%	100%	100%	100%	100%	100%	100%	100%	90%
Existing	420	Injection Moulding - Impulse Cooling	84%	100%	100%	84%	84%	84%	84%	84%	84%	100%	100%	100%	100%	100%	100%	100%	84%
Existing	421	Injection Moulding - Direct drive	90%	100%	100%	90%	90%	90%	90%	90%	90%	100%	100%	100%	100%	100%	100%	100%	90%
Existing	422	Efficient grinding	100%	100%	100%	100%	100%	100%	100%	100%	20%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	423	Process control	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	424	Process optimization	100%	100%	100%	100%	100%	100%	100%	100%	25%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	425	Drives - Process Control	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%
Existing	426	Efficient drives - rolling	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%
Existing	427	Drives - Optimization process (M&T)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%	50%	100%	40%	100%	100%	100%
Existing	428	Drives - Scheduling	72%	29%	29%	72%	72%	72%	72%	72%	72%	29%	29%	29%	29%	29%	29%	29%	72%
Existing	429	Machinery	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	25%	25%	20%	100%	100%
Existing	430	Efficient Machinery	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	25%	100%
Existing	431	Custom Measures--Drives	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	500	Base Process Heating	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	501	Bakery - Process	50%	100%	100%	50%	50%	50%	50%	50%	50%	50%	100%	100%	100%	100%	100%	100%	50%
Existing	502	Drying (UV/IR)	100%	20%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	503	Heat Pumps - Drying	100%	100%	20%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	504	Top-heating (glass)	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	50%
Existing	505	Efficient electric melting	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	506	Intelligent extruder (DOE)	100%	100%	100%	100%	100%	100%	100%	100%	100%	25%	100%	100%	100%	100%	100%	100%	100%
Existing	507	Near Net Shape Casting	100%	100%	100%	100%	100%	100%	100%	100%	100%	25%	100%	100%	100%	100%	100%	100%	100%
Existing	508	Heating - Process Control	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%
Existing	509	Efficient Curing ovens	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	25%	25%	25%	25%	25%	25%	100%
Existing	510	Heating - Optimization process (M&T)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%	50%	100%	40%	100%	100%	100%
Existing	511	Heating - Scheduling	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	30%	30%	100%	100%	100%	100%	100%
Existing	512	Custom Measures--Process Heating	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	550	Base Process Cooling	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	551	Efficient Refrigeration - Operations	83%	52%	52%	83%	83%	83%	83%	83%	83%	52%	52%	52%	52%	52%	52%	52%	83%
Existing	552	Optimization Refrigeration	95%	45%	45%	95%	95%	95%	95%	95%	95%	45%	45%	45%	45%	45%	45%	45%	95%
Existing	553	Custom Measures--Process Cooling	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	600	Base Other Process	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	601	Other Process Controls (batch + site)	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	602	Efficient desalter	100%	100%	100%	100%	100%	100%	50.0%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	603	New transformers welding	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%	50%	100%	50%	100.0%	100%	100%
Existing	604	Efficient processes (welding, etc.)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%
Existing	605	Custom Measures--Other Process	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Existing	700	Base Space Cooling Centrifugal Chiller, 0.5	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	701	Centrifugal Chiller, 0.51 kW/ton, 500 tons	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	702	Window Film - Chiller	50.5%	50.5%	50.5%	50.5%	50.5%	50.5%	50.5%	50.5%	50.5%	50.5%	50.5%	50.5%	50.5%	50.5%	50.5%	50.5%	50.5%
Existing	703	EMS - Chiller	63.2%	63.2%	63.2%	63.2%	63.2%	63.2%	63.2%	63.2%	63.2%	63.2%	63.2%	63.2%	63.2%	63.2%	63.2%	63.2%	63.2%
Existing	704	Cool Roof - Chiller	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%
Existing	705	Chiller Tune Up/Diagnostics	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Existing	706	Cooling Circ. Pumps - VSD	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Existing	710	Base Space Cooling DX Packaged System	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	711	DX Tune Up/ Advanced Diagnostics	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%

Industrial Elec Measure Inputs			INCOMPLETE FACTOR (percent)																
Segment	Measure #	Measure Description	Food	Textiles,App	Lumber,Fur	Paper	Printing	Chemicals	Petroleum	Rubber,Pla	Stone,Clay	Prim Metals	Fab Metals	Ind Mach	Electronics	Transp	Equ	Misc.	Water/WW
Existing	712	DX Packaged System, EER=10.9, 10 tons	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	713	Window Film - DX	30.7%	30.7%	30.7%	30.7%	30.7%	30.7%	30.7%	30.7%	30.7%	30.7%	30.7%	30.7%	30.7%	30.7%	30.7%	30.7%	30.7%
Existing	715	Prog. Thermostat - DX	45.3%	45.3%	45.3%	45.3%	45.3%	45.3%	45.3%	45.3%	45.3%	45.3%	45.3%	45.3%	45.3%	45.3%	45.3%	45.3%	45.3%
Existing	716	Cool Roof - DX	61.5%	61.5%	61.5%	61.5%	61.5%	61.5%	61.5%	61.5%	61.5%	61.5%	61.5%	61.5%	61.5%	61.5%	61.5%	61.5%	61.5%
Existing	800	Base Lighting	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	801	RET 2L4' Premium T8, 1EB	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%
Existing	802	CFL Hardwired, Modular 36W	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	200.00%	300.00%
Existing	803	Metal Halide, 50W	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%
Existing	804	Occupancy Sensor, 4L4' Fluorescent Fixtur	97%	97%	97%	97%	97%	97%	97%	97%	97%	97%	97%	97%	97%	97%	97%	97%	97%
Existing	900	Base Other	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Existing	901	Replace V-belts	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Existing	902	Membranes for wastewater	100%	15%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
New	100	Base Industrial Building	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New	101	High Performance Building/Efficient Proces	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
New	104	Base 2015 Code Industrial Building	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New	105	High Performance Building/Efficient Proces	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

F. Appendix F: Non-Additive Measure Level Results

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Residential Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Household	Base UEC	UEC	Peak Watts/ Household	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWH	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
100	Base Split-System Air Conditioner (13 SEER)	Single Family	0%	0%	0.00	3296.17	3296.17	2137.95	14	0	0	N/A	N/A	N/A	N/A	N/A
101	15 SEER (12.72 EER) Split-System Air Conditioner w/ quality install	Single Family	40%	40%	693.00	3426.53	2049.14	1329.11	14	214	139	0	77.04	4.88	1.22	9.11
102	17 SEER (12.28 EER) Split-System Air Conditioner w/ quality install	Single Family	47%	47%	1285.00	3369.27	1777.77	1153.09	14	261	169	0	123.63	3.04	0.76	14.62
103	AC Maintenance (Indoor Coil Cleaning)	Single Family	6%	6%	100.00	3338.25	3127.85	2028.77	4	23	15	0	240.82	1.56	0.44	8.61
104	AC Maintenance (Outdoor Coil Cleaning)	Single Family	6%	6%	60.00	3381.42	3168.30	2055.01	4	22	14	0	142.64	2.64	0.74	5.10
105	AC Maintenance and/or tune-up	Single Family	4%	4%	50.00	3340.26	3206.65	2079.89	4	15	10	0	189.61	1.98	0.55	6.78
107	Ceiling R-0 to R-38 Insulation (base split-system)	Single Family	33%	33%	1256.54	3296.17	2218.58	1439.00	30	10	6	0	103.97	2.84	0.65	21.12
108	Ceiling R-0 to R-49 Insulation (base split-system)	Single Family	34%	34%	1523.24	3296.17	2172.09	1408.85	30	10	7	0	120.82	2.45	0.56	24.54
109	Ceiling R-11 to R-38 Insulation (base split-system)	Single Family	13%	13%	944.79	3296.17	2865.05	1858.32	30	7	5	0	195.39	1.51	0.35	39.69
110	Ceiling R-11 to R-49 Insulation (base split-system)	Single Family	15%	15%	1241.03	3296.17	2805.02	1819.38	30	8	5	0	225.29	1.31	0.30	45.77
111	Ceiling R-19 to R-38 Insulation (base split-system)	Single Family	6%	6%	809.61	3296.17	3095.69	2007.91	30	16	10	0	360.05	0.82	0.19	73.14
112	Ceiling R-19 to R-49 Insulation (base split-system)	Single Family	8%	8%	975.32	3296.17	3030.83	1965.84	30	12	8	0	327.72	0.90	0.21	66.58
113	Comprehensive Shell Air Sealing - Inf. Reduction (base split-system)	Single Family	2%	2%	190.59	3326.13	3264.53	2117.43	10	5	4	0	654.57	0.57	0.15	56.04
114	Duct Insulation	Single Family	16%	16%	412.70	3781.53	3164.29	2052.41	18	23	15	0	82.34	4.57	1.08	12.11
115	Duct Repair	Single Family	8%	8%	324.33	3359.12	3098.79	2009.92	18	34	22	0	153.42	2.45	0.58	22.57
116	Programmable Thermostat (base split-system)	Single Family	16%	19%	33.35	3619.24	3042.49	1897.06	15	44	34	0	6.91	52.66	11.10	1.05
117	Proper Refrigerant Charging and Air Flow	Single Family	13%	13%	127.02	3439.17	3005.84	1949.63	10	50	32	0	62.01	6.07	1.56	5.31
118	Proper Sizing and Quality Install	Single Family	31%	40%	220.00	3902.05	2690.30	1510.97	18	104	87	0	17.23	20.86	4.13	3.16
119	Sealed Attic w/Sprayed Foam Insulated Roof Deck (base split-system)	Single Family	9%	9%	1949.32	3304.43	3007.03	1950.41	30	8	5	0	584.40	0.51	0.12	118.72
120	Self Install Weatherization (base split-system)	Single Family	2%	2%	6.52	3321.42	3254.99	2111.24	10	1	0	0	20.76	18.12	4.67	1.78
121	Wall Blow-in R-0 to R-13 Insulation (base split-system)	Single Family	16%	16%	852.36	3296.17	2785.07	1806.44	30	68	44	0	148.69	1.99	0.45	30.21
122	Single Pane Windows to ENERGY STAR (base split-system)	Single Family	4%	4%	390.35	3315.37	3166.68	2053.96	25	14	9	0	259.09	1.26	0.29	47.55
123	Double Pane Windows to ENERGY STAR (base split-system)	Single Family	3%	3%	1861.32	3307.77	3217.93	2087.20	25	6	4	1	2044.66	0.16	0.04	375.25
130	Base Early Replacement Split-System Air Conditioner (13 SEER)	Single Family	0%	0%	0.00	4869.35	4869.35	3158.33	7	0	0	N/A	N/A	N/A	N/A	N/A
131	15 SEER (12.72 EER) Split-System Air Conditioner--early replacement	Single Family	20%	20%	514.00	4879.21	3892.64	2524.82	7	30	19	0	153.83	2.45	0.66	9.44
140	Base Room Air Conditioner - EER 9.7	Single Family	0%	0%	0.00	1824.17	1824.17	1183.18	12	0	0	N/A	N/A	N/A	N/A	N/A
141	HE Room Air Conditioner - Energy star EER 10.8	Single Family	9%	9%	67.50	1842.40	1671.71	1084.30	12	1	1	0	69.99	5.37	1.37	7.16
142	HE Room Air Conditioner - CEE Tier 1 EER 11.3	Single Family	13%	13%	71.55	1826.59	1584.63	1027.81	12	1	1	0	52.33	7.19	1.83	5.36
143	Ceiling Fans (base RAC)	Single Family	5%	5%	297.60	1898.62	1803.69	1169.90	15	0	0	0	450.97	0.83	0.21	56.78
144	Single Pane Windows to ENERGY STAR (base RAC)	Single Family	4%	4%	213.03	1834.79	1752.51	1136.70	25	0	0	0	255.50	1.28	0.29	46.89
145	Double Pane with Glazing to Energy Star (base RAC)	Single Family	3%	3%	1371.68	1830.59	1780.87	1155.10	25	0	2	0	2722.70	0.12	0.03	499.69
146	Ceiling R-0 to R-38 Insulation (base RAC)	Single Family	33%	33%	1035.69	1824.17	1227.80	796.37	30	0	0	0	154.84	1.91	0.44	31.46
147	Ceiling R-0 to R-49 Insulation (base RAC)	Single Family	34%	34%	1255.51	1824.17	1202.08	779.69	30	0	0	0	179.94	1.64	0.38	36.55
148	Ceiling R-11 to R-38 Insulation (base RAC)	Single Family	13%	13%	778.73	1824.17	1585.58	1028.43	30	0	0	0	291.00	1.02	0.23	59.12
149	Ceiling R-11 to R-49 Insulation (base RAC)	Single Family	15%	15%	1022.91	1824.17	1552.35	1006.88	30	0	0	0	335.53	0.88	0.20	68.16
150	Ceiling R-19 to R-38 Insulation (base RAC)	Single Family	6%	6%	667.31	1824.17	1713.22	1111.22	30	0	0	0	536.24	0.55	0.13	108.94
151	Ceiling R-19 to R-49 Insulation (base RAC)	Single Family	8%	8%	803.89	1824.17	1677.32	1087.94	30	0	0	0	488.09	0.61	0.14	99.15
152	Wall 2x4 R-0 to Blow-In R-13 Insulation (base RAC)	Single Family	16%	16%	718.93	2125.50	1795.92	1164.86	30	0	0	0	194.49	1.52	0.35	39.51
153	Self Install Weatherization (base RAC)	Single Family	2%	2%	6.52	1838.14	1801.37	1168.40	10	0	0	0	37.51	10.03	2.59	3.21
154	Infiltration Reduction (base RAC)	Single Family	2%	2%	140.31	1840.91	1806.82	1171.93	10	0	1	0	870.66	0.43	0.11	74.54
155	Ductless Split Heat Pump	Single Family	32%	32%	238.92	1829.96	1250.34	810.99	18	0	0	0	50.76	7.41	1.75	7.47
160	Base Early Replacement Room Air Conditioner- EER 9.7	Single Family	0%	0%	0.00	1951.86	1951.86	1266.01	12	0	0	N/A	N/A	N/A	N/A	N/A
161	EER 8.5 AC Early Replacement, CEE Tier 1 EER 11.3	Single Family	18%	18%	91.41	1951.86	1596.62	1035.59	12	0	0	0	45.54	8.26	2.10	4.66
170	Base Dehumidifier - New Federal Standard	Single Family	0%	0%	0.00	915.27	915.27	127.68	12	0	0	N/A	N/A	N/A	N/A	N/A
171	Energy Star Dehumidifier (ROB)	Single Family	20%	20%	10.00	930.62	744.50	103.86	12	3	0	0	44.21	14.51	8.83	1.11
200	Base Resistance Space Heating (Primary)	Single Family	0%	0%	1252.66	2993.95	2993.95	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A
202	Ceiling R-0 to R-38 Insulation (base space heating)	Single Family	40%	40%	784.73	2993.95	1782.53	0.00	30	1	0	0	N/A	0.99	0.93	14.74
203	Ceiling R-0 to R-49 Insulation (base space heating)	Single Family	42%	42%	902.72	2993.95	1750.61	0.00	30	1	0	0	N/A	0.88	0.83	16.52
204	Ceiling R-11 to R-38 Insulation (base space heating)	Single Family	16%	16%	618.19	2993.95	2505.34	0.00	30	1	0	0	N/A	0.51	0.48	28.80
205	Ceiling R-11 to R-49 Insulation (base space heating)	Single Family	18%	18%	798.89	2993.95	2460.47	0.00	30	1	0	0	N/A	0.43	0.40	34.08
206	Ceiling R-19 to R-38 Insulation (base space heating)	Single Family	8%	8%	423.66	2993.95	2755.42	0.00	30	1	0	0	N/A	0.36	0.34	40.43
207	Ceiling R-19 to R-49 Insulation (base space heating)	Single Family	10%	10%	630.77	2993.95	2706.07	0.00	30	1	0	0	N/A	0.29	0.27	49.87
208	Wall Blow-in R-0 to R-13 Insulation (base space heating)	Single Family	16%	16%	1017.60	2993.95	2529.71	0.00	30	4	0	0	N/A	0.29	0.27	49.89
209	Basement insulation R-11 (base space heating)	Single Family	3%	3%	1139.80	2993.95	2906.49	0.00	30	0	1	0	N/A	0.05	0.05	296.61
211	Comprehensive Shell Air Sealing - Inf. Reduction (base space heating)	Single Family	15%	15%	70.15	3131.97	2671.89	0.00	10	4	0	0	N/A	2.25	2.39	3.47
212	Self Install Weatherization (base space heating)	Single Family	2%	2%	3.48	3016.87	2956.54	0.00	10	0	0	0	N/A	5.96	6.32	1.31
213	Single Pane Windows to ENERGY STAR (base space heating)	Single Family	13%	13%	4808.32	3045.56	2645.86	0.00	25	3	0	1	N/A	0.05	0.05	273.80
214	Double Pane Windows to ENERGY STAR (base space heating)	Single Family	8%	8%	839.74	3025.83	2778.89	0.00	25	1	0	0	N/A	0.19	0.18	77.40
217	Programmable Thermostat (base space heating)	Single Family	10%	10%	50.66	3171.74	2854.33	0.00	10	2	0	0	N/A	2.15	2.29	3.63
250	Base Air-Source Heat Pump, 13 SEER, 7.7 HSPF	Single Family	0%	0%	4155.00	1313.67	1313.67	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A
251	High Efficiency Air Source Heat Pump, 15 SEER, 8.2 HSPF	Single Family	6%	6%	718.00	1321.30	1240.70	0.00	18	2	0	1	N/A	0.07	0.06	202.75
252	Ceiling R-0 to R-38 Insulation (base ASHP)	Single Family	40%	40%	784.73	1313.67	782.13	0.00	30	1	0	0	N/A	0.43	0.41	33.60
253	Ceiling R-0 to R-49 Insulation (base ASHP)	Single Family	42%	42%	902.72	1313.67	768.13	0.00	30	1	0	0	N/A	0.39	0.36	37.66
254	Ceiling R-11 to R-38 Insulation (base ASHP)	Single Family	16%	16%	618.19	1313.67	1099.29	0.00	30	1	0	0	N/A	0.22	0.21	65.63
255	Ceiling R-11 to R-49 Insulation (base ASHP)	Single Family	18%	18%	798.89	1313.67	1079.60	0.00	30	1	0	0	N/A	0.19	0.18	77.68
256	Ceiling R-19 to R-38 Insulation (base ASHP)	Single Family	8%	8%	423.66	1313.67	1209.01	0.00	30	1	0	0	N/A	0.16	0.15	92.13
257	Ceiling R-19 to R-49 Insulation (base ASHP)	Single Family	10%	10%	630.77	1313.67	1187.36	0.00	30	1	0	0	N/A	0.13	0.12	113.66
258	Wall Blow-in R-0 to R-13 Insulation (base ASHP)	Single Family	16%	16%	1017.60	1313.67	1109.98	0.00	30	4	0	0	N/A	0.13	0.12	113.70
259	Basement insulation R-11 (base ASHP)	Single Family	3%	3%	1139.80	1313.67	1275.30	0.00	30	0	2	0	N/A	0.02	0.02	676.00
261	Comprehensive Shell Air Sealing - Inf. Reduction (base ASHP)	Single Family	15%	15%	70.15	1374.24	1172.36	0.00	10	4	0	0	N/A	0.99	1.05	7.91
262	Self Install Weatherization (base ASHP)	Single Family	2%	2%	3.48	1323.73	1297.26	0.00	10	0	0	0	N/A	2.61	2.77	2.99
263	Single Pane Windows to ENERGY STAR (base ASHP)	Single Family	13%	13%	4808.32	1336.32	1160.94	0.00	25	3	0	2	N/A	0.02	0.02	624.00

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Residential Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Household	Base UEC	UEC	Peak Watts/ Household	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWh	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
264	Double Pane Windows to ENERGY STAR (base ASHP)	Single Family	8%	8%	839.74	1327.67	1219.31	0.00	25	1	0	0	N/A	0.08	0.08	176.39
265	Programmable Thermostat (base ASHP)	Single Family	10%	10%	50.66	1391.69	1252.42	0.00	10	2	0	0	N/A	0.95	1.00	8.28
300	Base High-Efficiency Incandescent Lighting,<1.15 hrs/day	Single Family	0%	0%	9.43	113.07	113.07	11.55	5	0	0	N/A	N/A	N/A	N/A	N/A
301	CFL 15W (base HE incandescent<1.15 hrs/day)	Single Family	75%	75%	2.36	113.07	28.27	2.89	37	14	1	0	14.39	37.75	23.66	0.58
302	CFL 15W - Specialty (base HE incandescent<1.15 hrs/day)	Single Family	75%	75%	75.40	113.07	28.27	2.89	37	2	0	0	460.43	1.18	0.74	18.54
303	LEDs (base HE incandescent<1.15 hrs/day)	Single Family	90%	90%	216.78	113.07	11.31	1.16	160	21	2	0	836.45	0.50	0.31	43.91
310	Base High-Efficiency Incandescent Lighting,1.15-2.15 hrs/day	Single Family	0%	0%	14.78	487.74	487.74	49.84	2	0	0	N/A	N/A	N/A	N/A	N/A
311	CFL 15W (base HE incandescent 1.15-2.15 hrs/day)	Single Family	75%	75%	7.54	487.74	121.93	12.46	13	62	6	0	21.00	36.43	25.24	0.42
312	CFL 15W - Specialty (base HE incandescent 1.15-2.15 hrs/day)	Single Family	75%	75%	118.28	487.74	121.93	12.46	13	7	1	0	329.44	2.32	1.61	6.51
313	LEDs (base HE incandescent 1.15-2.15 hrs/day)	Single Family	90%	90%	340.05	487.74	48.77	4.98	58	92	9	0	337.33	1.37	0.86	15.92
320	Base High-Efficiency Incandescent Lighting,2.15-5 hrs/day	Single Family	0%	0%	3.02	211.40	211.40	21.60	1	0	0	N/A	N/A	N/A	N/A	N/A
321	CFL 15W (base HE incandescent 2.15-5 hrs/day)	Single Family	75%	75%	1.54	211.40	52.85	5.40	6	27	3	0	20.20	37.87	28.34	0.19
322	CFL 15W - Specialty (base HE incandescent 2.15-5 hrs/day)	Single Family	75%	75%	24.17	211.40	52.85	5.40	6	3	0	0	316.89	2.41	1.81	3.01
323	LEDs (base HE incandescent 2.15-5 hrs/day)	Single Family	90%	90%	69.48	211.40	21.14	2.16	27	40	4	0	215.69	2.95	1.85	7.41
330	Base High-Efficiency Incandescent Lighting,>5 hrs/day	Single Family	0%	0%	1.60	319.76	319.76	32.67	1	0	0	N/A	N/A	N/A	N/A	N/A
331	CFL 15W (base HE incandescent >5 hrs/day)	Single Family	75%	75%	0.82	319.76	79.94	8.17	2	41	4	0	19.68	38.88	30.64	0.06
332	CFL 15W - Specialty (base HE incandescent >5 hrs/day)	Single Family	75%	75%	12.79	319.76	79.94	8.17	2	5	0	0	308.67	2.48	1.95	1.00
333	LEDs (base HE incandescent >5 hrs/day)	Single Family	90%	90%	36.78	319.76	31.98	3.27	10	61	6	0	178.99	4.27	3.03	2.74
340	Base Lighting 15 Watt CFL, <1.15 hrs/day	Single Family	0%	0%	2.69	7.65	7.65	0.78	37	0	0	N/A	N/A	N/A	N/A	N/A
341	LEDs (base CFL < 1.15 hrs/day)	Single Family	60%	60%	40.13	7.65	3.06	0.31	160	1	0	0	3435.19	0.12	0.08	180.33
342	Photocell/timeclock (outdoor) (base CFL < 1.15 hrs/day)	Single Family	15%	18%	35.69	7.65	6.50	0.64	320	0	0	1	10163.75	0.04	0.02	639.62
350	Base Lighting 15 Watt CFL, 1.15-2.15 hrs/day	Single Family	0%	0%	7.95	62.02	62.02	6.34	13	0	0	N/A	N/A	N/A	N/A	N/A
351	LEDs (base CFL 1.15-2.15 hrs/day)	Single Family	60%	60%	118.39	62.02	24.81	2.54	58	7	1	0	1385.35	0.33	0.21	65.37
352	Photocell/timeclock (outdoor) (base CFL 1.15-2.15 hrs/day)	Single Family	15%	18%	105.28	62.02	52.72	5.20	116	2	0	0	3723.71	0.10	0.06	231.86
360	Base Lighting 15 Watt CFL, 2.15-5 hrs/day	Single Family	0%	0%	3.26	53.95	53.95	5.51	6	0	0	N/A	N/A	N/A	N/A	N/A
361	LEDs (base CFL 2.15-5 hrs/day)	Single Family	60%	60%	48.55	53.95	21.58	2.20	27	6	1	0	885.81	0.72	0.45	30.43
362	Photocell/timeclock (outdoor) (base CFL 2.15-5 hrs/day)	Single Family	15%	18%	43.17	53.95	45.86	4.52	55	1	0	0	1975.35	0.21	0.12	109.94
370	Base Lighting 15 Watt CFL, >5 hrs/day	Single Family	0%	0%	1.73	81.60	81.60	8.34	2	0	0	N/A	N/A	N/A	N/A	N/A
371	LEDs (base CFL >5 hrs/day)	Single Family	60%	60%	25.70	81.60	32.64	3.34	10	9	1	0	735.11	1.04	0.74	11.27
372	Photocell/timeclock (outdoor) (base CFL >5 hrs/day)	Single Family	15%	18%	22.86	81.60	69.36	6.84	19	2	0	0	1154.44	0.60	0.35	37.98
380	Base Fluorescent Fixture, 2L4/T8, 1.8 hrs/day	Single Family	0%	0%	0.00	281.39	281.39	28.75	38	0	0	N/A	N/A	N/A	N/A	N/A
381	ROB 2L4 Premium T8	Single Family	17%	17%	16.68	281.39	233.27	23.84	38	10	1	0	174.92	3.07	1.92	7.13
400	Base Refrigerator	Single Family	0%	0%	0.00	805.89	805.89	149.25	12	0	0	N/A	N/A	N/A	N/A	N/A
401	HE Refrigerator (Energy Star)	Single Family	20%	20%	97.17	822.34	657.87	121.83	12	25	5	0	366.21	1.52	0.82	11.93
402	HE Refrigerator (CEE Tier 2)	Single Family	25%	25%	220.17	807.91	605.93	112.21	12	34	6	0	675.66	0.83	0.45	22.01
410	Base Early Replacement Refrigerator	Single Family	0%	0%	0.00	937.08	937.08	173.54	12	0	0	N/A	N/A	N/A	N/A	N/A
411	Refrigerator - Early Replacement (Energy Star)	Single Family	28%	28%	251.15	937.08	678.17	125.59	5	8	1	0	1387.06	0.40	0.23	19.59
420	Base Second Refrigerator	Single Family	0%	0%	0.00	1341.81	1341.81	248.49	5	0	0	N/A	N/A	N/A	N/A	N/A
421	Refrigerator Recycling - second refrigerator	Single Family	100%	100%	162.50	1341.81	1.34	0.25	5	46	8	0	173.35	3.22	1.88	2.45
430	Base Freezer	Single Family	0%	0%	0.00	716.54	716.54	100.07	12	0	0	N/A	N/A	N/A	N/A	N/A
431	Freezer (Energy Star)	Single Family	15%	15%	64.79	719.78	611.81	85.45	12	5	1	0	493.22	1.30	0.81	12.12
440	Base Early Replacement Freezer	Single Family	0%	0%	0.00	716.54	716.54	100.07	12	0	0	N/A	N/A	N/A	N/A	N/A
441	Freezer - Early Replacement (Energy Star)	Single Family	15%	15%	81.30	716.54	607.66	84.87	12	1	0	0	613.74	1.04	0.65	15.08
500	Base 40 gal. Water Heating (EF=0.88)	Single Family	0%	0%	0.00	3754.33	3754.33	480.82	15	0	0	N/A	N/A	N/A	N/A	N/A
502	Faucet Aerators (1.5 GPM)	Single Family	4%	4%	34.40	3788.71	3645.47	466.88	5	10	1	0	496.59	1.35	0.92	5.00
503	HE Water Heater (EF=0.93)	Single Family	5%	5%	72.30	3778.82	3574.76	457.82	10	16	2	0	379.61	1.77	1.13	7.37
504	Heat Pump Water Heater - Energy Star	Single Family	65%	65%	1410.85	3778.82	1330.14	170.35	12	55	7	0	516.41	1.30	0.82	11.99
505	Low Flow Showerhead 1.5 Gal/Min	Single Family	7%	7%	46.59	3823.32	3547.37	454.31	5	19	2	0	349.09	1.92	1.31	3.51
506	Pipe Wrap	Single Family	3%	3%	2.96	3767.29	3654.27	468.01	15	8	1	0	19.08	35.20	21.40	0.55
507	Solar Domestic Water Heating	Single Family	50%	50%	3500.00	3773.19	1886.60	241.62	15	170	22	0	1351.60	0.50	0.30	38.61
508	Tankless Water Heater	Single Family	29%	29%	843.00	3765.18	2679.72	343.19	20	73	9	0	446.20	1.51	0.85	16.16
509	Energy Star CW CEE Tier 2 (MEF=2.0) (base WH)	Single Family	3%	3%	166.24	3779.09	3661.18	537.59	11	7	1	0	1199.24	0.52	0.32	28.76
510	Tier 3 CW (MEF=2.20) (base WH)	Single Family	3%	3%	393.16	3755.55	3633.12	533.46	11	9	1	0	2731.42	0.23	0.14	65.50
511	Energy Star Dishwasher (EF=0.72) (base WH)	Single Family	2%	2%	143.22	3789.81	3708.88	866.19	11	3	1	0	946.47	0.53	0.25	36.48
550	Base Early Replacement Water Heating to Heat Pump Water Heater	Single Family	0%	0%	0.00	3754.33	3754.33	480.82	10	0	0	N/A	N/A	N/A	N/A	N/A
551	Early Replacement Water Heating to Heat Pump Water Heater	Single Family	64%	64%	1374.36	3754.33	1367.33	175.11	10	2	0	0	616.87	1.09	0.69	11.98
600	Base Clotheswasher (MEF=1.26)	Single Family	0%	0%	0.00	105.25	105.25	15.45	11	0	0	N/A	N/A	N/A	N/A	N/A
601	Energy Star CW CEE Tier 2 (MEF=2.0) (base CW)	Single Family	29%	29%	131.73	112.20	79.11	11.62	11	5	1	0	3386.33	0.18	0.11	81.20
602	Tier 3 CW (MEF=2.20) (base CW)	Single Family	32%	32%	178.73	105.59	72.05	10.58	11	6	1	1	4533.08	0.14	0.08	108.70
610	Base Clothes Dryer (EF=3.01)	Single Family	0%	0%	0.00	1263.79	1263.79	169.11	12	0	0	N/A	N/A	N/A	N/A	N/A
611	Heat Pump Dryer	Single Family	60%	60%	1680.98	1271.42	508.57	68.05	12	105	14	0	1890.33	0.35	0.22	45.51
612	High Efficiency CD (EF=3.01 w/moisture sensor)	Single Family	15%	15%	238.23	1304.89	1109.16	148.41	12	21	3	0	1044.12	0.63	0.39	25.14
700	Base Dishwasher (EF=0.65)	Single Family	0%	0%	292.65	211.28	211.28	49.34	11	0	0	N/A	N/A	N/A	N/A	N/A
701	Energy Star Dishwasher (EF=0.72) (base DW)	Single Family	1%	1%	93.00	211.94	209.31	48.88	13	0	0	4	16093.53	0.03	0.01	728.24
800	Base Single Speed Pool Pump (RET)	Single Family	0%	0%	630.44	1071.87	1071.87	98.82	10	0	0	N/A	N/A	N/A	N/A	N/A
801	Variable Speed Pool Pump (1.5 hp)	Single Family	90%	90%	791.53	1216.37	121.64	11.21	10	5	0	0	1076.06	0.76	0.57	14.60
810	Base Two Speed Pool Pump (1.5 hp) (ROB)	Single Family	0%	0%	0.00	663.05	663.05	61.13	10	0	0	N/A	N/A	N/A	N/A	N/A
811	Variable Speed Pool Pump (1.5 hp)	Single Family	33%	33%	751.59	693.25	464.47	42.82	10	1	0	0	4889.45	0.17	0.13	66.33
900	Base Plasma TV	Single Family	0%	0%	0.00	306.33	306.33	43.14	6	0	0	N/A	N/A	N/A	N/A	N/A
901	Energy Star Plasma TV	Single Family	30%	30%	1.11	325.88	228.12	32.12	6	3	0	0	17.88	35.71	23.45	0.23
910	Base LCD TV	Single Family	0%	0%	0.00	206.07	206.07	29.02	6	0	0	N/A	N/A	N/A	N/A	N/A
911	Energy Star LCD TV	Single Family	30%	30%	1.58	245.03	171.52	24.15	6	3	0	0	33.84	18.86	12.39	0.44

APPENDIX F

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Residential Electric Existing Construction

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920	Base CRT TV	Single Family	0%	0%	0.00	242.27	242.27	34.12	6	0	0	N/A	N/A	N/A	N/A	N/A
921	Energy Star LCD TV	Single Family	40%	40%	2.16	242.27	145.36	20.47	6	15	2	0	35.09	18.19	11.94	0.45
930	Base Set-Top Box	Single Family	0%	0%	0.00	305.05	305.05	42.95	7	0	0	N/A	N/A	N/A	N/A	N/A
931	Energy Star Set-Top Box	Single Family	40%	40%	1.78	359.02	216.99	30.56	7	12	2	0	17.04	37.45	24.26	0.26
940	Base DVD Player	Single Family	0%	0%	0.00	43.12	43.12	6.07	7	0	0	N/A	N/A	N/A	N/A	N/A
941	Energy Star DVD Player	Single Family	55%	55%	1.74	58.56	26.39	3.72	7	2	0	0	73.56	8.68	5.62	1.10
950	Base Desktop PC	Single Family	0%	0%	0.00	951.48	951.48	132.73	4	0	0	N/A	N/A	N/A	N/A	N/A
951	Energy Star Desktop PC	Single Family	18%	18%	1.25	963.55	791.07	110.36	4	26	4	0	17.07	37.57	25.06	0.15
960	Base Laptop PC	Single Family	0%	0%	0.00	250.33	250.33	34.92	4	0	0	N/A	N/A	N/A	N/A	N/A
961	Energy Star Laptop PC	Single Family	13%	13%	1.62	258.64	223.99	31.25	4	1	0	0	110.12	5.83	3.89	0.97
970	Base Cooking	Single Family	0%	0%	0.00	412.13	412.13	169.23	15	0	0	N/A	N/A	N/A	N/A	N/A
980	Base Miscellaneous	Single Family	0%	0%	0.00	2351.41	2351.41	328.02	10	0	0	N/A	N/A	N/A	N/A	N/A
981	Plug Load Controls - Smart Power Strip	Single Family	2%	2%	25.00	2351.88	2304.84	321.53	5	10	1	0	1008.93	0.64	0.42	10.99
982	Energy Star Ventilating Fans	Single Family	1%	1%	100.00	2361.33	2328.27	324.79	10	4	1	0	2975.35	0.22	0.13	62.54
990	Base House Practices	Single Family	0%	0%	0.00	14834.68	14834.68	5930.22	1	0	0	N/A	N/A	N/A	N/A	N/A
991	Indirect feedback	Single Family	2%	2%	7.00	14834.68	14537.99	5811.61	1	62	25	0	75.92	5.55	2.17	0.46
100	Base Split-System Air Conditioner (13 SEER)	Multifamily	0%	0%	0.00	1001.93	1001.93	649.87	14	0	0	N/A	N/A	N/A	N/A	N/A
101	15 SEER (12.72 EER) Split-System Air Conditioner w/ quality install	Multifamily	40%	40%	587.29	1041.55	622.87	404.00	14	43	28	0	214.78	1.75	0.44	25.41
102	17 SEER (12.28 EER) Split-System Air Conditioner w/ quality install	Multifamily	47%	47%	1088.98	1024.15	540.38	350.50	14	52	34	0	344.67	1.09	0.27	40.77
103	AC Maintenance (Indoor Coil Cleaning)	Multifamily	6%	6%	100.00	1014.72	950.76	616.68	4	5	3	1	792.24	0.47	0.13	28.32
104	AC Maintenance (Outdoor Coil Cleaning)	Multifamily	6%	6%	60.00	1027.84	963.06	624.65	4	4	3	0	469.28	0.80	0.22	16.78
105	AC Maintenance and/or tune-up	Multifamily	4%	4%	50.00	1016.57	975.90	632.99	4	3	2	0	623.04	0.60	0.17	22.27
107	Ceiling R-0 to R-38 Insulation (base split-system)	Multifamily	33%	33%	1213.89	1001.93	674.38	437.41	30	2	1	0	330.42	0.89	0.20	67.12
108	Ceiling R-0 to R-49 Insulation (base split-system)	Multifamily	34%	34%	1471.53	1001.93	680.25	428.25	30	2	1	0	383.98	0.77	0.18	78.01
109	Ceiling R-11 to R-38 Insulation (base split-system)	Multifamily	13%	13%	912.72	1001.93	870.88	564.87	30	1	0	0	620.98	0.48	0.11	126.15
110	Ceiling R-11 to R-49 Insulation (base split-system)	Multifamily	15%	15%	1198.91	1001.93	852.63	553.03	30	2	1	0	716.00	0.41	0.09	145.45
111	Ceiling R-19 to R-38 Insulation (base split-system)	Multifamily	6%	6%	782.13	1001.93	940.99	610.34	30	3	2	1	1144.30	0.26	0.06	232.46
112	Ceiling R-19 to R-49 Insulation (base split-system)	Multifamily	8%	8%	942.21	1001.93	921.27	597.55	30	2	2	1	1041.54	0.28	0.06	211.59
113	Comprehensive Shell Air Sealing - Inf. Reduction (base split-system)	Multifamily	2%	2%	119.24	1011.03	992.31	643.63	10	1	1	1	1347.32	0.28	0.07	115.36
114	Duct Insulation	Multifamily	16%	16%	454.87	1149.46	961.84	623.87	18	5	3	0	298.56	1.26	0.30	43.91
115	Duct Repair	Multifamily	8%	8%	324.33	1021.06	941.93	610.95	18	7	4	0	504.73	0.75	0.18	74.24
116	Programmable Thermostat (base split-system)	Multifamily	16%	19%	33.35	1100.13	924.82	576.64	15	9	7	0	22.73	16.01	3.37	3.46
117	Proper Refrigerant Charging and Air Flow	Multifamily	11%	11%	84.68	1039.31	926.03	600.64	10	9	6	0	158.13	2.38	0.61	13.54
118	Proper Sizing and Quality Install	Multifamily	31%	40%	220.00	1186.09	817.76	459.28	18	21	18	0	56.68	6.34	1.25	10.40
119	Sealed Attic w/Sprayed Foam Insulated Roof Deck (base split-system)	Multifamily	9%	9%	1219.63	1004.44	914.04	592.86	30	1	1	1	1202.89	0.25	0.06	244.36
120	Self Install Weatherization (base split-system)	Multifamily	2%	2%	6.52	1009.60	989.41	641.75	10	0	0	0	68.28	5.51	1.42	5.85
121	Wall Blow-in R-0 to R-13 Insulation (base split-system)	Multifamily	16%	16%	395.36	1001.93	846.57	549.10	30	7	5	0	226.89	1.30	0.30	46.09
122	Single Pane Windows to ENERGY STAR (base split-system)	Multifamily	4%	4%	228.14	1007.77	962.57	624.34	25	3	2	0	498.16	0.66	0.15	91.43
123	Double Pane Windows to ENERGY STAR (base split-system)	Multifamily	3%	3%	1129.11	1005.46	978.15	634.44	25	1	3	3	4080.46	0.08	0.02	748.88
130	Base Early Replacement Split-System Air Conditioner (13 SEER)	Multifamily	0%	0%	0.00	1480.12	1480.12	960.03	7	0	0	N/A	N/A	N/A	N/A	N/A
131	15 SEER (12.72 EER) Split-System Air Conditioner--early replacement	Multifamily	20%	20%	435.59	1483.12	1183.23	767.46	7	6	4	0	428.87	0.88	0.24	26.31
140	Base Room Air Conditioner - EER 9.7	Multifamily	0%	0%	0.00	554.49	554.49	359.65	12	0	0	N/A	N/A	N/A	N/A	N/A
141	HE Room Air Conditioner - Energy star EER 10.8	Multifamily	9%	9%	63.50	554.49	503.12	326.33	12	0	0	0	218.76	1.72	0.44	22.39
142	HE Room Air Conditioner - CEE Tier 1 EER 11.3	Multifamily	13%	13%	67.31	555.22	481.67	312.42	12	1	0	0	161.96	2.32	0.59	16.58
143	Ceiling Fans (base RAC)	Multifamily	5%	5%	205.20	569.50	541.02	350.92	15	0	0	1	1036.66	0.36	0.09	130.52
144	Single Pane Windows to ENERGY STAR (base RAC)	Multifamily	4%	4%	231.83	557.72	532.70	345.52	25	0	0	1	914.69	0.36	0.08	167.87
145	Double Pane with Glazing to Energy Star (base RAC)	Multifamily	3%	3%	497.78	556.44	541.33	351.11	25	0	0	2	3250.54	0.10	0.02	596.57
146	Ceiling R-0 to R-38 Insulation (base RAC)	Multifamily	33%	33%	749.89	554.49	373.21	242.07	30	0	0	0	368.83	0.80	0.18	74.93
147	Ceiling R-0 to R-49 Insulation (base RAC)	Multifamily	34%	34%	909.06	554.49	365.39	237.00	30	0	0	0	428.63	0.69	0.16	87.07
148	Ceiling R-11 to R-38 Insulation (base RAC)	Multifamily	13%	13%	563.84	554.49	481.96	312.61	30	0	0	0	693.17	0.43	0.10	140.82
149	Ceiling R-11 to R-49 Insulation (base RAC)	Multifamily	15%	15%	740.64	554.49	471.86	306.06	30	0	0	1	799.24	0.37	0.08	162.36
150	Ceiling R-19 to R-38 Insulation (base RAC)	Multifamily	6%	6%	483.17	554.49	520.76	337.77	30	0	0	1	1277.34	0.23	0.05	259.49
151	Ceiling R-19 to R-49 Insulation (base RAC)	Multifamily	8%	8%	582.06	554.49	509.85	330.70	30	0	0	1	1162.63	0.25	0.06	236.18
152	Wall 2x4 R-0 to Blow-In R-13 Insulation (base RAC)	Multifamily	16%	16%	309.60	642.38	542.77	352.05	30	0	0	0	277.13	1.07	0.24	56.30
153	Self Install Weatherization (base RAC)	Multifamily	2%	2%	6.52	558.73	547.56	355.16	10	0	0	0	123.39	3.05	0.79	10.56
154	Infiltration Reduction (base RAC)	Multifamily	2%	2%	81.98	559.48	549.12	356.17	10	0	0	1	1673.93	0.22	0.06	143.32
155	Ductless Split Heat Pump	Multifamily	32%	32%	160.08	556.25	380.06	246.52	18	0	0	0	111.89	3.36	0.79	16.46
160	Base Early Replacement Room Air Conditioner- EER 9.7	Multifamily	0%	0%	0.00	593.30	593.30	384.82	12	0	0	N/A	N/A	N/A	N/A	N/A
161	EER 8.5 AC Early Replacement, CEE Tier 1 EER 11.3	Multifamily	18%	18%	85.99	593.30	485.32	314.79	12	0	0	0	140.94	2.67	0.68	14.42
170	Base Dehumidifier - New Federal Standard	Multifamily	0%	0%	0.00	302.04	302.04	42.13	12	0	0	0	N/A	N/A	N/A	N/A
171	Energy Star Dehumidifier (ROB)	Multifamily	20%	20%	10.00	305.99	244.79	34.15	12	0	0	0	134.46	4.77	2.90	3.38
200	Base Resistance Space Heating (Primary)	Multifamily	0%	0%	496.22	3351.48	3351.48	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A
202	Ceiling R-0 to R-38 Insulation (base space heating)	Multifamily	40%	40%	812.38	3351.48	1995.40	0.00	30	1	0	0	N/A	1.07	1.01	13.63
203	Ceiling R-0 to R-49 Insulation (base space heating)	Multifamily	42%	42%	934.54	3351.48	1959.66	0.00	30	1	0	0	N/A	0.95	0.90	15.28
204	Ceiling R-11 to R-38 Insulation (base space heating)	Multifamily	16%	16%	639.97	3351.48	2804.52	0.00	30	1	0	0	N/A	0.55	0.51	26.63
205	Ceiling R-11 to R-49 Insulation (base space heating)	Multifamily	18%	18%	827.04	3351.48	2754.29	0.00	30	1	0	0	N/A	0.46	0.43	31.52
206	Ceiling R-19 to R-38 Insulation (base space heating)	Multifamily	8%	8%	438.59	3351.48	3084.46	0.00	30	2	0	0	N/A	0.39	0.37	37.39
207	Ceiling R-19 to R-49 Insulation (base space heating)	Multifamily	10%	10%	653.00	3351.48	3029.22	0.00	30	1	0	0	N/A	0.32	0.30	46.12
208	Wall Blow-in R-0 to R-13 Insulation (base space heating)	Multifamily	16%	16%	194.16	3351.48	2831.80	0.00	30	3	0	0	N/A	1.72	1.61	8.50
209	Basement insulation R-11 (base space heating)	Multifamily	3%	3%	740.18	3351.48	3253.57	0.00	30	0	0	0	N/A	0.08	0.08	172.07
211	Comprehensive Shell Air Sealing - Inf. Reduction (base space heating)	Multifamily	15%	15%	27.79	3505.98	2990.96	0.00	10	5	0	0	N/A	6.37	6.76	1.23
212	Self Install Weatherization (base space heating)	Multifamily	2%	2%	3.48	3377.14	3309.60	0.00	10	0	0	0	N/A	6.67	7.08	1.17

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Residential Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Household	Base UEC	UEC	Peak Watts/ Household	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWh	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)	
213	Single Pane Windows to ENERGY STAR(base space heating)	Multifamily	13%	13%	784.98	3409.26	2961.82	0.00	25	3	0	0	N/A	0.37	0.34	39.93	
214	Double Pane Windows to ENERGY STAR (base space heating)	Multifamily	8%	8%	262.22	3387.17	3110.75	0.00	25	1	0	0	N/A	0.68	0.63	21.59	
217	Programmable Thermostat (base space heating)	Multifamily	10%	10%	50.66	3550.51	3195.19	0.00	10	2	0	0	N/A	2.41	2.56	3.24	
250	Base Air-Source Heat Pump, 13 SEER, 7.7 HSPF	Multifamily	0%	0%	3521.19	723.67	723.67	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	
300	Base High-Efficiency Incandescent Lighting,<1.15 hrs/day	Multifamily	0%	0%	5.32	73.45	73.45	7.51	5	0	0	0	N/A	N/A	N/A	N/A	
301	CFL 15W (base HE incandescent<1.15 hrs/day)	Multifamily	75%	75%	1.33	73.45	18.36	1.88	37	6	1	0	12.51	43.43	27.22	0.50	
302	CFL 15W - Specialty (base HE incandescent<1.15 hrs/day)	Multifamily	75%	75%	42.58	73.45	18.36	1.88	37	1	0	0	400.23	1.36	0.85	16.12	
303	LEDs (base HE incandescent<1.15 hrs/day)	Multifamily	90%	90%	122.41	73.45	7.35	0.75	160	9	1	0	727.08	0.57	0.36	38.17	
310	Base High-Efficiency Incandescent Lighting,1.15-2.15 hrs/day	Multifamily	0%	0%	8.35	316.85	316.85	32.38	2	0	0	N/A	N/A	N/A	N/A	N/A	
311	CFL 15W (base HE incandescent 1.15-2.15 hrs/day)	Multifamily	75%	75%	4.26	316.85	79.21	8.09	13	27	3	0	18.26	41.91	29.03	0.36	
312	CFL 15W - Specialty (base HE incandescent 1.15-2.15 hrs/day)	Multifamily	75%	75%	66.79	316.85	79.21	8.09	13	3	0	0	286.37	2.67	1.85	5.66	
313	LEDs (base HE incandescent 1.15-2.15 hrs/day)	Multifamily	90%	90%	192.02	316.85	31.68	3.24	58	40	4	0	293.22	1.58	0.99	13.84	
320	Base High-Efficiency Incandescent Lighting,2.15-5 hrs/day	Multifamily	0%	0%	1.71	137.33	137.33	14.03	1	0	0	N/A	N/A	N/A	N/A	N/A	
321	CFL 15W (base HE incandescent 2.15-5 hrs/day)	Multifamily	75%	75%	0.87	137.33	34.33	3.51	6	12	1	0	17.56	43.57	32.60	0.17	
322	CFL 15W - Specialty (base HE incandescent 2.15-5 hrs/day)	Multifamily	75%	75%	13.65	137.33	34.33	3.51	6	1	0	0	275.46	2.78	2.08	2.61	
323	LEDs (base HE incandescent 2.15-5 hrs/day)	Multifamily	90%	90%	39.23	137.33	13.73	1.40	27	18	2	0	187.49	3.40	2.13	6.44	
330	Base High-Efficiency Incandescent Lighting,>5 hrs/day	Multifamily	0%	0%	0.90	207.72	207.72	21.23	1	0	0	N/A	N/A	N/A	N/A	N/A	
331	CFL 15W (base HE incandescent >5 hrs/day)	Multifamily	75%	75%	0.46	207.72	51.93	5.31	2	18	2	0	17.10	44.73	35.25	0.06	
332	CFL 15W - Specialty (base HE incandescent >5 hrs/day)	Multifamily	75%	75%	7.22	207.72	51.93	5.31	2	2	0	0	268.31	2.85	2.25	0.87	
333	LEDs (base HE incandescent >5 hrs/day)	Multifamily	90%	90%	20.77	207.72	20.77	2.12	10	27	3	0	155.59	4.92	3.48	2.39	
340	Base Lighting 15 Watt CFL, <1.15 hrs/day	Multifamily	0%	0%	1.34	4.36	4.36	0.45	37	0	0	N/A	N/A	N/A	N/A	N/A	
341	LEDs (base CFL < 1.15 hrs/day)	Multifamily	60%	60%	19.89	4.36	1.74	0.18	160	0	0	0	2986.04	0.14	0.09	156.75	
342	Photocell/timerclock (outdoor) (base CFL < 1.15 hrs/day)	Multifamily	15%	18%	17.69	4.36	3.71	0.37	320	0	0	1	8834.82	0.04	0.02	555.99	
350	Base Lighting 15 Watt CFL, 1.15-2.15 hrs/day	Multifamily	0%	0%	3.94	35.37	35.37	3.61	13	0	0	N/A	N/A	N/A	N/A	N/A	
351	LEDs (base CFL 1.15-2.15 hrs/day)	Multifamily	60%	60%	58.68	35.37	14.15	1.45	58	3	0	0	1204.22	0.38	0.24	56.82	
352	Photocell/timerclock (outdoor) (base CFL 1.15-2.15 hrs/day)	Multifamily	15%	18%	52.18	35.37	30.06	2.96	116	1	0	0	3236.83	0.12	0.07	201.55	
360	Base Lighting 15 Watt CFL, 2.15-5 hrs/day	Multifamily	0%	0%	1.62	30.76	30.76	3.14	6	0	0	0	N/A	N/A	N/A	N/A	
361	LEDs (base CFL 2.15-5 hrs/day)	Multifamily	60%	60%	24.06	30.76	12.30	1.26	27	2	0	0	769.99	0.83	0.52	26.45	
362	Photocell/timerclock (outdoor) (base CFL 2.15-5 hrs/day)	Multifamily	15%	18%	21.40	30.76	26.15	2.58	55	1	0	0	1717.07	0.25	0.14	95.56	
370	Base Lighting 15 Watt CFL, >5 hrs/day	Multifamily	0%	0%	0.86	46.53	46.53	4.75	2	0	0	N/A	N/A	N/A	N/A	N/A	
371	LEDs (base CFL >5 hrs/day)	Multifamily	60%	60%	12.74	46.53	18.61	1.90	10	3	0	0	638.99	1.20	0.85	9.80	
372	Photocell/timerclock (outdoor) (base CFL >5 hrs/day)	Multifamily	15%	18%	11.33	46.53	39.55	3.90	19	1	0	0	1003.50	0.69	0.41	33.01	
380	Base Fluorescent Fixture, 2L4T8, 1.8 hrs/day	Multifamily	0%	0%	0.00	99.50	99.50	10.17	38	0	0	0	N/A	N/A	N/A	N/A	
381	ROB 2L4 Premium T8	Multifamily	17%	17%	5.40	99.50	82.49	8.43	38	2	0	0	160.15	3.35	2.10	6.53	
400	Base Refrigerator	Multifamily	0%	0%	0.00	927.11	927.11	171.69	12	0	0	0	N/A	N/A	N/A	N/A	N/A
401	HE Refrigerator (Energy Star)	Multifamily	20%	20%	105.07	951.86	761.49	141.02	12	19	4	0	342.10	1.63	0.88	11.14	
402	HE Refrigerator (CEE Tier 2)	Multifamily	25%	25%	238.07	929.44	697.08	129.09	12	27	5	0	635.06	0.88	0.47	20.69	
410	Base Early Replacement Refrigerator	Multifamily	0%	0%	0.00	1078.04	1078.04	199.65	12	0	0	0	N/A	N/A	N/A	N/A	N/A
411	Refrigerator - Early Replacement (Energy Star)	Multifamily	28%	28%	271.57	1078.04	780.18	144.48	5	6	1	0	1303.73	0.43	0.25	18.41	
420	Base Second Refrigerator	Multifamily	0%	0%	0.00	1187.42	1187.42	219.90	5	0	0	0	N/A	N/A	N/A	N/A	N/A
421	Refrigerator Recycling - second refrigerator	Multifamily	100%	100%	125.00	1187.42	1.19	0.22	5	14	3	0	150.68	3.70	2.16	2.13	
430	Base Freezer	Multifamily	0%	0%	0.00	824.32	824.32	115.12	12	0	0	0	N/A	N/A	N/A	N/A	N/A
431	Freezer (Energy Star)	Multifamily	15%	15%	63.59	831.81	707.03	98.74	12	1	0	0	418.89	1.53	0.95	10.29	
440	Base Early Replacement Freezer	Multifamily	0%	0%	0.00	824.32	824.32	115.12	12	0	0	0	N/A	N/A	N/A	N/A	N/A
441	Freezer - Early Replacement (Energy Star)	Multifamily	15%	15%	79.80	824.32	699.06	97.63	12	0	0	0	523.61	1.22	0.76	12.86	
500	Base 40 gal. Water Heating (EF=0.88)	Multifamily	0%	0%	0.00	2620.99	2620.99	335.67	15	0	0	0	N/A	N/A	N/A	N/A	N/A
502	Faucet Aerators (1.5 GPM)	Multifamily	4%	4%	21.28	2636.94	2537.25	324.95	5	5	1	0	441.37	1.52	1.03	4.44	
503	HE Water Heater (EF=0.93)	Multifamily	5%	5%	72.30	2620.99	2479.45	317.55	10	9	1	0	547.30	1.23	0.78	10.63	
504	Heat Pump Water Heater - Energy Star	Multifamily	65%	65%	1410.85	2638.08	928.61	118.93	12	26	3	0	739.72	0.91	0.57	17.18	
505	Low Flow Showerhead 1.5 Gal/Min	Multifamily	7%	7%	32.13	2638.12	2447.72	313.48	5	11	1	0	348.92	1.93	1.31	3.51	
506	Pipe Wrap	Multifamily	3%	3%	2.96	2629.33	2550.45	326.64	15	4	0	0	27.34	24.57	14.94	0.78	
507	Solar Domestic Water Heating	Multifamily	50%	50%	3500.00	2634.16	1317.08	168.68	15	80	10	0	1936.05	0.35	0.21	55.31	
508	Tankless Water Heater	Multifamily	29%	29%	843.00	2628.57	1870.78	239.59	20	35	4	0	639.15	1.05	0.59	23.15	
509	Energy Star CW CEE Tier 2 (MEF=2.0) (base WH)	Multifamily	4%	4%	166.24	2643.69	2535.57	372.31	11	4	1	0	1307.72	0.48	0.29	31.36	
510	Tier 3 CW (MEF=2.20) (base WH)	Multifamily	4%	4%	393.16	2622.11	2509.88	368.54	11	5	1	0	2979.79	0.21	0.13	71.45	
511	Energy Star Dishwasher (EF=0.72) (base WH)	Multifamily	2%	2%	143.22	2620.99	2565.02	599.05	11	2	0	0	1368.55	0.37	0.17	52.75	
550	Base Early Replacement Water Heating to Heat Pump Water Heater	Multifamily	0%	0%	0.00	2620.99	2620.99	335.67	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
551	Early Replacement Water Heating to Heat Pump Water Heater	Multifamily	64%	64%	1374.36	2620.99	954.56	122.25	10	1	0	0	883.61	0.76	0.48	17.17	
600	Base Clotheswasher (MEF=1.26)	Multifamily	0%	0%	0.00	121.08	121.08	17.78	11	0	0	0	N/A	N/A	N/A	N/A	N/A
601	Energy Star CW CEE Tier 2 (MEF=2.0) (base CW)	Multifamily	29%	29%	129.15	129.08	91.01	13.36	11	3	0	0	2885.85	0.22	0.13	69.20	
602	Tier 3 CW (MEF=2.20) (base CW)	Multifamily	32%	32%	175.23	121.47	82.89	12.17	11	4	1	1	3863.11	0.16	0.10	92.63	
610	Base Clothes Dryer (EF=3.01)	Multifamily	0%	0%	0.00	873.98	873.98	116.95	12	0	0	N/A	N/A	N/A	N/A	N/A	N/A
611	Heat Pump Dryer	Multifamily	60%	60%	1680.98	879.26	351.70	47.06	12	49	7	0	2733.44	0.24	0.15	65.80	
612	High Efficiency CD (EF=3.01 w/moisture sensor)	Multifamily	15%	15%	238.23	902.41	767.05	102.64	12	10	1	0	1509.81	0.43	0.27	36.35	
700	Base Dishwasher (EF=0.65)	Multifamily	0%	0%	292.65	243.06	243.06	56.77	11	0	0	N/A	N/A	N/A	N/A	N/A	N/A
701	Energy Star Dishwasher (EF=0.72) (base DW)	Multifamily	1%	1%	93.00	243.82	240.79	56.24	13	0	0	3	13989.28	0.04	0.02	633.02	
800	Base Single Speed Pool Pump (RET)	Multifamily	0%	0%	630.44	1233.10	1233.10	113.69	10	0	0	0	N/A	N/A	N/A	N/A	N/A
801	Variable Speed Pool Pump (1.5 hp)	Multifamily	90%	90%	791.53	1399.34	139.93	12.90	10	4	0	0	935.37	0.87	0.65	12.69	
810	Base Two Speed Pool Pump (1.5 hp) (ROB)	Multifamily	0%	0%	0.00	877.52	877.52	80.90	10	0	0	0	N/A	N/A	N/A	N/A	N/A
811	Variable Speed Pool Pump (1.5 hp)	Multifamily	33%	33%	751.59	917.49	614.72	56.67	10	1	0	0	3694.43	0.22	0.17	50.12	
900	Base Plasma TV	Multifamily	0%	0%													

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Residential Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Household	Base UEC	UEC	Peak Watts/ Household	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWh	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
910	Base LCD TV	Multifamily	0%	0%	0.00	213.06	213.06	30.00	6	0	0	N/A	N/A	N/A	N/A	N/A
911	Energy Star LCD TV	Multifamily	30%	30%	1.42	265.66	185.96	26.19	6	2	0	0	28.05	22.76	14.94	0.36
920	Base CRT TV	Multifamily	0%	0%	0.00	184.52	184.52	25.98	6	0	0	N/A	N/A	N/A	N/A	N/A
921	Energy Star LCD TV	Multifamily	40%	40%	1.43	184.52	110.71	15.59	6	7	1	0	30.51	20.93	13.74	0.40
930	Base Set-Top Box	Multifamily	0%	0%	0.00	295.73	295.73	41.64	7	0	0	N/A	N/A	N/A	N/A	N/A
931	Energy Star Set-Top Box	Multifamily	40%	40%	1.50	368.65	222.81	31.37	7	7	1	0	13.99	45.64	29.56	0.21
940	Base DVD Player	Multifamily	0%	0%	0.00	39.63	39.63	5.58	7	0	0	N/A	N/A	N/A	N/A	N/A
941	Energy Star DVD Player	Multifamily	55%	55%	1.39	54.63	24.62	3.47	7	1	0	0	62.99	10.14	6.56	0.94
950	Base Desktop PC	Multifamily	0%	0%	0.00	857.97	857.97	119.69	4	0	0	N/A	N/A	N/A	N/A	N/A
951	Energy Star Desktop PC	Multifamily	18%	18%	1.13	886.54	727.85	101.53	4	12	2	0	16.78	38.24	25.50	0.15
960	Base Laptop PC	Multifamily	0%	0%	0.00	252.76	252.76	35.26	4	0	0	N/A	N/A	N/A	N/A	N/A
961	Energy Star Laptop PC	Multifamily	13%	13%	1.66	263.71	228.38	31.86	4	3	0	0	110.67	5.80	3.87	0.97
970	Base Cooking	Multifamily	0%	0%	0.00	474.13	474.13	194.68	15	0	0	N/A	N/A	N/A	N/A	N/A
980	Base Miscellaneous	Multifamily	0%	0%	0.00	51.56	51.56	7.19	10	0	0	N/A	N/A	N/A	N/A	N/A
981	Plug Load Controls - Smart Power Strip	Multifamily	2%	2%	25.00	51.57	50.54	7.05	5	0	0	6	46011.97	0.01	0.01	501.14
982	Energy Star Ventilating Fans	Multifamily	1%	1%	100.00	51.78	51.05	7.12	10	0	0	19	135690.39	0.00	0.00	2,852.17
990	Base House Practices	Multifamily	0%	0%	0.00	7758.50	7758.50	3101.49	1	0	0	N/A	N/A	N/A	N/A	N/A
991	Indirect feedback	Multifamily	2%	2%	7.00	7758.50	7603.33	3039.46	1	22	9	0	145.17	2.90	1.14	0.88
100	Base Split-System Air Conditioner (13 SEER)	Low Income	0%	0%	0.00	2567.59	2567.59	1665.38	14	0	0	N/A	N/A	N/A	N/A	N/A
101	15 SEER (12.72 EER) Split-System Air Conditioner w/ quality install	Low Income	40%	40%	537.37	2669.13	1596.20	1035.32	14	10	6	0	76.69	4.90	1.22	9.07
102	17 SEER (12.28 EER) Split-System Air Conditioner w/ quality install	Low Income	47%	47%	996.42	2624.54	1384.82	898.21	14	12	8	0	123.07	3.06	0.76	14.56
103	AC Maintenance (Indoor Coil Cleaning)	Low Income	6%	6%	100.00	2600.37	2436.48	1580.34	4	1	1	0	309.15	1.22	0.34	11.05
104	AC Maintenance (Outdoor Coil Cleaning)	Low Income	6%	6%	60.00	2634.00	2467.98	1600.77	4	1	1	0	183.12	2.05	0.57	6.55
105	AC Maintenance and/or tune-up	Low Income	4%	4%	50.00	2600.89	2496.85	1619.50	4	1	0	0	243.52	1.54	0.43	8.70
107	Ceiling R-0 to R-38 Insulation (base split-system)	Low Income	33%	33%	992.16	2567.59	1728.19	1120.93	30	0	0	0	105.38	2.81	0.64	21.41
108	Ceiling R-0 to R-49 Insulation (base split-system)	Low Income	34%	34%	1202.74	2567.59	1691.98	1097.44	30	0	0	0	122.47	2.41	0.55	24.88
109	Ceiling R-11 to R-38 Insulation (base split-system)	Low Income	13%	13%	746.00	2567.59	2231.77	1447.56	30	0	0	0	198.06	1.49	0.34	40.23
110	Ceiling R-11 to R-49 Insulation (base split-system)	Low Income	15%	15%	979.92	2567.59	2185.01	1417.23	30	0	0	0	228.36	1.29	0.30	46.39
111	Ceiling R-19 to R-38 Insulation (base split-system)	Low Income	6%	6%	639.26	2567.59	2411.43	1564.09	30	1	0	0	364.97	0.81	0.18	74.14
112	Ceiling R-19 to R-49 Insulation (base split-system)	Low Income	8%	8%	770.11	2567.59	2360.90	1531.32	30	1	0	0	332.19	0.89	0.20	67.48
113	Comprehensive Shell Air Sealing - Inf. Reduction (base split-system)	Low Income	2%	2%	105.22	2590.93	2542.95	1649.40	10	0	0	0	463.93	0.81	0.21	39.72
114	Duct Insulation	Low Income	16%	16%	301.07	2945.67	2464.87	1598.75	18	1	1	0	77.11	4.88	1.15	11.34
115	Duct Repair	Low Income	8%	8%	324.33	2616.63	2413.84	1565.65	18	2	1	0	196.96	1.91	0.45	28.97
116	Programmable Thermostat (base split-system)	Low Income	16%	19%	33.35	2819.25	2369.99	1477.74	15	2	2	0	8.87	41.02	8.65	1.35
117	Proper Refrigerant Charging and Air Flow	Low Income	12%	12%	106.57	2671.44	2356.77	1528.64	10	2	0	0	71.65	5.25	1.35	6.13
118	Proper Sizing and Quality Install	Low Income	31%	40%	220.00	3039.55	2095.64	1176.98	18	5	4	0	22.12	16.25	3.21	4.06
119	Sealed Attic w/Sprayed Foam Insulated Roof Deck (base split-system)	Low Income	9%	9%	1076.22	2574.03	2342.37	1519.30	30	0	0	0	414.20	0.71	0.16	84.14
120	Self Install Weatherization (base split-system)	Low Income	2%	2%	6.52	2587.26	2535.51	1644.57	10	0	0	0	26.65	14.12	3.64	2.28
121	Wall Blow-in R-0 to R-13 Insulation (base split-system)	Low Income	16%	16%	442.01	2567.59	2169.46	1407.15	30	3	2	0	98.99	2.99	0.68	20.11
122	Single Pane Windows to ENERGY STAR (base split-system)	Low Income	4%	4%	102.42	2582.55	2466.73	1599.96	25	1	0	0	87.27	3.75	0.86	16.02
123	Double Pane Windows to ENERGY STAR (base split-system)	Low Income	3%	3%	988.88	2576.63	2506.65	1625.85	25	0	0	1	1394.52	0.23	0.05	255.93
130	Base Early Replacement Split-System Air Conditioner (13 SEER)	Low Income	0%	0%	0.00	3793.04	3793.04	2460.22	7	0	0	N/A	N/A	N/A	N/A	N/A
131	15 SEER (12.72 EER) Split-System Air Conditioner-early replacement	Low Income	20%	20%	398.57	3800.72	3032.22	1966.74	7	1	1	0	153.13	2.46	0.66	9.39
140	Base Room Air Conditioner - EER 9.7	Low Income	0%	0%	0.00	1420.96	1420.96	921.66	12	0	0	N/A	N/A	N/A	N/A	N/A
141	HE Room Air Conditioner - Energy star EER 10.8	Low Income	9%	9%	62.00	1420.96	1289.31	836.27	12	0	0	0	83.35	4.51	1.15	8.53
142	HE Room Air Conditioner - CEE Tier 1 EER 11.3	Low Income	13%	13%	65.72	1422.84	1234.36	800.63	12	0	0	0	61.71	6.10	1.55	6.32
143	Ceiling Fans (base RAC)	Low Income	5%	5%	228.00	1468.96	1395.51	905.15	15	0	0	0	446.56	0.84	0.21	56.23
144	Single Pane Windows to ENERGY STAR (base RAC)	Low Income	4%	4%	133.82	1429.24	1365.14	885.45	25	0	0	0	206.03	1.59	0.36	37.81
145	Double Pane with Glazing to Energy Star (base RAC)	Low Income	3%	3%	840.01	1425.96	1387.23	899.78	25	0	0	1	2140.49	0.15	0.03	392.84
146	Ceiling R-0 to R-38 Insulation (base RAC)	Low Income	33%	33%	935.67	1420.96	956.41	620.35	30	0	0	0	179.58	1.65	0.38	36.48
147	Ceiling R-0 to R-49 Insulation (base RAC)	Low Income	34%	34%	1134.26	1420.96	936.37	607.35	30	0	0	0	208.69	1.42	0.32	42.40
148	Ceiling R-11 to R-38 Insulation (base RAC)	Low Income	13%	13%	703.53	1420.96	1235.10	801.11	30	0	0	0	337.50	0.88	0.20	68.56
149	Ceiling R-11 to R-49 Insulation (base RAC)	Low Income	15%	15%	924.12	1420.96	1209.23	784.32	30	0	0	0	389.14	0.76	0.17	79.05
150	Ceiling R-19 to R-38 Insulation (base RAC)	Low Income	6%	6%	602.87	1420.96	1334.53	865.60	30	0	0	0	621.93	0.48	0.11	126.34
151	Ceiling R-19 to R-49 Insulation (base RAC)	Low Income	8%	8%	726.26	1420.96	1306.57	847.46	30	0	0	0	566.08	0.52	0.12	115.00
152	Wall 2x4 R-0 to Blow-In R-13 Insulation (base RAC)	Low Income	16%	16%	334.54	1651.08	1395.07	904.86	30	0	0	0	116.51	2.54	0.58	23.67
153	Self Install Weatherization (base RAC)	Low Income	2%	2%	6.52	1431.84	1403.20	910.14	10	0	0	0	48.15	7.81	2.01	4.12
154	Infiltration Reduction (base RAC)	Low Income	2%	2%	91.84	1433.85	1407.30	912.80	10	0	0	0	731.69	0.51	0.13	62.65
155	Ductless Split Heat Pump	Low Income	32%	32%	200.85	1425.47	973.97	631.73	18	0	0	0	54.78	6.87	1.62	8.06
160	Base Early Replacement Room Air Conditioner- EER 9.7	Low Income	0%	0%	0.00	1520.42	1520.42	986.17	12	0	0	N/A	N/A	N/A	N/A	N/A
161	EER 8.5 AC Early Replacement, CEE Tier 1 EER 11.3	Low Income	18%	18%	83.96	1520.42	1243.71	806.69	12	0	0	0	53.70	7.00	1.78	5.50
170	Base Dehumidifier - New Federal Standard	Low Income	0%	0%	0.00	732.22	732.22	102.14	12	0	0	N/A	N/A	N/A	N/A	N/A
171	Energy Star Dehumidifier (ROB)	Low Income	20%	20%	10.00	747.28	597.82	83.40	12	0	0	0	55.06	11.65	7.09	1.38
200	Base Resistance Space Heating (Primary)	Low Income	0%	0%	819.94	5407.78	5407.78	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A
202	Ceiling R-0 to R-38 Insulation (base space heating)	Low Income	40%	40%	787.90	5407.78	3219.68	0.00	30	0	0	0	N/A	1.78	1.67	8.20
203	Ceiling R-0 to R-49 Insulation (base space heating)	Low Income	42%	42%	906.37	5407.78	3162.01	0.00	30	0	0	0	N/A	1.59	1.49	9.19
204	Ceiling R-11 to R-38 Insulation (base space heating)	Low Income	16%	16%	620.68	5407.78	4525.24	0.00	30	0	0	0	N/A	0.91	0.86	16.01
205	Ceiling R-11 to R-49 Insulation (base space heating)	Low Income	18%	18%	802.12	5407.78	4444.19	0.00	30	0	0	0	N/A	0.77	0.72	18.95
206	Ceiling R-19 to R-38 Insulation (base space heating)	Low Income	8%	8%	425.37	5407.78	4976.94	0.00	30	0	0	0	N/A	0.65	0.61	22.47
207	Ceiling R-19 to R-49 Insulation (base space heating)	Low Income	10%	10%	633.32	5407.78	4887.80	0.00	30	0	0	0	N/A	0.53	0.49	27.72
208	Wall Blow-in R-0 to R-13 Insulation (base space heating)	Low Income	16%	16%	390.73	5407.78	4569.25	0.00	30	0	0	0	N/A	1.38	1.29	10.61
209	Basement insulation R-11 (base space heating)	Low Income	3%	3%	934.63	5407.78	5249.80	0.00	30	0	0	0	N/A	0.11	0.10	134.66

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Residential Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Household	Base UEC	UEC	Peak Watts/ Household	Service Life (yrs)	Technical Potential GWH	System Peak Tech. MW	Levelized Cost of Conserved Energy \$/kWh	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
211	Comprehensive Shell Air Sealing - Inf. Reduction (base space heating)	Low Income	15%	15%	45.92	5657.08	4826.06	0.00	10	0	0	0	N/A	6.22	6.60	1.26
212	Self Install Weatherization (base space heating)	Low Income	2%	2%	3.48	5449.19	5340.21	0.00	10	0	0	0	N/A	10.76	11.42	0.73
213	Single Pane Windows to ENERGY STAR(base space heating)	Low Income	13%	13%	269.81	5501.01	4779.05	0.00	25	0	0	0	N/A	1.72	1.61	8.51
214	Double Pane Windows to ENERGY STAR (base space heating)	Low Income	8%	8%	624.19	5465.37	5019.34	0.00	25	0	0	0	N/A	0.46	0.43	31.85
217	Programmable Thermostat (base space heating)	Low Income	10%	10%	50.66	5728.92	5155.60	0.00	10	0	0	0	N/A	3.89	4.13	2.01
250	Base Air-Source Heat Pump, 13 SEER, 7.7 HSPF	Low Income	0%	0%	3221.89	1167.69	1167.69	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A
251	High Efficiency Air Source Heat Pump, 15 SEER, 8.2 HSPF	Low Income	6%	6%	556.75	1174.47	1102.82	0.00	18	0	0	1	N/A	0.08	0.07	176.87
252	Ceiling R-0 to R-38 Insulation (base ASHP)	Low Income	40%	40%	787.90	1167.69	695.22	0.00	30	0	0	0	N/A	0.38	0.36	37.95
253	Ceiling R-0 to R-49 Insulation (base ASHP)	Low Income	42%	42%	906.37	1167.69	682.76	0.00	30	0	0	0	N/A	0.34	0.32	42.54
254	Ceiling R-11 to R-38 Insulation (base ASHP)	Low Income	16%	16%	620.68	1167.69	977.12	0.00	30	0	0	0	N/A	0.20	0.18	74.13
255	Ceiling R-11 to R-49 Insulation (base ASHP)	Low Income	18%	18%	802.12	1167.69	959.62	0.00	30	0	0	0	N/A	0.17	0.16	87.74
256	Ceiling R-19 to R-38 Insulation (base ASHP)	Low Income	8%	8%	425.37	1167.69	1074.66	0.00	30	0	0	0	N/A	0.14	0.13	104.07
257	Ceiling R-19 to R-49 Insulation (base ASHP)	Low Income	10%	10%	633.32	1167.69	1055.41	0.00	30	0	0	0	N/A	0.11	0.11	128.38
258	Wall Blow-in R-0 to R-13 Insulation (base ASHP)	Low Income	16%	16%	390.73	1167.69	986.62	0.00	30	0	0	0	N/A	0.30	0.28	49.12
259	Basement insulation R-11 (base ASHP)	Low Income	3%	3%	934.63	1167.69	1133.57	0.00	30	0	0	2	N/A	0.02	0.02	623.62
261	Comprehensive Shell Air Sealing - Inf. Reduction (base ASHP)	Low Income	15%	15%	45.92	1221.52	1042.08	0.00	10	0	0	0	N/A	1.34	1.43	5.82
262	Self Install Weatherization (base ASHP)	Low Income	2%	2%	3.48	1176.63	1153.10	0.00	10	0	0	0	N/A	2.32	2.47	3.37
263	Single Pane Windows to ENERGY STAR(base ASHP)	Low Income	13%	13%	269.81	1187.82	1031.93	0.00	25	0	0	0	N/A	0.37	0.35	39.39
264	Double Pane Windows to ENERGY STAR (base ASHP)	Low Income	8%	8%	624.19	1180.12	1083.81	0.00	25	0	0	0	N/A	0.10	0.09	147.51
265	Programmable Thermostat (base ASHP)	Low Income	10%	10%	50.66	1237.03	1113.24	0.00	10	0	0	0	N/A	0.84	0.89	9.31
300	Base High-Efficiency Incandescent Lighting,<1.15 hrs/day	Low Income	0%	0%	4.88	60.20	60.20	6.15	5	0	0	N/A	N/A	N/A	N/A	N/A
301	CFL 15W (base HE incandescent<1.15 hrs/day)	Low Income	75%	75%	1.22	60.20	15.05	1.54	37	0	0	0	14.00	38.79	24.31	0.56
302	CFL 15W - Specialty (base HE incandescent<1.15 hrs/day)	Low Income	75%	75%	39.07	60.20	15.05	1.54	37	0	0	0	448.11	1.21	0.76	18.05
303	LEDs (base HE incandescent<1.15 hrs/day)	Low Income	90%	90%	112.34	60.20	6.02	0.62	160	1	0	0	814.07	0.51	0.32	42.73
310	Base High-Efficiency Incandescent Lighting,1.15-2.15 hrs/day	Low Income	0%	0%	7.66	259.70	259.70	26.54	2	0	0	N/A	N/A	N/A	N/A	N/A
311	CFL 15W (base HE incandescent 1.15-2.15 hrs/day)	Low Income	75%	75%	3.91	259.70	64.92	6.63	13	2	0	0	20.44	37.43	25.93	0.40
312	CFL 15W - Specialty (base HE incandescent 1.15-2.15 hrs/day)	Low Income	75%	75%	61.29	259.70	64.92	6.63	13	0	0	0	320.63	2.39	1.65	6.34
313	LEDs (base HE incandescent 1.15-2.15 hrs/day)	Low Income	90%	90%	176.22	259.70	25.97	2.65	58	3	0	0	328.30	1.41	0.88	15.49
320	Base High-Efficiency Incandescent Lighting,2.15-5 hrs/day	Low Income	0%	0%	1.57	112.56	112.56	11.50	1	0	0	N/A	N/A	N/A	N/A	N/A
321	CFL 15W (base HE incandescent 2.15-5 hrs/day)	Low Income	75%	75%	0.80	112.56	28.14	2.88	6	1	0	0	19.66	38.91	29.12	0.19
322	CFL 15W - Specialty (base HE incandescent 2.15-5 hrs/day)	Low Income	75%	75%	12.52	112.56	28.14	2.88	6	0	0	0	308.41	2.48	1.86	2.93
323	LEDs (base HE incandescent 2.15-5 hrs/day)	Low Income	90%	90%	36.01	112.56	11.26	1.15	27	1	0	0	209.92	3.03	1.90	7.21
330	Base High-Efficiency Incandescent Lighting,>5 hrs/day	Low Income	0%	0%	0.83	170.26	170.26	17.40	1	0	0	N/A	N/A	N/A	N/A	N/A
331	CFL 15W (base HE incandescent >5 hrs/day)	Low Income	75%	75%	0.42	170.26	42.56	4.35	2	1	0	0	19.15	39.95	31.49	0.06
332	CFL 15W - Specialty (base HE incandescent >5 hrs/day)	Low Income	75%	75%	6.63	170.26	42.56	4.35	2	0	0	0	300.41	2.55	2.01	0.98
333	LEDs (base HE incandescent >5 hrs/day)	Low Income	90%	90%	19.06	170.26	17.03	1.74	10	2	0	0	174.21	4.39	3.11	2.67
340	Base Lighting 15 Watt CFL, <1.15 hrs/day	Low Income	0%	0%	1.63	4.77	4.77	0.49	37	0	0	N/A	N/A	N/A	N/A	N/A
341	LEDs (base CFL < 1.15 hrs/day)	Low Income	60%	60%	24.35	4.77	1.91	0.19	160	0	0	0	3343.30	0.12	0.08	175.51
342	Photocell/timerlock (outdoor) (base CFL < 1.15 hrs/day)	Low Income	15%	18%	21.66	4.77	4.05	0.40	320	0	0	1	9891.85	0.04	0.02	622.51
350	Base Lighting 15 Watt CFL, 1.15-2.15 hrs/day	Low Income	0%	0%	4.82	38.67	38.67	3.95	13	0	0	N/A	N/A	N/A	N/A	N/A
351	LEDs (base CFL 1.15-2.15 hrs/day)	Low Income	60%	60%	71.84	38.67	15.47	1.58	58	0	0	0	1348.29	0.34	0.22	63.62
352	Photocell/timerlock (outdoor) (base CFL 1.15-2.15 hrs/day)	Low Income	15%	18%	63.88	38.67	32.87	3.24	116	0	0	0	3624.09	0.10	0.06	225.66
360	Base Lighting 15 Watt CFL, 2.15-5 hrs/day	Low Income	0%	0%	1.98	33.63	33.63	3.44	6	0	0	N/A	N/A	N/A	N/A	N/A
361	LEDs (base CFL 2.15-5 hrs/day)	Low Income	60%	60%	29.46	33.63	13.45	1.37	27	0	0	0	862.11	0.74	0.46	29.62
362	Photocell/timerlock (outdoor) (base CFL 2.15-5 hrs/day)	Low Income	15%	18%	26.19	33.63	28.59	2.82	55	0	0	0	1922.50	0.22	0.13	106.99
370	Base Lighting 15 Watt CFL, >5 hrs/day	Low Income	0%	0%	1.05	50.87	50.87	5.20	2	0	0	N/A	N/A	N/A	N/A	N/A
371	LEDs (base CFL >5 hrs/day)	Low Income	60%	60%	15.59	50.87	20.35	2.08	10	0	0	0	715.44	1.07	0.76	10.97
372	Photocell/timerlock (outdoor) (base CFL >5 hrs/day)	Low Income	15%	18%	13.87	50.87	43.24	4.26	19	0	0	0	1123.56	0.61	0.36	36.96
380	Base Fluorescent Fixture, 2L4T8, 1.8 hrs/day	Low Income	0%	0%	0.00	112.68	112.68	11.51	38	0	0	N/A	N/A	N/A	N/A	N/A
381	ROB 2L4 Premium T8	Low Income	17%	17%	6.60	112.68	93.41	9.55	38	0	0	0	172.84	3.11	1.95	7.04
400	Base Refrigerator	Low Income	0%	0%	0.00	828.04	828.04	153.35	12	0	0	N/A	N/A	N/A	N/A	N/A
401	HE Refrigerator (Energy Star)	Low Income	20%	20%	101.12	848.40	678.72	125.69	12	1	0	0	369.38	1.51	0.81	12.03
402	HE Refrigerator (CEE Tier 2)	Low Income	25%	25%	229.12	830.12	622.59	115.30	12	2	0	0	684.31	0.82	0.44	22.29
410	Base Early Replacement Refrigerator	Low Income	0%	0%	0.00	962.84	962.84	178.31	12	0	0	N/A	N/A	N/A	N/A	N/A
411	Refrigerator - Early Replacement (Energy Star)	Low Income	28%	28%	261.36	962.84	696.81	129.04	5	0	0	0	1404.83	0.40	0.23	19.84
420	Base Second Refrigerator	Low Income	0%	0%	0.00	1113.56	1113.56	206.22	5	0	0	N/A	N/A	N/A	N/A	N/A
421	Refrigerator Recycling - second refrigerator	Low Income	100%	100%	131.25	1113.56	1.11	0.21	5	2	0	0	168.71	3.31	1.93	2.38
430	Base Freezer	Low Income	0%	0%	0.00	736.23	736.23	102.82	12	0	0	N/A	N/A	N/A	N/A	N/A
431	Freezer (Energy Star)	Low Income	15%	15%	59.99	747.45	635.33	88.73	12	0	0	0	439.78	1.46	0.91	10.80
440	Base Early Replacement Freezer	Low Income	0%	0%	0.00	736.23	736.23	102.82	12	0	0	N/A	N/A	N/A	N/A	N/A
441	Freezer - Early Replacement (Energy Star)	Low Income	15%	15%	75.28	736.23	624.36	87.20	12	0	0	0	553.07	1.16	0.72	13.59
500	Base 40 gal. Water Heating (EF=0.88)	Low Income	0%	0%	0.00	3857.53	3857.53	494.04	15	0	0	N/A	N/A	N/A	N/A	N/A
502	Faucet Aerators (1.5 GPM)	Low Income	4%	4%	22.80	3885.44	3738.54	478.80	5	1	0	0	320.94	2.09	1.42	3.23
503	HE Water Heater (EF=0.93)	Low Income	5%	5%	72.30	3857.53	3649.22	467.36	10	1	0	0	371.86	1.81	1.15	7.22
504	Heat Pump Water Heater - Energy Star	Low Income	65%	65%	1410.85	3882.69	1366.71	175.04	12	3	0	0	502.60	1.34	0.84	11.67
505	Low Flow Showerhead 1.5 Gal/Min	Low Income	7%	7%	29.61	3891.23	3610.38	462.38	5	1	0	0	217.97	3.08	2.10	2.19
506	Pipe Wrap	Low Income	3%	3%	2.96	3886.48	3769.88	482.81	15	0	0	0	18.50	36.32	22.08	0.53
507	Solar Domestic Water Heating	Low Income	50%	50%	3500.00	3876.91	1938.46	248.26	15	10	1	0	1315.45	0.51	0.31	37.58
508	Tankless Water Heater	Low Income	29%	29%	843.00	3868.68	2753.38	352.63	20	4	1	0	434.27	1.55	0.87	15.73
509	Energy Star CW CEE Tier 2 (MEF=2.0) (base WH)	Low Income	4%	4%	166.24	3886.82	3747.34	550.24	11	0	0	0	1013.80	0.62	0.37	24.31
510	Tier 3 CW (MEF=2.20) (base WH)	Low Income	4%	4%	393.16	3858.97	3714.16	545.36	11	1	0	0	2309.30	0.27	0.16	55.38
511	Energy Star Dishwasher (EF=0.72) (base WH)	Low Income	2%	2%	143.22	3882.24	3799.34	887.31	11	0	0	0	923.94	0.55	0.25	35.61

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Residential Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Household	Base UEC	UEC	Peak Watts/ Household	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWH	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
550	Base Early Replacement Water Heating to Heat Pump Water Heater	Low Income	0%	0%	0.00	3857.53	3857.53	494.04	10	0	0	N/A	N/A	N/A	N/A	N/A
551	Early Replacement Water Heating to Heat Pump Water Heater	Low Income	64%	64%	1374.36	3857.53	1404.91	179.93	10	0	0	0	600.37	1.12	0.71	11.66
600	Base Clotheswasher (MEF=1.26)	Low Income	0%	0%	0.00	108.14	108.14	15.88	11	0	0	N/A	N/A	N/A	N/A	N/A
601	Energy Star CW CEE Tier 2 (MEF=2.0) (base CW)	Low Income	29%	29%	134.31	115.28	81.29	11.94	11	0	0	0	3360.36	0.19	0.11	80.58
602	Tier 3 CW (MEF=2.20) (base CW)	Low Income	32%	32%	182.24	108.49	74.03	10.87	11	0	0	1	4498.32	0.14	0.08	107.87

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Residential Electric New Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Household	Base UEC	UEC	Peak Watts/ Household	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWH	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
100	Base City of Austin Code Home	Single Family	0%	0%	0.00	10,990	10,990	4,393	30	0.00	0.00	N/A	N/A	N/A	N/A	N/A
101	011 Austin Green Building Hom	Single Family	3%	3%	376.00	10,990	10,610	4,241	30	3.20	1.28	0.06	143.22	2.31	0.71	19.33
100	Base City of Austin Code Home	Multifamily	0%	0%	0.00	5,747	5,747	2,298	30	0.00	0.00	N/A	N/A	N/A	N/A	N/A
101	011 Austin Green Building Hom	Multifamily	3%	3%	198.58	5,747	5,549	2,218	30	1.13	0.45	0.06	144.63	2.29	0.70	19.52
100	Base City of Austin Code Home	Low Income	0%	0%	0.00	9,202	9,202	3,678	30	0.00	0.00	N/A	N/A	N/A	N/A	N/A
101	011 Austin Green Building Hom	Low Income	3%	3%	216.75	9,202	8,884	3,551	30	0.16	0.06	0.04	98.60	3.36	1.03	13.31

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Sq Ft	Base EUI	EUI	Peak Watts/ Sq Ft	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/KWH	Levelized Cost of Avoided Peak Capacity \$/KW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)	Revenue Test
100	Base Fluorescent Fixture, 4L4'T8	Office	0%	0%	0.00	8.15	8.15	1.24	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	ROB 4L4' Premium T8	Office	17%	17%	0.18	8.20	6.80	1.04	5	70	11	0	213.50	2.87	2.34	1.96	1.48
102	Delamping 3L4' F32T8	Office	25%	25%	0.71	8.15	6.11	0.93	18	42	6	0	182.00	3.36	2.35	5.54	1.48
103	LED Troffer (Base 4L4'T8)	Office	40%	40%	4.51	8.15	4.89	0.75	11	119	18	0	1177.33	0.52	0.40	22.94	1.48
104	Lighting Control Tuneup	Office	5%	2%	0.03	8.15	7.73	1.23	6	15	1	0	342.00	3.98	4.96	1.09	0.96
105	Occupancy Sensor, 4L4' Fluorescent Fixtures	Office	31%	9%	0.14	8.15	5.63	1.13	18	37	2	0	96.26	14.15	15.26	0.85	0.96
106	Continuous Dimming, 4L4' Fluorescent Fixtures	Office	54%	16%	0.75	8.15	3.79	1.05	10	63	3	0	529.98	2.57	3.03	2.74	0.96
107	High Performance Lighting R/R - 25% Savings, Base 4L4'T8	Office	25%	13%	0.40	8.15	6.09	1.09	20	32	2	0	189.17	4.90	4.43	3.09	1.11
110	Base Fluorescent Fixture, 2L4'T8, 1 EB	Office	0%	0%	0.00	4.74	4.74	0.72	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
111	ROB 2L4' Premium T8	Office	17%	17%	0.09	4.74	3.93	0.60	5	27	4	0	190.47	3.21	2.63	1.75	1.48
112	Delamping 1L4' F32T8	Office	48%	48%	0.73	4.74	2.47	0.38	18	30	5	0	168.28	3.64	2.54	5.13	1.48
113	LED Troffer (Base 2L4'T8)	Office	40%	40%	2.95	4.74	2.84	0.43	11	44	7	0	1323.19	0.46	0.35	25.78	1.48
114	Lighting Control Tuneup	Office	5%	2%	0.01	4.74	4.49	0.71	6	6	0	0	294.04	4.63	5.77	0.94	0.96
115	Occupancy Sensor, 2L4' Fluorescent Fixtures	Office	31%	9%	0.14	4.74	3.28	0.66	18	14	1	0	165.52	8.23	8.87	1.47	0.96
116	Continuous Dimming, 2L4' Fluorescent Fixtures	Office	54%	16%	0.75	4.74	2.20	0.61	10	24	1	0	911.32	1.50	1.76	4.71	0.96
117	High Performance Lighting R/R - 25% Savings, Base 2L4'T8	Office	25%	13%	0.40	4.74	3.54	0.63	20	12	1	0	325.28	2.85	2.58	5.32	1.11
120	Base Other Fluorescent Fixture	Office	0%	0%	0.00	3.82	3.82	0.58	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
121	ROB Premium T8 (base other fluorescent)	Office	17%	17%	0.15	3.82	3.17	0.48	5	4	1	0	380.94	1.61	1.31	3.50	1.48
122	Lighting Control Tuneup	Office	5%	2%	0.03	3.82	3.62	0.58	6	1	0	0	729.12	1.87	2.33	2.33	0.96
123	Occupancy Sensor, 4L8' Fluorescent Fixtures	Office	31%	9%	0.14	3.82	2.64	0.53	18	2	0	0	205.22	6.64	7.16	1.82	0.96
124	Continuous Dimming, 4L8' Fluorescent Fixtures	Office	54%	16%	0.75	3.82	1.78	0.49	10	4	0	0	1129.89	1.21	1.42	5.84	0.96
125	High Performance Lighting R/R - 25% Savings, Base Other Fluorescent	Office	25%	13%	0.40	3.82	2.86	0.51	20	2	0	0	403.30	2.30	2.08	6.60	1.11
130	Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacement	Office	0%	0%	0.00	18.28	18.28	2.79	1	0	0	N/A	N/A	N/A	N/A	N/A	N/A
131	CFL Screw-in 18W	Office	66%	66%	0.07	18.28	6.21	0.95	2	34	5	0	22.75	26.91	22.92	0.09	1.48
132	Cold Cathode Lamps	Office	66%	66%	0.15	18.28	6.21	0.95	5	2	0	0	20.77	29.47	24.09	0.19	1.48
133	LED screw-in PAR replacement (base incandescent)	Office	90%	90%	3.78	18.28	1.92	0.29	11	49	8	0	196.60	3.11	2.37	3.83	1.48
140	Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacement	Office	0%	0%	0.00	18.28	18.28	2.79	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
141	CFL Hardwired, Modular 18W	Office	66%	66%	3.45	18.28	6.21	0.95	18	40	6	0	149.30	4.10	2.87	4.55	1.48
142	Ceramic Metal Halide	Office	37%	37%	8.27	18.35	11.54	1.76	18	11	2	0	633.95	0.97	0.68	19.31	1.48
143	LED fixture replacement (base incandescent flood)	Office	90%	90%	7.80	18.28	1.92	0.29	11	55	8	0	405.64	1.51	1.15	7.90	1.48
150	Base CFL to screw-in replacement	Office	0%	0%	0.00	1.50	1.50	0.23	2	0	0	N/A	N/A	N/A	N/A	N/A	N/A
151	LED screw-in replacement (base CFL)	Office	68%	68%	1.06	1.50	0.49	0.07	11	8	1	0	885.79	0.69	0.53	17.26	1.48
160	Base High Bay Metal Halide, 400W	Office	0%	0%	0.87	0.00	0.00	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
180	Base Parking Garage Metal Halide, 250 W	Office	0%	0%	0.00	0.00	0.00	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
185	Base Fluorescent Parking Garage Lighting	Office	0%	0%	0.00	0.17	0.17	0.03	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
186	Parking Garage Low Wattage T8 Lamps replacing 32W lamps	Office	15%	15%	0.00	0.17	0.15	0.02	3	0	0	0	102.53	5.97	5.02	0.57	1.48
187	Bi-Level LED Parking Garage Fixtures (Base Fluorescent)	Office	2%	1%	0.13	0.17	0.17	0.03	5	0	0	9	118749.64	0.01	0.01	547.40	1.11
190	Base Exit Sign	Office	0%	0%	0.00	0.02	0.02	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
191	LED Exit Sign	Office	81%	81%	0.02	0.03	0.01	0.00	18	1	0	0	562.87	1.27	1.01	12.92	1.30
200	Base Outdoor High Pressure Sodium 250W Lamp	Office	0%	0%	0.12	1.12	1.12	0.07	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
201	Outdoor Lighting Controls (Photocell/Timeclock)	Office	22%	6%	0.03	1.23	0.95	0.08	18	6	0	0	501.97	6.34	7.95	1.64	0.82
202	LED Outdoor Area Lighting	Office	52%	52%	0.35	1.12	0.54	0.04	9	25	2	0	1344.35	0.75	0.82	9.42	1.06
203	Bi-Level LED Outdoor Lighting	Office	68%	70%	1.30	1.12	0.36	0.02	9	17	1	0	3730.32	0.27	0.29	26.64	1.07
300	Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	Office	0%	0%	1.80	2.80	2.80	1.30	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
301	Centrifugal Chiller, 0.51 kW/ton, 500 tons	Office	12%	12%	0.23	2.92	2.56	1.19	20	10	5	0	101.77	3.98	1.35	10.18	2.96
309	Ceiling/roof Insulation - Chiller	Office	12%	12%	0.27	3.13	2.75	1.27	20	1	0	0	115.53	3.51	1.19	11.56	2.96
320	Base DX Packaged System, EER=10.3, 10 tons	Office	0%	0%	4.76	4.86	4.86	2.25	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
321	DX Tune Up/ Advanced Diagnostics	Office	5%	4%	0.13	5.08	4.83	2.27	10	1	0	0	208.72	2.15	1.05	7.89	2.30
322	aged System, EER=10.3, 10 tons, with Automated Fault Detection and Die	Office	10%	10%	0.12	4.86	4.37	2.02	20	15	7	0	39.31	10.31	3.49	3.93	2.96
323	DX Packaged System, EER=10.9, 10 tons	Office	6%	6%	0.45	4.86	4.59	2.12	20	10	5	0	267.81	1.51	0.51	26.79	2.96
324	DX Packaged System, EER=13.4, 10 tons	Office	23%	23%	0.66	4.86	3.74	1.73	20	43	20	0	94.27	4.30	1.45	9.43	2.96
325	Window Film (Standard) - DX	Office	4%	4%	0.25	4.97	4.76	2.20	10	3	2	0	355.43	1.14	0.44	19.07	2.96
326	Prog. Thermostat - DX	Office	5%	3%	0.06	5.06	4.80	2.27	8	3	1	0	147.50	3.23	1.84	3.80	2.05
330	Optimize Controls - DX	Office	5%	3%	0.04	5.03	4.78	2.26	5	3	1	0	151.84	3.14	1.85	2.49	2.05
331	Economizer - DX	Office	21%	13%	0.51	5.37	4.22	2.17	15	28	8	0	152.17	3.13	1.65	7.08	2.05
332	Aerosol Duct Sealing - DX	Office	7%	7%	0.05	4.86	4.52	2.09	15	5	2	0	31.81	12.75	4.65	2.51	2.96
334	Duct/Pipe Insulation - DX	Office	2%	2%	0.65	4.96	4.66	2.25	10	0	0	1	1944.11	0.21	0.08	104.28	2.96
335	DX Coil Cleaning	Office	5%	5%	0.04	4.91	4.67	2.16	5	6	3	0	95.05	4.27	1.74	2.64	2.96
337	Geothermal Heat Pump, EER=13, 10 tons - DX	Office	37%	37%	1.90	4.88	3.07	1.42	15	4	2	0	212.18	1.91	0.70	16.74	2.96
340	Base PTAC, EER=8.3, 1 ton	Office	0%	0%	0.00	0.00	0.00	0.00	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
400	Base Fan Motor, 5hp, 1800rpm, 87.5%	Office	0%	0%	0.02	3.03	3.03	0.65	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Sq Ft	Base EUI	EUI	Peak Watts/ Sq Ft	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/KWH	Levelized Cost of Avoided Peak Capacity \$/KW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)	Revenue Test
401	Fan Motor, 5hp, 1800rpm, 89.5%	Office	2%	2%	0.01	3.04	2.97	0.64	20	2	0	0	34.79	14.99	8.42	1.63	1.78
402	Variable Speed Drive Control, 5 HP	Office	30%	18%	0.13	3.33	2.33	0.59	15	25	3	0	96.24	6.93	5.48	2.13	1.37
410	Base Fan Motor, 15hp, 1800rpm, 91.0%	Office	0%	0%	0.01	2.80	2.80	0.61	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
414	Energy Recovery Ventilation (ERV)	Office	7%	7%	0.31	2.89	2.68	0.58	20	3	1	0	530.07	0.98	0.55	24.81	1.78
420	Base Fan Motor, 40hp, 1800rpm, 93.0%	Office	0%	0%	0.04	2.75	2.75	0.59	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
423	Air Handler Tuneups	Office	10%	10%	0.05	2.77	2.49	0.54	8	1	0	0	140.50	3.71	2.43	2.88	1.78
500	Base Built-Up Refrigeration System	Office	0%	0%	0.00	0.51	0.51	0.06	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
501	High-efficiency fan motors	Office	12%	12%	0.01	0.54	0.47	0.06	20	0	0	0	132.23	5.14	3.82	3.59	1.35
505	Compressor VSD retrofit	Office	6%	3%	0.01	0.51	0.48	0.06	13	0	0	0	269.29	3.94	4.17	2.51	1.04
507	Refrigeration Commissioning	Office	5%	5%	0.00	0.53	0.50	0.06	3	0	0	0	287.79	2.36	2.18	1.32	1.35
508	Demand Hot Gas Defrost	Office	3%	3%	0.00	0.51	0.50	0.06	10	0	0	0	34.38	19.77	16.60	0.50	1.35
511	Freezer-Cooler Replacement Gaskets (built-up systems)	Office	7%	7%	0.01	0.53	0.50	0.06	4	0	0	0	462.79	1.47	1.34	2.81	1.35
513	Bi-level LED Case Lighting (built-up systems)	Office	1%	1%	0.12	0.51	0.51	0.06	10	0	0	4	41722.26	0.02	0.02	463.70	1.20
514	Fiber Optic Case Lighting (built-up systems)	Office	25%	25%	0.14	0.51	0.39	0.05	10	0	0	0	1228.62	0.55	0.46	17.88	1.35
517	Oversized Air Cooled Condenser	Office	8%	8%	0.01	0.54	0.49	0.06	16	0	0	0	125.74	5.41	4.28	2.85	1.35
520	Base Self-Contained Refrigeration	Office	0%	0%	0.00	0.51	0.51	0.06	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
523	Freezer-Cooler Replacement Gaskets (self-contained)	Office	4%	4%	0.00	0.52	0.51	0.06	4	0	0	0	18.22	37.31	33.93	0.11	1.35
524	Bi-level LED Case Lighting (self-contained units)	Office	1%	1%	0.00	0.51	0.51	0.06	10	0	0	0	834.83	0.95	0.90	9.28	1.20
526	Energy-Star Refrigerator, solid door	Office	3%	3%	0.00	0.52	0.50	0.06	10	0	0	0	30.42	22.35	18.77	0.44	1.35
527	Energy-Star Freezer, solid door	Office	1%	1%	0.00	0.52	0.51	0.06	10	0	0	0	91.05	7.46	6.27	1.32	1.35
528	Energy-Star Refrigerator, glass door	Office	7%	7%	0.00	0.53	0.49	0.06	10	0	0	0	0.49	1,397.49	1,173.55	0.01	1.35
529	Energy-Star Freezer, glass door	Office	2%	2%	0.00	0.52	0.51	0.06	10	0	0	0	4.47	152.07	127.70	0.07	1.35
530	Energy Star Ice Machines	Office	2%	2%	0.00	0.52	0.51	0.06	10	0	0	0	7.19	94.52	79.37	0.10	1.35
600	Base Desktop PC	Office	0%	0%	0.00	1.24	1.24	0.14	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
601	PC Manual Power Management Enabling	Office	69%	45%	0.03	1.51	0.46	0.09	4	61	4	0	139.69	6.80	7.60	0.49	1.09
602	PC Network Power Management Enabling	Office	69%	45%	0.03	1.51	0.46	0.09	4	61	4	0	139.69	6.80	7.60	0.49	1.09
603	Energy Star or Better PC	Office	33%	25%	0.02	1.31	0.88	0.11	4	28	2	0	175.10	4.89	5.19	0.72	1.15
610	Base Monitor, CRT	Office	0%	0%	0.00	0.01	0.01	0.00	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
611	Energy Star or Better Monitor-CRT	Office	56%	42%	0.00	0.01	0.00	0.00	4	0	0	0	149.51	5.73	6.07	0.62	1.15
612	Monitor Power Management Enabling--CRT	Office	54%	35%	0.00	0.02	0.01	0.00	4	0	0	0	188.79	5.03	5.62	0.67	1.09
620	Base Monitor, LCD	Office	0%	0%	0.00	0.48	0.48	0.05	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
621	Energy Star or Better Monitor--LCD	Office	56%	42%	0.03	0.69	0.31	0.05	4	18	2	0	269.26	3.18	3.37	1.11	1.15
622	Monitor Power Management Enabling--LCD	Office	57%	37%	0.04	0.77	0.33	0.05	4	12	1	0	457.41	2.08	2.32	1.62	1.09
630	Base Copier	Office	0%	0%	0.00	0.04	0.04	0.00	6	0	0	N/A	N/A	N/A	N/A	N/A	N/A
631	Energy Star or Better Copier	Office	20%	15%	0.00	0.05	0.04	0.00	6	0	0	0	184.89	4.63	4.79	1.13	1.15
632	Copier Power Management Enabling	Office	20%	13%	0.00	0.05	0.04	0.01	6	0	0	0	1062.04	0.89	0.98	5.57	1.09
640	Base Laser Printer	Office	0%	0%	0.00	0.18	0.18	0.02	5	0	0	N/A	N/A	N/A	N/A	N/A	N/A
641	Printer Power Management Enabling	Office	50%	32%	0.02	0.29	0.15	0.02	5	2	0	0	461.83	2.06	2.27	2.03	1.09
650	Base Data Center/Server Room	Office	0%	0%	0.00	253.76	253.76	28.60	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
651	Data Center Improved Operations	Office	20%	13%	0.50	264.55	210.62	25.88	10	9	1	0	17.43	54.48	56.24	0.15	1.09
652	Data Center Best Practices	Office	45%	34%	2.50	265.80	145.41	19.85	10	11	1	0	33.92	25.50	25.11	0.33	1.15
653	Data Center State of the Art practices	Office	56%	56%	5.00	253.76	111.66	12.59	10	5	1	0	42.83	16.85	14.82	0.56	1.28
660	Base Water Heating	Office	0%	0%	0.00	0.33	0.33	0.04	15	0	0	N/A	N/A	N/A	N/A	N/A	N/A
661	Demand controlled circulating systems	Office	5%	2%	0.02	0.33	0.31	0.04	15	1	0	0	2848.59	0.47	0.52	22.32	0.96
662	High Efficiency Water Heater (electric)	Office	2%	2%	0.00	0.33	0.32	0.04	15	0	0	0	235.95	3.04	2.54	4.60	1.29
663	Hot Water Pipe Insulation	Office	2%	2%	0.01	0.33	0.33	0.04	15	0	0	0	712.70	1.01	0.84	13.88	1.29
664	Tankless Water Heater	Office	10%	10%	0.02	0.33	0.30	0.03	20	1	0	0	320.15	2.24	1.73	7.91	1.29
665	Heat Pump Water Heater (air source)	Office	20%	20%	0.04	0.33	0.26	0.03	15	3	0	0	544.30	1.32	1.10	10.60	1.29
666	Heat Recovery Unit	Office	65%	65%	0.08	0.33	0.12	0.01	10	1	0	0	446.79	1.60	1.40	5.92	1.29
667	Heat Trap	Office	9%	9%	0.00	0.34	0.31	0.04	10	1	0	0	135.99	5.27	4.61	1.80	1.29
668	Solar Water Heater	Office	70%	70%	0.14	0.33	0.10	0.01	20	9	1	0	383.50	1.87	1.45	9.47	1.29
670	Base Vending Machines	Office	0%	0%	0.00	0.06	0.06	0.01	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
671	Vending Misers	Office	10%	7%	0.00	0.06	0.06	0.01	5	0	0	0	1992.60	0.47	0.51	8.94	1.10
700	Base Cooking	Office	0%	0%	0.00	0.13	0.13	0.01	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
800	Base Heating	Office	0%	0%	0.00	0.63	0.63	0.04	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
900	Base Miscellaneous	Office	0%	0%	0.00	0.82	0.82	0.09	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
100	Base Fluorescent Fixture, 4L4'T8	Restaurant	0%	0%	0.00	6.66	6.66	1.28	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	ROB 4L4' Premium T8	Restaurant	17%	17%	0.29	6.66	5.52	1.06	10	1	0	0	176.92	3.10	2.10	3.95	1.67
102	Delamping 3L4' F32T8	Restaurant	25%	25%	1.11	6.66	5.00	0.96	18	0	0	0	276.19	1.99	1.23	10.59	1.67
103	LED Troffer (Base 4L4'T8)	Restaurant	40%	40%	7.04	6.66	4.00	0.77	20	1	0	0	1001.62	0.55	0.33	41.70	1.67
104	Lighting Control Tuneup	Restaurant	5%	2%	0.03	6.69	6.35	1.27	6	0	0	0	330.88	3.44	4.04	1.34	1.02

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Sq Ft	Base EUI	Peak Watts/ Sq Ft	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/KWH	Levelized Cost of Avoided Peak Capacity \$/KW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)	Revenue Test
105	Occupancy Sensor, 4L4' Fluorescent Fixtures	Restaurant	31%	9%	0.14	6.66	4.62	1.17	18	0	0	93.48	12.18	12.38	1.05	1.02
106	Continuous Dimming, 4L4' Fluorescent Fixtures	Restaurant	53%	16%	0.75	6.66	3.12	1.08	10	1	0	514.69	2.21	2.46	3.38	1.02
107	High Performance Lighting R/R - 25% Savings, Base 4L4'T8	Restaurant	25%	13%	0.40	6.66	5.02	1.12	20	0	0	183.71	4.29	3.54	3.87	1.21
110	Base Fluorescent Fixture, 2L4'T8, 1 EB	Restaurant	0%	0%	0.00	3.19	3.19	0.61	18	0	N/A	N/A	N/A	N/A	N/A	N/A
111	ROB 2L4' Premium T8	Restaurant	17%	17%	0.12	3.19	2.64	0.51	10	2	0	156.77	3.50	2.37	3.50	1.67
112	Delamping 1L4' F32T8	Restaurant	48%	48%	0.94	3.19	1.66	0.32	18	3	1	255.36	2.15	1.33	9.79	1.67
113	LED Troffer (Base 2L4'T8)	Restaurant	40%	40%	3.79	3.19	1.91	0.37	20	4	0	1125.72	0.49	0.29	46.87	1.67
114	Lighting Control Tuneup	Restaurant	5%	2%	0.01	3.19	3.03	0.60	6	1	0	346.87	3.28	3.86	1.41	1.02
115	Occupancy Sensor, 2L4' Fluorescent Fixtures	Restaurant	31%	9%	0.14	3.19	2.21	0.56	18	0	0	195.26	5.83	5.93	2.20	1.02
116	Continuous Dimming, 2L4' Fluorescent Fixtures	Restaurant	53%	16%	0.75	3.19	1.50	0.52	10	3	0	1075.08	1.06	1.18	7.05	1.02
117	High Performance Lighting R/R - 25% Savings, Base 2L4'T8	Restaurant	25%	13%	0.40	3.19	2.40	0.54	20	1	0	383.73	2.05	1.69	8.09	1.21
120	Base Other Fluorescent Fixture	Restaurant	0%	0%	0.00	0.00	0.00	0.00	18	0	N/A	N/A	N/A	N/A	N/A	N/A
130	Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacement	Restaurant	0%	0%	0.00	2.26	2.26	0.43	1	0	N/A	N/A	N/A	N/A	N/A	N/A
131	CFL Screw-in 18W	Restaurant	66%	66%	0.02	2.26	0.77	0.15	4	1	0	18.33	29.93	21.97	0.17	1.67
132	Cold Cathode Lamps	Restaurant	66%	66%	0.04	2.26	0.77	0.15	10	0	0	17.10	32.09	21.76	0.38	1.67
133	LED screw-in PAR replacement (base incandescent)	Restaurant	89%	90%	0.89	2.26	0.24	0.05	20	2	0	167.26	3.28	1.97	6.96	1.67
140	Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacement	Restaurant	0%	0%	0.00	2.26	2.26	0.43	18	0	N/A	N/A	N/A	N/A	N/A	N/A
141	CFL Hardwired, Modular 18W	Restaurant	66%	66%	0.81	2.26	0.77	0.15	18	3	1	226.56	2.42	1.50	8.69	1.67
142	Ceramic Metal Halide	Restaurant	37%	37%	1.95	2.27	1.43	0.27	18	1	0	962.03	0.57	0.35	36.90	1.67
143	LED fixture replacement (base incandescent flood)	Restaurant	89%	90%	1.84	2.26	0.24	0.05	20	4	1	345.10	1.59	0.95	14.37	1.67
150	Base CFL to screw-in replacement	Restaurant	0%	0%	0.00	0.83	0.83	0.16	4	0	N/A	N/A	N/A	N/A	N/A	N/A
151	LED screw-in replacement (base CFL)	Restaurant	67%	68%	1.11	0.83	0.27	0.05	20	1	0	753.60	0.73	0.44	31.38	1.67
160	Base High Bay Metal Halide, 400W	Restaurant	0%	0%	0.02	0.07	0.07	0.01	18	0	N/A	N/A	N/A	N/A	N/A	N/A
161	High Bay T5	Restaurant	49%	49%	0.01	0.07	0.04	0.01	18	0	0	97.93	5.60	3.47	3.76	1.67
162	Induction High Bay Lighting	Restaurant	37%	37%	0.03	0.07	0.05	0.01	32	0	0	277.43	1.50	0.90	15.19	1.67
163	PSMH + electronic ballast	Restaurant	37%	37%	0.02	0.07	0.05	0.01	18	0	0	304.72	1.80	1.12	11.69	1.67
165	Occupancy Sensor, High Bay T5	Restaurant	20%	6%	0.14	0.08	0.06	0.01	18	0	1	12185.53	0.09	0.09	137.29	1.02
180	Base Parking Garage Metal Halide, 250 W	Restaurant	0%	0%	0.00	0.00	0.00	0.00	18	0	N/A	N/A	N/A	N/A	N/A	N/A
185	Base Fluorescent Parking Garage Lighting	Restaurant	0%	0%	0.00	0.00	0.00	0.00	18	0	N/A	N/A	N/A	N/A	N/A	N/A
190	Base Exit Sign	Restaurant	0%	0%	0.00	0.06	0.06	0.01	18	0	N/A	N/A	N/A	N/A	N/A	N/A
191	LED Exit Sign	Restaurant	81%	81%	0.02	0.09	0.02	0.00	18	0	0	143.02	3.85	2.40	5.43	1.66
200	Base Outdoor High Pressure Sodium 250W Lamp	Restaurant	0%	0%	0.42	3.87	3.87	0.49	18	0	N/A	N/A	N/A	N/A	N/A	N/A
201	Outdoor Lighting Controls (Photocell/Timeclock)	Restaurant	22%	6%	0.07	4.24	3.32	0.51	18	6	0	190.32	9.15	10.47	1.25	0.90
202	LED Outdoor Area Lighting	Restaurant	52%	52%	0.88	3.87	1.86	0.24	9	23	3	507.81	1.32	1.12	6.86	1.36
203	Bi-Level LED Outdoor Lighting	Restaurant	69%	70%	3.27	3.87	1.20	0.15	9	15	2	1409.08	0.47	0.40	19.21	1.36
300	Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	Restaurant	0%	0%	1.80	5.63	5.63	3.01	20	0	N/A	N/A	N/A	N/A	N/A	N/A
309	Ceiling/roof Insulation - Chiller	Restaurant	12%	12%	0.55	5.94	5.22	2.79	20	0	0	105.16	3.73	1.13	12.16	3.30
320	Base DX Packaged System, EER=10.3, 10 tons	Restaurant	0%	0%	4.76	9.76	9.76	5.21	20	0	N/A	N/A	N/A	N/A	N/A	N/A
321	DX Tune Up/ Advanced Diagnostics	Restaurant	5%	4%	0.13	10.19	9.70	5.25	10	0	0	90.06	4.72	2.05	4.04	2.60
322	aged System, EER=10.3, 10 tons, with Automated Fault Detection and Dis	Restaurant	10%	10%	0.12	9.76	8.79	4.69	20	6	3	16.93	23.14	7.00	1.96	3.30
323	DX Packaged System, EER=10.9, 10 tons	Restaurant	6%	6%	0.45	9.76	9.23	4.93	20	5	2	115.35	3.40	1.03	13.33	3.30
324	DX Packaged System, EER=13.4, 10 tons	Restaurant	23%	23%	0.66	9.76	7.52	4.02	20	20	10	40.60	9.65	2.92	4.69	3.30
325	Window Film (Standard) - DX	Restaurant	5%	5%	0.08	9.80	9.34	4.99	10	3	1	45.36	8.64	2.95	2.81	3.30
326	Prog. Thermostat - DX	Restaurant	5%	3%	0.06	10.10	9.61	5.23	8	1	0	63.95	6.97	3.48	2.01	2.33
330	Optimize Controls - DX	Restaurant	5%	3%	0.04	10.09	9.60	5.23	5	1	0	65.52	6.80	3.52	1.31	2.33
331	Economizer - DX	Restaurant	8%	5%	0.51	10.32	9.52	5.25	15	2	1	180.01	2.48	1.14	10.19	2.33
332	Aerosol Duct Sealing - DX	Restaurant	7%	7%	0.05	9.82	9.13	4.88	15	2	1	13.62	28.76	9.40	1.24	3.30
333	Ceiling/roof Insulation - DX	Restaurant	12%	12%	0.24	11.10	9.76	5.21	20	0	0	24.51	15.99	4.84	2.83	3.30
334	Duct/Pipe Insulation - DX	Restaurant	2%	2%	0.65	9.80	9.61	5.13	10	1	1	851.03	0.46	0.16	52.75	3.30
335	DX Coil Cleaning	Restaurant	5%	5%	0.04	10.02	9.53	5.09	5	1	1	40.30	9.72	3.55	1.29	3.30
337	Geothermal Heat Pump, EER=13, 10 tons - DX	Restaurant	37%	37%	2.75	9.80	6.17	3.30	15	2	1	132.70	2.95	0.96	12.10	3.30
340	Base PTAC, EER=8.3, 1 ton	Restaurant	0%	0%	0.00	0.00	0.00	0.00	20	0	N/A	N/A	N/A	N/A	N/A	N/A
400	Base Fan Motor, 5hp, 1800rpm, 87.5%	Restaurant	0%	0%	0.09	4.89	4.89	1.13	20	0	N/A	N/A	N/A	N/A	N/A	N/A
401	Fan Motor, 5hp, 1800rpm, 89.5%	Restaurant	2%	2%	0.04	4.91	4.80	1.11	20	0	0	105.86	4.80	2.59	5.28	1.85
402	Variable Speed Drive Control, 5 HP	Restaurant	30%	18%	0.70	4.89	3.42	0.92	15	8	1	322.38	2.00	1.53	7.60	1.41
410	Base Fan Motor, 15hp, 1800rpm, 91.0%	Restaurant	0%	0%	0.04	4.53	4.53	1.04	20	0	N/A	N/A	N/A	N/A	N/A	N/A
420	Base Fan Motor, 40hp, 1800rpm, 93.0%	Restaurant	0%	0%	0.00	4.44	4.44	1.02	20	0	N/A	N/A	N/A	N/A	N/A	N/A
500	Base Built-Up Refrigeration System	Restaurant	0%	0%	0.00	5.31	5.31	0.72	10	0	N/A	N/A	N/A	N/A	N/A	N/A
501	High-efficiency fan motors	Restaurant	12%	12%	0.58	5.31	4.67	0.63	20	2	0	497.41	1.31	0.94	14.54	1.39
505	Compressor VSD retrofit	Restaurant	6%	3%	0.20	5.31	4.98	0.69	13	1	0	969.32	1.03	1.06	9.87	1.07
507	Refrigeration Commissioning	Restaurant	5%	5%	0.09	5.44	5.17	0.70	3	0	0	1035.93	0.63	0.56	5.13	1.39

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Sq Ft	Base EUI	EUI	Peak Watts/ Sq Ft	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/KWH	Levelized Cost of Avoided Peak Capacity \$/KW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)	Revenue Test
508	Demand Hot Gas Defrost	Restaurant	3%	3%	0.02	5.31	5.17	0.70	10	1	0	0	123.77	5.27	4.28	1.94	1.39
511	Freezer-Cooler Replacement Gaskets (built-up systems)	Restaurant	7%	7%	0.01	5.49	5.13	0.69	4	1	0	0	91.95	7.10	6.24	0.60	1.39
513	Bi-level LED Case Lighting (built-up systems)	Restaurant	1%	1%	0.27	5.31	5.27	0.71	10	0	0	1	8289.52	0.09	0.08	100.13	1.24
514	Fiber Optic Case Lighting (built-up systems)	Restaurant	25%	25%	0.31	5.31	4.01	0.54	10	4	1	0	244.11	2.67	2.17	3.83	1.39
517	Oversized Air Cooled Condenser	Restaurant	8%	8%	0.31	5.53	5.08	0.69	16	1	0	0	452.60	1.44	1.10	11.04	1.39
520	Base Self-Contained Refrigeration	Restaurant	0%	0%	0.00	5.31	5.31	0.72	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
521	Strip curtains for walk-ins	Restaurant	1%	1%	0.15	5.31	5.27	0.71	4	0	0	1	10308.85	0.06	0.06	67.47	1.39
522	Night covers for display cases (self-contained)	Restaurant	1%	0%	0.00	5.31	5.25	0.72	5	0	0	0	N/A	4.64	7.52	0.61	0.74
523	Freezer-Cooler Replacement Gaskets (self-contained)	Restaurant	3%	3%	0.00	5.38	5.23	0.71	4	0	0	0	42.27	15.44	13.57	0.28	1.39
524	Bi-level LED Case Lighting (self-contained units)	Restaurant	1%	1%	0.04	5.31	5.27	0.71	10	0	0	0	1338.65	0.57	0.51	16.17	1.24
526	Energy-Star Refrigerator, solid door	Restaurant	3%	3%	0.02	5.37	5.19	0.70	10	1	0	0	84.66	7.71	6.26	1.33	1.39
527	Energy-Star Freezer, solid door	Restaurant	1%	1%	0.02	5.33	5.26	0.71	10	0	0	0	253.24	2.58	2.09	3.97	1.39
528	Energy-Star Refrigerator, glass door	Restaurant	2%	2%	0.00	5.34	5.25	0.71	10	0	0	0	1.38	472.46	383.50	0.02	1.39
529	Energy-Star Freezer, glass door	Restaurant	3%	3%	0.00	5.37	5.19	0.70	10	1	0	0	12.39	52.66	42.75	0.19	1.39
530	Energy Star Ice Machines	Restaurant	2%	2%	0.00	5.35	5.22	0.71	10	0	0	0	20.02	32.60	26.46	0.31	1.39
600	Base Desktop PC	Restaurant	0%	0%	0.00	0.28	0.28	0.05	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
601	PC Manual Power Management Enabling	Restaurant	62%	45%	0.01	0.33	0.13	0.03	4	1	0	0	85.74	7.60	6.67	0.56	1.39
602	PC Network Power Management Enabling	Restaurant	62%	45%	0.01	0.33	0.13	0.03	4	1	0	0	85.74	7.60	6.67	0.56	1.39
603	Energy Star or Better PC	Restaurant	30%	25%	0.00	0.28	0.20	0.04	4	1	0	0	110.11	5.54	4.57	0.82	1.48
610	Base Monitor, CRT	Restaurant	0%	0%	0.00	0.02	0.02	0.00	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
611	Energy Star or Better Monitor-CRT	Restaurant	51%	42%	0.00	0.02	0.01	0.00	4	0	0	0	180.75	3.37	2.78	1.35	1.48
612	Monitor Power Management Enabling--CRT	Restaurant	49%	35%	0.00	0.03	0.02	0.00	4	0	0	0	262.43	2.48	2.18	1.72	1.39
620	Base Monitor, LCD	Restaurant	0%	0%	0.00	0.09	0.09	0.02	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
621	Energy Star or Better Monitor--LCD	Restaurant	51%	42%	0.01	0.09	0.05	0.01	4	0	0	0	227.58	2.68	2.21	1.70	1.48
622	Monitor Power Management Enabling--LCD	Restaurant	51%	37%	0.01	0.12	0.06	0.01	4	0	0	0	337.09	1.93	1.70	2.21	1.39
630	Base Copier	Restaurant	0%	0%	0.00	0.05	0.05	0.01	6	0	0	N/A	N/A	N/A	N/A	N/A	N/A
631	Energy Star or Better Copier	Restaurant	19%	15%	0.00	0.05	0.04	0.01	6	0	0	0	121.77	5.01	4.03	1.35	1.48
632	Copier Power Management Enabling	Restaurant	18%	13%	0.00	0.05	0.04	0.01	6	0	0	0	723.67	0.90	0.77	7.04	1.39
640	Base Laser Printer	Restaurant	0%	0%	0.00	0.02	0.02	0.00	5	0	0	N/A	N/A	N/A	N/A	N/A	N/A
641	Printer Power Management Enabling	Restaurant	45%	32%	0.00	0.02	0.01	0.00	5	0	0	0	461.84	1.41	1.22	3.76	1.39
650	Base Data Center/Server Room	Restaurant	0%	0%	0.00	285.82	285.82	53.62	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
651	Data Center Improved Operations	Restaurant	18%	13%	0.50	296.67	242.43	48.31	10	0	0	0	9.34	69.79	56.57	0.15	1.39
652	Data Center Best Practices	Restaurant	42%	34%	2.50	298.33	173.27	37.08	10	0	0	0	18.16	33.90	26.09	0.32	1.47
653	Data Center State of the Art practices	Restaurant	56%	56%	5.00	285.82	125.76	23.59	10	0	0	0	22.85	24.29	16.69	0.50	1.64
660	Base Water Heating	Restaurant	0%	0%	0.00	2.39	2.39	0.38	15	0	0	N/A	N/A	N/A	N/A	N/A	N/A
661	Demand controlled circulating systems	Restaurant	4%	2%	0.05	2.39	2.30	0.37	15	0	0	0	569.52	1.48	1.37	8.49	1.16
662	High Efficiency Water Heater (electric)	Restaurant	2%	2%	0.00	2.39	2.34	0.37	15	0	0	0	43.77	13.74	9.86	1.18	1.50
664	Tankless Water Heater	Restaurant	10%	10%	0.03	2.39	2.15	0.34	20	1	0	0	59.38	10.12	6.73	2.04	1.50
665	Heat Pump Water Heater (air source)	Restaurant	20%	20%	0.08	2.39	1.91	0.30	15	1	0	0	100.96	5.95	4.27	2.73	1.50
666	Heat Recovery Unit	Restaurant	65%	65%	0.08	2.39	0.84	0.13	10	4	1	0	44.66	13.46	10.11	0.82	1.50
667	Heat Trap	Restaurant	9%	9%	0.01	2.44	2.22	0.35	10	0	0	0	25.22	23.83	17.91	0.46	1.50
668	Solar Water Heater	Restaurant	70%	70%	0.26	2.39	0.72	0.11	20	1	0	0	71.13	8.45	5.62	2.44	1.50
670	Base Vending Machines	Restaurant	0%	0%	0.00	0.15	0.15	0.03	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
700	Base Cooking	Restaurant	0%	0%	0.00	11.23	11.23	2.27	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
701	Convection Oven	Restaurant	0%	0%	0.06	11.23	11.20	2.27	10	0	0	0	1379.90	0.39	0.26	32.41	1.71
702	Efficient Fryer	Restaurant	5%	5%	0.04	11.23	10.71	2.17	10	4	1	0	48.69	11.02	7.26	1.14	1.71
703	Efficient Steamer	Restaurant	21%	21%	0.14	11.23	8.82	1.78	10	18	4	0	38.37	13.98	9.22	0.90	1.71
704	Energy Star Hot Food Holding Cabinets	Restaurant	0%	0%	0.10	11.23	11.18	2.26	10	0	0	0	1501.71	0.36	0.24	35.27	1.71
800	Base Heating	Restaurant	0%	0%	0.00	0.37	0.37	0.00	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
900	Base Miscellaneous	Restaurant	0%	0%	0.00	1.49	1.49	0.28	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
100	Base Fluorescent Fixture, 4L4'T8	Retail	0%	0%	0.00	3.68	3.68	0.59	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	ROB 4L4' Premium T8	Retail	17%	17%	0.15	3.68	3.05	0.49	10	14	2	0	211.99	2.82	2.10	3.95	1.51
102	Delamping 3L4' F32T8	Retail	25%	25%	0.58	3.68	2.76	0.44	18	8	1	0	313.40	1.91	1.30	10.03	1.51
103	LED Troffer (Base 4L4'T8)	Retail	40%	40%	3.69	3.68	2.21	0.35	19	22	4	0	1185.67	0.50	0.34	39.62	1.51
104	Lighting Control Tuneup	Retail	5%	2%	0.03	3.68	3.49	0.58	6	3	0	0	719.83	1.82	2.24	2.42	0.97
105	Occupancy Sensor, 4L4' Fluorescent Fixtures	Retail	31%	9%	0.14	3.68	2.55	0.54	18	2	0	0	202.60	6.47	6.89	1.89	0.97
106	Continuous Dimming, 4L4' Fluorescent Fixtures	Retail	53%	16%	0.75	3.68	1.71	0.50	10	4	0	0	1115.50	1.17	1.37	6.07	0.97
107	High Performance Lighting R/R - 25% Savings, Base 4L4'T8	Retail	25%	13%	0.40	3.68	2.77	0.52	20	6	0	0	398.16	2.23	1.98	6.94	1.13
110	Base Fluorescent Fixture, 2L4'T8, 1 EB	Retail	0%	0%	0.00	2.16	2.16	0.35	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
111	ROB 2L4' Premium T8	Retail	17%	17%	0.08	2.16	1.79	0.29	10	3	0	0	187.84	3.18	2.37	3.50	1.51
112	Delamping 1L4' F32T8	Retail	48%	48%	0.60	2.16	1.12	0.18	18	3	0	0	289.77	2.06	1.41	9.28	1.51

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Sq Ft	Base EUI	EUI	Peak Watts/ Sq Ft	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/KWH	Levelized Cost of Avoided Peak Capacity \$/KW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)	Revenue Test
113	LED Troffer (Base 2L4T8)	Retail	40%	40%	2.43	2.16	1.30	0.21	19	4	1	0	1332.57	0.45	0.30	44.53	1.51
114	Lighting Control Tuneup	Retail	5%	2%	0.01	2.16	2.05	0.34	6	1	0	0	614.06	2.13	2.63	2.07	0.97
115	Occupancy Sensor, 2L4' Fluorescent Fixtures	Retail	31%	9%	0.14	2.16	1.49	0.32	18	0	0	0	345.67	3.79	4.04	3.23	0.97
116	Continuous Dimming, 2L4' Fluorescent Fixtures	Retail	53%	16%	0.75	2.16	1.00	0.29	10	1	0	0	1903.19	0.69	0.80	10.35	0.97
117	High Performance Lighting R/R - 25% Savings, Base 2L4T8	Retail	25%	13%	0.40	2.16	1.62	0.30	20	1	0	0	679.31	1.31	1.16	11.84	1.13
120	Base Other Fluorescent Fixture	Retail	0%	0%	0.00	1.11	1.11	0.18	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
121	ROB Premium T8 (base other fluorescent)	Retail	17%	17%	0.08	1.11	0.92	0.15	10	1	0	0	375.68	1.59	1.19	7.00	1.51
122	Lighting Control Tuneup	Retail	5%	2%	0.03	1.11	1.05	0.18	6	0	0	0	2386.99	0.55	0.68	8.03	0.97
123	Occupancy Sensor, 4L8' Fluorescent Fixtures	Retail	31%	9%	0.14	1.11	0.77	0.16	18	0	0	0	671.84	1.95	2.08	6.28	0.97
124	Continuous Dimming, 4L8' Fluorescent Fixtures	Retail	53%	16%	0.75	1.11	0.52	0.15	10	0	0	0	3699.05	0.35	0.41	20.12	0.97
125	High Performance Lighting R/R - 25% Savings, Base Other Fluorescent	Retail	25%	13%	0.40	1.11	0.83	0.16	20	1	0	0	1320.31	0.67	0.60	23.02	1.13
130	Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacement	Retail	0%	0%	0.00	2.91	2.91	0.47	1	0	0	N/A	N/A	N/A	N/A	N/A	N/A
131	CFL Screw-in 18W	Retail	66%	66%	0.02	2.91	0.99	0.16	4	5	1	0	21.96	27.19	21.97	0.17	1.51
132	Cold Cathode Lamps	Retail	66%	66%	0.04	2.91	0.99	0.16	10	0	0	0	20.48	29.16	21.76	0.38	1.51
133	LED screw-in PAR replacement (base incandescent)	Retail	90%	90%	1.09	2.91	0.31	0.05	19	6	1	0	198.00	3.02	2.03	6.62	1.51
140	Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacement	Retail	0%	0%	0.00	2.91	2.91	0.47	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
141	CFL Hardwired, Modular 18W	Retail	66%	66%	0.99	2.91	0.99	0.16	18	10	2	0	257.09	2.32	1.58	8.23	1.51
142	Ceramic Metal Halide	Retail	37%	37%	2.38	2.92	1.83	0.29	18	5	1	0	1091.64	0.55	0.37	34.94	1.51
143	LED fixture replacement (base incandescent flood)	Retail	90%	90%	2.24	2.91	0.31	0.05	19	13	2	0	408.51	1.46	0.98	13.65	1.51
150	Base CFL to screw-in replacement	Retail	0%	0%	0.00	0.67	0.67	0.11	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
151	LED screw-in replacement (base CFL)	Retail	68%	68%	0.85	0.67	0.22	0.04	19	1	0	0	892.07	0.67	0.45	29.81	1.51
160	Base High Bay Metal Halide, 400W	Retail	0%	0%	1.10	0.00	0.00	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
180	Base Parking Garage Metal Halide, 250 W	Retail	0%	0%	0.00	0.00	0.00	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
185	Base Fluorescent Parking Garage Lighting	Retail	0%	0%	0.00	0.00	0.00	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
190	Base Exit Sign	Retail	0%	0%	0.00	0.02	0.02	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
191	LED Exit Sign	Retail	81%	81%	0.01	0.02	0.00	0.00	18	1	0	0	227.50	2.62	1.79	7.30	1.52
200	Base Outdoor High Pressure Sodium 250W Lamp	Retail	0%	0%	0.14	1.30	1.30	0.22	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
201	Outdoor Lighting Controls (Photocell/Timeclock)	Retail	22%	6%	0.02	1.43	1.12	0.22	18	8	0	0	138.28	10.15	11.03	1.18	0.95
202	LED Outdoor Area Lighting	Retail	52%	52%	0.28	1.30	0.63	0.10	9	34	6	0	368.88	1.59	1.18	6.49	1.54
203	Bi-Level LED Outdoor Lighting	Retail	69%	70%	1.04	1.30	0.41	0.07	9	23	4	0	1023.57	0.57	0.42	18.21	1.55
300	Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	Retail	0%	0%	1.80	2.04	2.04	1.33	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
301	Centrifugal Chiller, 0.51 kW/ton, 500 tons	Retail	12%	12%	0.23	2.12	1.86	1.22	20	1	1	0	99.06	3.79	0.98	14.00	3.87
309	Ceiling/roof Insulation - Chiller	Retail	12%	12%	0.55	2.27	2.00	1.30	20	0	0	0	224.91	1.67	0.43	31.79	3.87
320	Base DX Packaged System, EER=10.3, 10 tons	Retail	0%	0%	4.76	3.53	3.53	2.31	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
321	DX Tune Up/ Advanced Diagnostics	Retail	5%	4%	0.13	3.62	3.45	2.28	10	2	1	0	207.34	1.92	0.69	11.99	3.13
322	aged System, EER=10.3, 10 tons, with Automated Fault Detection and Dis	Retail	10%	10%	0.12	3.53	3.18	2.08	20	8	5	0	38.27	9.82	2.53	5.41	3.87
323	DX Packaged System, EER=10.9, 10 tons	Retail	6%	6%	0.45	3.53	3.34	2.18	20	6	4	0	260.68	1.44	0.37	36.85	3.87
324	DX Packaged System, EER=13.4, 10 tons	Retail	23%	23%	0.66	3.53	2.72	1.78	20	26	17	0	91.76	4.09	1.06	12.97	3.87
325	Window Film (Standard) - DX	Retail	1%	1%	0.12	3.56	3.52	2.30	10	0	0	0	613.83	0.61	0.18	46.53	3.87
326	Prog. Thermostat - DX	Retail	4%	3%	0.06	3.57	3.41	2.26	8	4	2	0	148.06	2.76	1.11	6.29	2.89
330	Optimize Controls - DX	Retail	4%	3%	0.04	3.64	3.48	2.31	5	1	1	0	148.54	2.75	1.15	4.01	2.89
331	Economizer - DX	Retail	15%	10%	0.51	3.68	3.13	2.16	15	13	6	0	194.31	2.10	0.78	14.89	2.89
332	Aerosol Duct Sealing - DX	Retail	7%	7%	0.05	3.53	3.29	2.15	15	3	2	0	30.96	12.13	3.38	3.45	3.87
334	Duct/Pipe Insulation - DX	Retail	2%	2%	0.65	3.56	3.49	2.28	10	1	1	1	1915.51	0.20	0.06	145.19	3.87
335	DX Coil Cleaning	Retail	5%	5%	0.04	3.62	3.44	2.25	5	2	1	0	91.29	4.11	1.28	3.59	3.87
337	Geothermal Heat Pump, EER=13, 10 tons - DX	Retail	37%	37%	1.65	3.55	2.23	1.46	15	2	1	0	179.77	2.09	0.58	20.04	3.87
340	Base PTAC, EER=8.3, 1 ton	Retail	0%	0%	0.00	0.00	0.00	0.00	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
400	Base Fan Motor, 5hp, 1800rpm, 87.5%	Retail	0%	0%	0.01	2.73	2.73	0.66	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
401	Fan Motor, 5hp, 1800rpm, 89.5%	Retail	2%	2%	0.01	2.74	2.68	0.64	20	2	1	0	27.66	18.07	9.54	1.44	1.89
402	Variable Speed Drive Control, 5 HP	Retail	29%	18%	0.11	2.73	1.95	0.54	15	39	6	0	84.23	7.32	5.39	2.17	1.47
410	Base Fan Motor, 15hp, 1800rpm, 91.0%	Retail	0%	0%	0.06	2.53	2.53	0.61	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
412	Variable Speed Drive Control, 15 HP	Retail	29%	18%	0.31	2.53	1.80	0.50	20	1	0	0	207.59	2.97	2.03	6.77	1.47
413	Electronically Commutated Motors (ECM) on an Air Handler Unit	Retail	14%	9%	0.04	2.53	2.18	0.55	15	1	0	0	77.54	7.95	5.85	1.99	1.47
414	Energy Recovery Ventilation (ERV)	Retail	7%	7%	0.21	2.53	2.35	0.56	20	0	0	0	357.28	1.40	0.74	18.56	1.89
420	Base Fan Motor, 40hp, 1800rpm, 93.0%	Retail	0%	0%	0.07	2.48	2.48	0.59	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
422	Variable Speed Drive Control, 40 HP	Retail	29%	18%	0.30	2.48	1.77	0.49	20	1	0	0	207.31	2.97	2.03	6.76	1.47
423	Air Handler Tuneups	Retail	10%	10%	0.05	2.48	2.23	0.53	8	0	0	0	141.53	3.53	2.17	3.22	1.89
424	Demand Controlled Ventilation	Retail	14%	9%	0.12	2.48	2.12	0.54	15	0	0	0	217.15	2.84	2.09	5.58	1.47
500	Base Built-Up Refrigeration System	Retail	0%	0%	0.00	1.24	1.24	0.17	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
501	High-efficiency fan motors	Retail	12%	12%	0.12	1.32	1.16	0.16	20	0	0	0	399.73	1.63	1.17	11.70	1.39
503	Night covers for display cases (built-up systems)	Retail	6%	0%	0.01	1.24	1.16	0.17	5	0	0	0	N/A	2.50	4.05	1.13	0.74

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Sq Ft	Base EUI	EUI	Peak Watts/ Sq Ft	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/KWH	Levelized Cost of Avoided Peak Capacity \$/KW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)	Revenue Test
505	Compressor VSD retrofit	Retail	6%	3%	0.04	1.24	1.16	0.16	13	0	0	0	830.71	1.20	1.24	8.47	1.07
507	Refrigeration Commissioning	Retail	5%	5%	0.02	1.27	1.20	0.16	3	0	0	0	887.80	0.73	0.65	4.40	1.39
508	Demand Hot Gas Defrost	Retail	3%	3%	0.00	1.24	1.21	0.16	10	0	0	0	106.07	6.15	4.99	1.67	1.39
509	Demand Defrost Electric	Retail	8%	8%	0.00	1.32	1.22	0.17	10	0	0	0	32.01	20.38	16.53	0.50	1.39
511	Freezer-Cooler Replacement Gaskets (built-up systems)	Retail	7%	7%	0.00	1.28	1.19	0.16	4	0	0	0	80.85	8.07	7.08	0.53	1.39
512	High R-Value Glass Doors	Retail	2%	2%	0.06	1.24	1.22	0.16	10	0	0	0	2835.55	0.23	0.19	44.52	1.39
513	Bi-level LED Case Lighting (built-up systems)	Retail	1%	1%	0.06	1.24	1.23	0.17	10	0	0	1	7289.08	0.10	0.09	88.17	1.24
514	Fiber Optic Case Lighting (built-up systems)	Retail	25%	25%	0.06	1.24	0.93	0.13	10	0	0	0	214.65	3.04	2.46	3.37	1.39
517	Oversized Air Cooled Condenser	Retail	8%	8%	0.06	1.29	1.18	0.16	16	0	0	0	387.88	1.68	1.28	9.48	1.39
520	Base Self-Contained Refrigeration	Retail	0%	0%	0.00	1.13	1.13	0.15	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
521	Strip curtains for walk-ins	Retail	1%	1%	0.08	1.13	1.12	0.15	4	0	0	5	33476.98	0.02	0.02	219.43	1.39
522	Night covers for display cases (self-contained)	Retail	1%	0%	0.00	1.13	1.12	0.15	5	0	0	0	N/A	1.43	2.31	1.99	0.74
523	Freezer-Cooler Replacement Gaskets (self-contained)	Retail	4%	4%	0.00	1.15	1.10	0.15	4	0	0	0	173.19	3.77	3.31	1.14	1.39
524	Bi-level LED Case Lighting (self-contained units)	Retail	1%	1%	0.07	1.13	1.12	0.15	10	0	0	1	9264.13	0.08	0.07	112.06	1.24
526	Energy-Star Refrigerator, solid door	Retail	2%	2%	0.01	1.14	1.12	0.15	10	0	0	0	276.57	2.36	1.91	4.34	1.39
527	Energy-Star Freezer, solid door	Retail	1%	1%	0.01	1.13	1.12	0.15	10	0	0	0	823.21	0.79	0.64	12.92	1.39
528	Energy-Star Refrigerator, glass door	Retail	10%	10%	0.00	1.17	1.05	0.14	10	0	0	0	4.34	150.17	121.81	0.07	1.39
529	Energy-Star Freezer, glass door	Retail	3%	3%	0.00	1.14	1.11	0.15	10	0	0	0	40.35	16.16	13.11	0.63	1.39
530	Energy Star Ice Machines	Retail	1%	1%	0.00	1.13	1.12	0.15	10	0	0	0	65.29	9.99	8.10	1.03	1.39
600	Base Desktop PC	Retail	0%	0%	0.00	0.08	0.08	0.01	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
601	PC Manual Power Management Enabling	Retail	63%	45%	0.00	0.09	0.03	0.01	4	1	0	0	106.75	6.98	6.80	0.55	1.26
602	PC Network Power Management Enabling	Retail	63%	45%	0.00	0.09	0.03	0.01	4	1	0	0	106.75	6.98	6.80	0.55	1.26
603	Energy Star or Better PC	Retail	31%	25%	0.00	0.09	0.06	0.01	4	0	0	0	115.07	6.00	5.52	0.68	1.33
610	Base Monitor, CRT	Retail	0%	0%	0.00	0.00	0.00	0.00	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
611	Energy Star or Better Monitor-CRT	Retail	52%	42%	0.00	0.00	0.00	0.00	4	0	0	0	645.21	1.07	0.99	3.81	1.33
612	Monitor Power Management Enabling--CRT	Retail	50%	35%	0.00	0.01	0.00	0.00	4	0	0	0	847.97	0.88	0.86	4.38	1.26
620	Base Monitor, LCD	Retail	0%	0%	0.00	0.03	0.03	0.01	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
621	Energy Star or Better Monitor--LCD	Retail	52%	42%	0.00	0.04	0.02	0.00	4	1	0	0	236.67	2.92	2.69	1.40	1.33
622	Monitor Power Management Enabling--LCD	Retail	52%	37%	0.00	0.05	0.03	0.01	4	0	0	0	344.60	2.16	2.11	1.78	1.26
630	Base Copier	Retail	0%	0%	0.00	0.02	0.02	0.00	6	0	0	N/A	N/A	N/A	N/A	N/A	N/A
631	Energy Star or Better Copier	Retail	19%	15%	0.00	0.02	0.02	0.00	6	0	0	0	156.35	4.42	3.97	1.37	1.33
632	Copier Power Management Enabling	Retail	18%	13%	0.00	0.02	0.02	0.00	6	0	0	0	861.17	0.87	0.82	6.60	1.26
640	Base Laser Printer	Retail	0%	0%	0.00	0.03	0.03	0.00	5	0	0	N/A	N/A	N/A	N/A	N/A	N/A
641	Printer Power Management Enabling	Retail	46%	32%	0.00	0.04	0.02	0.00	5	1	0	0	395.65	1.88	1.81	2.54	1.26
650	Base Data Center/Server Room	Retail	0%	0%	0.00	303.46	303.46	45.59	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
651	Data Center Improved Operations	Retail	19%	13%	0.50	315.18	256.60	41.10	10	1	0	0	10.98	67.91	61.09	0.14	1.26
652	Data Center Best Practices	Retail	42%	34%	2.50	316.90	182.53	31.54	10	1	0	0	21.35	32.69	28.03	0.30	1.32
653	Data Center State of the Art practices	Retail	56%	56%	5.00	303.46	133.52	20.06	10	0	0	0	26.87	22.97	17.72	0.47	1.46
660	Base Water Heating	Retail	0%	0%	0.00	0.27	0.27	0.04	15	0	0	N/A	N/A	N/A	N/A	N/A	N/A
661	Demand controlled circulating systems	Retail	4%	2%	0.01	0.28	0.27	0.04	15	0	0	0	1380.09	0.69	0.68	17.07	1.09
662	High Efficiency Water Heater (electric)	Retail	2%	2%	0.00	0.27	0.26	0.04	15	0	0	0	210.72	3.03	2.30	5.07	1.42
663	Hot Water Pipe Insulation	Retail	2%	2%	0.01	0.27	0.26	0.04	15	0	0	0	643.18	0.99	0.75	15.46	1.42
664	Tankless Water Heater	Retail	10%	10%	0.01	0.27	0.24	0.03	20	1	0	0	285.92	2.23	1.57	8.72	1.42
665	Heat Pump Water Heater (air source)	Retail	20%	20%	0.04	0.27	0.22	0.03	15	2	0	0	486.10	1.31	1.00	11.69	1.42
666	Heat Recovery Unit	Retail	65%	65%	0.08	0.27	0.09	0.01	10	0	0	0	446.06	1.43	1.14	7.29	1.42
667	Heat Trap	Retail	9%	9%	0.00	0.28	0.25	0.04	10	1	0	0	121.45	5.26	4.18	1.99	1.42
668	Solar Water Heater	Retail	70%	70%	0.12	0.27	0.08	0.01	20	0	0	0	342.49	1.86	1.31	10.44	1.42
670	Base Vending Machines	Retail	0%	0%	0.00	0.11	0.11	0.02	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
700	Base Cooking	Retail	0%	0%	0.00	0.28	0.28	0.04	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
701	Convection Oven	Retail	3%	3%	0.06	0.28	0.27	0.04	10	0	0	1	5538.24	0.11	0.09	92.96	1.44
704	Energy Star Hot Food Holding Cabinets	Retail	14%	14%	0.09	0.28	0.24	0.03	10	0	0	0	2195.50	0.29	0.23	36.85	1.44
800	Base Heating	Retail	0%	0%	0.00	0.39	0.39	0.00	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
900	Base Miscellaneous	Retail	0%	0%	0.00	0.86	0.86	0.14	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
100	Base Fluorescent Fixture, 4L4T8	Grocery	0%	0%	0.00	8.07	8.07	1.22	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	ROB 4L4' Premium T8	Grocery	17%	17%	0.20	8.09	6.70	1.01	6	5	1	0	217.58	2.83	2.30	2.36	1.47
102	Delamping 3L4' F32T8	Grocery	25%	25%	0.76	8.07	6.05	0.91	18	3	0	0	200.26	3.07	2.16	6.04	1.47
103	LED Troffer (Base 4L4T8)	Grocery	40%	40%	4.86	8.07	4.84	0.73	12	8	1	0	1192.76	0.52	0.39	25.02	1.47
104	Lighting Control Tuneup	Grocery	5%	2%	0.03	8.07	7.66	1.20	6	1	0	0	348.66	3.95	4.93	1.10	0.96
105	Occupancy Sensor, 4L4' Fluorescent Fixtures	Grocery	31%	9%	0.14	8.07	5.57	1.11	18	1	0	0	98.21	14.01	15.14	0.86	0.96
106	Continuous Dimming, 4L4' Fluorescent Fixtures	Grocery	54%	16%	0.75	8.07	3.74	1.03	10	3	0	0	540.75	2.54	3.01	2.76	0.96
107	High Performance Lighting R/R - 25% Savings, Base 4L4T8	Grocery	26%	13%	0.40	8.07	5.98	1.07	20	2	0	0	193.01	4.92	4.50	3.05	1.09

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Sq Ft	Base EUI	EUI	Peak Watts/ Sq Ft	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWh	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)	Revenue Test
110	Base Fluorescent Fixture, 2L4'T8, 1 EB	Grocery	0%	0%	0.00	6.75	6.75	1.02	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
111	ROB 2L4' Premium T8	Grocery	17%	17%	0.15	6.81	5.64	0.85	6	0	0	0	191.59	3.21	2.61	2.08	1.47
112	Delamping 1L4' F32T8	Grocery	48%	48%	1.13	6.75	3.51	0.53	18	0	0	0	185.16	3.32	2.34	5.58	1.47
113	LED Troffer (Base 2L4'T8)	Grocery	40%	40%	4.57	6.75	4.05	0.61	12	0	0	0	1340.53	0.46	0.35	28.12	1.47
114	Lighting Control Tuneup	Grocery	5%	2%	0.01	6.75	6.40	1.00	6	0	0	0	208.61	6.60	8.24	0.66	0.96
115	Occupancy Sensor, 2L4' Fluorescent Fixtures	Grocery	31%	9%	0.14	6.75	4.66	0.93	18	0	0	0	117.43	11.72	12.66	1.03	0.96
116	Continuous Dimming, 2L4' Fluorescent Fixtures	Grocery	54%	16%	0.75	6.75	3.13	0.86	10	0	0	0	646.57	2.13	2.52	3.30	0.96
117	High Performance Lighting R/R - 25% Savings, Base 2L4'T8	Grocery	26%	13%	0.40	6.75	5.00	0.89	20	0	0	0	230.78	4.12	3.76	3.64	1.09
120	Base Other Fluorescent Fixture	Grocery	0%	0%	0.00	0.00	0.00	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
130	Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacement	Grocery	0%	0%	0.00	3.85	3.85	0.58	1	0	0	N/A	N/A	N/A	N/A	N/A	N/A
131	CFL Screw-in 18W	Grocery	66%	66%	0.02	3.85	1.31	0.20	2	0	0	0	22.99	26.77	22.92	0.09	1.47
132	Cold Cathode Lamps	Grocery	66%	66%	0.04	3.85	1.31	0.20	6	0	0	0	21.09	29.18	23.72	0.23	1.47
133	LED screw-in PAR replacement (base incandescent)	Grocery	89%	90%	0.87	3.85	0.40	0.06	12	0	0	0	199.18	3.09	2.35	4.18	1.47
140	Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacement	Grocery	0%	0%	0.00	3.85	3.85	0.58	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
141	CFL Hardwired, Modular 18W	Grocery	66%	66%	0.79	3.85	1.31	0.20	18	0	0	0	164.28	3.75	2.63	4.95	1.47
142	Ceramic Metal Halide	Grocery	37%	37%	1.90	3.86	2.43	0.37	18	0	0	0	697.57	0.88	0.62	21.03	1.47
143	LED fixture replacement (base incandescent flood)	Grocery	89%	90%	1.79	3.85	0.40	0.06	12	0	0	0	410.95	1.50	1.14	8.62	1.47
150	Base CFL to screw-in replacement	Grocery	0%	0%	0.00	6.78	6.78	1.02	2	0	0	N/A	N/A	N/A	N/A	N/A	N/A
151	LED screw-in replacement (base CFL)	Grocery	67%	68%	5.19	6.78	2.20	0.33	12	0	0	0	897.40	0.69	0.52	18.83	1.47
160	Base High Bay Metal Halide, 400W	Grocery	0%	0%	2.22	11.79	11.79	1.78	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
161	High Bay T5	Grocery	49%	49%	0.77	11.79	6.06	0.92	18	3	0	0	71.01	8.67	6.09	2.14	1.47
162	Induction High Bay Lighting	Grocery	37%	37%	2.39	11.79	7.38	1.12	32	2	0	0	201.16	2.33	1.58	8.66	1.47
163	PSMH + electronic ballast	Grocery	37%	37%	1.83	11.92	7.55	1.14	10	2	0	0	365.89	1.68	1.29	6.42	1.47
165	Occupancy Sensor, High Bay T5	Grocery	21%	6%	0.14	12.24	9.72	1.74	18	0	0	0	97.07	14.17	15.32	0.85	0.96
180	Base Parking Garage Metal Halide, 250 W	Grocery	0%	0%	0.00	0.00	0.00	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
185	Base Fluorescent Parking Garage Lighting	Grocery	0%	0%	0.00	0.00	0.00	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
190	Base Exit Sign	Grocery	0%	0%	0.00	0.01	0.01	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
191	LED Exit Sign	Grocery	81%	81%	0.00	0.06	0.01	0.00	18	0	0	0	41.87	14.89	10.59	1.23	1.45
200	Base Outdoor High Pressure Sodium 250W Lamp	Grocery	0%	0%	0.05	0.47	0.47	0.04	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
201	Outdoor Lighting Controls (Photocell/Timeclock)	Grocery	22%	6%	0.04	0.51	0.40	0.04	18	0	0	0	1360.35	2.06	2.55	5.11	0.83
202	LED Outdoor Area Lighting	Grocery	52%	52%	0.45	0.47	0.22	0.02	9	1	0	0	3640.20	0.25	0.26	29.07	1.11
203	Bi-Level LED Outdoor Lighting	Grocery	68%	70%	1.67	0.47	0.15	0.01	9	1	0	1	10100.86	0.09	0.09	81.95	1.11
300	Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	Grocery	0%	0%	1.47	3.43	3.43	1.91	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
320	Base DX Packaged System, EER=10.3, 10 tons	Grocery	0%	0%	3.90	5.72	5.72	3.18	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
321	DX Tune Up/ Advanced Diagnostics	Grocery	5%	4%	0.13	6.02	5.72	3.23	10	0	0	0	146.55	2.89	1.25	6.66	2.62
322	aged System, EER=10.3, 10 tons, with Automated Fault Detection and Dis	Grocery	10%	10%	0.10	5.72	5.15	2.86	20	1	1	0	22.73	17.08	5.02	2.73	3.40
323	DX Packaged System, EER=10.9, 10 tons	Grocery	6%	6%	0.37	5.72	5.41	3.00	20	1	1	0	154.88	2.51	0.74	18.62	3.40
324	DX Packaged System, EER=13.4, 10 tons	Grocery	23%	23%	0.54	5.72	4.41	2.45	20	4	2	0	54.52	7.12	2.09	6.55	3.40
325	Window Film (Standard) - DX	Grocery	1%	1%	0.13	5.72	5.66	3.14	10	0	0	0	505.11	0.77	0.26	32.56	3.40
326	Prog. Thermostat - DX	Grocery	5%	3%	0.05	6.02	5.71	3.24	8	0	0	0	84.41	5.30	2.67	2.62	2.31
330	Optimize Controls - DX	Grocery	5%	3%	0.04	5.93	5.62	3.19	5	0	0	0	107.31	4.17	2.17	2.11	2.31
331	Economizer - DX	Grocery	1%	1%	0.42	5.78	5.72	3.19	15	0	0	1	2022.65	0.22	0.10	113.10	2.31
332	Aerosol Duct Sealing - DX	Grocery	7%	7%	0.04	5.72	5.32	2.96	15	0	0	0	18.39	21.11	6.69	1.74	3.40
333	Ceiling/roof Insulation - DX	Grocery	12%	12%	0.24	6.50	5.72	3.17	20	0	0	0	40.23	9.65	2.83	4.84	3.40
334	Duct/Pipe Insulation - DX	Grocery	2%	2%	0.65	5.72	5.61	3.11	10	0	0	1	1401.64	0.28	0.09	90.34	3.40
335	DX Coil Cleaning	Grocery	5%	5%	0.03	5.98	5.69	3.16	5	0	0	0	53.13	7.31	2.59	1.77	3.40
337	Geothermal Heat Pump, EER=13, 10 tons - DX	Grocery	37%	37%	1.96	5.74	3.62	2.01	15	0	0	0	155.25	2.50	0.79	14.72	3.40
340	Base PTAC, EER=8.3, 1 ton	Grocery	0%	0%	0.00	0.00	0.00	0.00	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
400	Base Fan Motor, 5hp, 1800rpm, 87.5%	Grocery	0%	0%	0.03	4.44	4.44	0.85	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
401	Fan Motor, 5hp, 1800rpm, 89.5%	Grocery	2%	2%	0.01	4.46	4.36	0.83	20	0	0	0	38.64	14.26	8.60	1.59	1.66
402	Variable Speed Drive Control, 5 HP	Grocery	31%	18%	0.19	4.44	3.05	0.69	15	6	1	0	117.68	6.23	5.30	2.20	1.27
410	Base Fan Motor, 15hp, 1800rpm, 91.0%	Grocery	0%	0%	0.00	4.11	4.11	0.78	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
420	Base Fan Motor, 40hp, 1800rpm, 93.0%	Grocery	0%	0%	0.00	4.03	4.03	0.77	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
423	Air Handler Tuneups	Grocery	10%	10%	0.05	4.03	3.62	0.69	8	0	0	0	109.70	5.02	3.53	1.98	1.66
424	Demand Controlled Ventilation	Grocery	16%	9%	0.12	4.03	3.40	0.70	15	3	0	0	168.32	4.36	3.70	3.15	1.27
500	Base Built-Up Refrigeration System	Grocery	0%	0%	0.00	24.11	24.11	3.41	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
501	High-efficiency fan motors	Grocery	12%	12%	1.16	25.42	22.37	3.16	20	0	0	0	198.50	3.21	2.26	6.07	1.42
503	Night covers for display cases (built-up systems)	Grocery	6%	0%	0.13	24.11	22.69	3.41	5	1	0	0	N/A	1.87	3.04	1.51	0.74
504	Efficient compressor motor retrofit	Grocery	7%	7%	0.09	25.82	24.06	3.40	10	0	0	0	48.32	13.19	10.48	0.79	1.42
505	Compressor VSD retrofit	Grocery	6%	3%	0.41	24.11	22.63	3.30	13	1	0	0	407.82	2.36	2.41	4.36	1.09
506	Floating head pressure controls	Grocery	7%	2%	0.12	25.74	24.05	3.58	14	0	0	0	199.68	7.96	9.45	1.17	0.92

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Sq Ft	Base EUI	EUI	Peak Watts/ Sq Ft	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/KWH	Levelized Cost of Avoided Peak Capacity \$/KW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)	Revenue Test
507	Refrigeration Commissioning	Grocery	5%	5%	0.18	24.73	23.49	3.32	3	0	0	0	435.85	1.46	1.28	2.26	1.42
508	Demand Hot Gas Defrost	Grocery	3%	3%	0.03	24.11	23.50	3.32	10	0	0	0	52.07	12.24	9.72	0.85	1.42
510	Anti-sweat (humidistat) controls	Grocery	5%	2%	0.16	25.00	23.78	3.45	12	0	0	0	209.88	4.56	4.67	2.10	1.09
511	Freezer-Cooler Replacement Gaskets (built-up systems)	Grocery	7%	7%	0.07	24.93	23.28	3.29	4	0	0	0	102.73	6.20	5.34	0.70	1.42
512	High R-Value Glass Doors	Grocery	2%	2%	1.46	24.13	23.73	3.35	10	0	0	1	3599.86	0.18	0.14	59.05	1.42
513	Bi-level LED Case Lighting (built-up systems)	Grocery	1%	1%	1.45	24.12	23.92	3.39	10	0	0	1	9261.70	0.08	0.07	117.26	1.27
514	Fiber Optic Case Lighting (built-up systems)	Grocery	25%	25%	1.66	24.11	18.20	2.57	10	1	0	0	272.73	2.34	1.86	4.47	1.42
516	Multiplex Compressor System	Grocery	14%	14%	2.71	27.62	23.68	3.35	14	0	0	0	483.90	1.32	1.01	10.97	1.42
517	Oversized Air Cooled Condenser	Grocery	8%	8%	0.62	25.12	23.09	3.26	16	0	0	0	190.42	3.35	2.51	4.86	1.42
520	Base Self-Contained Refrigeration	Grocery	0%	0%	0.00	21.51	21.51	3.04	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
522	Night covers for display cases (self-contained)	Grocery	0%	0%	0.00	21.51	21.50	3.04	5	0	0	0	N/A	35.18	57.01	0.08	0.74
523	Freezer-Cooler Replacement Gaskets (self-contained)	Grocery	3%	3%	0.00	21.79	21.22	3.00	4	1	0	0	3.52	181.27	155.97	0.02	1.42
524	Bi-level LED Case Lighting (self-contained units)	Grocery	1%	1%	0.01	21.51	21.34	3.02	10	0	0	0	105.23	6.99	6.23	1.33	1.27
526	Energy-Star Refrigerator, solid door	Grocery	0%	0%	0.00	21.51	21.49	3.04	10	0	0	0	10.73	59.41	47.21	0.18	1.42
527	Energy-Star Freezer, solid door	Grocery	3%	3%	0.02	21.76	21.01	2.97	10	2	0	0	31.47	20.24	16.09	0.52	1.42
528	Energy-Star Refrigerator, glass door	Grocery	0%	0%	0.00	21.52	21.48	3.04	10	0	0	0	0.17	3,666.67	2,913.48	0.00	1.42
529	Energy-Star Freezer, glass door	Grocery	8%	8%	0.00	22.18	20.31	2.87	10	5	1	0	1.52	418.44	332.49	0.02	1.42
530	Energy Star Ice Machines	Grocery	0%	0%	0.00	21.51	21.50	3.04	10	0	0	0	2.53	252.10	200.31	0.04	1.42
600	Base Desktop PC	Grocery	0%	0%	0.00	0.06	0.06	0.01	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
601	PC Manual Power Management Enabling	Grocery	63%	45%	0.00	0.07	0.03	0.01	4	0	0	0	96.00	7.28	6.77	0.55	1.32
602	PC Network Power Management Enabling	Grocery	63%	45%	0.00	0.07	0.03	0.01	4	0	0	0	96.00	7.28	6.77	0.55	1.32
603	Energy Star or Better PC	Grocery	30%	25%	0.00	0.06	0.04	0.01	4	0	0	0	123.17	5.28	4.63	0.81	1.40
610	Base Monitor, CRT	Grocery	0%	0%	0.00	0.01	0.01	0.00	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
611	Energy Star or Better Monitor-CRT	Grocery	52%	42%	0.00	0.01	0.01	0.00	4	0	0	0	105.37	6.17	5.41	0.69	1.40
612	Monitor Power Management Enabling--CRT	Grocery	49%	35%	0.00	0.01	0.01	0.00	4	0	0	0	209.90	3.33	3.10	1.21	1.32
620	Base Monitor, LCD	Grocery	0%	0%	0.00	0.02	0.02	0.00	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
621	Energy Star or Better Monitor--LCD	Grocery	52%	42%	0.00	0.02	0.01	0.00	4	0	0	0	256.20	2.54	2.22	1.69	1.40
622	Monitor Power Management Enabling--LCD	Grocery	52%	37%	0.00	0.02	0.01	0.00	4	0	0	0	477.61	1.46	1.36	2.76	1.32
630	Base Copier	Grocery	0%	0%	0.00	0.02	0.02	0.00	6	0	0	N/A	N/A	N/A	N/A	N/A	N/A
631	Energy Star or Better Copier	Grocery	19%	15%	0.00	0.02	0.01	0.00	6	0	0	0	145.36	4.47	3.83	1.42	1.40
632	Copier Power Management Enabling	Grocery	18%	13%	0.00	0.02	0.01	0.00	6	0	0	0	867.71	0.81	0.73	7.43	1.32
640	Base Laser Printer	Grocery	0%	0%	0.00	0.01	0.01	0.00	5	0	0	N/A	N/A	N/A	N/A	N/A	N/A
641	Printer Power Management Enabling	Grocery	46%	32%	0.00	0.01	0.01	0.00	5	0	0	0	431.23	1.62	1.49	3.09	1.32
650	Base Data Center/Server Room	Grocery	0%	0%	0.00	438.15	438.15	73.25	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
651	Data Center Improved Operations	Grocery	19%	13%	0.50	455.01	370.75	66.02	10	0	0	0	6.83	102.33	87.87	0.09	1.32
652	Data Center Best Practices	Grocery	42%	34%	2.50	457.50	264.00	50.67	10	0	0	0	13.29	49.44	40.36	0.21	1.38
653	Data Center State of the Art practices	Grocery	56%	56%	5.00	438.15	192.79	32.23	10	0	0	0	16.73	35.01	25.59	0.32	1.55
660	Base Water Heating	Grocery	0%	0%	0.00	0.55	0.55	0.08	15	0	0	N/A	N/A	N/A	N/A	N/A	N/A
661	Demand controlled circulating systems	Grocery	4%	2%	0.01	0.55	0.53	0.08	15	0	0	0	634.08	1.42	1.37	8.51	1.12
662	High Efficiency Water Heater (electric)	Grocery	2%	2%	0.00	0.55	0.54	0.08	15	0	0	0	153.00	3.98	2.89	4.04	1.49
663	Hot Water Pipe Insulation	Grocery	2%	2%	0.01	0.55	0.54	0.08	15	0	0	0	466.73	1.30	0.95	12.32	1.49
664	Tankless Water Heater	Grocery	10%	10%	0.02	0.55	0.49	0.08	20	0	0	0	207.60	2.93	1.97	6.95	1.49
665	Heat Pump Water Heater (air source)	Grocery	20%	20%	0.06	0.55	0.44	0.07	15	0	0	0	352.95	1.72	1.25	9.32	1.49
666	Heat Recovery Unit	Grocery	65%	65%	0.08	0.55	0.19	0.03	10	0	0	0	199.13	3.06	2.32	3.57	1.49
667	Heat Trap	Grocery	9%	9%	0.01	0.56	0.51	0.08	10	0	0	0	88.18	6.90	5.25	1.58	1.49
668	Solar Water Heater	Grocery	70%	70%	0.20	0.55	0.16	0.03	20	0	0	0	248.68	2.45	1.65	8.32	1.49
670	Base Vending Machines	Grocery	0%	0%	0.00	0.18	0.18	0.03	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
671	Vending Misers	Grocery	10%	7%	0.01	0.18	0.16	0.02	5	0	0	0	1583.30	0.50	0.50	9.17	1.21
700	Base Cooking	Grocery	0%	0%	0.00	2.33	2.33	0.31	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
703	Efficient Steamer	Grocery	22%	22%	0.19	2.33	1.83	0.25	10	2	0	0	382.66	1.71	1.39	5.98	1.39
704	Energy Star Hot Food Holding Cabinets	Grocery	1%	1%	0.11	2.33	2.32	0.31	10	0	0	1	7869.14	0.08	0.07	122.89	1.39
800	Base Heating	Grocery	0%	0%	0.00	0.59	0.59	0.00	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
900	Base Miscellaneous	Grocery	0%	0%	0.00	1.10	1.10	0.16	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
100	Base Fluorescent Fixture, 4L4T8	Warehouse	0%	0%	0.00	1.51	1.51	0.22	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	ROB 4L4' Premium T8	Warehouse	17%	17%	0.06	1.57	1.30	0.19	9	2	0	0	218.69	2.84	2.25	3.42	1.45
102	Delamping 3L4' F32T8	Warehouse	25%	25%	0.22	1.51	1.13	0.17	18	1	0	0	317.38	1.96	1.39	9.37	1.45
103	LED Troffer (Base 4L4'T8)	Warehouse	40%	40%	1.41	1.51	0.90	0.13	18	4	1	0	1270.81	0.49	0.35	37.53	1.45
104	Lighting Control Tuneup	Warehouse	5%	2%	0.03	1.51	1.43	0.22	6	0	0	0	1906.74	0.73	0.92	5.90	0.95
105	Occupancy Sensor, 4L4' Fluorescent Fixtures	Warehouse	31%	9%	0.14	1.51	1.04	0.20	18	1	0	0	536.67	2.61	2.83	4.61	0.95
106	Continuous Dimming, 4L4' Fluorescent Fixtures	Warehouse	54%	16%	0.75	1.51	0.70	0.19	10	2	0	0	2954.82	0.47	0.56	14.77	0.95
107	High Performance Lighting R/R - 25% Savings, Base 4L4'T8	Warehouse	26%	13%	0.40	1.51	1.12	0.20	20	1	0	0	1054.67	0.91	0.83	16.44	1.09

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Sq Ft	Base EUI	EUI	Peak Watts/ Sq Ft	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/KWH	Levelized Cost of Avoided Peak Capacity \$/KW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)	Revenue Test
110	Base Fluorescent Fixture, 2L4'T8, 1 EB	Warehouse	0%	0%	0.00	1.45	1.45	0.22	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
111	ROB 2L4' Premium T8	Warehouse	17%	17%	0.05	1.46	1.21	0.18	9	0	0	0	200.96	3.09	2.45	3.15	1.45
112	Delamping 1L4' F32T8	Warehouse	48%	48%	0.38	1.45	0.76	0.11	18	0	0	0	293.45	2.12	1.50	8.67	1.45
113	LED Troffer (Base 2L4'T8)	Warehouse	40%	40%	1.53	1.45	0.87	0.13	18	0	0	0	1428.25	0.44	0.31	42.18	1.45
114	Lighting Control Tuneup	Warehouse	5%	2%	0.01	1.45	1.38	0.21	6	0	0	0	988.94	1.41	1.78	3.06	0.95
115	Occupancy Sensor, 2L4' Fluorescent Fixtures	Warehouse	31%	9%	0.14	1.45	1.00	0.20	18	0	0	0	556.69	2.51	2.73	4.78	0.95
116	Continuous Dimming, 2L4' Fluorescent Fixtures	Warehouse	54%	16%	0.75	1.45	0.67	0.18	10	0	0	0	3065.05	0.46	0.54	15.32	0.95
117	High Performance Lighting R/R - 25% Savings, Base 2L4'T8	Warehouse	26%	13%	0.40	1.45	1.08	0.19	20	0	0	0	1094.02	0.88	0.80	17.05	1.09
120	Base Other Fluorescent Fixture	Warehouse	0%	0%	0.00	2.28	2.28	0.34	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
121	ROB Premium T8 (base other fluorescent)	Warehouse	17%	17%	0.15	2.28	1.89	0.28	9	0	0	0	402.56	1.54	1.22	6.30	1.45
122	Lighting Control Tuneup	Warehouse	5%	2%	0.03	2.28	2.16	0.33	6	0	0	0	1261.21	1.11	1.39	3.90	0.95
123	Occupancy Sensor, 4L8' Fluorescent Fixtures	Warehouse	31%	9%	0.14	2.28	1.57	0.31	18	0	0	0	354.98	3.94	4.28	3.05	0.95
124	Continuous Dimming, 4L8' Fluorescent Fixtures	Warehouse	54%	16%	0.75	2.28	1.06	0.28	10	0	0	0	1954.46	0.72	0.85	9.77	0.95
125	High Performance Lighting R/R - 25% Savings, Base Other Fluorescent	Warehouse	26%	13%	0.40	2.28	1.69	0.30	20	0	0	0	697.61	1.37	1.26	10.87	1.09
130	Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacement	Warehouse	0%	0%	0.00	0.00	0.00	0.00	1	0	0	N/A	N/A	N/A	N/A	N/A	N/A
140	Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacement	Warehouse	0%	0%	0.00	2.13	2.13	0.32	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
141	CFL Hardwired, Modular 18W	Warehouse	66%	66%	0.68	2.13	0.72	0.11	18	1	0	0	260.36	2.39	1.70	7.69	1.45
142	Ceramic Metal Halide	Warehouse	37%	37%	1.63	2.13	1.34	0.20	18	1	0	0	1105.53	0.56	0.40	32.65	1.45
143	LED fixture replacement (base incandescent flood)	Warehouse	89%	90%	1.53	2.13	0.22	0.03	18	2	0	0	437.85	1.42	1.01	12.93	1.45
150	Base CFL to screw-in replacement	Warehouse	0%	0%	0.00	0.75	0.75	0.11	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
151	LED screw-in replacement (base CFL)	Warehouse	67%	68%	0.89	0.75	0.24	0.04	18	0	0	0	956.13	0.65	0.46	28.24	1.45
160	Base High Bay Metal Halide, 400W	Warehouse	0%	0%	0.39	1.32	1.32	0.20	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
161	High Bay T5	Warehouse	49%	49%	0.13	1.32	0.68	0.10	18	2	0	0	112.54	5.53	3.92	3.32	1.45
162	Induction High Bay Lighting	Warehouse	37%	37%	0.42	1.32	0.82	0.12	32	2	0	0	318.81	1.48	1.02	13.44	1.45
163	PSMH + electronic ballast	Warehouse	37%	37%	0.32	1.32	0.83	0.12	16	2	0	0	388.24	1.60	1.17	10.39	1.45
165	Occupancy Sensor, High Bay T5	Warehouse	21%	6%	0.14	1.37	1.09	0.19	18	0	0	0	887.23	1.58	1.71	7.62	0.95
180	Base Parking Garage Metal Halide, 250 W	Warehouse	0%	0%	0.00	0.00	0.00	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
185	Base Fluorescent Parking Garage Lighting	Warehouse	0%	0%	0.00	0.00	0.00	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
190	Base Exit Sign	Warehouse	0%	0%	0.00	0.00	0.00	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
191	LED Exit Sign	Warehouse	81%	81%	0.02	0.00	0.00	0.00	18	0	0	0	2598.72	0.23	0.15	85.59	1.54
200	Base Outdoor High Pressure Sodium 250W Lamp	Warehouse	0%	0%	0.06	0.60	0.60	0.03	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
201	Outdoor Lighting Controls (Photocell/Timeclock)	Warehouse	23%	6%	0.04	0.66	0.51	0.03	18	1	0	0	1683.63	2.29	2.92	4.46	0.81
202	LED Outdoor Area Lighting	Warehouse	52%	52%	0.51	0.60	0.29	0.02	9	3	0	0	4512.80	0.26	0.30	25.86	1.00
203	Bi-Level LED Outdoor Lighting	Warehouse	68%	70%	1.90	0.60	0.19	0.01	9	2	0	1	12522.15	0.09	0.11	73.13	1.01
300	Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	Warehouse	0%	0%	11.36	1.03	1.03	0.65	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
320	Base DX Packaged System, EER=10.3, 10 tons	Warehouse	0%	0%	30.08	1.79	1.79	1.13	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
321	DX Tune Up/ Advanced Diagnostics	Warehouse	5%	4%	0.13	1.84	1.76	1.13	10	0	0	0	418.38	0.96	0.36	22.99	3.01
322	aged System, EER=10.3, 10 tons, with Automated Fault Detection and Di	Warehouse	10%	10%	0.76	1.79	1.61	1.02	20	2	1	0	491.14	0.77	0.20	67.56	3.79
323	DX Packaged System, EER=10.9, 10 tons	Warehouse	6%	6%	2.84	1.79	1.69	1.07	20	2	1	2	3345.91	0.11	0.03	460.23	3.79
324	DX Packaged System, EER=13.4, 10 tons	Warehouse	23%	23%	4.18	1.79	1.37	0.87	20	7	4	1	1177.75	0.32	0.08	162.00	3.79
325	Window Film (Standard) - DX	Warehouse	4%	4%	2.88	1.83	1.75	1.11	10	0	0	5	8142.17	0.05	0.01	600.59	3.79
326	Prog. Thermostat - DX	Warehouse	5%	3%	0.39	1.82	1.73	1.12	8	1	0	1	1886.26	0.22	0.09	73.72	2.72
330	Optimize Controls - DX	Warehouse	5%	3%	0.04	1.84	1.76	1.14	5	0	0	0	301.52	1.39	0.61	7.49	2.72
332	Aerosol Duct Sealing - DX	Warehouse	7%	7%	0.34	1.79	1.66	1.06	15	1	0	0	396.63	0.95	0.27	43.02	3.79
333	Ceiling/roof Insulation - DX	Warehouse	12%	12%	0.24	1.94	1.70	1.08	20	1	1	0	117.97	3.20	0.84	16.23	3.79
334	Duct/Pipe Insulation - DX	Warehouse	2%	2%	0.65	1.82	1.78	1.13	10	0	0	2	3857.33	0.10	0.03	284.53	3.79
335	DX Coil Cleaning	Warehouse	5%	5%	0.25	1.79	1.70	1.08	5	1	1	1	1195.63	0.32	0.10	45.70	3.79
337	Geothermal Heat Pump, EER=13, 10 tons - DX	Warehouse	37%	37%	1.41	1.79	1.13	0.72	15	1	0	0	311.59	1.21	0.35	33.80	3.79
340	Base PTAC, EER=8.3, 1 ton	Warehouse	0%	0%	0.00	0.00	0.00	0.00	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
400	Base Fan Motor, 5hp, 1800rpm, 87.5%	Warehouse	0%	0%	0.01	1.27	1.27	0.30	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
401	Fan Motor, 5hp, 1800rpm, 89.5%	Warehouse	2%	2%	0.01	1.27	1.25	0.30	20	0	0	0	59.84	8.40	4.47	3.07	1.88
402	Variable Speed Drive Control, 5 HP	Warehouse	30%	18%	0.11	1.58	1.10	0.31	15	1	0	0	146.09	4.37	3.32	3.51	1.42
410	Base Fan Motor, 15hp, 1800rpm, 91.0%	Warehouse	0%	0%	0.00	1.17	1.17	0.28	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
420	Base Fan Motor, 40hp, 1800rpm, 93.0%	Warehouse	0%	0%	0.01	1.15	1.15	0.27	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
422	Variable Speed Drive Control, 40 HP	Warehouse	30%	18%	0.05	1.60	1.12	0.31	20	0	0	0	59.24	10.78	7.60	1.80	1.42
423	Air Handler Tuneups	Warehouse	10%	10%	0.05	1.15	1.04	0.25	8	0	0	0	308.70	1.63	1.01	6.92	1.88
424	Demand Controlled Ventilation	Warehouse	15%	9%	0.12	1.34	1.14	0.29	15	0	0	0	407.02	1.57	1.19	9.78	1.42
500	Base Built-Up Refrigeration System	Warehouse	0%	0%	0.00	2.53	2.53	0.42	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
501	High-efficiency fan motors	Warehouse	12%	12%	0.12	2.69	2.37	0.39	20	0	0	0	159.61	3.68	2.39	5.73	1.54
507	Refrigeration Commissioning	Warehouse	5%	5%	0.02	2.59	2.46	0.41	3	0	0	0	354.48	1.66	1.34	2.15	1.54
517	Oversized Air Cooled Condenser	Warehouse	8%	8%	0.06	2.63	2.42	0.40	16	0	0	0	154.88	3.80	2.62	4.64	1.54

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ \$/KWh	Base EUI	Peak Watts/ \$/KWh	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/KWh	Levelized Cost of Avoided Peak Capacity \$/KWh	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)	Revenue Test
520	Base Self-Contained Refrigeration	Warehouse	0%	0%	0.00	2.53	2.53	0.42	10	0	0	N/A	N/A	N/A	N/A	N/A
600	Base Desktop PC	Warehouse	0%	0%	0.00	0.20	0.20	0.03	4	0	0	N/A	N/A	N/A	N/A	N/A
601	PC Manual Power Management Enabling	Warehouse	65%	45%	0.01	0.24	0.09	0.02	4	2	0	0	125.97	6.69	7.03	0.53
602	PC Network Power Management Enabling	Warehouse	65%	45%	0.01	0.24	0.09	0.02	4	2	0	0	125.97	6.69	7.03	0.53
603	Energy Star or Better PC	Warehouse	31%	25%	0.00	0.20	0.14	0.02	4	1	0	0	163.16	4.73	4.72	0.80
610	Base Monitor, CRT	Warehouse	0%	0%	0.00	0.01	0.01	0.00	4	0	0	N/A	N/A	N/A	N/A	N/A
611	Energy Star or Better Monitor-CRT	Warehouse	53%	42%	0.00	0.01	0.01	0.00	4	0	0	0	124.99	6.18	6.16	0.61
612	Monitor Power Management Enabling--CRT	Warehouse	51%	35%	0.00	0.02	0.01	0.00	4	0	0	0	210.52	4.00	4.21	0.89
620	Base Monitor, LCD	Warehouse	0%	0%	0.00	0.06	0.06	0.01	4	0	0	N/A	N/A	N/A	N/A	N/A
621	Energy Star or Better Monitor--LCD	Warehouse	53%	42%	0.00	0.06	0.03	0.00	4	1	0	0	339.48	2.27	2.27	1.66
622	Monitor Power Management Enabling--LCD	Warehouse	54%	37%	0.01	0.12	0.06	0.01	4	0	0	0	323.73	2.60	2.74	1.37
630	Base Copier	Warehouse	0%	0%	0.00	0.02	0.02	0.00	6	0	0	N/A	N/A	N/A	N/A	N/A
631	Energy Star or Better Copier	Warehouse	19%	15%	0.00	0.02	0.02	0.00	6	0	0	0	174.63	4.42	4.30	1.26
632	Copier Power Management Enabling	Warehouse	19%	13%	0.00	0.03	0.02	0.00	6	0	0	0	984.23	0.86	0.88	6.19
640	Base Laser Printer	Warehouse	0%	0%	0.00	0.03	0.03	0.00	5	0	0	N/A	N/A	N/A	N/A	N/A
641	Printer Power Management Enabling	Warehouse	47%	32%	0.00	0.05	0.03	0.00	5	0	0	0	416.33	2.02	2.10	2.19
650	Base Data Center/Server Room	Warehouse	0%	0%	0.00	27.85	27.85	3.53	10	0	0	N/A	N/A	N/A	N/A	N/A
651	Data Center Improved Operations	Warehouse	19%	13%	0.50	28.95	23.42	3.18	10	0	0	0	141.76	5.94	5.77	1.44
652	Data Center Best Practices	Warehouse	43%	34%	2.50	29.10	16.52	2.44	10	0	0	0	275.78	2.83	2.63	3.16
653	Data Center State of the Art practices	Warehouse	56%	56%	5.00	27.85	12.25	1.55	10	0	0	0	347.44	1.95	1.63	5.11
660	Base Water Heating	Warehouse	0%	0%	0.00	0.07	0.07	0.01	15	0	0	N/A	N/A	N/A	N/A	N/A
661	Demand controlled circulating systems	Warehouse	5%	2%	0.05	0.07	0.07	0.01	15	0	0	1	25906.50	0.05	0.05	234.38
662	High Efficiency Water Heater (electric)	Warehouse	2%	2%	0.01	0.07	0.07	0.01	15	0	0	1	5568.76	0.12	0.10	114.60
663	Hot Water Pipe Insulation	Warehouse	2%	2%	0.03	0.07	0.07	0.01	15	0	0	2	16994.30	0.04	0.03	349.71
664	Tankless Water Heater	Warehouse	10%	10%	0.09	0.07	0.07	0.01	20	0	0	1	7556.15	0.09	0.07	197.17
665	Heat Pump Water Heater (air source)	Warehouse	20%	20%	0.24	0.07	0.06	0.01	15	0	0	2	12846.41	0.05	0.04	264.36
666	Heat Recovery Unit	Warehouse	65%	65%	0.08	0.07	0.03	0.00	10	0	0	0	1930.78	0.36	0.31	27.02
667	Heat Trap	Warehouse	9%	9%	0.02	0.07	0.07	0.01	10	0	0	0	3209.61	0.22	0.18	44.91
668	Solar Water Heater	Warehouse	70%	70%	0.75	0.07	0.02	0.00	20	0	0	1	9051.29	0.08	0.06	236.19
670	Base Vending Machines	Warehouse	0%	0%	0.00	0.10	0.10	0.02	10	0	0	N/A	N/A	N/A	N/A	N/A
671	Vending Misers	Warehouse	10%	7%	0.01	0.10	0.09	0.02	5	0	0	0	1377.32	0.54	0.52	8.85
700	Base Cooking	Warehouse	0%	0%	0.00	0.02	0.02	0.00	10	0	0	N/A	N/A	N/A	N/A	N/A
800	Base Heating	Warehouse	0%	0%	0.00	0.39	0.39	0.00	10	0	0	N/A	N/A	N/A	N/A	N/A
900	Base Miscellaneous	Warehouse	0%	0%	0.00	0.47	0.47	0.08	10	0	0	N/A	N/A	N/A	N/A	N/A
100	Base Fluorescent Fixture, 4L4'T8	School	0%	0%	0.00	3.47	3.47	0.28	18	0	0	N/A	N/A	N/A	N/A	N/A
101	ROB 4L4' Premium T8	School	17%	17%	0.15	3.48	2.88	0.23	10	15	1	0	417.13	2.12	2.11	3.94
102	Delamping 3L4' F32T8	School	25%	25%	0.58	3.47	2.60	0.21	18	9	1	0	651.23	1.36	1.23	10.56
103	LED Troffer (Base 4L4'T8)	School	40%	40%	3.66	3.47	2.08	0.17	20	24	2	0	2368.82	0.37	0.33	41.70
104	Lighting Control Tuneup	School	5%	2%	0.03	3.50	3.32	0.28	6	3	0	0	1494.37	1.57	2.19	2.48
105	Occupancy Sensor, 4L4' Fluorescent Fixtures	School	32%	9%	0.14	3.47	2.37	0.26	18	10	0	0	424.68	5.52	6.66	1.96
106	Continuous Dimming, 4L4' Fluorescent Fixtures	School	55%	16%	0.75	3.47	1.57	0.24	10	10	0	0	2338.21	1.00	1.32	6.28
107	High Performance Lighting R/R - 25% Savings, Base 4L4'T8	School	25%	13%	0.40	3.47	2.59	0.25	20	7	0	0	834.58	1.77	1.89	7.27
110	Base Fluorescent Fixture, 2L4'T8, 1 EB	School	0%	0%	0.00	2.36	2.36	0.19	18	0	0	N/A	N/A	N/A	N/A	N/A
111	ROB 2L4' Premium T8	School	17%	17%	0.09	2.36	1.95	0.16	10	1	0	0	370.75	2.38	2.37	3.50
112	Delamping 1L4' F32T8	School	48%	48%	0.69	2.36	1.23	0.10	18	1	0	0	602.13	1.47	1.34	9.77
113	LED Troffer (Base 2L4'T8)	School	40%	40%	2.80	2.36	1.42	0.12	20	2	0	0	2662.29	0.33	0.29	46.87
114	Lighting Control Tuneup	School	5%	2%	0.01	2.36	2.23	0.19	6	0	0	0	1109.14	2.11	2.95	1.84
115	Occupancy Sensor, 2L4' Fluorescent Fixtures	School	32%	9%	0.14	2.36	1.61	0.17	18	1	0	0	624.35	3.75	4.53	2.88
116	Continuous Dimming, 2L4' Fluorescent Fixtures	School	55%	16%	0.75	2.36	1.07	0.16	10	1	0	0	3437.61	0.68	0.90	9.23
117	High Performance Lighting R/R - 25% Savings, Base 2L4'T8	School	25%	13%	0.40	2.36	1.76	0.17	20	0	0	0	1226.99	1.20	1.28	10.69
120	Base Other Fluorescent Fixture	School	0%	0%	0.00	0.44	0.44	0.04	18	0	0	N/A	N/A	N/A	N/A	N/A
121	ROB Premium T8 (base other fluorescent)	School	17%	17%	0.03	0.44	0.37	0.03	10	0	0	0	741.50	1.19	1.19	7.00
122	Lighting Control Tuneup	School	5%	2%	0.03	0.45	0.43	0.04	6	0	0	0	11585.50	0.20	0.28	19.25
123	Occupancy Sensor, 4L8' Fluorescent Fixtures	School	32%	9%	0.14	0.44	0.30	0.03	18	0	0	0	3319.20	0.71	0.85	15.31
124	Continuous Dimming, 4L8' Fluorescent Fixtures	School	55%	16%	0.75	0.44	0.20	0.03	10	0	0	0	18275.08	0.13	0.17	49.07
125	High Performance Lighting R/R - 25% Savings, Base Other Fluorescent	School	25%	13%	0.40	0.44	0.33	0.03	20	0	0	0	6522.97	0.23	0.24	56.82
130	Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacement	School	0%	0%	0.00	0.11	0.11	0.01	1	0	0	N/A	N/A	N/A	N/A	N/A
131	CFL Screw-in 18W	School	66%	66%	0.00	0.11	0.04	0.00	4	0	0	0	43.35	20.38	21.97	0.17
132	Cold Cathode Lamps	School	66%	66%	0.00	0.11	0.04	0.00	10	0	0	0	40.43	21.85	21.76	0.38
133	LED screw-in PAR replacement (base incandescent)	School	90%	90%	0.04	0.11	0.01	0.00	20	0	0	0	395.57	2.23	1.97	6.96
140	Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacement	School	0%	0%	0.00	0.11	0.11	0.01	18	0	0	N/A	N/A	N/A	N/A	N/A

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Sq Ft	Base EUI	EUI	Peak Watts/ Sq Ft	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/KWH	Levelized Cost of Avoided Peak Capacity \$/KW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)	Revenue Test
141	CFL Hardwired, Modular 18W	School	66%	66%	0.04	0.11	0.04	0.00	18	0	0	0	534.21	1.65	1.51	8.66	1.13
142	Ceramic Metal Halide	School	37%	37%	0.10	0.11	0.07	0.01	18	0	0	0	2268.39	0.39	0.35	36.79	1.13
143	LED fixture replacement (base incandescent flood)	School	90%	90%	0.09	0.11	0.01	0.00	20	0	0	0	816.16	1.08	0.95	14.37	1.13
150	Base CFL to screw-in replacement	School	0%	0%	0.00	1.43	1.43	0.12	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
151	LED screw-in replacement (base CFL)	School	68%	68%	1.92	1.43	0.47	0.04	20	1	0	0	1782.24	0.50	0.44	31.38	1.13
160	Base High Bay Metal Halide, 400W	School	0%	0%	1.16	3.52	3.52	0.29	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
161	High Bay T5	School	49%	49%	0.40	3.52	1.81	0.15	18	1	0	0	230.91	3.83	3.48	3.74	1.13
162	Induction High Bay Lighting	School	37%	37%	1.25	3.52	2.20	0.18	32	1	0	0	654.15	1.03	0.91	15.15	1.13
163	PSMH + electronic ballast	School	37%	37%	0.95	4.65	2.94	0.24	18	0	0	0	545.50	1.62	1.47	8.85	1.13
165	Occupancy Sensor, High Bay T5	School	21%	6%	0.14	3.66	2.89	0.28	18	0	0	0	603.86	3.88	4.68	2.79	0.86
180	Base Parking Garage Metal Halide, 250 W	School	0%	0%	0.00	0.00	0.00	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
185	Base Fluorescent Parking Garage Lighting	School	0%	0%	0.00	0.00	0.00	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
190	Base Exit Sign	School	0%	0%	0.00	0.01	0.01	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
191	LED Exit Sign	School	81%	81%	0.01	0.02	0.00	0.00	18	0	0	0	608.99	1.89	1.93	6.74	1.01
200	Base Outdoor High Pressure Sodium 250W Lamp	School	0%	0%	0.09	0.84	0.84	0.08	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
201	Outdoor Lighting Controls (Photocell/Timeclock)	School	22%	6%	0.02	0.92	0.72	0.09	18	3	0	0	345.20	6.31	7.53	1.73	0.87
202	LED Outdoor Area Lighting	School	52%	52%	0.27	0.84	0.41	0.04	9	13	1	0	923.60	0.83	0.78	9.84	1.23
203	Bi-Level LED Outdoor Lighting	School	68%	70%	1.02	0.84	0.27	0.03	9	8	1	0	2562.82	0.30	0.28	27.81	1.24
300	Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	School	0%	0%	1.50	1.24	1.24	0.34	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
301	Centrifugal Chiller, 0.51 kW/ton, 500 tons	School	12%	12%	0.19	1.29	1.13	0.31	20	1	0	0	327.40	1.46	0.71	19.21	2.04
302	Window Film (Standard) - Chiller	School	2%	2%	0.07	1.26	1.23	0.33	10	0	0	0	1577.67	0.30	0.17	49.63	2.04
303	EMS - Chiller	School	10%	10%	0.15	1.34	1.21	0.33	15	0	0	0	384.86	1.24	0.66	17.80	2.04
306	VSD for Chiller Pumps and Towers	School	10%	10%	0.11	1.36	1.22	0.33	15	0	0	0	266.71	1.79	0.95	12.34	2.04
310	Duct/Pipe Insulation - Chiller	School	2%	2%	0.77	1.25	1.23	0.33	10	0	0	4	15564.11	0.03	0.02	489.64	2.04
311	High Efficiency Chiller Motors	School	3%	3%	0.06	1.25	1.21	0.33	20	0	0	0	441.54	1.08	0.53	25.90	2.04
320	Base DX Packaged System, EER=10.3, 10 tons	School	0%	0%	3.97	2.15	2.15	0.58	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
321	DX Tune Up/ Advanced Diagnostics	School	4%	4%	0.13	2.22	2.12	0.58	10	0	0	0	814.45	0.65	0.42	20.00	1.76
322	aged System, EER=10.3, 10 tons, with Automated Fault Detection and Die	School	10%	10%	0.10	2.15	1.93	0.52	20	2	1	0	126.46	3.78	1.85	7.42	2.04
323	DX Packaged System, EER=10.9, 10 tons	School	6%	6%	0.38	2.15	2.03	0.55	20	2	1	0	861.53	0.55	0.27	50.54	2.04
324	DX Packaged System, EER=13.4, 10 tons	School	23%	23%	0.55	2.15	1.65	0.45	20	8	2	0	303.26	1.57	0.77	17.79	2.04
325	Window Film (Standard) - DX	School	2%	2%	0.07	2.18	2.14	0.58	10	0	0	0	909.22	0.53	0.29	28.60	2.04
326	Prog. Thermostat - DX	School	4%	3%	0.05	2.17	2.08	0.57	8	1	0	0	489.01	1.11	0.76	9.18	1.69
330	Optimize Controls - DX	School	4%	3%	0.04	2.21	2.12	0.58	5	0	0	0	590.16	0.92	0.65	7.04	1.69
331	Economizer - DX	School	8%	6%	0.43	2.30	2.11	0.58	15	1	0	0	1062.67	0.51	0.32	35.95	1.69
332	Aerosol Duct Sealing - DX	School	7%	7%	0.04	2.15	2.00	0.54	15	1	0	0	102.32	4.67	2.46	4.73	2.04
333	Ceiling/roof Insulation - DX	School	12%	12%	0.12	2.44	2.14	0.58	20	0	0	0	109.92	4.34	2.13	6.45	2.04
334	Duct/Pipe Insulation - DX	School	2%	2%	0.65	2.15	2.11	0.57	10	0	0	2	7650.26	0.06	0.03	240.68	2.04
335	DX Coil Cleaning	School	5%	5%	0.03	2.19	2.09	0.57	5	1	0	0	302.20	1.58	0.93	4.93	2.04
337	Geothermal Heat Pump, EER=13, 10 tons - DX	School	37%	37%	2.64	2.15	1.36	0.37	15	1	0	0	1139.92	0.42	0.22	52.74	2.04
340	Base PTAC, EER=8.3, 1 ton	School	0%	0%	2.27	0.00	0.00	0.00	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
400	Base Fan Motor, 5hp, 1800rpm, 87.5%	School	0%	0%	0.02	1.17	1.17	0.14	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
401	Fan Motor, 5hp, 1800rpm, 89.5%	School	2%	2%	0.01	1.18	1.15	0.14	20	0	0	0	170.92	4.04	3.04	4.50	1.33
402	Variable Speed Drive Control, 5 HP	School	27%	18%	0.14	1.25	0.91	0.12	15	3	0	0	488.13	1.81	1.72	6.78	1.13
410	Base Fan Motor, 15hp, 1800rpm, 91.0%	School	0%	0%	0.03	1.09	1.09	0.13	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
411	Fan Motor, 15hp, 1800rpm, 92.4%	School	2%	2%	0.01	1.09	1.07	0.13	20	0	0	0	295.13	2.34	1.76	7.78	1.33
412	Variable Speed Drive Control, 15 HP	School	27%	18%	0.17	1.12	0.81	0.11	20	5	0	0	509.20	1.73	1.53	8.96	1.13
413	Electronically Commutated Motors (ECM) on an Air Handler Unit	School	13%	9%	0.07	1.09	0.95	0.12	15	2	0	0	591.64	1.49	1.42	8.21	1.13
414	Energy Recovery Ventilation (ERV)	School	7%	7%	0.34	1.09	1.01	0.12	20	1	0	0	2736.60	0.25	0.19	72.11	1.33
420	Base Fan Motor, 40hp, 1800rpm, 93.0%	School	0%	0%	0.00	1.06	1.06	0.13	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
423	Air Handler Tuneups	School	10%	10%	0.05	1.06	0.96	0.12	8	1	0	0	649.24	1.06	0.93	7.48	1.33
424	Demand Controlled Ventilation	School	13%	9%	0.12	1.08	0.93	0.12	15	2	0	0	982.98	0.90	0.85	13.65	1.13
500	Base Built-Up Refrigeration System	School	0%	0%	0.00	0.55	0.55	0.07	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
505	Compressor VSD retrofit	School	6%	3%	0.04	0.55	0.51	0.07	13	0	0	0	2040.60	0.52	0.55	18.90	1.04
507	Refrigeration Commissioning	School	5%	5%	0.02	0.56	0.53	0.07	3	0	0	0	2180.83	0.31	0.29	9.92	1.34
508	Demand Hot Gas Defrost	School	3%	3%	0.00	0.55	0.53	0.07	10	0	0	0	260.55	2.62	2.21	3.75	1.34
511	Freezer-Cooler Replacement Gaskets (built-up systems)	School	7%	7%	0.00	0.57	0.53	0.07	4	0	0	0	55.58	12.29	11.23	0.33	1.34
513	Bi-level LED Case Lighting (built-up systems)	School	1%	1%	0.02	0.55	0.54	0.07	10	0	0	0	5010.83	0.16	0.15	55.25	1.20
514	Fiber Optic Case Lighting (built-up systems)	School	25%	25%	0.02	0.55	0.41	0.05	10	0	0	0	147.56	4.63	3.91	2.13	1.34
517	Oversized Air Cooled Condenser	School	8%	8%	0.06	0.57	0.53	0.07	16	0	0	0	952.82	0.72	0.57	21.37	1.34
520	Base Self-Contained Refrigeration	School	0%	0%	0.00	0.48	0.48	0.06	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
521	Strip curtains for walk-ins	School	1%	1%	0.01	0.48	0.48	0.06	4	0	0	1	4943.50	0.14	0.13	29.75	1.34

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Sq Ft	Base EUI	EUI	Peak Watts/ Sq Ft	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/KWH	Levelized Cost of Avoided Peak Capacity \$/KW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)	Revenue Test
522	Night covers for display cases (self-contained)	School	1%	0%	0.00	0.48	0.48	0.06	5	0	0	0	N/A	10.76	17.44	0.26	0.74
523	Freezer-Cooler Replacement Gaskets (self-contained)	School	3%	3%	0.00	0.49	0.48	0.06	4	0	0	0	21.07	32.43	29.62	0.13	1.34
524	Bi-level LED Case Lighting (self-contained units)	School	1%	1%	0.00	0.48	0.48	0.06	10	0	0	0	718.09	1.11	1.05	7.92	1.20
526	Energy-Star Refrigerator, solid door	School	3%	3%	0.00	0.49	0.48	0.06	10	0	0	0	40.69	16.79	14.16	0.59	1.34
527	Energy-Star Freezer, solid door	School	2%	2%	0.00	0.49	0.48	0.06	10	0	0	0	121.36	5.63	4.75	1.75	1.34
528	Energy-Star Refrigerator, glass door	School	3%	3%	0.00	0.49	0.48	0.06	10	0	0	0	0.66	1,036.20	873.88	0.01	1.34
529	Energy-Star Freezer, glass door	School	4%	4%	0.00	0.49	0.47	0.06	10	0	0	0	5.93	115.17	97.13	0.09	1.34
530	Energy Star Ice Machines	School	2%	2%	0.00	0.49	0.48	0.06	10	0	0	0	9.62	71.05	59.92	0.14	1.34
600	Base Desktop PC	School	0%	0%	0.00	0.26	0.26	0.02	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
601	PC Manual Power Management Enabling	School	66%	45%	0.01	0.31	0.11	0.01	4	3	0	0	245.09	5.56	7.10	0.53	0.96
602	PC Network Power Management Enabling	School	66%	45%	0.01	0.31	0.11	0.01	4	3	0	0	245.09	5.56	7.10	0.53	0.96
603	Energy Star or Better PC	School	31%	25%	0.00	0.27	0.19	0.01	4	2	0	0	303.03	4.03	4.97	0.75	0.99
610	Base Monitor, CRT	School	0%	0%	0.00	0.00	0.00	0.00	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
611	Energy Star or Better Monitor-CRT	School	53%	42%	0.00	0.00	0.00	0.00	4	0	0	0	1395.89	0.87	1.08	3.48	0.99
612	Monitor Power Management Enabling--CRT	School	51%	35%	0.00	0.00	0.00	0.00	4	0	0	0	1901.86	0.72	0.92	4.10	0.96
620	Base Monitor, LCD	School	0%	0%	0.00	0.07	0.07	0.00	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
621	Energy Star or Better Monitor--LCD	School	53%	42%	0.00	0.07	0.03	0.00	4	1	0	0	611.37	2.00	2.47	1.52	0.99
622	Monitor Power Management Enabling--LCD	School	54%	37%	0.01	0.13	0.06	0.01	4	0	0	0	656.71	2.08	2.65	1.42	0.96
630	Base Copier	School	0%	0%	0.00	0.01	0.01	0.00	6	0	0	N/A	N/A	N/A	N/A	N/A	N/A
631	Energy Star or Better Copier	School	19%	15%	0.00	0.01	0.01	0.00	6	0	0	0	314.17	3.89	4.68	1.16	0.99
632	Copier Power Management Enabling	School	19%	13%	0.00	0.01	0.01	0.00	6	0	0	0	1916.86	0.71	0.89	6.13	0.96
640	Base Laser Printer	School	0%	0%	0.00	0.01	0.01	0.00	5	0	0	N/A	N/A	N/A	N/A	N/A	N/A
641	Printer Power Management Enabling	School	47%	32%	0.00	0.02	0.01	0.00	5	0	0	0	851.93	1.60	2.02	2.28	0.96
650	Base Data Center/Server Room	School	0%	0%	0.00	101.77	101.77	6.61	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
651	Data Center Improved Operations	School	19%	13%	0.50	105.85	85.46	5.97	10	0	0	0	75.57	18.04	21.27	0.39	0.96
652	Data Center Best Practices	School	43%	34%	2.50	106.40	60.12	4.58	10	0	0	0	147.01	8.43	9.65	0.86	0.99
653	Data Center State of the Art practices	School	56%	56%	5.00	101.77	44.78	2.91	10	0	0	0	185.26	5.56	5.94	1.40	1.06
660	Base Water Heating	School	0%	0%	0.00	0.23	0.23	0.01	15	0	0	N/A	N/A	N/A	N/A	N/A	N/A
661	Demand controlled circulating systems	School	4%	2%	0.01	0.23	0.22	0.01	15	0	0	0	4330.55	0.45	0.55	21.08	0.88
662	High Efficiency Water Heater (electric)	School	2%	2%	0.00	0.23	0.22	0.01	15	0	0	0	1249.50	0.93	0.99	11.74	1.01
663	Hot Water Pipe Insulation	School	2%	2%	0.01	0.23	0.23	0.01	15	0	0	0	3744.55	0.31	0.33	35.19	1.01
664	Tankless Water Heater	School	10%	10%	0.03	0.23	0.20	0.01	20	0	0	0	1695.43	0.68	0.68	20.20	1.01
665	Heat Pump Water Heater (air source)	School	20%	20%	0.08	0.23	0.18	0.01	15	0	0	0	2882.44	0.40	0.43	27.09	1.01
666	Heat Recovery Unit	School	65%	65%	0.08	0.23	0.08	0.00	10	0	0	0	1358.47	0.85	0.96	8.68	1.01
667	Heat Trap	School	9%	9%	0.01	0.23	0.21	0.01	10	0	0	0	720.16	1.61	1.80	4.60	1.01
668	Solar Water Heater	School	70%	70%	0.24	0.23	0.07	0.00	20	0	0	0	2030.90	0.57	0.57	24.20	1.01
670	Base Vending Machines	School	0%	0%	0.00	0.14	0.14	0.01	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
671	Vending Misers	School	10%	7%	0.01	0.14	0.13	0.01	5	0	0	0	4014.12	0.39	0.50	9.16	0.93
700	Base Cooking	School	0%	0%	0.00	0.19	0.19	0.01	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
701	Convection Oven	School	5%	5%	0.02	0.19	0.18	0.01	10	0	0	0	7719.26	0.21	0.25	32.86	0.92
704	Energy Star Hot Food Holding Cabinets	School	14%	14%	0.03	0.19	0.17	0.01	10	1	0	0	4110.17	0.39	0.47	17.49	0.92
800	Base Heating	School	0%	0%	0.00	0.22	0.22	0.00	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
900	Base Miscellaneous	School	0%	0%	0.00	0.28	0.28	0.02	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
100	Base Fluorescent Fixture, 4L4'T8	College	0%	0%	0.00	8.92	8.92	1.78	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	ROB 4L4' Premium T8	College	17%	17%	0.27	8.92	7.39	1.48	7	14	3	0	166.29	3.24	2.24	2.77	1.70
102	Delamping 3L4' F32T8	College	25%	25%	1.07	8.92	6.69	1.34	18	8	2	0	190.82	2.83	1.71	7.61	1.70
103	LED Troffer (Base 4L4'T8)	College	40%	40%	6.77	8.92	5.35	1.07	14	23	5	0	910.39	0.59	0.38	29.19	1.70
104	Lighting Control Tuneup	College	5%	2%	0.03	8.92	8.46	1.76	6	3	0	0	238.60	4.68	5.47	0.99	1.02
105	Occupancy Sensor, 4L4' Fluorescent Fixtures	College	31%	9%	0.14	8.92	6.15	1.62	18	9	1	0	67.19	16.63	16.80	0.78	1.02
106	Continuous Dimming, 4L4' Fluorescent Fixtures	College	54%	16%	0.75	8.92	4.12	1.51	10	9	1	0	369.93	3.02	3.34	2.49	1.02
107	High Performance Lighting R/R - 25% Savings, Base 4L4'T8	College	25%	13%	0.40	8.92	6.67	1.56	20	6	1	0	132.04	5.91	4.84	2.83	1.22
110	Base Fluorescent Fixture, 2L4'T8, 1 EB	College	0%	0%	0.00	5.73	5.73	1.15	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
111	ROB 2L4' Premium T8	College	17%	17%	0.16	5.81	4.81	0.96	7	13	3	0	145.37	3.71	2.57	2.42	1.70
112	Delamping 1L4' F32T8	College	48%	48%	1.21	5.73	2.98	0.60	18	15	3	0	176.44	3.06	1.85	7.03	1.70
113	LED Troffer (Base 2L4'T8)	College	40%	40%	4.89	5.73	3.44	0.69	14	22	4	0	1023.18	0.53	0.34	32.81	1.70
114	Lighting Control Tuneup	College	5%	2%	0.01	5.73	5.43	1.13	6	3	0	0	185.84	6.01	7.02	0.77	1.02
115	Occupancy Sensor, 2L4' Fluorescent Fixtures	College	31%	9%	0.14	5.73	3.95	1.04	18	9	0	0	104.61	10.68	10.79	1.21	1.02
116	Continuous Dimming, 2L4' Fluorescent Fixtures	College	54%	16%	0.75	5.73	2.64	0.97	10	9	1	0	575.98	1.94	2.14	3.87	1.02
117	High Performance Lighting R/R - 25% Savings, Base 2L4'T8	College	25%	13%	0.40	5.73	4.28	1.00	20	6	1	0	205.59	3.79	3.11	4.41	1.22
120	Base Other Fluorescent Fixture	College	0%	0%	0.00	2.83	2.83	0.56	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
121	ROB Premium T8 (base other fluorescent)	College	17%	17%	0.15	3.26	2.70	0.54	7	0	0	0	255.21	2.11	1.46	4.24	1.70

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Sq Ft	Base EUI	EUI	Peak Watts/ Sq Ft	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/KWH	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)	Revenue Test
122	Lighting Control Tuneup	College	5%	2%	0.03	2.83	2.68	0.56	6	0	0	0	752.59	1.49	1.73	3.13	1.02
123	Occupancy Sensor, 4L8' Fluorescent Fixtures	College	31%	9%	0.14	2.83	1.95	0.51	18	0	0	0	212.09	5.27	5.32	2.45	1.02
124	Continuous Dimming, 4L8' Fluorescent Fixtures	College	54%	16%	0.75	2.83	1.30	0.48	10	1	0	0	1167.73	0.96	1.06	7.85	1.02
125	High Performance Lighting R/R - 25% Savings, Base Other Fluorescent	College	25%	13%	0.40	2.83	2.11	0.49	20	0	0	0	416.80	1.87	1.53	8.93	1.22
130	Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacement	College	0%	0%	0.00	3.25	3.25	0.65	1	0	0	N/A	N/A	N/A	N/A	N/A	N/A
131	CFL Screw-in 18W	College	66%	66%	0.02	3.25	1.10	0.22	3	1	0	0	17.50	30.82	22.47	0.13	1.70
132	Cold Cathode Lamps	College	66%	66%	0.04	3.25	1.10	0.22	7	0	0	0	16.07	33.56	23.22	0.27	1.70
133	LED screw-in PAR replacement (base incandescent)	College	89%	90%	0.92	3.25	0.34	0.07	14	2	0	0	152.03	3.55	2.28	4.87	1.70
140	Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacement	College	0%	0%	0.00	3.25	3.25	0.65	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
141	CFL Hardwired, Modular 18W	College	66%	66%	0.84	3.25	1.10	0.22	18	1	0	0	156.54	3.45	2.09	6.24	1.70
142	Ceramic Metal Halide	College	37%	37%	2.02	3.26	2.05	0.41	18	1	0	0	664.69	0.81	0.49	26.50	1.70
143	LED fixture replacement (base incandescent flood)	College	89%	90%	1.90	3.25	0.34	0.07	14	2	0	0	313.67	1.72	1.10	10.06	1.70
150	Base CFL to screw-in replacement	College	0%	0%	0.00	1.40	1.40	0.28	3	0	0	N/A	N/A	N/A	N/A	N/A	N/A
151	LED screw-in replacement (base CFL)	College	67%	68%	1.35	1.40	0.46	0.09	14	1	0	0	684.96	0.79	0.51	21.96	1.70
160	Base High Bay Metal Halide, 400W	College	0%	0%	3.45	14.51	14.51	2.90	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
161	High Bay T5	College	49%	49%	1.19	14.51	7.46	1.49	18	3	1	0	67.66	7.97	4.83	2.70	1.70
162	Induction High Bay Lighting	College	37%	37%	3.71	14.51	9.09	1.82	32	2	0	0	191.68	2.14	1.26	10.91	1.70
163	PSMH + electronic ballast	College	37%	37%	2.83	14.51	9.18	1.84	13	2	0	0	281.98	1.91	1.24	8.44	1.70
165	Occupancy Sensor, High Bay T5	College	21%	6%	0.14	15.07	11.95	2.83	18	0	0	0	59.63	18.74	18.93	0.69	1.02
180	Base Parking Garage Metal Halide, 250 W	College	0%	0%	0.00	0.12	0.12	0.02	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
181	High-efficiency fluorescent parking garage fixture (Base MH)	College	62%	62%	0.02	0.12	0.04	0.01	18	0	0	0	82.84	6.51	3.95	3.30	1.70
182	Bi-Level LED Parking Garage Fixtures (Base MH)	College	62%	31%	0.03	0.13	0.05	0.02	5	0	0	0	1058.14	0.73	0.72	6.41	1.23
185	Base Fluorescent Parking Garage Lighting	College	0%	0%	0.00	0.00	0.00	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
190	Base Exit Sign	College	0%	0%	0.00	0.02	0.02	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
191	LED Exit Sign	College	81%	81%	0.01	0.04	0.01	0.00	18	0	0	0	117.93	4.85	3.16	4.12	1.58
200	Base Outdoor High Pressure Sodium 250W Lamp	College	0%	0%	0.09	0.79	0.79	0.02	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
201	Outdoor Lighting Controls (Photocell/Timeclock)	College	23%	6%	0.00	0.87	0.67	0.02	18	2	0	0	286.65	27.97	37.31	0.35	0.77
202	LED Outdoor Area Lighting	College	52%	52%	0.05	0.79	0.38	0.01	9	6	0	0	769.15	2.82	3.75	2.05	0.87
203	Bi-Level LED Outdoor Lighting	College	68%	70%	0.20	0.79	0.25	0.01	9	4	0	0	2134.26	1.00	1.33	5.81	0.87
300	Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	College	0%	0%	1.59	2.53	2.53	1.24	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
301	Centrifugal Chiller, 0.51 kW/ton, 500 tons	College	12%	12%	0.20	2.63	2.31	1.13	20	4	2	0	94.00	4.25	1.37	9.98	3.09
303	EMS - Chiller	College	10%	10%	0.16	2.53	2.27	1.11	15	5	2	0	119.71	3.34	1.16	10.02	3.09
320	Base DX Packaged System, EER=10.3, 10 tons	College	0%	0%	4.20	4.38	4.38	2.15	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
321	DX Tune Up/ Advanced Diagnostics	College	5%	4%	0.13	4.59	4.36	2.17	10	0	0	0	217.98	2.02	0.96	8.68	2.39
322	aged System, EER=10.3, 10 tons, with Automated Fault Detection and Die	College	10%	10%	0.11	4.38	3.94	1.93	20	0	0	0	36.31	11.01	3.56	3.85	3.09
323	DX Packaged System, EER=10.9, 10 tons	College	6%	6%	0.40	4.38	4.14	2.03	20	0	0	0	247.36	1.62	0.52	26.25	3.09
324	DX Packaged System, EER=13.4, 10 tons	College	23%	23%	0.58	4.38	3.37	1.65	20	0	0	0	87.07	4.59	1.48	9.24	3.09
325	Window Film (Standard) - DX	College	1%	1%	0.18	4.39	4.34	2.13	10	0	0	0	1014.13	0.39	0.14	57.71	3.09
326	Prog. Thermostat - DX	College	5%	3%	0.05	4.58	4.35	2.18	8	0	0	0	135.45	3.46	1.91	3.65	2.11
330	Optimize Controls - DX	College	5%	3%	0.04	4.53	4.30	2.16	5	0	0	0	158.85	2.95	1.69	2.72	2.11
331	Economizer - DX	College	10%	6%	0.45	4.71	4.22	2.17	15	0	0	0	303.34	1.55	0.79	14.75	2.11
332	Aerosol Duct Sealing - DX	College	7%	7%	0.05	4.58	4.26	2.09	15	0	0	0	28.08	14.23	4.96	2.35	3.09
334	Duct/Pipe Insulation - DX	College	2%	2%	0.65	4.44	4.35	2.13	10	0	0	1	2045.65	0.20	0.07	116.41	3.09
335	DX Coil Cleaning	College	5%	5%	0.03	4.53	4.31	2.11	5	0	0	0	85.68	4.66	1.82	2.53	3.09
337	Geothermal Heat Pump, EER=13, 10 tons - DX	College	37%	37%	2.12	4.39	2.77	1.36	15	0	0	0	247.96	1.61	0.56	20.75	3.09
340	Base PTAC, EER=8.3, 1 ton	College	0%	0%	4.20	0.00	0.00	0.00	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
400	Base Fan Motor, 5hp, 1800rpm, 87.5%	College	0%	0%	0.01	2.65	2.65	0.64	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
401	Fan Motor, 5hp, 1800rpm, 89.5%	College	2%	2%	0.00	2.66	2.60	0.63	20	1	0	0	14.29	34.89	18.33	0.75	1.90
402	Variable Speed Drive Control, 5 HP	College	29%	18%	0.05	2.73	1.93	0.54	15	16	2	0	42.26	14.65	10.82	1.08	1.46
410	Base Fan Motor, 15hp, 1800rpm, 91.0%	College	0%	0%	0.01	2.45	2.45	0.59	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
414	Energy Recovery Ventilation (ERV)	College	7%	7%	0.26	2.59	2.40	0.58	20	1	0	0	430.99	1.16	0.61	22.56	1.90
420	Base Fan Motor, 40hp, 1800rpm, 93.0%	College	0%	0%	0.02	2.40	2.40	0.58	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
421	Fan Motor, 40hp, 1800rpm, 94.1%	College	1%	1%	0.01	2.42	2.39	0.58	20	0	0	0	59.04	8.44	4.44	3.09	1.90
423	Air Handler Tuneups	College	10%	10%	0.05	2.40	2.16	0.52	8	2	0	0	144.79	3.44	2.11	3.31	1.90
424	Demand Controlled Ventilation	College	15%	9%	0.12	2.40	2.05	0.53	15	7	1	0	222.15	2.79	2.06	5.67	1.46
500	Base Built-Up Refrigeration System	College	0%	0%	0.00	0.55	0.55	0.07	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
501	High-efficiency fan motors	College	12%	12%	0.01	0.55	0.48	0.07	20	0	0	0	120.07	5.43	3.90	3.52	1.39
507	Refrigeration Commissioning	College	5%	5%	0.00	0.56	0.53	0.07	3	0	0	0	250.06	2.61	2.32	1.24	1.39
511	Freezer-Cooler Replacement Gaskets (built-up systems)	College	7%	7%	0.00	0.57	0.53	0.07	4	0	0	0	83.06	7.85	6.89	0.54	1.39
513	Bi-level LED Case Lighting (built-up systems)	College	1%	1%	0.03	0.55	0.54	0.07	10	0	0	1	7488.06	0.10	0.09	90.46	1.24
514	Fiber Optic Case Lighting (built-up systems)	College	24%	25%	0.03	0.55	0.41	0.06	10	0	0	0	220.51	2.96	2.40	3.46	1.39

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Sq Ft	Base EUI	EUI	Peak Watts/ Sq Ft	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/KWH	Levelized Cost of Avoided Peak Capacity \$/KW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)	Revenue Test
517	Oversized Air Cooled Condenser	College	8%	8%	0.01	0.57	0.53	0.07	16	0	0	0	109.25	5.97	4.56	2.67	1.39
520	Base Self-Contained Refrigeration	College	0%	0%	0.00	0.55	0.55	0.07	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
600	Base Desktop PC	College	0%	0%	0.00	0.09	0.09	0.01	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
601	PC Manual Power Management Enabling	College	66%	45%	0.00	0.11	0.04	0.01	4	1	0	0	99.73	7.40	7.16	0.52	1.26
602	PC Network Power Management Enabling	College	66%	45%	0.00	0.11	0.04	0.01	4	1	0	0	99.73	7.40	7.16	0.52	1.26
603	Energy Star or Better PC	College	31%	25%	0.00	0.09	0.06	0.01	4	1	0	0	121.66	5.58	5.07	0.74	1.35
610	Base Monitor, CRT	College	0%	0%	0.00	0.01	0.01	0.00	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
611	Energy Star or Better Monitor-CRT	College	53%	42%	0.00	0.01	0.01	0.00	4	0	0	0	23.73	28.60	25.97	0.14	1.35
612	Monitor Power Management Enabling--CRT	College	52%	35%	0.00	0.01	0.01	0.00	4	0	0	0	47.28	15.61	15.10	0.25	1.26
620	Base Monitor, LCD	College	0%	0%	0.00	0.02	0.02	0.00	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
621	Energy Star or Better Monitor--LCD	College	53%	42%	0.00	0.03	0.01	0.00	4	0	0	0	243.67	2.79	2.53	1.48	1.35
622	Monitor Power Management Enabling--LCD	College	54%	37%	0.00	0.04	0.02	0.00	4	0	0	0	298.18	2.47	2.39	1.57	1.26
630	Base Copier	College	0%	0%	0.00	0.00	0.00	0.00	6	0	0	N/A	N/A	N/A	N/A	N/A	N/A
631	Energy Star or Better Copier	College	20%	15%	0.00	0.01	0.00	0.00	6	0	0	0	135.94	4.99	4.43	1.23	1.35
632	Copier Power Management Enabling	College	19%	13%	0.00	0.01	0.00	0.00	6	0	0	0	805.38	0.92	0.87	6.28	1.26
640	Base Laser Printer	College	0%	0%	0.00	0.01	0.01	0.00	5	0	0	N/A	N/A	N/A	N/A	N/A	N/A
641	Printer Power Management Enabling	College	48%	32%	0.00	0.01	0.01	0.00	5	0	0	0	465.97	1.58	1.51	3.04	1.26
650	Base Data Center/Server Room	College	0%	0%	0.00	80.84	80.84	12.89	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
651	Data Center Improved Operations	College	19%	13%	0.50	84.10	67.79	11.64	10	0	0	0	38.75	19.05	17.01	0.49	1.26
652	Data Center Best Practices	College	44%	34%	2.50	84.53	47.59	8.93	10	0	0	0	75.39	9.11	7.71	1.08	1.33
653	Data Center State of the Art practices	College	56%	56%	5.00	80.84	35.57	5.67	10	0	0	0	95.02	6.31	4.72	1.76	1.51
660	Base Water Heating	College	0%	0%	0.00	0.26	0.26	0.05	15	0	0	N/A	N/A	N/A	N/A	N/A	N/A
661	Demand controlled circulating systems	College	4%	2%	0.00	0.26	0.25	0.05	15	0	0	0	451.27	1.82	1.67	6.99	1.18
662	High Efficiency Water Heater (electric)	College	2%	2%	0.00	0.26	0.25	0.05	15	0	0	0	324.76	1.72	1.14	10.25	1.63
663	Hot Water Pipe Insulation	College	2%	2%	0.01	0.26	0.25	0.05	15	0	0	0	992.50	0.56	0.37	31.33	1.63
664	Tankless Water Heater	College	10%	10%	0.03	0.26	0.23	0.04	20	0	0	0	441.68	1.26	0.78	17.68	1.63
665	Heat Pump Water Heater (air source)	College	20%	20%	0.08	0.26	0.21	0.04	15	0	0	0	750.92	0.74	0.49	23.70	1.63
666	Heat Recovery Unit	College	65%	65%	0.08	0.26	0.09	0.02	10	0	0	0	353.90	1.58	1.09	7.60	1.63
667	Heat Trap	College	9%	9%	0.01	0.26	0.24	0.04	10	0	0	0	187.61	2.98	2.06	4.03	1.63
670	Base Vending Machines	College	0%	0%	0.00	0.13	0.13	0.02	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
700	Base Cooking	College	0%	0%	0.00	0.34	0.34	0.06	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
701	Convection Oven	College	0%	0%	0.05	0.34	0.34	0.06	10	0	0	8	43860.68	0.01	0.01	948.80	1.64
800	Base Heating	College	0%	0%	0.00	1.03	1.03	0.09	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
900	Base Miscellaneous	College	0%	0%	0.00	0.54	0.54	0.09	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
100	Base Fluorescent Fixture, 4L4'T8	Health	0%	0%	0.00	6.06	6.06	0.87	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	ROB 4L4' Premium T8	Health	17%	17%	0.11	6.06	5.02	0.72	4	7	1	0	227.26	2.78	2.38	1.58	1.43
102	Delamping 3L4' F32T8	Health	25%	25%	0.44	6.06	4.54	0.65	18	4	1	0	162.68	3.89	2.80	4.65	1.43
103	LED Troffer (Base 4L4'T8)	Health	40%	40%	2.81	6.06	3.63	0.52	9	11	2	0	1237.93	0.51	0.41	18.77	1.43
104	Lighting Control Tuneup	Health	5%	2%	0.03	6.06	5.75	0.86	6	1	0	0	489.66	2.93	3.71	1.47	0.94
105	Occupancy Sensor, 4L4' Fluorescent Fixtures	Health	31%	9%	0.14	6.06	4.18	0.79	18	4	0	0	137.86	10.41	11.39	1.15	0.94
106	Continuous Dimming, 4L4' Fluorescent Fixtures	Health	54%	16%	0.75	6.06	2.80	0.73	10	1	0	0	759.05	1.89	2.26	3.67	0.94
107	High Performance Lighting R/R - 25% Savings, Base 4L4'T8	Health	26%	13%	0.40	6.06	4.47	0.76	20	3	0	0	270.93	3.66	3.41	4.02	1.07
110	Base Fluorescent Fixture, 2L4'T8, 1 EB	Health	0%	0%	0.00	2.87	2.87	0.41	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
111	ROB 2L4' Premium T8	Health	17%	17%	0.05	2.87	2.38	0.34	4	1	0	0	201.37	3.14	2.68	1.40	1.43
112	Delamping 1L4' F32T8	Health	48%	48%	0.37	2.87	1.49	0.21	18	1	0	0	150.41	4.20	3.03	4.30	1.43
113	LED Troffer (Base 2L4'T8)	Health	40%	40%	1.50	2.87	1.72	0.25	9	1	0	0	1391.29	0.45	0.36	21.09	1.43
114	Lighting Control Tuneup	Health	5%	2%	0.01	2.87	2.72	0.41	6	0	0	0	516.95	2.78	3.51	1.55	0.94
115	Occupancy Sensor, 2L4' Fluorescent Fixtures	Health	31%	9%	0.14	2.87	1.98	0.37	18	0	0	0	291.00	4.93	5.39	2.42	0.94
116	Continuous Dimming, 2L4' Fluorescent Fixtures	Health	54%	16%	0.75	2.87	1.33	0.35	10	0	0	0	1602.19	0.90	1.07	7.75	0.94
117	High Performance Lighting R/R - 25% Savings, Base 2L4'T8	Health	26%	13%	0.40	2.87	2.12	0.36	20	0	0	0	571.88	1.73	1.61	8.49	1.07
120	Base Other Fluorescent Fixture	Health	0%	0%	0.00	2.28	2.28	0.33	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
121	ROB Premium T8 (base other fluorescent)	Health	17%	17%	0.08	2.28	1.89	0.27	4	0	0	0	402.73	1.57	1.34	2.80	1.43
122	Lighting Control Tuneup	Health	5%	2%	0.03	2.35	2.22	0.33	6	0	0	0	1265.06	1.13	1.43	3.79	0.94
123	Occupancy Sensor, 4L8' Fluorescent Fixtures	Health	31%	9%	0.14	2.28	1.58	0.30	18	0	0	0	365.59	3.93	4.29	3.04	0.94
124	Continuous Dimming, 4L8' Fluorescent Fixtures	Health	54%	16%	0.75	2.28	1.06	0.28	10	0	0	0	2012.86	0.71	0.85	9.73	0.94
125	High Performance Lighting R/R - 25% Savings, Base Other Fluorescent	Health	26%	13%	0.40	2.28	1.69	0.29	20	0	0	0	718.46	1.38	1.28	10.67	1.07
130	Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacement	Health	0%	0%	0.00	2.00	2.00	0.29	1	0	0	N/A	N/A	N/A	N/A	N/A	N/A
131	CFL Screw-in 18W	Health	66%	66%	0.01	2.00	0.68	0.10	2	0	0	0	24.22	26.10	22.92	0.09	1.43
132	Cold Cathode Lamps	Health	66%	66%	0.01	2.00	0.68	0.10	4	0	0	0	21.96	28.79	24.59	0.15	1.43
133	LED screw-in PAR replacement (base incandescent)	Health	90%	90%	0.35	2.00	0.21	0.03	9	1	0	0	206.72	3.06	2.46	3.13	1.43
140	Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacement	Health	0%	0%	0.00	2.00	2.00	0.29	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Sq Ft	Base EUI	Peak Watts/ Sq Ft	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/KWH	Levelized Cost of Avoided Peak Capacity \$/KW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)	Revenue Test
141	CFL Hardwired, Modular 18W	Health	66%	66%	0.32	2.00	0.68	0.10	18	0	0	133.45	4.74	3.42	3.82	1.43
142	Ceramic Metal Halide	Health	37%	37%	0.76	2.00	1.26	0.18	18	0	0	566.64	1.12	0.80	16.21	1.43
143	LED fixture replacement (base incandescent flood)	Health	90%	90%	0.71	2.00	0.21	0.03	9	1	0	426.52	1.48	1.19	6.47	1.43
150	Base CFL to screw-in replacement	Health	0%	0%	0.00	0.92	0.92	0.13	2	0	N/A	N/A	N/A	N/A	N/A	N/A
151	LED screw-in replacement (base CFL)	Health	68%	68%	0.55	0.92	0.30	0.04	9	1	0	931.39	0.68	0.54	14.12	1.43
160	Base High Bay Metal Halide, 400W	Health	0%	0%	0.00	0.00	0.00	0.00	18	0	N/A	N/A	N/A	N/A	N/A	N/A
180	Base Parking Garage Metal Halide, 250 W	Health	0%	0%	0.00	0.46	0.46	0.07	18	0	N/A	N/A	N/A	N/A	N/A	N/A
181	High-efficiency fluorescent parking garage fixture (Base MH)	Health	62%	62%	0.06	0.46	0.17	0.02	18	0	0	115.45	5.48	3.95	3.30	1.43
182	Bi-Level LED Parking Garage Fixtures (Base MH)	Health	64%	31%	0.11	0.49	0.18	0.05	5	0	0	1472.73	0.66	0.73	6.27	1.08
185	Base Fluorescent Parking Garage Lighting	Health	0%	0%	0.00	0.00	0.00	0.00	18	0	N/A	N/A	N/A	N/A	N/A	N/A
190	Base Exit Sign	Health	0%	0%	0.00	0.03	0.03	0.00	18	0	N/A	N/A	N/A	N/A	N/A	N/A
191	LED Exit Sign	Health	81%	81%	0.02	0.12	0.02	0.00	18	0	0	162.65	4.29	3.36	3.89	1.32
200	Base Outdoor High Pressure Sodium 250W Lamp	Health	0%	0%	0.04	0.41	0.41	0.02	18	0	N/A	N/A	N/A	N/A	N/A	N/A
201	Outdoor Lighting Controls (Photocell/Timeclock)	Health	23%	6%	0.01	0.45	0.35	0.03	18	0	0	367.90	9.64	12.23	1.07	0.81
202	LED Outdoor Area Lighting	Health	52%	52%	0.08	0.41	0.20	0.01	9	2	0	985.74	1.12	1.25	6.16	1.03
203	Bi-Level LED Outdoor Lighting	Health	68%	70%	0.31	0.41	0.13	0.01	9	1	0	2735.23	0.40	0.44	17.41	1.03
300	Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	Health	0%	0%	1.50	4.13	4.13	1.87	20	0	N/A	N/A	N/A	N/A	N/A	N/A
301	Centrifugal Chiller, 0.51 kW/ton, 500 tons	Health	12%	12%	0.19	4.30	3.78	1.71	20	3	1	58.86	6.93	2.38	5.76	2.91
302	Window Film (Standard) - Chiller	Health	1%	1%	0.05	4.17	4.12	1.86	10	0	0	316.18	1.29	0.50	16.58	2.91
303	EMS - Chiller	Health	10%	10%	0.15	4.56	4.10	1.85	15	0	0	67.98	6.00	2.23	5.24	2.91
305	Chiller Tune Up/Diagnostics	Health	9%	5%	0.10	4.53	4.13	1.95	10	0	0	139.79	3.53	2.06	4.04	1.94
306	VSD for Chiller Pumps and Towers	Health	10%	10%	0.11	4.52	4.07	1.84	15	0	0	47.93	8.51	3.16	3.70	2.91
310	Duct/Pipe Insulation - Chiller	Health	2%	2%	0.77	4.15	4.07	1.84	10	0	1	2811.20	0.15	0.06	147.43	2.91
311	High Efficiency Chiller Motors	Health	3%	3%	0.07	4.19	4.06	1.83	20	0	0	83.02	4.91	1.69	8.12	2.91
320	Base DX Packaged System, EER=10.3, 10 tons	Health	0%	0%	3.97	7.16	7.16	3.24	20	0	N/A	N/A	N/A	N/A	N/A	N/A
321	DX Tune Up/ Advanced Diagnostics	Health	5%	4%	0.13	7.49	7.09	3.26	10	0	0	144.88	3.19	1.67	4.98	2.16
322	aged System, EER=10.3, 10 tons, with Automated Fault Detection and Dis	Health	10%	10%	0.10	7.16	6.45	2.91	20	1	0	22.74	17.94	6.17	2.22	2.91
323	DX Packaged System, EER=10.9, 10 tons	Health	6%	6%	0.38	7.16	6.77	3.06	20	1	0	154.89	2.63	0.90	15.15	2.91
324	DX Packaged System, EER=13.4, 10 tons	Health	23%	23%	0.55	7.16	5.51	2.49	20	3	1	54.52	7.48	2.57	5.33	2.91
325	Window Film (Standard) - DX	Health	1%	1%	0.05	7.19	7.11	3.21	10	0	0	183.32	2.22	0.86	9.61	2.91
326	Prog. Thermostat - DX	Health	6%	3%	0.05	7.48	7.04	3.28	8	0	0	85.06	5.94	3.72	1.88	1.86
330	Optimize Controls - DX	Health	6%	3%	0.04	7.45	7.02	3.27	5	0	0	104.85	4.82	3.12	1.47	1.86
331	Economizer - DX	Health	12%	6%	0.43	7.28	6.43	3.09	15	1	0	201.13	2.51	1.46	8.01	1.86
332	Aerosol Duct Sealing - DX	Health	7%	7%	0.04	7.16	6.66	3.01	15	0	0	18.40	22.17	8.22	1.42	2.91
334	Duct/Pipe Insulation - DX	Health	2%	2%	0.65	7.20	7.06	3.19	10	0	1	1369.08	0.30	0.12	71.80	2.91
337	Geothermal Heat Pump, EER=13, 10 tons - DX	Health	37%	37%	2.77	7.19	4.53	2.05	15	0	0	215.04	1.90	0.70	16.58	2.91
340	Base PTAC, EER=8.3, 1 ton	Health	0%	0%	0.00	2.44	2.44	1.10	20	0	N/A	N/A	N/A	N/A	N/A	N/A
341	HE PTAC, EER=9.6, 1 ton	Health	14%	14%	0.65	2.44	2.11	0.95	20	0	0	320.78	1.27	0.44	31.37	2.91
400	Base Fan Motor, 5hp, 1800rpm, 87.5%	Health	0%	0%	0.02	4.91	4.91	0.87	20	0	N/A	N/A	N/A	N/A	N/A	N/A
401	Fan Motor, 5hp, 1800rpm, 89.5%	Health	2%	2%	0.01	4.94	4.83	0.86	20	0	0	22.84	24.93	15.64	0.88	1.59
402	Variable Speed Drive Control, 5 HP	Health	33%	18%	0.12	4.91	3.29	0.71	15	3	0	69.55	11.36	10.14	1.15	1.21
410	Base Fan Motor, 15hp, 1800rpm, 91.0%	Health	0%	0%	0.01	4.55	4.55	0.81	20	0	N/A	N/A	N/A	N/A	N/A	N/A
411	Fan Motor, 15hp, 1800rpm, 92.4%	Health	2%	2%	0.00	4.61	4.54	0.80	20	0	0	11.43	49.81	31.24	0.44	1.59
412	Variable Speed Drive Control, 15 HP	Health	33%	18%	0.04	6.14	4.12	0.89	20	3	0	15.16	52.10	43.09	0.32	1.21
413	Electronically Commutated Motors (ECM) on an Air Handler Unit	Health	16%	9%	0.12	4.55	3.83	0.74	15	5	0	153.60	5.14	4.59	2.54	1.21
414	Energy Recovery Ventilation (ERV)	Health	7%	7%	0.54	4.55	4.23	0.75	20	2	0	708.79	0.80	0.50	27.21	1.59
420	Base Fan Motor, 40hp, 1800rpm, 93.0%	Health	0%	0%	0.00	4.46	4.46	0.79	20	0	N/A	N/A	N/A	N/A	N/A	N/A
424	Demand Controlled Ventilation	Health	16%	9%	0.12	4.73	3.95	0.76	15	3	0	153.91	5.13	4.58	2.55	1.21
500	Base Built-Up Refrigeration System	Health	0%	0%	0.00	0.54	0.54	0.07	10	0	N/A	N/A	N/A	N/A	N/A	N/A
501	High-efficiency fan motors	Health	12%	12%	0.02	0.54	0.47	0.06	20	0	0	169.92	3.92	2.87	4.78	1.37
505	Compressor VSD retrofit	Health	6%	3%	0.01	0.54	0.50	0.07	13	0	0	331.12	3.09	3.23	3.24	1.06
507	Refrigeration Commissioning	Health	5%	5%	0.00	0.55	0.52	0.07	3	0	0	353.88	1.88	1.71	1.69	1.37
508	Demand Hot Gas Defrost	Health	3%	3%	0.00	0.54	0.52	0.07	10	0	0	42.28	15.75	13.01	0.64	1.37
511	Freezer-Cooler Replacement Gaskets (built-up systems)	Health	7%	7%	0.00	0.56	0.52	0.07	4	0	0	91.17	7.31	6.53	0.57	1.37
513	Bi-level LED Case Lighting (built-up systems)	Health	1%	1%	0.03	0.54	0.53	0.07	10	0	1	8218.98	0.09	0.09	95.59	1.22
514	Fiber Optic Case Lighting (built-up systems)	Health	25%	25%	0.03	0.54	0.41	0.05	10	0	0	242.03	2.75	2.27	3.65	1.37
517	Oversized Air Cooled Condenser	Health	8%	8%	0.01	0.56	0.51	0.07	16	0	0	154.61	4.31	3.35	3.63	1.37
520	Base Self-Contained Refrigeration	Health	0%	0%	0.00	0.67	0.67	0.09	10	0	N/A	N/A	N/A	N/A	N/A	N/A
522	Night covers for display cases (self-contained)	Health	2%	0%	0.00	0.67	0.65	0.09	5	0	0	N/A	12.01	19.47	0.24	0.74
523	Freezer-Cooler Replacement Gaskets (self-contained)	Health	3%	3%	0.00	0.68	0.66	0.09	4	0	0	19.74	33.74	30.17	0.12	1.37
524	Bi-level LED Case Lighting (self-contained units)	Health	1%	1%	0.00	0.67	0.66	0.09	10	0	0	809.93	0.96	0.88	9.42	1.22

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Sq Ft	Base EUI	EUI	Peak Watts/ Sq Ft	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/KWH	Levelized Cost of Avoided Peak Capacity \$/KW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)	Revenue Test
526	Energy-Star Refrigerator, solid door	Health	5%	5%	0.00	0.68	0.64	0.08	10	0	0	0	33.75	19.73	16.30	0.51	1.37
528	Energy-Star Refrigerator, glass door	Health	4%	4%	0.00	0.68	0.65	0.08	10	0	0	0	0.55	1,210.42	999.65	0.01	1.37
530	Energy Star Ice Machines	Health	4%	4%	0.00	0.68	0.65	0.08	10	0	0	0	8.00	83.27	68.77	0.12	1.37
600	Base Desktop PC	Health	0%	0%	0.00	0.74	0.74	0.09	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
601	PC Manual Power Management Enabling	Health	69%	45%	0.02	0.89	0.28	0.06	4	3	0	0	127.23	7.08	7.71	0.49	1.12
602	PC Network Power Management Enabling	Health	69%	45%	0.02	0.89	0.28	0.06	4	3	0	0	127.23	7.08	7.71	0.49	1.12
603	Energy Star or Better PC	Health	32%	25%	0.01	0.75	0.51	0.07	4	2	0	0	164.03	4.97	5.13	0.73	1.19
610	Base Monitor, CRT	Health	0%	0%	0.00	0.04	0.04	0.00	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
611	Energy Star or Better Monitor-CRT	Health	55%	42%	0.00	0.04	0.02	0.00	4	0	0	0	65.49	12.45	12.85	0.29	1.19
612	Monitor Power Management Enabling--CRT	Health	54%	35%	0.00	0.05	0.02	0.00	4	0	0	0	109.38	8.24	8.97	0.42	1.12
620	Base Monitor, LCD	Health	0%	0%	0.00	0.22	0.22	0.03	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
621	Energy Star or Better Monitor--LCD	Health	55%	42%	0.01	0.22	0.10	0.02	4	1	0	0	329.11	2.48	2.56	1.47	1.19
622	Monitor Power Management Enabling--LCD	Health	57%	37%	0.02	0.36	0.16	0.03	4	0	0	0	386.31	2.33	2.54	1.48	1.12
630	Base Copier	Health	0%	0%	0.00	0.06	0.06	0.01	6	0	0	N/A	N/A	N/A	N/A	N/A	N/A
631	Energy Star or Better Copier	Health	20%	15%	0.00	0.07	0.05	0.01	6	0	0	0	153.81	5.30	5.34	1.02	1.19
632	Copier Power Management Enabling	Health	20%	13%	0.00	0.07	0.06	0.01	6	0	0	0	848.75	1.06	1.13	4.81	1.12
640	Base Laser Printer	Health	0%	0%	0.00	0.09	0.09	0.01	5	0	0	N/A	N/A	N/A	N/A	N/A	N/A
641	Printer Power Management Enabling	Health	50%	32%	0.01	0.14	0.07	0.01	5	0	0	0	405.85	2.22	2.39	1.93	1.12
650	Base Data Center/Server Room	Health	0%	0%	0.00	127.23	127.23	15.38	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
651	Data Center Improved Operations	Health	20%	13%	0.50	132.59	105.80	13.91	10	0	0	0	32.43	27.78	27.94	0.30	1.12
652	Data Center Best Practices	Health	45%	34%	2.50	133.23	73.26	10.67	10	0	0	0	63.12	13.05	12.51	0.66	1.18
653	Data Center State of the Art practices	Health	56%	56%	5.00	127.23	55.98	6.77	10	0	0	0	79.67	8.71	7.43	1.12	1.32
660	Base Water Heating	Health	0%	0%	0.00	0.39	0.39	0.04	15	0	0	N/A	N/A	N/A	N/A	N/A	N/A
670	Base Vending Machines	Health	0%	0%	0.00	0.06	0.06	0.01	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
671	Vending Misers	Health	10%	7%	0.00	0.07	0.06	0.01	5	0	0	0	1847.77	0.50	0.54	8.52	1.11
700	Base Cooking	Health	0%	0%	0.00	0.47	0.47	0.08	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
800	Base Heating	Health	0%	0%	0.00	1.05	1.05	0.06	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
900	Base Miscellaneous	Health	0%	0%	0.00	2.73	2.73	0.33	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
100	Base Fluorescent Fixture, 4L4T8	Lodging	0%	0%	0.00	1.92	1.92	0.30	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	ROB 4L4' Premium T8	Lodging	17%	17%	0.07	1.92	1.59	0.25	9	0	0	0	213.66	2.82	2.16	3.56	1.50
102	Delamping 3L4' F32T8	Lodging	25%	25%	0.29	1.92	1.44	0.23	18	0	0	0	304.58	1.98	1.36	9.56	1.50
103	LED Troffer (Base 4L4T8)	Lodging	40%	40%	1.83	1.92	1.15	0.18	18	0	0	0	1195.31	0.50	0.35	37.53	1.50
104	Lighting Control Tuneup	Lodging	5%	2%	0.03	1.92	1.82	0.30	6	0	0	0	1409.70	0.95	1.17	4.64	0.96
105	Occupancy Sensor, 4L4' Fluorescent Fixtures	Lodging	31%	9%	0.14	1.92	1.32	0.27	18	0	0	0	396.77	3.36	3.60	3.62	0.96
106	Continuous Dimming, 4L4' Fluorescent Fixtures	Lodging	54%	16%	0.75	1.92	0.89	0.25	10	0	0	0	2184.58	0.61	0.71	11.62	0.96
107	High Performance Lighting R/R - 25% Savings, Base 4L4T8	Lodging	26%	13%	0.40	1.92	1.41	0.26	20	0	0	0	779.75	1.20	1.09	12.59	1.10
110	Base Fluorescent Fixture, 2L4T8, 1 EB	Lodging	0%	0%	0.00	1.37	1.37	0.22	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
111	ROB 2L4' Premium T8	Lodging	17%	17%	0.05	1.37	1.14	0.18	9	1	0	0	189.32	3.18	2.44	3.15	1.50
112	Delamping 1L4' F32T8	Lodging	48%	48%	0.37	1.37	0.72	0.11	18	1	0	0	281.61	2.14	1.47	8.84	1.50
113	LED Troffer (Base 2L4T8)	Lodging	40%	40%	1.47	1.37	0.82	0.13	18	2	0	0	1343.40	0.45	0.31	42.18	1.50
114	Lighting Control Tuneup	Lodging	5%	2%	0.01	1.37	1.30	0.21	6	0	0	0	983.82	1.35	1.68	3.24	0.96
115	Occupancy Sensor, 2L4' Fluorescent Fixtures	Lodging	31%	9%	0.14	1.37	0.95	0.20	18	0	0	0	553.81	2.41	2.58	5.06	0.96
116	Continuous Dimming, 2L4' Fluorescent Fixtures	Lodging	54%	16%	0.75	1.37	0.64	0.18	10	1	0	0	3049.18	0.44	0.51	16.21	0.96
117	High Performance Lighting R/R - 25% Savings, Base 2L4T8	Lodging	26%	13%	0.40	1.37	1.01	0.19	20	1	0	0	1088.35	0.86	0.78	17.57	1.10
120	Base Other Fluorescent Fixture	Lodging	0%	0%	0.00	0.61	0.61	0.10	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
121	ROB Premium T8 (base other fluorescent)	Lodging	17%	17%	0.04	0.61	0.50	0.08	9	0	0	0	378.64	1.59	1.22	6.30	1.50
122	Lighting Control Tuneup	Lodging	5%	2%	0.03	0.61	0.58	0.09	6	0	0	0	4439.88	0.30	0.37	14.61	0.96
123	Occupancy Sensor, 4L8' Fluorescent Fixtures	Lodging	31%	9%	0.14	0.61	0.42	0.09	18	0	0	0	1249.64	1.07	1.14	11.41	0.96
124	Continuous Dimming, 4L8' Fluorescent Fixtures	Lodging	54%	16%	0.75	0.61	0.28	0.08	10	0	0	0	6880.36	0.19	0.23	36.59	0.96
125	High Performance Lighting R/R - 25% Savings, Base Other Fluorescent	Lodging	26%	13%	0.40	0.61	0.45	0.08	20	0	0	0	2455.82	0.38	0.35	39.65	1.10
130	Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacement	Lodging	0%	0%	0.00	2.71	2.71	0.43	1	0	0	N/A	N/A	N/A	N/A	N/A	N/A
131	CFL Screw-in 18W	Lodging	66%	66%	0.02	2.71	0.92	0.15	4	3	1	0	22.39	26.93	21.97	0.17	1.50
132	Cold Cathode Lamps	Lodging	66%	66%	0.04	2.71	0.92	0.15	9	0	0	0	20.65	29.20	22.40	0.34	1.50
133	LED screw-in PAR replacement (base incandescent)	Lodging	90%	90%	0.97	2.71	0.28	0.04	18	5	1	0	199.61	3.02	2.08	6.27	1.50
140	Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacement	Lodging	0%	0%	0.00	2.71	2.71	0.43	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
141	CFL Hardwired, Modular 18W	Lodging	66%	66%	0.88	2.71	0.92	0.15	18	5	1	0	249.85	2.41	1.66	7.85	1.50
142	Ceramic Metal Halide	Lodging	37%	37%	2.12	2.72	1.71	0.27	18	0	0	0	1060.93	0.57	0.39	33.31	1.50
143	LED fixture replacement (base incandescent flood)	Lodging	90%	90%	2.00	2.71	0.28	0.04	18	6	1	0	411.83	1.46	1.01	12.93	1.50
150	Base CFL to screw-in replacement	Lodging	0%	0%	0.00	0.68	0.68	0.11	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
151	LED screw-in replacement (base CFL)	Lodging	68%	68%	0.83	0.68	0.22	0.03	18	1	0	0	899.32	0.67	0.46	28.24	1.50
160	Base High Bay Metal Halide, 400W	Lodging	0%	0%	0.63	2.11	2.11	0.33	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Sq Ft	Base EUI	EUI	Peak Watts/ Sq Ft	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/KWH	Levelized Cost of Avoided Peak Capacity \$/KW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)	Revenue Test
161	High Bay T5	Lodging	49%	49%	0.22	2.11	1.08	0.17	18	0	0	0	108.00	5.58	3.85	3.39	1.50
162	Induction High Bay Lighting	Lodging	37%	37%	0.68	2.11	1.32	0.21	32	0	0	0	305.95	1.50	1.00	13.72	1.50
163	PSMH + electronic ballast	Lodging	37%	37%	0.52	2.11	1.34	0.21	16	0	0	0	363.98	1.66	1.18	10.35	1.50
165	Occupancy Sensor, High Bay T5	Lodging	21%	6%	0.14	2.19	1.74	0.32	18	0	0	0	521.35	2.56	2.74	4.76	0.96
180	Base Parking Garage Metal Halide, 250 W	Lodging	0%	0%	0.00	0.00	0.00	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
185	Base Fluorescent Parking Garage Lighting	Lodging	0%	0%	0.00	0.40	0.40	0.06	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
186	Parking Garage Low Wattage T8 Lamps replacing 32W lamps	Lodging	15%	15%	0.00	0.40	0.34	0.05	3	0	0	0	102.10	5.91	4.89	0.59	1.50
187	Bi-Level LED Parking Garage Fixtures (Base Fluorescent)	Lodging	2%	1%	0.30	0.40	0.39	0.06	5	0	0	9	118249.26	0.01	0.01	551.31	1.12
190	Base Exit Sign	Lodging	0%	0%	0.00	0.03	0.03	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
191	LED Exit Sign	Lodging	81%	81%	0.01	0.06	0.01	0.00	18	0	0	0	144.93	4.06	2.73	4.78	1.54
200	Base Outdoor High Pressure Sodium 250W Lamp	Lodging	0%	0%	0.04	0.40	0.40	0.02	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
201	Outdoor Lighting Controls (Photocell/Timeclock)	Lodging	23%	6%	0.01	0.44	0.34	0.03	18	0	0	0	615.53	5.57	7.04	1.85	0.82
202	LED Outdoor Area Lighting	Lodging	52%	52%	0.14	0.40	0.19	0.01	9	2	0	0	1650.11	0.65	0.72	10.76	1.04
203	Bi-Level LED Outdoor Lighting	Lodging	68%	70%	0.52	0.40	0.13	0.01	9	1	0	0	4578.75	0.23	0.25	30.48	1.05
300	Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	Lodging	0%	0%	2.10	1.93	1.93	0.98	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
302	Window Film (Standard) - Chiller	Lodging	3%	3%	0.05	1.95	1.88	0.95	10	0	0	0	212.43	1.87	0.67	12.49	3.17
303	EMS - Chiller	Lodging	10%	10%	0.21	1.99	1.79	0.91	15	1	0	0	194.55	2.04	0.69	16.81	3.17
305	Chiller Tune Up/Diagnostics	Lodging	9%	5%	0.10	2.10	1.92	1.01	10	0	0	0	268.32	1.76	0.96	8.69	2.08
306	VSD for Chiller Pumps and Towers	Lodging	10%	10%	0.15	1.93	1.73	0.88	15	0	0	0	140.65	2.82	0.96	12.16	3.17
310	Duct/Pipe Insulation - Chiller	Lodging	2%	2%	0.77	1.95	1.91	0.97	10	0	0	3	5337.02	0.07	0.03	313.67	3.17
311	High Efficiency Chiller Motors	Lodging	3%	3%	0.05	1.99	1.92	0.97	20	0	0	0	125.73	3.15	0.99	13.78	3.17
320	Base DX Packaged System, EER=10.3, 10 tons	Lodging	0%	0%	5.56	3.34	3.34	1.69	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
321	DX Tune Up/ Advanced Diagnostics	Lodging	5%	4%	0.13	3.50	3.31	1.71	10	0	0	0	276.41	1.61	0.78	10.65	2.34
322	aged System, EER=10.3, 10 tons, with Automated Fault Detection and Di	Lodging	10%	10%	0.14	3.34	3.00	1.52	20	1	0	0	60.94	6.51	2.05	6.68	3.17
323	DX Packaged System, EER=10.9, 10 tons	Lodging	6%	6%	0.53	3.34	3.15	1.60	20	1	0	0	415.19	0.96	0.30	45.50	3.17
324	DX Packaged System, EER=13.4, 10 tons	Lodging	23%	23%	0.77	3.34	2.57	1.30	20	2	1	0	146.14	2.71	0.86	16.02	3.17
325	Window Film (Standard) - DX	Lodging	3%	3%	0.05	3.34	3.24	1.64	10	0	0	0	123.74	3.21	1.14	7.27	3.17
326	Prog. Thermostat - DX	Lodging	6%	3%	0.07	3.47	3.27	1.71	8	0	0	0	228.78	2.12	1.24	5.65	2.00
330	Optimize Controls - DX	Lodging	6%	3%	0.04	3.47	3.27	1.71	5	0	0	0	200.75	2.41	1.46	3.15	2.00
331	Economizer - DX	Lodging	9%	5%	0.60	3.41	3.10	1.65	15	1	0	0	669.32	0.72	0.39	29.83	2.00
332	Aerosol Duct Sealing - DX	Lodging	7%	7%	0.06	3.34	3.10	1.57	15	0	0	0	49.31	8.04	2.74	4.26	3.17
334	Duct/Pipe Insulation - DX	Lodging	2%	2%	0.65	3.36	3.29	1.67	10	0	0	1	2620.77	0.15	0.05	154.03	3.17
335	DX Coil Cleaning	Lodging	5%	5%	0.05	3.44	3.28	1.66	5	0	0	0	144.36	2.75	1.05	4.40	3.17
337	Geothermal Heat Pump, EER=13, 10 tons - DX	Lodging	37%	37%	2.23	3.35	2.11	1.07	15	0	0	0	331.07	1.20	0.41	28.61	3.17
340	Base PTAC, EER=8.3, 1 ton	Lodging	0%	0%	2.65	3.54	3.54	1.79	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
341	HE PTAC, EER=9.6, 1 ton	Lodging	14%	14%	0.52	3.54	3.06	1.55	20	3	2	0	158.52	2.50	0.79	17.37	3.17
342	Hotel Room Controllers	Lodging	35%	35%	1.00	3.54	2.30	1.17	10	6	3	0	218.51	1.81	0.65	12.84	3.17
400	Base Fan Motor, 5hp, 1800rpm, 87.5%	Lodging	0%	0%	0.02	2.23	2.23	0.42	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
401	Fan Motor, 5hp, 1800rpm, 89.5%	Lodging	2%	2%	0.01	2.24	2.19	0.41	20	0	0	0	51.94	10.67	6.48	2.11	1.65
410	Base Fan Motor, 15hp, 1800rpm, 91.0%	Lodging	0%	0%	0.00	2.06	2.06	0.39	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
420	Base Fan Motor, 40hp, 1800rpm, 93.0%	Lodging	0%	0%	0.00	2.02	2.02	0.38	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
423	Air Handler Tuneups	Lodging	10%	10%	0.05	2.02	1.82	0.34	8	0	0	0	221.08	2.51	1.78	3.94	1.65
424	Demand Controlled Ventilation	Lodging	17%	9%	0.12	2.02	1.69	0.35	15	0	0	0	339.20	2.25	1.97	5.93	1.24
500	Base Built-Up Refrigeration System	Lodging	0%	0%	0.00	0.98	0.98	0.13	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
505	Compressor VSD retrofit	Lodging	6%	3%	0.01	0.98	0.92	0.13	13	0	0	0	133.46	7.53	7.80	1.34	1.07
507	Refrigeration Commissioning	Lodging	5%	5%	0.00	1.00	0.95	0.13	3	0	0	0	142.64	4.61	4.14	0.69	1.38
508	Demand Hot Gas Defrost	Lodging	3%	3%	0.00	0.98	0.95	0.13	10	0	0	0	17.04	38.62	31.57	0.26	1.38
511	Freezer-Cooler Replacement Gaskets (built-up systems)	Lodging	7%	7%	0.00	1.01	0.95	0.13	4	0	0	0	37.41	17.59	15.57	0.24	1.38
513	Bi-level LED Case Lighting (built-up systems)	Lodging	1%	1%	0.02	0.98	0.97	0.13	10	0	0	0	3373.05	0.23	0.21	40.27	1.24
514	Fiber Optic Case Lighting (built-up systems)	Lodging	25%	25%	0.02	0.98	0.74	0.10	10	0	0	0	99.33	6.63	5.42	1.53	1.38
517	Oversized Air Cooled Condenser	Lodging	8%	8%	0.01	1.02	0.94	0.12	16	0	0	0	62.32	10.56	8.13	1.50	1.38
520	Base Self-Contained Refrigeration	Lodging	0%	0%	0.00	0.98	0.98	0.13	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
523	Freezer-Cooler Replacement Gaskets (self-contained)	Lodging	3%	3%	0.00	0.99	0.97	0.13	4	0	0	0	8.93	73.73	65.27	0.06	1.38
524	Bi-level LED Case Lighting (self-contained units)	Lodging	1%	1%	0.00	0.98	0.97	0.13	10	0	0	0	201.97	3.77	3.44	2.41	1.24
526	Energy-Star Refrigerator, solid door	Lodging	2%	2%	0.00	0.98	0.97	0.13	10	0	0	0	21.26	30.96	25.31	0.33	1.38
527	Energy-Star Freezer, solid door	Lodging	3%	3%	0.00	0.99	0.96	0.13	10	0	0	0	62.97	10.45	8.54	0.97	1.38
529	Energy-Star Freezer, glass door	Lodging	6%	6%	0.00	1.00	0.94	0.12	10	0	0	0	3.06	214.90	175.69	0.05	1.38
530	Energy Star Ice Machines	Lodging	1%	1%	0.00	0.98	0.97	0.13	10	0	0	0	5.02	131.14	107.21	0.08	1.38
600	Base Desktop PC	Lodging	0%	0%	0.00	0.04	0.04	0.01	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
601	PC Manual Power Management Enabling	Lodging	68%	45%	0.00	0.05	0.02	0.00	4	0	0	0	110.31	7.28	7.45	0.50	1.20
602	PC Network Power Management Enabling	Lodging	68%	45%	0.00	0.05	0.02	0.00	4	0	0	0	110.31	7.28	7.45	0.50	1.20

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Sq Ft	Base EUI	EUI	Peak Watts/ Sq Ft	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/KWH	Levelized Cost of Avoided Peak Capacity \$/KW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)	Revenue Test
603	Energy Star or Better PC	Lodging	32%	25%	0.00	0.05	0.04	0.01	4	0	0	0	123.12	5.95	5.73	0.66	1.27
610	Base Monitor, CRT	Lodging	0%	0%	0.00	0.01	0.01	0.00	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
611	Energy Star or Better Monitor-CRT	Lodging	55%	42%	0.00	0.01	0.00	0.00	4	0	0	0	44.57	16.44	15.83	0.24	1.27
612	Monitor Power Management Enabling--CRT	Lodging	53%	35%	0.00	0.01	0.00	0.00	4	0	0	0	60.72	13.23	13.53	0.28	1.20
620	Base Monitor, LCD	Lodging	0%	0%	0.00	0.01	0.01	0.00	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
621	Energy Star or Better Monitor--LCD	Lodging	55%	42%	0.00	0.02	0.01	0.00	4	0	0	0	207.69	3.53	3.40	1.11	1.27
622	Monitor Power Management Enabling--LCD	Lodging	56%	37%	0.00	0.01	0.01	0.00	4	0	0	0	488.75	1.64	1.68	2.23	1.20
630	Base Copier	Lodging	0%	0%	0.00	0.00	0.00	0.00	6	0	0	N/A	N/A	N/A	N/A	N/A	N/A
631	Energy Star or Better Copier	Lodging	20%	15%	0.00	0.00	0.00	0.00	6	0	0	0	150.07	4.88	4.59	1.18	1.27
632	Copier Power Management Enabling	Lodging	19%	13%	0.00	0.00	0.00	0.00	6	0	0	0	868.86	0.92	0.92	5.89	1.20
640	Base Laser Printer	Lodging	0%	0%	0.00	0.01	0.01	0.00	5	0	0	N/A	N/A	N/A	N/A	N/A	N/A
641	Printer Power Management Enabling	Lodging	49%	32%	0.00	0.01	0.01	0.00	5	0	0	0	406.16	1.98	1.99	2.30	1.20
650	Base Data Center/Server Room	Lodging	0%	0%	0.00	209.52	209.52	30.01	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
651	Data Center Improved Operations	Lodging	20%	13%	0.50	218.27	174.52	27.14	10	0	0	0	16.62	48.33	45.62	0.18	1.20
652	Data Center Best Practices	Lodging	45%	34%	2.50	219.33	121.19	20.81	10	0	0	0	32.35	22.87	20.47	0.41	1.26
653	Data Center State of the Art practices	Lodging	56%	56%	5.00	209.52	92.19	13.21	10	0	0	0	40.82	15.50	12.24	0.68	1.43
660	Base Water Heating	Lodging	0%	0%	0.00	1.08	1.08	0.14	15	0	0	N/A	N/A	N/A	N/A	N/A	N/A
670	Base Vending Machines	Lodging	0%	0%	0.00	0.13	0.13	0.02	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
700	Base Cooking	Lodging	0%	0%	0.00	0.77	0.77	0.16	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
704	Energy Star Hot Food Holding Cabinets	Lodging	13%	13%	0.05	0.77	0.67	0.14	10	0	0	0	313.30	1.70	1.10	7.52	1.74
800	Base Heating	Lodging	0%	0%	0.00	0.53	0.53	0.02	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
900	Base Miscellaneous	Lodging	0%	0%	0.00	1.20	1.20	0.20	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
100	Base Fluorescent Fixture, 4L4'T8	City of Austin	0%	0%	0.00	5.45	5.45	0.81	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	ROB 4L4' Premium T8	City of Austin	17%	17%	0.14	5.47	4.53	0.67	7	5	1	0	208.49	2.99	2.42	2.56	1.45
102	Delamping 3L4' F32T8	City of Austin	25%	25%	0.56	5.45	4.09	0.60	18	3	0	0	222.39	2.80	1.99	6.55	1.45
103	LED Troffer (Base 4L4'T8)	City of Austin	40%	40%	3.56	5.45	3.27	0.48	13	9	1	0	1139.65	0.55	0.42	25.22	1.45
104	Lighting Control Tuneup	City of Austin	5%	2%	0.03	5.45	5.17	0.79	6	1	0	0	528.54	2.65	3.32	1.63	0.95
105	Occupancy Sensor, 4L4' Fluorescent Fixtures	City of Austin	31%	9%	0.14	5.45	3.76	0.73	18	2	0	0	148.79	9.41	10.21	1.28	0.95
106	Continuous Dimming, 4L4' Fluorescent Fixtures	City of Austin	54%	16%	0.75	5.45	2.53	0.68	10	4	0	0	819.24	1.71	2.03	4.09	0.95
107	High Performance Lighting R/R - 25% Savings, Base 4L4'T8	City of Austin	25%	13%	0.40	5.45	4.08	0.70	20	2	0	0	292.41	3.24	2.95	4.64	1.10
110	Base Fluorescent Fixture, 2L4'T8, 1 EB	City of Austin	0%	0%	0.00	3.49	3.49	0.52	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
111	ROB 2L4' Premium T8	City of Austin	17%	17%	0.09	3.52	2.92	0.43	7	3	0	0	191.20	3.26	2.64	2.35	1.45
112	Delamping 1L4' F32T8	City of Austin	48%	48%	0.66	3.49	1.82	0.27	18	3	0	0	213.87	2.91	2.07	6.30	1.45
113	LED Troffer (Base 2L4'T8)	City of Austin	40%	40%	2.67	3.49	2.10	0.31	13	4	1	0	1332.21	0.47	0.36	29.48	1.45
114	Lighting Control Tuneup	City of Austin	5%	2%	0.01	3.49	3.31	0.51	6	1	0	0	412.36	3.39	4.26	1.27	0.95
115	Occupancy Sensor, 2L4' Fluorescent Fixtures	City of Austin	31%	9%	0.14	3.49	2.41	0.47	18	1	0	0	232.12	6.03	6.55	1.99	0.95
116	Continuous Dimming, 2L4' Fluorescent Fixtures	City of Austin	54%	16%	0.75	3.49	1.62	0.44	10	2	0	0	1278.04	1.10	1.30	6.38	0.95
117	High Performance Lighting R/R - 25% Savings, Base 2L4'T8	City of Austin	25%	13%	0.40	3.49	2.61	0.45	20	1	0	0	456.17	2.07	1.89	7.24	1.10
120	Base Other Fluorescent Fixture	City of Austin	0%	0%	0.00	2.21	2.21	0.33	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
121	ROB Premium T8 (base other fluorescent)	City of Austin	17%	17%	0.10	2.26	1.88	0.28	7	0	0	0	334.70	1.86	1.51	4.11	1.45
122	Lighting Control Tuneup	City of Austin	5%	2%	0.03	2.21	2.09	0.32	6	0	0	0	1304.79	1.07	1.35	4.03	0.95
123	Occupancy Sensor, 4L8' Fluorescent Fixtures	City of Austin	31%	9%	0.14	2.21	1.53	0.30	18	0	0	0	367.24	3.81	4.14	3.15	0.95
124	Continuous Dimming, 4L8' Fluorescent Fixtures	City of Austin	54%	16%	0.75	2.21	1.02	0.28	10	0	0	0	2021.99	0.69	0.82	10.10	0.95
125	High Performance Lighting R/R - 25% Savings, Base Other Fluorescent	City of Austin	25%	13%	0.40	2.21	1.65	0.29	20	0	0	0	721.71	1.31	1.20	11.46	1.10
130	Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacement	City of Austin	0%	0%	0.00	10.33	10.33	1.53	1	0	0	N/A	N/A	N/A	N/A	N/A	N/A
131	CFL Screw-in 18W	City of Austin	66%	66%	0.04	10.33	3.51	0.52	3	4	1	0	20.22	30.80	26.31	0.11	1.45
132	Cold Cathode Lamps	City of Austin	66%	66%	0.09	10.33	3.51	0.52	7	0	0	0	18.56	33.53	27.19	0.23	1.45
133	LED screw-in PAR replacement (base incandescent)	City of Austin	90%	90%	2.32	10.33	1.08	0.16	13	5	1	0	174.71	3.56	2.71	3.87	1.45
140	Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacement	City of Austin	0%	0%	0.00	10.33	10.33	1.53	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
141	CFL Hardwired, Modular 18W	City of Austin	66%	66%	2.11	10.33	3.51	0.52	18	4	1	0	167.48	3.72	2.64	4.94	1.45
142	Ceramic Metal Halide	City of Austin	37%	37%	5.07	10.37	6.52	0.96	18	1	0	0	711.15	0.88	0.62	20.96	1.45
143	LED fixture replacement (base incandescent flood)	City of Austin	90%	90%	4.78	10.33	1.08	0.16	13	6	1	0	360.47	1.73	1.31	7.98	1.45
150	Base CFL to screw-in replacement	City of Austin	0%	0%	0.00	1.06	1.06	0.16	3	0	0	N/A	N/A	N/A	N/A	N/A	N/A
151	LED screw-in replacement (base CFL)	City of Austin	68%	68%	0.90	1.06	0.34	0.05	13	1	0	0	880.51	0.71	0.54	19.48	1.45
160	Base High Bay Metal Halide, 400W	City of Austin	0%	0%	0.61	0.57	0.57	0.08	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
161	High Bay T5	City of Austin	49%	49%	0.21	0.57	0.29	0.04	18	0	0	0	407.31	1.53	1.09	12.00	1.45
162	Induction High Bay Lighting	City of Austin	37%	37%	0.65	0.57	0.36	0.05	32	0	0	0	1153.88	0.41	0.28	48.55	1.45
163	PSMH + electronic ballast	City of Austin	37%	37%	0.50	0.57	0.36	0.05	12	0	0	0	1823.10	0.34	0.26	37.39	1.45
165	Occupancy Sensor, High Bay T5	City of Austin	21%	6%	0.14	0.60	0.47	0.08	18	0	0	0	2042.23	0.69	0.74	17.52	0.95
180	Base Parking Garage Metal Halide, 250 W	City of Austin	0%	0%	0.00	0.00	0.00	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
185	Base Fluorescent Parking Garage Lighting	City of Austin	0%	0%	0.00	0.44	0.44	0.06	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings	Peak Reduction	Total Costs/	Base	Peak	Peak	Service Life (yrs)	Technical Potential GWH	System Peak Tech.	Levelized Cost of Conserved	Levelized Cost of Avoided	Total Resource	Participant Test	Customer Payback (Years)	Revenue Test
			Fraction	Fraction	Costs/ Sq Ft	EUI	EUI	Watts/ Sq Ft			Potential MW	Energy \$/kWh	Peak Capacity \$/kW	Cost Test (TRC)			
186	Parking Garage Low Wattage T8 Lamps replacing 32W lamps	City of Austin	15%	15%	0.00	0.44	0.38	0.06	3	0	0	0	108.45	5.74	4.90	0.59	1.45
187	Bi-Level LED Parking Garage Fixtures (Base Fluorescent)	City of Austin	2%	1%	0.33	0.44	0.43	0.06	5	0	0	9	125606.03	0.01	0.01	560.38	1.10
190	Base Exit Sign	City of Austin	0%	0%	0.00	0.01	0.01	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
191	LED Exit Sign	City of Austin	81%	81%	0.01	0.02	0.00	0.00	18	0	0	0	544.55	1.23	0.93	14.02	1.36
200	Base Outdoor High Pressure Sodium 250W Lamp	City of Austin	0%	0%	0.08	0.77	0.77	0.08	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
201	Outdoor Lighting Controls (Photocell/Timeclock)	City of Austin	22%	6%	0.02	0.85	0.66	0.08	18	1	0	0	405.90	5.27	6.27	2.08	0.87
202	LED Outdoor Area Lighting	City of Austin	52%	52%	0.30	0.77	0.37	0.04	9	3	0	0	1084.34	0.71	0.66	11.61	1.23
203	Bi-Level LED Outdoor Lighting	City of Austin	69%	70%	1.10	0.77	0.24	0.02	9	2	0	0	3008.84	0.25	0.24	32.64	1.24
300	Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	City of Austin	0%	0%	1.50	1.98	1.98	1.04	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
301	Centrifugal Chiller, 0.51 kW/ton, 500 tons	City of Austin	12%	12%	0.19	2.06	1.81	0.95	20	1	0	0	105.63	3.72	1.14	12.00	3.26
302	Window Film (Standard) - Chiller	City of Austin	3%	3%	0.16	2.01	1.96	1.03	10	0	0	0	807.62	0.49	0.17	49.19	3.26
303	EMS - Chiller	City of Austin	10%	10%	0.15	2.19	1.97	1.04	15	0	0	0	121.70	3.23	1.07	10.90	3.26
305	Chiller Tune Up/Diagnostics	City of Austin	8%	5%	0.10	2.10	1.93	1.05	10	0	0	0	259.75	1.73	0.86	9.69	2.28
306	VSD for Chiller Pumps and Towers	City of Austin	10%	10%	0.11	2.13	1.92	1.01	15	0	0	0	87.66	4.49	1.49	7.85	3.26
309	Ceiling/roof Insulation - Chiller	City of Austin	12%	12%	0.27	2.20	1.94	1.02	20	0	0	0	144.28	2.73	0.84	16.39	3.26
310	Duct/Pipe Insulation - Chiller	City of Austin	2%	2%	0.77	2.00	1.96	1.03	10	0	0	3	5014.14	0.08	0.03	305.43	3.26
311	High Efficiency Chiller Motors	City of Austin	3%	3%	0.06	2.03	1.96	1.03	20	0	0	0	132.90	2.96	0.91	15.10	3.26
320	Base DX Packaged System, EER=10.3, 10 tons	City of Austin	0%	0%	3.97	3.44	3.44	1.80	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
321	DX Tune Up/ Advanced Diagnostics	City of Austin	5%	4%	0.13	3.57	3.40	1.81	10	0	0	0	261.44	1.64	0.73	11.42	2.55
322	aged System, EER=10.3, 10 tons, with Automated Fault Detection and Di	City of Austin	10%	10%	0.10	3.44	3.09	1.62	20	2	1	0	40.80	9.64	2.96	4.63	3.26
323	DX Packaged System, EER=10.9, 10 tons	City of Austin	6%	6%	0.38	3.44	3.25	1.70	20	1	1	0	277.97	1.41	0.43	31.57	3.26
324	DX Packaged System, EER=13.4, 10 tons	City of Austin	23%	23%	0.55	3.44	2.65	1.39	20	5	3	0	97.85	4.02	1.23	11.11	3.26
325	Window Film (Standard) - DX	City of Austin	3%	3%	0.16	3.49	3.39	1.78	10	0	0	0	466.37	0.84	0.29	28.41	3.26
326	Prog. Thermostat - DX	City of Austin	5%	3%	0.05	3.59	3.41	1.83	8	0	0	0	152.74	2.95	1.52	4.62	2.27
330	Optimize Controls - DX	City of Austin	5%	3%	0.04	3.55	3.38	1.81	5	0	0	0	189.33	2.38	1.26	3.63	2.27
331	Economizer - DX	City of Austin	14%	9%	0.43	3.69	3.16	1.77	15	2	1	0	235.70	1.91	0.91	12.84	2.27
332	Aerosol Duct Sealing - DX	City of Austin	7%	7%	0.04	3.44	3.20	1.68	15	1	0	0	32.97	11.93	3.95	2.95	3.26
333	Ceiling/roof Insulation - DX	City of Austin	12%	12%	0.12	3.91	3.44	1.80	20	0	0	0	35.41	11.11	3.41	4.02	3.26
334	Duct/Pipe Insulation - DX	City of Austin	2%	2%	0.65	3.49	3.42	1.80	10	0	0	1	2431.54	0.16	0.06	148.11	3.26
335	DX Coil Cleaning	City of Austin	5%	5%	0.03	3.49	3.32	1.74	5	1	0	0	98.14	4.01	1.48	3.10	3.26
337	Geothermal Heat Pump, EER=13, 10 tons - DX	City of Austin	37%	37%	2.49	3.45	2.17	1.14	15	0	0	0	346.88	1.13	0.38	31.07	3.26
340	Base PTAC, EER=8.3, 1 ton	City of Austin	0%	0%	1.04	1.72	1.72	0.90	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
341	HE PTAC, EER=9.6, 1 ton	City of Austin	14%	14%	0.59	1.72	1.49	0.78	20	0	0	0	351.71	1.12	0.34	39.95	3.26
400	Base Fan Motor, 5hp, 1800rpm, 87.5%	City of Austin	0%	0%	0.02	2.24	2.24	0.50	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
401	Fan Motor, 5hp, 1800rpm, 89.5%	City of Austin	2%	2%	0.01	2.26	2.21	0.49	20	0	0	0	55.15	9.36	5.19	2.64	1.81
402	Variable Speed Drive Control, 5 HP	City of Austin	30%	18%	0.16	2.43	1.70	0.44	15	3	0	0	155.30	4.23	3.30	3.53	1.38
410	Base Fan Motor, 15hp, 1800rpm, 91.0%	City of Austin	0%	0%	0.02	2.08	2.08	0.46	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
411	Fan Motor, 15hp, 1800rpm, 92.4%	City of Austin	2%	2%	0.01	2.09	2.06	0.46	20	0	0	0	61.08	8.45	4.68	2.93	1.81
412	Variable Speed Drive Control, 15 HP	City of Austin	30%	18%	0.12	2.58	1.81	0.47	20	1	0	0	87.80	7.49	5.42	2.53	1.38
413	Electronically Commutated Motors (ECM) on an Air Handler Unit	City of Austin	14%	9%	0.05	2.24	1.92	0.45	15	1	0	0	114.16	5.76	4.49	2.60	1.38
414	Energy Recovery Ventilation (ERV)	City of Austin	7%	7%	0.25	2.17	2.02	0.45	20	0	0	0	543.67	0.95	0.53	26.06	1.81
420	Base Fan Motor, 40hp, 1800rpm, 93.0%	City of Austin	0%	0%	0.07	2.04	2.04	0.45	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
421	Fan Motor, 40hp, 1800rpm, 94.1%	City of Austin	1%	1%	0.02	2.06	2.03	0.45	20	0	0	0	247.91	2.08	1.15	11.88	1.81
422	Variable Speed Drive Control, 40 HP	City of Austin	30%	18%	0.28	2.90	2.03	0.53	20	0	0	0	179.44	3.66	2.65	5.17	1.38
423	Air Handler Tuneups	City of Austin	10%	10%	0.05	2.08	1.87	0.41	8	0	0	0	182.53	2.83	1.83	3.83	1.81
424	Demand Controlled Ventilation	City of Austin	15%	9%	0.12	2.37	2.01	0.48	15	0	0	0	246.01	2.67	2.09	5.59	1.38
500	Base Built-Up Refrigeration System	City of Austin	0%	0%	0.00	0.74	0.74	0.10	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
501	High-efficiency fan motors	City of Austin	12%	12%	0.07	0.76	0.67	0.09	20	0	0	0	406.24	1.64	1.20	11.46	1.37
505	Compressor VSD retrofit	City of Austin	6%	3%	0.02	0.74	0.70	0.09	13	0	0	0	809.09	1.27	1.33	7.89	1.06
507	Refrigeration Commissioning	City of Austin	5%	5%	0.01	0.76	0.72	0.09	3	0	0	0	864.69	0.77	0.70	4.13	1.37
508	Demand Hot Gas Defrost	City of Austin	3%	3%	0.00	0.74	0.72	0.09	10	0	0	0	103.31	6.44	5.31	1.56	1.37
511	Freezer-Cooler Replacement Gaskets (built-up systems)	City of Austin	7%	7%	0.00	0.77	0.72	0.09	4	0	0	0	184.59	3.60	3.22	1.17	1.37
512	High R-Value Glass Doors	City of Austin	2%	2%	0.07	0.75	0.74	0.10	10	0	0	1	6421.07	0.10	0.09	97.14	1.37
513	Bi-level LED Case Lighting (built-up systems)	City of Austin	1%	1%	0.07	0.74	0.74	0.10	10	0	0	2	16641.68	0.05	0.04	192.98	1.22
514	Fiber Optic Case Lighting (built-up systems)	City of Austin	25%	25%	0.08	0.74	0.56	0.07	10	0	0	0	490.06	1.36	1.12	7.41	1.37
517	Oversized Air Cooled Condenser	City of Austin	8%	8%	0.03	0.77	0.71	0.09	16	0	0	0	377.79	1.76	1.37	8.90	1.37
520	Base Self-Contained Refrigeration	City of Austin	0%	0%	0.00	0.74	0.74	0.10	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
521	Strip curtains for walk-ins	City of Austin	0%	0%	0.00	0.74	0.74	0.10	4	0	0	0	2467.73	0.27	0.24	15.59	1.37
522	Night covers for display cases (self-contained)	City of Austin	2%	0%	0.00	0.75	0.74	0.10	5	0	0	0	N/A	20.89	33.85	0.14	0.74
523	Freezer-Cooler Replacement Gaskets (self-contained)	City of Austin	3%	3%	0.00	0.75	0.73	0.10	4	0	0	0	11.65	57.09	51.01	0.07	1.37
524	Bi-level LED Case Lighting (self-contained units)	City of Austin	1%	1%	0.00	0.74	0.74	0.10	10	0	0	0	485.59	1.60	1.47	5.63	1.22

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Sq Ft	Base EUI	EUI	Peak Watts/ Sq Ft	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/KWH	Levelized Cost of Avoided Peak Capacity \$/KW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)	Revenue Test
526	Energy-Star Refrigerator, solid door	City of Austin	4%	4%	0.00	0.75	0.72	0.09	10	0	0	0	19.88	33.46	27.61	0.30	1.37
527	Energy-Star Freezer, solid door	City of Austin	0%	0%	0.00	0.74	0.74	0.10	10	0	0	0	60.88	10.93	9.02	0.92	1.37
528	Energy-Star Refrigerator, glass door	City of Austin	5%	5%	0.00	0.75	0.72	0.09	10	0	0	0	0.33	2,044.23	1,686.74	0.00	1.37
529	Energy-Star Freezer, glass door	City of Austin	1%	1%	0.00	0.74	0.74	0.10	10	0	0	0	2.99	222.14	183.29	0.05	1.37
530	Energy Star Ice Machines	City of Austin	3%	3%	0.00	0.75	0.73	0.09	10	0	0	0	4.71	141.33	116.62	0.07	1.37
600	Base Desktop PC	City of Austin	0%	0%	0.00	0.66	0.66	0.08	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
601	PC Manual Power Management Enabling	City of Austin	67%	45%	0.02	0.80	0.26	0.05	4	4	0	0	137.60	6.64	7.29	0.52	1.11
602	PC Network Power Management Enabling	City of Austin	67%	45%	0.02	0.80	0.26	0.05	4	4	0	0	137.60	6.64	7.29	0.52	1.11
603	Energy Star or Better PC	City of Austin	32%	25%	0.01	0.69	0.47	0.06	4	2	0	0	173.32	4.79	4.99	0.75	1.17
610	Base Monitor, CRT	City of Austin	0%	0%	0.00	0.01	0.01	0.00	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
611	Energy Star or Better Monitor-CRT	City of Austin	54%	42%	0.00	0.01	0.00	0.00	4	0	0	0	218.48	3.80	3.96	0.95	1.17
612	Monitor Power Management Enabling--CRT	City of Austin	53%	35%	0.00	0.01	0.00	0.00	4	0	0	0	296.99	3.08	3.38	1.11	1.11
620	Base Monitor, LCD	City of Austin	0%	0%	0.00	0.25	0.25	0.03	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
621	Energy Star or Better Monitor--LCD	City of Austin	54%	42%	0.01	0.31	0.14	0.02	4	1	0	0	305.60	2.72	2.83	1.33	1.17
622	Monitor Power Management Enabling--LCD	City of Austin	55%	37%	0.02	0.42	0.19	0.03	4	1	0	0	427.62	2.14	2.35	1.60	1.11
630	Base Copier	City of Austin	0%	0%	0.00	0.02	0.02	0.00	6	0	0	N/A	N/A	N/A	N/A	N/A	N/A
631	Energy Star or Better Copier	City of Austin	20%	15%	0.00	0.03	0.02	0.00	6	0	0	0	188.06	4.41	4.49	1.21	1.17
632	Copier Power Management Enabling	City of Austin	19%	13%	0.00	0.03	0.02	0.00	6	0	0	0	1072.47	0.85	0.91	5.95	1.11
640	Base Laser Printer	City of Austin	0%	0%	0.00	0.09	0.09	0.01	5	0	0	N/A	N/A	N/A	N/A	N/A	N/A
641	Printer Power Management Enabling	City of Austin	48%	32%	0.01	0.15	0.08	0.01	5	0	0	0	479.35	1.91	2.06	2.23	1.11
650	Base Data Center/Server Room	City of Austin	0%	0%	0.00	189.35	189.35	21.82	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
651	Data Center Improved Operations	City of Austin	20%	13%	0.50	197.11	158.30	19.72	10	0	0	0	22.88	39.94	40.48	0.21	1.11
652	Data Center Best Practices	City of Austin	44%	34%	2.50	198.10	110.58	15.12	10	1	0	0	44.52	18.85	18.26	0.45	1.17
653	Data Center State of the Art practices	City of Austin	56%	56%	5.00	189.35	83.31	9.60	10	0	0	0	56.14	12.69	11.06	0.75	1.30
660	Base Water Heating	City of Austin	0%	0%	0.00	0.35	0.35	0.04	15	0	0	N/A	N/A	N/A	N/A	N/A	N/A
661	Demand controlled circulating systems	City of Austin	5%	2%	0.02	0.35	0.34	0.04	15	0	0	0	2440.58	0.48	0.52	22.35	1.00
662	High Efficiency Water Heater (electric)	City of Austin	2%	2%	0.00	0.35	0.35	0.04	15	0	0	0	210.11	3.24	2.61	4.47	1.34
663	Hot Water Pipe Insulation	City of Austin	2%	2%	0.01	0.36	0.35	0.04	15	0	0	0	636.66	1.07	0.86	13.55	1.34
664	Tankless Water Heater	City of Austin	10%	10%	0.02	0.35	0.32	0.04	20	0	0	0	285.10	2.39	1.78	7.69	1.34
665	Heat Pump Water Heater (air source)	City of Austin	20%	20%	0.05	0.35	0.28	0.04	15	0	0	0	484.70	1.41	1.13	10.32	1.34
666	Heat Recovery Unit	City of Austin	65%	65%	0.08	0.35	0.12	0.02	10	0	0	0	382.80	1.78	1.50	5.54	1.34
667	Heat Trap	City of Austin	9%	9%	0.00	0.36	0.33	0.04	10	0	0	0	121.10	5.63	4.74	1.75	1.34
668	Solar Water Heater	City of Austin	70%	70%	0.14	0.35	0.11	0.01	20	1	0	0	341.51	2.00	1.49	9.22	1.34
670	Base Vending Machines	City of Austin	0%	0%	0.00	0.05	0.05	0.01	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
671	Vending Misers	City of Austin	10%	7%	0.00	0.05	0.05	0.01	5	0	0	0	1793.11	0.48	0.50	9.22	1.15
700	Base Cooking	City of Austin	0%	0%	0.00	0.22	0.22	0.03	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
702	Efficient Fryer	City of Austin	4%	4%	0.02	0.23	0.22	0.03	10	0	0	0	3387.50	0.21	0.18	46.63	1.31
704	Energy Star Hot Food Holding Cabinets	City of Austin	2%	2%	0.08	0.23	0.22	0.03	10	0	0	3	23396.32	0.03	0.03	322.04	1.31
800	Base Heating	City of Austin	0%	0%	0.00	0.52	0.52	0.02	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
900	Base Miscellaneous	City of Austin	0%	0%	0.00	0.99	0.99	0.13	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A
100	Base Fluorescent Fixture, 4L4T8	Other	0%	0%	0.00	2.72	2.72	0.39	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	ROB 4L4' Premium T8	Other	17%	17%	0.11	2.72	2.25	0.32	9	9	1	0	235.37	2.69	2.17	3.55	1.43
102	Delamping 3L4' F32T8	Other	25%	25%	0.41	2.72	2.04	0.29	18	5	1	0	339.16	1.87	1.35	9.66	1.43
103	LED Troffer (Base 4L4T8)	Other	40%	40%	2.62	2.72	1.63	0.23	18	14	2	0	1317.70	0.48	0.35	37.53	1.43
104	Lighting Control Tuneup	Other	5%	2%	0.03	2.72	2.58	0.38	6	2	0	0	1096.54	1.31	1.66	3.27	0.94
105	Occupancy Sensor, 4L4' Fluorescent Fixtures	Other	31%	9%	0.14	2.72	1.88	0.35	18	2	0	0	308.76	4.66	5.10	2.56	0.94
106	Continuous Dimming, 4L4' Fluorescent Fixtures	Other	54%	16%	0.75	2.72	1.26	0.33	10	6	0	0	1699.96	0.85	1.01	8.20	0.94
107	High Performance Lighting R/R - 25% Savings, Base 4L4T8	Other	25%	13%	0.40	2.72	2.03	0.34	20	4	0	0	606.77	1.59	1.47	9.35	1.09
110	Base Fluorescent Fixture, 2L4'T8, 1 EB	Other	0%	0%	0.00	2.21	2.21	0.32	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
111	ROB 2L4' Premium T8	Other	17%	17%	0.08	2.25	1.86	0.27	9	6	1	0	205.09	3.09	2.49	3.10	1.43
112	Delamping 1L4' F32T8	Other	48%	48%	0.59	2.21	1.15	0.16	18	7	1	0	313.59	2.02	1.46	8.93	1.43
113	LED Troffer (Base 2L4'T8)	Other	40%	40%	2.39	2.21	1.33	0.19	18	11	2	0	1480.95	0.43	0.31	42.18	1.43
114	Lighting Control Tuneup	Other	5%	2%	0.01	2.21	2.10	0.31	6	1	0	0	674.40	2.13	2.70	2.01	0.94
115	Occupancy Sensor, 2L4' Fluorescent Fixtures	Other	31%	9%	0.14	2.21	1.53	0.29	18	2	0	0	379.63	3.79	4.15	3.14	0.94
116	Continuous Dimming, 2L4' Fluorescent Fixtures	Other	54%	16%	0.75	2.21	1.02	0.27	10	4	0	0	2090.19	0.69	0.82	10.08	0.94
117	High Performance Lighting R/R - 25% Savings, Base 2L4'T8	Other	25%	13%	0.40	2.21	1.65	0.28	20	3	0	0	746.06	1.30	1.19	11.49	1.09
120	Base Other Fluorescent Fixture	Other	0%	0%	0.00	0.55	0.55	0.08	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
121	ROB Premium T8 (base other fluorescent)	Other	17%	17%	0.04	0.58	0.48	0.07	9	0	0	0	418.32	1.51	1.22	6.31	1.43
122	Lighting Control Tuneup	Other	5%	2%	0.03	0.55	0.52	0.08	6	0	0	0	5425.53	0.27	0.34	16.19	0.94
123	Occupancy Sensor, 4L8' Fluorescent Fixtures	Other	31%	9%	0.14	0.55	0.38	0.07	18	0	0	0	1527.06	0.94	1.03	12.65	0.94
124	Continuous Dimming, 4L8' Fluorescent Fixtures	Other	54%	16%	0.75	0.55	0.25	0.07	10	0	0	0	8407.78	0.17	0.20	40.54	0.94

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Sq Ft	Base EUI	EUI	Peak Watts/ Sq Ft	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/KWH	Levelized Cost of Avoided Peak Capacity \$/KW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)	Revenue Test
125	High Performance Lighting R/R - 25% Savings, Base Other Fluorescent	Other	25%	13%	0.40	0.55	0.41	0.07	20	0	0	0	3001.01	0.32	0.30	46.22	1.09
130	Base High-Efficiency Incandescent Flood, 53W to Screw-in Replacement	Other	0%	0%	0.00	2.37	2.37	0.34	1	0	0	N/A	N/A	N/A	N/A	N/A	N/A
131	CFL Screw-in 18W	Other	66%	66%	0.02	2.37	0.81	0.12	4	4	1	0	24.68	25.67	21.97	0.17	1.43
132	Cold Cathode Lamps	Other	66%	66%	0.03	2.37	0.81	0.12	9	0	0	0	22.76	27.84	22.40	0.34	1.43
133	LED screw-in PAR replacement (base incandescent)	Other	89%	90%	0.85	2.37	0.25	0.04	18	6	1	0	220.04	2.88	2.08	6.27	1.43
140	Base High-Efficiency Incandescent Flood, 53W to Hardwired Replacement	Other	0%	0%	0.00	2.37	2.37	0.34	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
141	CFL Hardwired, Modular 18W	Other	66%	66%	0.78	2.37	0.81	0.12	18	5	1	0	278.22	2.28	1.65	7.92	1.43
142	Ceramic Metal Halide	Other	37%	37%	1.87	2.38	1.50	0.21	18	1	0	0	1181.38	0.54	0.39	33.65	1.43
143	LED fixture replacement (base incandescent flood)	Other	89%	90%	1.76	2.37	0.25	0.04	18	7	1	0	454.00	1.40	1.01	12.93	1.43
150	Base CFL to screw-in replacement	Other	0%	0%	0.00	0.61	0.61	0.09	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A
151	LED screw-in replacement (base CFL)	Other	67%	68%	0.74	0.61	0.20	0.03	18	1	0	0	991.41	0.64	0.46	28.24	1.43
160	Base High Bay Metal Halide, 400W	Other	0%	0%	0.35	1.15	1.15	0.16	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
161	High Bay T5	Other	49%	49%	0.12	1.15	0.59	0.08	18	1	0	0	120.26	5.27	3.81	3.43	1.43
162	Induction High Bay Lighting	Other	37%	37%	0.37	1.15	0.72	0.10	32	1	0	0	340.68	1.41	0.99	13.85	1.43
163	PSMH + electronic ballast	Other	37%	37%	0.28	1.15	0.73	0.10	17	1	0	0	405.03	1.56	1.15	11.01	1.43
165	Occupancy Sensor, High Bay T5	Other	21%	6%	0.14	1.19	0.95	0.16	18	0	0	0	1056.39	1.36	1.49	8.75	0.94
180	Base Parking Garage Metal Halide, 250 W	Other	0%	0%	0.00	0.00	0.00	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
185	Base Fluorescent Parking Garage Lighting	Other	0%	0%	0.00	0.71	0.71	0.10	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
186	Parking Garage Low Wattage T8 Lamps replacing 32W lamps	Other	15%	15%	0.00	0.72	0.61	0.09	3	0	0	0	112.81	5.62	4.88	0.59	1.43
187	Bi-Level LED Parking Garage Fixtures (Base Fluorescent)	Other	2%	1%	0.54	0.71	0.69	0.10	5	0	0	9	130660.41	0.01	0.01	563.68	1.09
190	Base Exit Sign	Other	0%	0%	0.00	0.00	0.00	0.00	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
191	LED Exit Sign	Other	81%	81%	0.01	0.01	0.00	0.00	18	0	0	0	772.76	0.82	0.59	22.17	1.43
200	Base Outdoor High Pressure Sodium 250W Lamp	Other	0%	0%	0.05	0.42	0.42	0.06	18	0	0	N/A	N/A	N/A	N/A	N/A	N/A
201	Outdoor Lighting Controls (Photocell/Timeclock)	Other	21%	6%	0.02	0.46	0.36	0.06	18	2	0	0	430.57	3.63	4.06	3.21	0.92
202	LED Outdoor Area Lighting	Other	52%	52%	0.24	0.42	0.20	0.03	9	10	1	0	1147.36	0.55	0.44	17.43	1.43
203	Bi-Level LED Outdoor Lighting	Other	69%	70%	0.91	0.42	0.13	0.02	9	6	1	0	3183.71	0.20	0.16	48.68	1.44
300	Base Centrifugal Chiller, 0.58 kW/ton, 500 tons	Other	0%	0%	1.20	1.16	1.16	0.69	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
301	Centrifugal Chiller, 0.51 kW/ton, 500 tons	Other	12%	12%	0.15	1.21	1.06	0.63	20	1	0	0	128.18	2.99	0.84	16.39	3.57
302	Window Film (Standard) - Chiller	Other	1%	1%	0.08	1.16	1.15	0.68	10	0	0	1	1444.70	0.27	0.08	99.07	3.57
303	EMS - Chiller	Other	10%	10%	0.12	1.28	1.15	0.68	15	0	0	0	148.44	2.58	0.78	14.97	3.57
305	Chiller Tune Up/Diagnostics	Other	8%	5%	0.10	1.20	1.11	0.67	10	0	0	0	404.15	1.07	0.48	17.35	2.52
306	VSD for Chiller Pumps and Towers	Other	10%	10%	0.08	1.21	1.09	0.64	15	0	0	0	109.91	3.49	1.05	11.08	3.57
309	Ceiling/roof Insulation - Chiller	Other	12%	12%	0.27	1.29	1.13	0.67	20	0	0	0	219.44	1.75	0.49	28.06	3.57
310	Duct/Pipe Insulation - Chiller	Other	2%	2%	0.77	1.16	1.14	0.67	10	0	0	5	7673.97	0.05	0.02	526.22	3.57
311	High Efficiency Chiller Motors	Other	3%	3%	0.08	1.18	1.14	0.67	20	0	0	0	252.07	1.52	0.43	32.23	3.57
320	Base DX Packaged System, EER=10.3, 10 tons	Other	0%	0%	3.18	2.01	2.01	1.19	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
321	DX Tune Up/ Advanced Diagnostics	Other	5%	4%	0.13	2.08	1.98	1.19	10	1	0	0	398.74	1.04	0.42	19.95	2.81
322	aged System, EER=10.3, 10 tons, with Automated Fault Detection and Dis	Other	10%	10%	0.08	2.01	1.81	1.07	20	4	3	0	49.51	7.74	2.17	6.33	3.57
323	DX Packaged System, EER=10.9, 10 tons	Other	6%	6%	0.30	2.01	1.90	1.12	20	3	2	0	337.31	1.14	0.32	43.13	3.57
324	DX Packaged System, EER=13.4, 10 tons	Other	23%	23%	0.44	2.01	1.55	0.92	20	14	8	0	118.73	3.23	0.90	15.18	3.57
325	Window Film (Standard) - DX	Other	1%	1%	0.08	2.02	2.00	1.18	10	0	0	0	829.67	0.46	0.15	56.89	3.57
326	Prog. Thermostat - DX	Other	5%	3%	0.04	2.10	2.00	1.21	8	0	0	0	184.96	2.33	1.08	6.50	2.52
330	Optimize Controls - DX	Other	5%	3%	0.04	2.08	1.98	1.19	5	1	0	0	287.48	1.50	0.72	6.42	2.52
331	Economizer - DX	Other	8%	5%	0.34	2.09	1.93	1.18	15	2	1	0	534.80	0.80	0.34	33.88	2.52
332	Aerosol Duct Sealing - DX	Other	7%	7%	0.04	2.02	1.88	1.11	15	1	1	0	39.95	9.59	2.90	4.03	3.57
333	Ceiling/roof Insulation - DX	Other	12%	12%	0.12	2.29	2.01	1.19	20	0	0	0	53.71	7.14	2.00	6.87	3.57
334	Duct/Pipe Insulation - DX	Other	2%	2%	0.65	2.04	2.00	1.18	10	0	0	2	3703.56	0.10	0.03	253.96	3.57
335	DX Coil Cleaning	Other	5%	5%	0.03	2.05	1.96	1.16	5	1	1	0	118.45	3.24	1.09	4.21	3.57
337	Geothermal Heat Pump, EER=13, 10 tons - DX	Other	37%	37%	3.08	2.02	1.27	0.75	15	1	1	0	651.46	0.59	0.18	65.69	3.57
340	Base PTAC, EER=8.3, 1 ton	Other	0%	0%	2.07	3.44	3.44	2.04	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
341	HE PTAC, EER=9.6, 1 ton	Other	14%	14%	0.72	3.44	2.98	1.76	20	2	1	0	193.42	1.98	0.55	24.73	3.57
400	Base Fan Motor, 5hp, 1800rpm, 87.5%	Other	0%	0%	0.03	1.46	1.46	0.33	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
401	Fan Motor, 5hp, 1800rpm, 89.5%	Other	2%	2%	0.01	1.47	1.44	0.33	20	1	0	0	96.64	5.29	2.89	4.74	1.83
402	Variable Speed Drive Control, 5 HP	Other	30%	18%	0.19	1.55	1.09	0.29	15	10	1	0	276.95	2.34	1.80	6.47	1.40
410	Base Fan Motor, 15hp, 1800rpm, 91.0%	Other	0%	0%	0.04	1.35	1.35	0.31	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
411	Fan Motor, 15hp, 1800rpm, 92.4%	Other	2%	2%	0.01	1.35	1.33	0.30	20	0	0	0	156.61	3.27	1.78	7.69	1.83
412	Variable Speed Drive Control, 15 HP	Other	30%	18%	0.21	1.48	1.04	0.28	20	7	1	0	252.85	2.56	1.83	7.49	1.40
413	Electronically Commutated Motors (ECM) on an Air Handler Unit	Other	14%	9%	0.04	1.35	1.16	0.28	15	3	0	0	135.43	4.78	3.69	3.16	1.40
414	Energy Recovery Ventilation (ERV)	Other	7%	7%	0.18	1.44	1.33	0.30	20	0	0	0	589.94	0.87	0.47	28.96	1.83
420	Base Fan Motor, 40hp, 1800rpm, 93.0%	Other	0%	0%	0.09	1.33	1.33	0.30	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
421	Fan Motor, 40hp, 1800rpm, 94.1%	Other	1%	1%	0.02	1.34	1.32	0.30	20	0	0	0	498.41	1.03	0.56	24.46	1.83

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Sq Ft	Base EUI	EUI	Peak Watts/ Sq Ft	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWH	Levelized Cost of Avoided Peak Capacity \$/KW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)	Revenue Test	
422	Variable Speed Drive Control, 40 HP	Other	30%	18%	0.38	1.88	1.32	0.35	20	0	0	0	361.72	1.79	1.28	10.72	1.40	
423	Air Handler Tuneups	Other	10%	10%	0.05	1.37	1.24	0.28	8	1	0	0	269.89	1.89	1.21	5.79	1.83	
424	Demand Controlled Ventilation	Other	15%	9%	0.12	1.53	1.30	0.32	15	0	0	0	372.79	1.74	1.34	8.71	1.40	
500	Base Built-Up Refrigeration System	Other	0%	0%	0.00	0.97	0.97	0.13	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A	
501	High-efficiency fan motors	Other	12%	12%	0.12	0.97	0.85	0.12	20	0	0	0	544.25	1.20	0.86	15.95	1.39	
505	Compressor VSD retrofit	Other	6%	3%	0.04	0.97	0.91	0.13	13	0	0	0	1060.59	0.94	0.97	10.80	1.07	
507	Refrigeration Commissioning	Other	5%	5%	0.02	0.99	0.94	0.13	3	0	0	0	1133.47	0.58	0.51	5.62	1.39	
508	Demand Hot Gas Defrost	Other	3%	3%	0.00	0.97	0.94	0.13	10	0	0	0	135.42	4.81	3.90	2.13	1.39	
511	Freezer-Cooler Replacement Gaskets (built-up systems)	Other	7%	7%	0.00	1.00	0.93	0.13	4	0	0	0	44.38	14.69	12.90	0.29	1.39	
512	High R-Value Glass Doors	Other	2%	2%	0.02	0.97	0.95	0.13	10	0	0	0	1556.48	0.42	0.34	24.46	1.39	
513	Bi-level LED Case Lighting (built-up systems)	Other	1%	1%	0.02	0.97	0.96	0.13	10	0	0	0	4001.11	0.19	0.17	48.36	1.24	
514	Fiber Optic Case Lighting (built-up systems)	Other	25%	25%	0.03	0.97	0.73	0.10	10	0	0	0	117.82	5.53	4.49	1.85	1.39	
517	Oversized Air Cooled Condenser	Other	8%	8%	0.06	1.01	0.93	0.13	16	0	0	0	495.22	1.32	1.01	12.11	1.39	
520	Base Self-Contained Refrigeration	Other	0%	0%	0.00	0.97	0.97	0.13	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A	
522	Night covers for display cases (self-contained)	Other	2%	0%	0.00	0.97	0.95	0.13	5	0	0	0	N/A	N/A	27.01	43.77	0.11	0.74
523	Freezer-Cooler Replacement Gaskets (self-contained)	Other	3%	3%	0.00	0.98	0.95	0.13	4	0	0	0	8.11	80.41	70.61	0.05	1.39	
524	Bi-level LED Case Lighting (self-contained units)	Other	1%	1%	0.00	0.97	0.96	0.13	10	0	0	0	305.10	2.48	2.25	3.69	1.24	
526	Energy-Star Refrigerator, solid door	Other	6%	6%	0.00	0.99	0.93	0.13	10	0	0	0	14.46	45.08	36.55	0.23	1.39	
528	Energy-Star Refrigerator, glass door	Other	2%	2%	0.00	0.98	0.95	0.13	10	0	0	0	0.24	2,746.08	2,226.63	0.00	1.39	
530	Energy Star Ice Machines	Other	4%	4%	0.00	0.98	0.94	0.13	10	0	0	0	3.43	190.14	154.17	0.05	1.39	
600	Base Desktop PC	Other	0%	0%	0.00	0.08	0.08	0.01	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A	
601	PC Manual Power Management Enabling	Other	65%	45%	0.00	0.10	0.04	0.01	4	1	0	0	135.82	6.48	6.98	0.54	1.14	
602	PC Network Power Management Enabling	Other	65%	45%	0.00	0.10	0.04	0.01	4	1	0	0	135.82	6.48	6.98	0.54	1.14	
603	Energy Star or Better PC	Other	31%	25%	0.00	0.09	0.06	0.01	4	1	0	0	171.79	4.69	4.80	0.78	1.19	
610	Base Monitor, CRT	Other	0%	0%	0.00	0.00	0.00	0.00	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A	
620	Base Monitor, LCD	Other	0%	0%	0.00	0.02	0.02	0.00	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A	
621	Energy Star or Better Monitor--LCD	Other	53%	42%	0.00	0.02	0.01	0.00	4	1	0	0	338.85	2.38	2.44	1.54	1.19	
622	Monitor Power Management Enabling--LCD	Other	53%	37%	0.00	0.04	0.02	0.00	4	0	0	0	401.72	2.19	2.36	1.59	1.14	
630	Base Copier	Other	0%	0%	0.00	0.01	0.01	0.00	6	0	0	N/A	N/A	N/A	N/A	N/A	N/A	
631	Energy Star or Better Copier	Other	19%	15%	0.00	0.01	0.01	0.00	6	0	0	0	191.04	4.22	4.22	1.29	1.19	
632	Copier Power Management Enabling	Other	18%	13%	0.00	0.0086	0.01	0.00	6	0	0	0	1082.32	0.81	0.86	6.35	1.14	
640	Base Laser Printer	Other	0%	0%	0.00	0.01	0.01	0.00	5	0	0	N/A	N/A	N/A	N/A	N/A	N/A	
641	Printer Power Management Enabling	Other	47%	32%	0.00	0.02	0.01	0.00	5	0	0	0	495.68	1.78	1.89	2.44	1.14	
650	Base Data Center/Server Room	Other	0%	0%	0.00	124.94	124.94	14.69	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A	
651	Data Center Improved Operations	Other	19%	13%	0.50	129.87	105.20	13.26	10	0	0	0	34.03	25.87	25.73	0.32	1.14	
652	Data Center Best Practices	Other	43%	34%	2.50	130.56	74.34	10.17	10	0	0	0	66.21	12.31	11.73	0.71	1.19	
653	Data Center State of the Art practices	Other	56%	56%	5.00	124.94	54.97	6.46	10	0	0	0	83.39	8.45	7.30	1.14	1.31	
660	Base Water Heating	Other	0%	0%	0.00	0.38	0.38	0.05	15	0	0	N/A	N/A	N/A	N/A	N/A	N/A	
661	Demand controlled circulating systems	Other	4%	2%	0.02	0.38	0.36	0.05	15	0	0	0	2108.84	0.50	0.52	22.59	1.05	
662	High Efficiency Water Heater (electric)	Other	2%	2%	0.00	0.38	0.37	0.05	15	0	0	0	188.43	3.46	2.67	4.36	1.39	
663	Hot Water Pipe Insulation	Other	2%	2%	0.01	0.38	0.37	0.05	15	0	0	0	572.76	1.14	0.88	13.26	1.39	
664	Tankless Water Heater	Other	10%	10%	0.02	0.38	0.34	0.05	20	0	0	0	255.68	2.55	1.83	7.51	1.39	
665	Heat Pump Water Heater (air source)	Other	20%	20%	0.05	0.38	0.30	0.04	15	1	0	0	434.69	1.50	1.16	10.07	1.39	
666	Heat Recovery Unit	Other	65%	65%	0.08	0.38	0.13	0.02	10	0	0	0	330.77	1.97	1.59	5.21	1.39	
667	Heat Trap	Other	9%	9%	0.00	0.39	0.35	0.05	10	0	0	0	108.61	6.00	4.86	1.71	1.39	
670	Base Vending Machines	Other	0%	0%	0.00	0.04	0.04	0.01	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A	
671	Vending Misers	Other	10%	7%	0.00	0.04	0.04	0.01	5	0	0	0	1622.95	0.49	0.48	9.51	1.21	
700	Base Cooking	Other	0%	0%	0.00	0.32	0.32	0.05	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A	
702	Efficient Fryer	Other	4%	4%	0.03	0.32	0.31	0.05	10	0	0	0	2644.10	0.23	0.18	47.45	1.49	
800	Base Heating	Other	0%	0%	0.00	0.42	0.42	0.01	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A	
900	Base Miscellaneous	Other	0%	0%	0.00	1.16	1.16	0.17	10	0	0	N/A	N/A	N/A	N/A	N/A	N/A	

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Commercial Electric New Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Sq Ft	Base EUI	EUI	Peak Watts/ Sq Ft	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWH	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
100	Base Bldg Design - 15%	Office	0%	0%	0.00	18.40	18.40	3.29	20	0.00	0.00	N/A	N/A	N/A	N/A	N/A
102	High Performance Building/Int Design - Tier 1 15% - Office	Office	15%	15%	1.57	18.40	15.64	2.80	20	5.14	0.92	0.04	233.40	2.43	1.52	9.03
200	Base Bldg Design - 30%	Office	0%	0%	0.00	18.40	18.40	3.29	20	0.00	0.00	N/A	N/A	N/A	N/A	N/A
202	High Performance Building/Int Design - Tier 2 30% - Office	Office	30%	30%	2.24	18.40	12.88	2.30	20	8.23	1.47	0.03	166.72	3.40	2.12	6.45
300	Base Bldg Design - 50%	Office	0%	0%	0.00	18.40	18.40	3.29	20	0.00	0.00	N/A	N/A	N/A	N/A	N/A
302	High Performance Building/Int Design - Tier 3 50% - Office	Office	50%	50%	3.92	18.40	9.20	1.65	20	3.09	0.55	0.03	175.05	3.24	2.02	6.78
400	Base Bldg Design - 70%	Office	0%	0%	0.00	18.40	18.40	3.29	20	0.00	0.00	N/A	N/A	N/A	N/A	N/A
402	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Office	Office	70%	70%	6.15	18.40	5.52	0.99	20	0.48	0.09	0.04	196.49	2.89	1.80	7.61
100	Base Bldg Design - 15%	Restaurant	0%	0%	0.00	31.18	31.18	6.50	20	0.00	0.00	N/A	N/A	N/A	N/A	N/A
103	High Performance Building/Int Design - Tier 1 15% - Restaurant	Restaurant	15%	15%	1.92	31.18	26.50	5.53	20	0.94	0.20	0.03	144.84	3.66	2.10	6.54
200	Base Bldg Design - 30%	Restaurant	0%	0%	0.00	31.18	31.18	6.50	20	0.00	0.00	N/A	N/A	N/A	N/A	N/A
203	High Performance Building/Int Design - Tier 2 30% - Restaurant	Restaurant	30%	30%	2.74	31.18	21.83	4.55	20	1.51	0.31	0.02	103.46	5.12	2.94	4.67
300	Base Bldg Design - 50%	Restaurant	0%	0%	0.00	31.18	31.18	6.50	20	0.00	0.00	N/A	N/A	N/A	N/A	N/A
303	High Performance Building/Int Design - Tier 3 50% - Restaurant	Restaurant	50%	50%	4.80	31.18	15.59	3.25	20	0.57	0.12	0.02	108.63	4.88	2.80	4.90
400	Base Bldg Design - 70%	Restaurant	0%	0%	0.00	31.18	31.18	6.50	20	0.00	0.00	N/A	N/A	N/A	N/A	N/A
403	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Restaurant	Restaurant	70%	70%	7.54	31.18	9.35	1.95	20	0.09	0.02	0.03	121.93	4.34	2.49	5.50
100	Base Bldg Design - 15%	Retail	0%	0%	0.00	5.68	5.68	1.23	20	0.00	0.00	N/A	N/A	N/A	N/A	N/A
105	High Performance Building/Int Design - Tier 1 15% - Retail	Retail	15%	15%	1.14	5.68	4.83	1.04	20	1.73	0.38	0.10	455.26	1.15	0.64	21.32
200	Base Bldg Design - 30%	Retail	0%	0%	0.00	5.68	5.68	1.23	20	0.00	0.00	N/A	N/A	N/A	N/A	N/A
205	High Performance Building/Int Design - Tier 2 30% - Retail	Retail	30%	30%	1.63	5.68	3.98	0.86	20	2.78	0.60	0.07	325.18	1.60	0.90	15.23
300	Base Bldg Design - 50%	Retail	0%	0%	0.00	5.68	5.68	1.23	20	0.00	0.00	N/A	N/A	N/A	N/A	N/A
305	High Performance Building/Int Design - Tier 3 50% - Retail	Retail	50%	50%	2.85	5.68	2.84	0.61	20	1.04	0.23	0.07	341.45	1.53	0.86	15.99
400	Base Bldg Design - 70%	Retail	0%	0%	0.00	5.68	5.68	1.23	20	0.00	0.00	N/A	N/A	N/A	N/A	N/A
405	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Retail	Retail	70%	70%	4.48	5.68	1.70	0.37	20	0.16	0.04	0.08	383.25	1.36	0.76	17.94
100	Base Bldg Design - 15%	Grocery	0%	0%	0.00	49.90	49.90	8.14	20	0.00	0.00	N/A	N/A	N/A	N/A	N/A
106	High Performance Building/Int Design - Tier 1 15% - Grocery	Grocery	15%	15%	1.00	49.90	42.42	6.92	20	0.57	0.09	0.01	60.04	9.87	6.47	2.12
200	Base Bldg Design - 30%	Grocery	0%	0%	0.00	49.90	49.90	8.14	20	0.00	0.00	N/A	N/A	N/A	N/A	N/A
206	High Performance Building/Int Design - Tier 2 30% - Grocery	Grocery	30%	30%	1.42	49.90	34.93	5.70	20	0.91	0.15	0.01	42.88	13.82	9.06	1.51
300	Base Bldg Design - 50%	Grocery	0%	0%	0.00	49.90	49.90	8.14	20	0.00	0.00	N/A	N/A	N/A	N/A	N/A
306	High Performance Building/Int Design - Tier 3 50% - Grocery	Grocery	50%	50%	2.49	49.90	24.95	4.07	20	0.34	0.06	0.01	45.03	13.16	8.63	1.59
400	Base Bldg Design - 70%	Grocery	0%	0%	0.00	49.90	49.90	8.14	20	0.00	0.00	N/A	N/A	N/A	N/A	N/A
406	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Grocery	Grocery	70%	70%	3.91	49.90	14.97	2.44	20	0.05	0.01	0.01	50.54	11.73	7.69	1.78
100	Base Bldg Design - 15%	Warehouse	0%	0%	0.00	4.24	4.24	0.72	20	0.00	0.00	N/A	N/A	N/A	N/A	N/A
107	High Performance Building/Int Design - Tier 1 15% - Warehouse	Warehouse	15%	15%	0.85	4.24	3.61	0.61	20	0.25	0.04	0.10	582.72	1.00	0.64	21.35
200	Base Bldg Design - 30%	Warehouse	0%	0%	0.00	4.24	4.24	0.72	20	0.00	0.00	N/A	N/A	N/A	N/A	N/A
207	High Performance Building/Int Design - Tier 2 30% - Warehouse	Warehouse	30%	30%	1.22	4.24	2.97	0.50	20	0.39	0.07	0.07	416.23	1.40	0.90	15.25
300	Base Bldg Design - 50%	Warehouse	0%	0%	0.00	4.24	4.24	0.72	20	0.00	0.00	N/A	N/A	N/A	N/A	N/A
307	High Performance Building/Int Design - Tier 3 50% - Warehouse	Warehouse	50%	50%	2.13	4.24	2.12	0.36	20	0.15	0.02	0.07	437.03	1.33	0.86	16.01
400	Base Bldg Design - 70%	Warehouse	0%	0%	0.00	4.24	4.24	0.72	20	0.00	0.00	N/A	N/A	N/A	N/A	N/A
407	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Warehouse	Warehouse	70%	70%	3.35	4.24	1.27	0.22	20	0.02	0.00	0.08	490.54	1.19	0.76	17.97

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Industrial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Base kWh	Base EUI	EUI	Peak Watts/ Base kWh	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWh	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
100	Base Compressed Air	Food	0%	0%	0.00	1.08	1.08	0.15	14	0	0	N/A	N/A	N/A	N/A	N/A
101	Compressed Air-O&M	Food	17%	17%	0.01	1.22	1.01	0.14	2	0	0	0	234.41	2.75	1.72	1.14
102	Compressed Air - Controls	Food	12%	12%	0.02	1.18	1.04	0.14	10	0	0	0	122.04	5.29	2.98	2.79
103	Compressed Air - System Optimization	Food	20%	20%	0.02	1.19	0.96	0.13	10	0	0	0	67.43	9.57	5.39	1.54
104	Compressed Air- Sizing	Food	9%	9%	0.00	1.16	1.06	0.15	10	0	0	0	43.76	14.74	8.30	1.00
105	Comp Air - Replace 1-5 HP motor	Food	3%	3%	0.05	1.08	1.05	0.14	17	0	0	0	1079.07	0.60	0.31	40.44
106	Comp Air - ASD (1-5 hp)	Food	6%	1%	0.08	1.08	1.01	0.15	17	0	0	0	7560.56	0.51	0.47	27.15
107	Comp Air - Motor practices-1 (1-5 HP)	Food	5%	5%	0.02	1.08	1.02	0.14	17	0	0	0	251.61	2.56	1.34	9.43
108	Comp Air - Replace 6-100 HP motor	Food	4%	4%	0.03	1.09	1.05	0.15	20	0	0	0	421.12	1.53	0.76	17.96
109	Comp Air - ASD (6-100 hp)	Food	6%	1%	0.00	1.08	1.01	0.15	20	0	0	0	222.34	17.41	15.09	0.91
110	Comp Air - Motor practices-1 (6-100 HP)	Food	2%	2%	0.01	1.10	1.07	0.15	20	0	0	0	109.30	5.90	2.94	4.66
111	Comp Air - Replace 100+ HP motor	Food	3%	3%	0.01	1.10	1.07	0.15	20	0	0	0	140.70	4.59	2.28	6.00
112	Comp Air - ASD (100+ hp)	Food	6%	1%	0.01	1.10	1.03	0.15	20	0	0	0	486.39	7.96	6.90	1.99
113	Comp Air - Motor practices-1 (100+ HP)	Food	2%	2%	0.00	1.08	1.06	0.15	20	0	0	0	72.35	8.92	4.44	3.09
200	Base Fans	Food	0%	0%	0.00	1.08	1.08	0.15	14	0	0	N/A	N/A	N/A	N/A	N/A
201	Fans - O&M	Food	2%	2%	0.00	1.08	1.06	0.15	2	0	0	0	217.68	2.96	1.86	1.05
202	Fans - Controls	Food	30%	30%	0.09	1.17	0.82	0.11	10	0	0	0	264.63	2.44	1.37	6.05
203	Fans - System Optimization	Food	20%	10%	0.06	1.11	0.88	0.14	10	0	0	0	546.88	1.84	1.36	6.11
204	Fans- Improve components	Food	5%	5%	0.01	1.09	1.04	0.14	10	0	0	0	92.84	6.95	3.91	2.12
205	Fans - Replace 1-5 HP motor	Food	3%	3%	0.05	1.08	1.05	0.14	17	0	0	0	1082.57	0.60	0.31	40.58
206	Fans - ASD (1-5 hp)	Food	6%	1%	0.08	1.08	1.01	0.15	17	0	0	0	7559.26	0.51	0.47	27.15
207	Fans - Motor practices-1 (1-5 HP)	Food	5%	5%	0.02	1.08	1.02	0.14	17	0	0	0	251.57	2.57	1.34	9.43
208	Fans - Replace 6-100 HP motor	Food	3%	4%	0.03	1.08	1.04	0.14	20	0	0	0	425.07	1.48	0.72	19.13
209	Fans - ASD (6-100 hp)	Food	5%	1%	0.00	1.08	1.03	0.15	20	0	0	0	221.60	13.42	11.33	1.21
210	Fans - Motor practices-1 (6-100 HP)	Food	2%	2%	0.01	1.08	1.05	0.15	20	0	0	0	111.30	5.80	2.89	4.75
211	Fans - Replace 100+ HP motor	Food	3%	3%	0.01	1.08	1.04	0.14	20	0	0	0	143.72	4.49	2.24	6.13
212	Fans - ASD (100+ hp)	Food	6%	1%	0.01	1.08	1.02	0.15	20	0	0	0	494.21	7.43	6.41	2.14
213	Fans - Motor practices-1 (100+ HP)	Food	1%	2%	0.00	1.08	1.06	0.15	20	0	0	0	72.75	7.76	3.37	4.07
300	Base Pumps	Food	0%	0%	0.00	1.08	1.08	0.15	14	0	0	N/A	N/A	N/A	N/A	N/A
301	Pumps - O&M	Food	10%	10%	0.01	1.17	1.05	0.15	2	0	0	0	204.38	3.16	1.98	0.99
302	Pumps - Controls	Food	30%	30%	0.03	1.45	1.02	0.14	10	0	0	0	62.57	10.31	5.80	1.43
303	Pumps - System Optimization	Food	33%	33%	0.07	1.49	1.00	0.14	10	0	0	0	135.11	4.78	2.69	3.09
304	Pumps - Sizing	Food	20%	20%	0.02	1.28	1.02	0.14	10	0	0	0	78.86	8.18	4.60	1.80
305	Pumps - Replace 1-5 HP motor	Food	3%	3%	0.05	1.08	1.05	0.14	17	0	0	0	1079.79	0.60	0.31	40.47
306	Pumps - ASD (1-5 hp)	Food	6%	1%	0.08	1.08	1.01	0.15	17	0	0	0	7560.56	0.51	0.47	27.15
307	Pumps - Motor practices-1 (1-5 HP)	Food	5%	5%	0.02	1.11	1.05	0.15	17	0	0	0	244.42	2.64	1.38	9.16
308	Pumps - Replace 6-100 HP motor	Food	4%	4%	0.03	1.08	1.04	0.14	20	0	0	0	426.06	1.51	0.75	18.17
309	Pumps - ASD (6-100 hp)	Food	6%	1%	0.00	1.08	1.01	0.15	20	0	0	0	222.06	17.43	15.11	0.91
310	Pumps - Motor practices-1 (6-100 HP)	Food	2%	2%	0.01	1.08	1.06	0.15	20	0	0	0	110.60	5.83	2.91	4.72
311	Pumps - Replace 100+ HP motor	Food	3%	3%	0.01	1.10	1.06	0.15	20	0	0	0	141.23	4.57	2.28	6.02
312	Pumps - ASD (100+ hp)	Food	6%	1%	0.01	1.08	1.01	0.15	20	0	0	0	495.99	7.81	6.76	2.03
313	Pumps - Motor practices-1 (100+ HP)	Food	2%	2%	0.00	1.08	1.06	0.15	20	0	0	0	72.75	8.87	4.42	3.10
400	Base Drives	Food	0%	0%	0.00	1.08	1.08	0.15	20	0	0	N/A	N/A	N/A	N/A	N/A
401	Bakery - Process (Mixing) - O&M	Food	10%	10%	0.01	1.11	1.00	0.14	10	0	0	0	45.76	14.10	7.94	1.05
431	Custom Measures--Drives	Food	3%	3%	0.01	1.08	1.04	0.14	15	0	0	0	209.65	3.08	1.65	7.05
500	Base Process Heating	Food	0%	0%	0.00	1.08	1.08	0.15	20	0	0	N/A	N/A	N/A	N/A	N/A
501	Bakery - Process	Food	37%	37%	0.05	1.32	0.83	0.11	15	0	0	0	70.30	9.18	4.93	2.36
512	Custom Measures--Process Heating	Food	3%	3%	0.01	1.08	1.04	0.14	15	0	0	0	209.65	3.08	1.65	7.05
550	Base Process Cooling	Food	0%	0%	0.00	1.08	1.08	0.15	20	0	0	N/A	N/A	N/A	N/A	N/A
551	Efficient Refrigeration - Operations	Food	12%	12%	0.01	1.10	0.97	0.13	10	0	0	0	55.14	11.70	6.59	1.26
552	Optimization Refrigeration	Food	26%	26%	0.11	1.09	0.81	0.11	15	1	0	0	264.82	2.44	1.31	8.91
553	Custom Measures--Process Cooling	Food	3%	3%	0.01	1.08	1.04	0.14	15	0	0	0	209.65	3.08	1.65	7.05
600	Base Other Process	Food	0%	0%	0.00	1.08	1.08	0.15	15	0	0	N/A	N/A	N/A	N/A	N/A
605	Custom Measures--Other Process	Food	3%	3%	0.01	1.08	1.04	0.14	15	0	0	0	209.65	3.08	1.65	7.05
700	Space Cooling Centrifugal Chiller, 0.58 kW/ton, 500	Food	0%	0%	0.00	1.08	1.08	0.28	20	0	0	N/A	N/A	N/A	N/A	N/A
710	Space Cooling DX Packaged System, EER=10.3, 10	Food	0%	0%	0.00	1.08	1.08	0.28	15	0	0	N/A	N/A	N/A	N/A	N/A

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Industrial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Base kWh	Base EUI	EUI	Peak Watts/ Base kWh	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWh	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
711	DX Tune Up/ Advanced Diagnostics	Food	10%	10%	0.07	1.13	1.02	0.26	3	0	0	0	1018.74	0.48	0.21	13.75
712	DX Packaged System, EER=10.9, 10 tons	Food	6%	6%	0.05	0.93	0.88	0.23	15	0	0	0	320.08	1.52	0.58	20.13
713	Window Film - DX	Food	10%	10%	0.03	1.16	1.04	0.27	10	0	0	0	151.43	3.21	1.28	6.48
715	Prog. Thermostat - DX	Food	10%	3%	0.00	1.13	1.03	0.29	10	0	0	0	90.48	11.06	8.19	1.01
800	Base Lighting	Food	0%	0%	0.00	1.08	1.08	0.15	10	0	0	N/A	N/A	N/A	N/A	N/A
801	RET 2L4' Premium T8, 1EB	Food	31%	31%	0.10	1.09	0.75	0.10	15	0	0	0	201.58	3.20	1.72	6.78
802	CFL Hardwired, Modular 36W	Food	72%	72%	0.10	1.08	0.30	0.04	4	0	0	0	311.80	2.07	1.26	2.98
803	Metal Halide, 50W	Food	58%	58%	0.67	1.27	0.53	0.07	5	0	0	0	1739.71	0.37	0.22	20.62
804	Occupancy Sensor, 4L4' Fluorescent Fixtures	Food	19%	20%	0.05	1.08	0.88	0.12	9	0	0	0	252.53	2.48	1.39	5.55
900	Base Other	Food	0%	0%	0.00	1.08	1.08	0.15	15	0	0	N/A	N/A	N/A	N/A	N/A
901	Replace V-belts	Food	0%	0%	0.00	1.08	1.07	0.15	5	0	0	0	297.42	2.17	1.30	3.52
100	Base Compressed Air	Textiles-Apparel	0%	0%	0.00	1.08	1.08	0.27	14	0	0	N/A	N/A	N/A	N/A	N/A
101	Compressed Air-O&M	Textiles-Apparel	17%	17%	0.01	1.24	1.03	0.26	2	0	0	0	124.62	3.92	1.75	1.12
102	Compressed Air - Controls	Textiles-Apparel	12%	12%	0.02	1.18	1.04	0.27	10	0	0	0	66.01	7.40	2.98	2.79
103	Compressed Air - System Optimization	Textiles-Apparel	20%	20%	0.02	1.19	0.96	0.24	10	0	0	0	36.47	13.39	5.39	1.54
104	Compressed Air- Sizing	Textiles-Apparel	9%	9%	0.00	1.08	0.98	0.25	10	0	0	0	25.55	19.11	7.69	1.08
105	Comp Air - Replace 1-5 HP motor	Textiles-Apparel	3%	3%	0.05	1.08	1.05	0.27	17	0	0	0	583.64	0.84	0.31	40.44
106	Comp Air - ASD (1-5 hp)	Textiles-Apparel	5%	1%	0.08	1.08	1.02	0.27	17	0	0	0	4089.32	0.49	0.41	30.53
107	Comp Air - Motor practices-1 (1-5 HP)	Textiles-Apparel	5%	5%	0.02	1.08	1.02	0.26	17	0	0	0	136.09	3.59	1.34	9.43
108	Comp Air - Replace 6-100 HP motor	Textiles-Apparel	3%	4%	0.03	1.11	1.07	0.27	20	0	0	0	224.32	2.18	0.78	17.69
109	Comp Air - ASD (6-100 hp)	Textiles-Apparel	5%	1%	0.00	1.08	1.02	0.27	20	0	0	0	120.26	16.80	13.42	1.02
110	Comp Air - Motor practices-1 (6-100 HP)	Textiles-Apparel	2%	2%	0.01	1.08	1.05	0.27	20	0	0	0	60.36	8.09	2.88	4.76
111	Comp Air - Replace 100+ HP motor	Textiles-Apparel	3%	3%	0.01	1.10	1.06	0.27	20	0	0	0	76.39	6.39	2.28	6.02
112	Comp Air - ASD (100+ hp)	Textiles-Apparel	5%	1%	0.01	1.08	1.02	0.27	20	0	0	0	268.27	7.53	6.02	2.28
113	Comp Air - Motor practices-1 (100+ HP)	Textiles-Apparel	1%	2%	0.00	1.09	1.07	0.27	20	0	0	0	38.99	12.52	4.46	3.07
200	Base Fans	Textiles-Apparel	0%	0%	0.00	1.08	1.08	0.27	14	0	0	N/A	N/A	N/A	N/A	N/A
201	Fans - O&M	Textiles-Apparel	2%	2%	0.00	1.09	1.07	0.27	2	0	0	0	116.05	4.21	1.88	1.04
202	Fans - Controls	Textiles-Apparel	30%	30%	0.09	1.41	0.99	0.25	10	0	0	0	119.31	4.09	1.65	5.05
203	Fans - System Optimization	Textiles-Apparel	19%	10%	0.06	1.27	1.02	0.29	10	0	0	0	258.96	2.54	1.46	5.70
204	Fans - Improve components	Textiles-Apparel	5%	5%	0.01	1.11	1.06	0.27	10	0	0	0	49.39	9.89	3.98	2.09
205	Fans - Replace 1-5 HP motor	Textiles-Apparel	3%	3%	0.05	1.08	1.05	0.27	17	0	0	0	583.64	0.84	0.31	40.44
206	Fans - ASD (1-5 hp)	Textiles-Apparel	5%	1%	0.08	1.09	1.03	0.28	17	0	0	0	4049.56	0.50	0.42	30.23
207	Fans - Motor practices-1 (1-5 HP)	Textiles-Apparel	5%	5%	0.02	1.08	1.02	0.26	17	0	0	0	136.09	3.59	1.34	9.43
208	Fans - Replace 6-100 HP motor	Textiles-Apparel	3%	4%	0.03	1.09	1.06	0.27	20	0	0	0	226.72	2.10	0.72	19.17
209	Fans - ASD (6-100 hp)	Textiles-Apparel	3%	1%	0.00	1.08	1.05	0.27	20	0	0	0	119.98	10.13	7.15	1.92
210	Fans - Motor practices-1 (6-100 HP)	Textiles-Apparel	2%	2%	0.01	1.09	1.06	0.27	20	0	0	0	59.51	8.21	2.92	4.69
211	Fans - Replace 100+ HP motor	Textiles-Apparel	3%	3%	0.01	1.08	1.05	0.27	20	0	0	0	77.64	6.29	2.24	6.12
212	Fans - ASD (100+ hp)	Textiles-Apparel	5%	1%	0.01	1.12	1.07	0.29	20	0	0	0	256.44	7.34	5.79	2.37
213	Fans - Motor practices-1 (100+ HP)	Textiles-Apparel	1%	2%	0.00	1.08	1.07	0.27	20	0	0	0	39.35	10.56	2.68	5.11
300	Base Pumps	Textiles-Apparel	0%	0%	0.00	1.08	1.08	0.27	14	0	0	N/A	N/A	N/A	N/A	N/A
301	Pumps - O&M	Textiles-Apparel	10%	10%	0.01	1.13	1.01	0.26	2	0	0	0	115.08	4.24	1.90	1.03
302	Pumps - Controls	Textiles-Apparel	30%	30%	0.03	1.39	0.97	0.25	10	0	0	0	35.28	13.84	5.57	1.49
303	Pumps - System Optimization	Textiles-Apparel	33%	33%	0.07	1.15	0.77	0.20	10	0	0	0	94.63	5.16	2.08	4.00
304	Pumps - Sizing	Textiles-Apparel	20%	20%	0.02	1.28	1.02	0.26	10	0	0	0	42.65	11.45	4.60	1.80
305	Pumps - Replace 1-5 HP motor	Textiles-Apparel	3%	3%	0.05	1.08	1.05	0.27	17	0	0	0	584.59	0.84	0.31	40.51
306	Pumps - ASD (1-5 hp)	Textiles-Apparel	5%	1%	0.08	1.09	1.03	0.28	17	0	0	0	4046.22	0.50	0.42	30.21
307	Pumps - Motor practices-1 (1-5 HP)	Textiles-Apparel	5%	5%	0.02	1.10	1.05	0.27	17	0	0	0	133.08	3.67	1.37	9.22
308	Pumps - Replace 6-100 HP motor	Textiles-Apparel	3%	4%	0.03	1.08	1.04	0.27	20	0	0	0	229.82	2.12	0.76	18.12
309	Pumps - ASD (6-100 hp)	Textiles-Apparel	5%	1%	0.00	1.11	1.05	0.28	20	0	0	0	116.80	17.29	13.82	0.99
310	Pumps - Motor practices-1 (6-100 HP)	Textiles-Apparel	2%	2%	0.01	1.08	1.05	0.27	20	0	0	0	60.09	8.13	2.89	4.74
311	Pumps - Replace 100+ HP motor	Textiles-Apparel	3%	3%	0.01	1.10	1.06	0.27	20	0	0	0	76.39	6.39	2.28	6.02
312	Pumps - ASD (100+ hp)	Textiles-Apparel	5%	1%	0.01	1.08	1.02	0.27	20	0	0	0	267.95	7.54	6.02	2.28
313	Pumps - Motor practices-1 (100+ HP)	Textiles-Apparel	1%	2%	0.00	1.08	1.06	0.27	20	0	0	0	39.35	12.41	4.42	3.10
400	Base Drives	Textiles-Apparel	0%	0%	0.00	1.08	1.08	0.27	20	0	0	N/A	N/A	N/A	N/A	N/A
402	O&M/drives spinning machines	Textiles-Apparel	16%	16%	0.03	1.19	1.00	0.25	10	0	0	0	91.86	5.32	2.14	3.88
431	Custom Measures--Drives	Textiles-Apparel	3%	3%	0.01	1.08	1.04	0.27	15	0	0	0	113.39	4.31	1.65	7.05

APPENDIX F

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Industrial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Base kWh	Base EUI	EUI	Peak Watts/ Base kWh	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWh	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
500	Base Process Heating	Textiles-Apparel	0%	0%	0.00	1.08	1.08	0.27	20	0	0	N/A	N/A	N/A	N/A	N/A
502	Drying (UV/IR)	Textiles-Apparel	24%	15%	0.08	1.33	1.01	0.29	8	0	0	0	251.28	2.39	1.30	5.37
512	Custom Measures--Process Heating	Textiles-Apparel	3%	3%	0.01	1.08	1.04	0.27	15	0	0	0	113.39	4.31	1.65	7.05
550	Base Process Cooling	Textiles-Apparel	0%	0%	0.00	1.08	1.08	0.27	20	0	0	N/A	N/A	N/A	N/A	N/A
553	Custom Measures--Process Cooling	Textiles-Apparel	3%	3%	0.01	1.08	1.04	0.27	15	0	0	0	113.39	4.31	1.65	7.05
600	Base Other Process	Textiles-Apparel	0%	0%	0.00	1.08	1.08	0.27	15	0	0	N/A	N/A	N/A	N/A	N/A
605	Custom Measures--Other Process	Textiles-Apparel	3%	3%	0.01	1.08	1.04	0.27	15	0	0	0	113.39	4.31	1.65	7.05
700	Space Cooling Centrifugal Chiller, 0.58 kW/ton, 500	Textiles-Apparel	0%	0%	0.00	1.08	1.08	0.51	20	0	0	N/A	N/A	N/A	N/A	N/A
701	Centrifugal Chiller, 0.51 kW/ton, 500 tons	Textiles-Apparel	12%	12%	0.03	0.96	0.84	0.40	20	0	0	0	42.35	9.50	2.20	6.24
702	Window Film - Chiller	Textiles-Apparel	10%	10%	0.06	1.13	1.02	0.48	10	0	0	0	143.49	2.80	0.73	11.35
703	EMS - Chiller	Textiles-Apparel	10%	10%	0.09	1.12	1.00	0.48	10	0	0	0	232.50	1.73	0.45	18.38
705	Chiller Tune Up/Diagnostics	Textiles-Apparel	8%	8%	0.05	1.12	1.03	0.49	10	0	0	0	170.93	2.35	0.61	13.52
706	Cooling Circ. Pumps - VSD	Textiles-Apparel	6%	6%	0.10	1.09	1.03	0.49	15	0	0	0	292.10	1.38	0.34	33.97
710	Space Cooling DX Packaged System, EER=10.3, 10	Textiles-Apparel	0%	0%	0.00	1.08	1.08	0.51	15	0	0	N/A	N/A	N/A	N/A	N/A
711	DX Tune Up/ Advanced Diagnostics	Textiles-Apparel	10%	10%	0.07	1.13	1.02	0.49	3	0	0	0	551.01	0.73	0.21	13.75
712	DX Packaged System, EER=10.9, 10 tons	Textiles-Apparel	6%	6%	0.05	0.93	0.88	0.42	15	0	0	0	173.12	2.32	0.58	20.13
713	Window Film - DX	Textiles-Apparel	10%	10%	0.03	1.16	1.04	0.50	10	0	0	0	81.91	4.91	1.28	6.48
715	Prog. Thermostat - DX	Textiles-Apparel	9%	3%	0.00	1.13	1.03	0.53	10	0	0	0	49.18	13.15	7.41	1.12
800	Base Lighting	Textiles-Apparel	0%	0%	0.00	1.08	1.08	0.27	10	0	0	N/A	N/A	N/A	N/A	N/A
801	RET 2L4' Premium T8, 1EB	Textiles-Apparel	31%	31%	0.10	1.09	0.75	0.19	15	0	0	0	109.03	4.48	1.72	6.78
802	CFL Hardwired, Modular 36W	Textiles-Apparel	72%	72%	0.10	1.08	0.30	0.08	4	0	0	0	168.65	2.90	1.26	2.98
803	Metal Halide, 50W	Textiles-Apparel	58%	58%	0.67	1.27	0.53	0.14	5	0	0	0	940.97	0.52	0.22	20.62
804	Occupancy Sensor, 4L4' Fluorescent Fixtures	Textiles-Apparel	19%	20%	0.05	1.08	0.88	0.22	9	0	0	0	136.60	3.48	1.36	5.64
900	Base Other	Textiles-Apparel	0%	0%	0.00	1.08	1.08	0.27	15	0	0	N/A	N/A	N/A	N/A	N/A
901	Replace V-belts	Textiles-Apparel	0%	0%	0.00	1.08	1.07	0.27	5	0	0	0	160.86	3.04	1.30	3.52
902	Membranes for wastewater	Textiles-Apparel	10%	10%	0.04	1.18	1.06	0.27	15	0	0	0	110.50	4.42	1.70	6.87
100	Base Compressed Air	Lumber-Furniture	0%	0%	0.00	1.08	1.08	0.18	14	0	0	N/A	N/A	N/A	N/A	N/A
101	Compressed Air-O&M	Lumber-Furniture	17%	17%	0.01	1.24	1.03	0.17	2	0	0	0	189.52	3.08	1.75	1.12
102	Compressed Air - Controls	Lumber-Furniture	12%	12%	0.02	1.18	1.04	0.17	10	0	0	0	100.39	5.82	2.98	2.79
103	Compressed Air - System Optimization	Lumber-Furniture	20%	20%	0.02	1.19	0.96	0.16	10	0	0	0	55.46	10.54	5.39	1.54
104	Compressed Air- Sizing	Lumber-Furniture	9%	9%	0.00	1.08	0.98	0.16	10	0	0	0	38.86	15.05	7.69	1.08
105	Comp Air - Replace 1-5 HP motor	Lumber-Furniture	3%	3%	0.05	1.08	1.05	0.18	17	0	0	0	887.58	0.66	0.31	40.44
106	Comp Air - ASD (1-5 hp)	Lumber-Furniture	6%	1%	0.08	1.08	1.01	0.18	17	0	0	0	6218.92	0.51	0.46	27.51
107	Comp Air - Motor practices-1 (1-5 HP)	Lumber-Furniture	5%	5%	0.02	1.08	1.02	0.17	17	0	0	0	206.96	2.82	1.34	9.43
108	Comp Air - Replace 6-100 HP motor	Lumber-Furniture	3%	4%	0.03	1.11	1.07	0.18	20	0	0	0	341.14	1.71	0.78	17.69
109	Comp Air - ASD (6-100 hp)	Lumber-Furniture	6%	1%	0.00	1.08	1.01	0.18	20	0	0	0	182.89	17.50	14.89	0.92
110	Comp Air - Motor practices-1 (6-100 HP)	Lumber-Furniture	2%	2%	0.01	1.08	1.05	0.18	20	0	0	0	91.79	6.37	2.88	4.76
111	Comp Air - Replace 100+ HP motor	Lumber-Furniture	3%	3%	0.01	1.10	1.06	0.18	20	0	0	0	116.17	5.03	2.28	6.02
112	Comp Air - ASD (100+ hp)	Lumber-Furniture	6%	1%	0.01	1.08	1.01	0.18	20	0	0	0	407.98	7.84	6.67	2.05
113	Comp Air - Motor practices-1 (100+ HP)	Lumber-Furniture	1%	2%	0.00	1.09	1.07	0.18	20	0	0	0	59.30	9.86	4.46	3.07
200	Base Fans	Lumber-Furniture	0%	0%	0.00	1.08	1.08	0.18	14	0	0	N/A	N/A	N/A	N/A	N/A
201	Fans - O&M	Lumber-Furniture	2%	2%	0.00	1.09	1.07	0.18	2	0	0	0	176.48	3.31	1.88	1.04
202	Fans - Controls	Lumber-Furniture	30%	30%	0.09	1.41	0.99	0.17	10	0	0	0	181.45	3.22	1.65	5.05
203	Fans - System Optimization	Lumber-Furniture	20%	10%	0.06	1.28	1.02	0.19	10	0	0	0	389.72	2.25	1.56	5.33
204	Fans- Improve components	Lumber-Furniture	5%	5%	0.01	1.11	1.06	0.18	10	0	0	0	75.10	7.78	3.98	2.09
205	Fans - Replace 1-5 HP motor	Lumber-Furniture	3%	3%	0.05	1.08	1.05	0.18	17	0	0	0	887.58	0.66	0.31	40.44
206	Fans - ASD (1-5 hp)	Lumber-Furniture	6%	1%	0.08	1.09	1.02	0.18	17	0	0	0	6151.82	0.52	0.46	27.22
207	Fans - Motor practices-1 (1-5 HP)	Lumber-Furniture	5%	5%	0.02	1.08	1.02	0.17	17	0	0	0	206.96	2.82	1.34	9.43
208	Fans - Replace 6-100 HP motor	Lumber-Furniture	3%	4%	0.03	1.09	1.06	0.18	20	0	0	0	344.68	1.66	0.73	18.82
209	Fans - ASD (6-100 hp)	Lumber-Furniture	4%	1%	0.00	1.08	1.03	0.18	20	0	0	0	182.23	13.55	11.17	1.23
210	Fans - Motor practices-1 (6-100 HP)	Lumber-Furniture	2%	2%	0.01	1.09	1.06	0.18	20	0	0	0	90.50	6.46	2.92	4.69
211	Fans - Replace 100+ HP motor	Lumber-Furniture	3%	3%	0.01	1.08	1.05	0.18	20	0	0	0	118.08	4.95	2.24	6.12
212	Fans - ASD (100+ hp)	Lumber-Furniture	6%	1%	0.01	1.13	1.07	0.19	20	0	0	0	387.44	7.86	6.65	2.06
213	Fans - Motor practices-1 (100+ HP)	Lumber-Furniture	1%	2%	0.00	1.08	1.06	0.18	20	0	0	0	59.84	8.67	3.38	4.05
214	Optimize drying process	Lumber-Furniture	20%	20%	0.05	1.12	0.90	0.15	10	0	0	0	185.56	3.15	1.61	5.16
300	Base Pumps	Lumber-Furniture	0%	0%	0.00	1.08	1.08	0.18	14	0	0	N/A	N/A	N/A	N/A	N/A

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Industrial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Base kWh	Base EUI	EUI	Peak Watts/ Base kWh	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWH	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
301	Pumps - O&M	Lumber-Furniture	10%	10%	0.01	1.13	1.01	0.17	2	0	0	0	175.02	3.34	1.90	1.03
302	Pumps - Controls	Lumber-Furniture	30%	30%	0.03	1.39	0.97	0.16	10	0	0	0	53.66	10.90	5.57	1.49
303	Pumps - System Optimization	Lumber-Furniture	33%	33%	0.07	1.15	0.77	0.13	10	0	0	0	143.91	4.06	2.08	4.00
304	Pumps - Sizing	Lumber-Furniture	20%	20%	0.02	1.28	1.02	0.17	10	0	0	0	64.86	9.01	4.60	1.80
305	Pumps - Replace 1-5 HP motor	Lumber-Furniture	3%	3%	0.05	1.08	1.05	0.18	17	0	0	0	889.03	0.66	0.31	40.51
306	Pumps - ASD (1-5 hp)	Lumber-Furniture	6%	1%	0.08	1.09	1.02	0.18	17	0	0	0	6146.18	0.52	0.46	27.19
307	Pumps - Motor practices-1 (1-5 HP)	Lumber-Furniture	5%	5%	0.02	1.10	1.05	0.18	17	0	0	0	202.38	2.89	1.37	9.22
308	Pumps - Replace 6-100 HP motor	Lumber-Furniture	3%	4%	0.03	1.08	1.04	0.17	20	0	0	0	349.50	1.67	0.76	18.12
309	Pumps - ASD (6-100 hp)	Lumber-Furniture	6%	1%	0.00	1.11	1.04	0.19	20	0	0	0	177.05	18.07	15.38	0.89
310	Pumps - Motor practices-1 (6-100 HP)	Lumber-Furniture	2%	2%	0.01	1.08	1.05	0.18	20	0	0	0	91.38	6.40	2.89	4.74
311	Pumps - Replace 100+ HP motor	Lumber-Furniture	3%	3%	0.01	1.10	1.06	0.18	20	0	0	0	116.17	5.03	2.28	6.02
312	Pumps - ASD (100+ hp)	Lumber-Furniture	6%	1%	0.01	1.08	1.01	0.18	20	0	0	0	407.43	7.85	6.68	2.05
313	Pumps - Motor practices-1 (100+ HP)	Lumber-Furniture	1%	2%	0.00	1.08	1.06	0.18	20	0	0	0	59.84	9.77	4.42	3.10
400	Base Drives	Lumber-Furniture	0%	0%	0.00	1.08	1.08	0.18	20	0	0	N/A	N/A	N/A	N/A	N/A
403	Air conveying systems	Lumber-Furniture	39%	10%	0.04	1.52	0.93	0.23	14	0	0	0	150.49	9.29	7.48	1.48
405	Drives - EE motor	Lumber-Furniture	3%	4%	0.01	1.11	1.07	0.18	10	0	0	0	134.95	4.33	2.21	3.75
431	Custom Measures--Drives	Lumber-Furniture	3%	3%	0.01	1.08	1.04	0.17	15	0	0	0	172.45	3.39	1.65	7.05
500	Base Process Heating	Lumber-Furniture	0%	0%	0.00	1.08	1.08	0.18	20	0	0	N/A	N/A	N/A	N/A	N/A
503	Heat Pumps - Drying	Lumber-Furniture	22%	22%	0.18	1.30	1.02	0.17	15	0	0	0	346.26	1.69	0.82	14.16
512	Custom Measures--Process Heating	Lumber-Furniture	3%	3%	0.01	1.08	1.04	0.17	15	0	0	0	172.45	3.39	1.65	7.05
550	Base Process Cooling	Lumber-Furniture	0%	0%	0.00	1.08	1.08	0.18	20	0	0	N/A	N/A	N/A	N/A	N/A
553	Custom Measures--Process Cooling	Lumber-Furniture	3%	3%	0.01	1.08	1.04	0.17	15	0	0	0	172.45	3.39	1.65	7.05
600	Base Other Process	Lumber-Furniture	0%	0%	0.00	1.08	1.08	0.18	15	0	0	N/A	N/A	N/A	N/A	N/A
605	Custom Measures--Other Process	Lumber-Furniture	3%	3%	0.01	1.08	1.04	0.17	15	0	0	0	172.45	3.39	1.65	7.05
700	Space Cooling Centrifugal Chiller, 0.58 kW/ton, 500	Lumber-Furniture	0%	0%	0.00	1.08	1.08	0.34	20	0	0	N/A	N/A	N/A	N/A	N/A
710	Space Cooling DX Packaged System, EER=10.3, 10	Lumber-Furniture	0%	0%	0.00	1.08	1.08	0.34	15	0	0	N/A	N/A	N/A	N/A	N/A
711	DX Tune Up/ Advanced Diagnostics	Lumber-Furniture	10%	10%	0.07	1.13	1.02	0.32	3	0	0	0	837.96	0.54	0.21	13.75
712	DX Packaged System, EER=10.9, 10 tons	Lumber-Furniture	6%	6%	0.05	0.93	0.88	0.28	15	0	0	0	263.28	1.72	0.58	20.13
713	Window Film - DX	Lumber-Furniture	10%	10%	0.03	1.16	1.04	0.33	10	0	0	0	124.56	3.64	1.28	6.48
715	Prog. Thermostat - DX	Lumber-Furniture	9%	3%	0.00	1.13	1.03	0.35	10	0	0	0	74.46	11.69	8.09	1.03
800	Base Lighting	Lumber-Furniture	0%	0%	0.00	1.08	1.08	0.18	10	0	0	N/A	N/A	N/A	N/A	N/A
801	RET 2L4' Premium T8, 1EB	Lumber-Furniture	31%	31%	0.10	1.09	0.75	0.13	15	0	0	0	165.81	3.53	1.72	6.78
802	CFL Hardwired, Modular 36W	Lumber-Furniture	72%	72%	0.10	1.08	0.30	0.05	4	0	0	0	256.47	2.28	1.26	2.98
803	Metal Halide, 50W	Lumber-Furniture	58%	58%	0.67	1.27	0.53	0.09	5	0	0	0	1430.99	0.41	0.22	20.62
804	Occupancy Sensor, 4L4' Fluorescent Fixtures	Lumber-Furniture	19%	20%	0.05	1.08	0.88	0.15	9	0	0	0	207.71	2.75	1.39	5.54
900	Base Other	Lumber-Furniture	0%	0%	0.00	1.08	1.08	0.18	15	0	0	N/A	N/A	N/A	N/A	N/A
901	Replace V-belts	Lumber-Furniture	0%	0%	0.00	1.08	1.07	0.18	5	0	0	0	244.64	2.39	1.30	3.52
100	Base Compressed Air	Paper	0%	0%	0.00	1.08	1.08	0.10	14	0	0	N/A	N/A	N/A	N/A	N/A
101	Compressed Air-O&M	Paper	17%	17%	0.01	1.22	1.01	0.09	2	0	0	0	348.47	2.33	1.72	1.14
102	Compressed Air - Controls	Paper	12%	12%	0.02	1.18	1.04	0.10	10	0	0	0	181.42	4.47	2.98	2.79
103	Compressed Air - System Optimization	Paper	20%	20%	0.02	1.19	0.96	0.09	10	0	0	0	100.23	8.10	5.39	1.54
104	Compressed Air- Sizing	Paper	9%	9%	0.00	1.16	1.06	0.10	10	0	0	0	65.06	12.48	8.30	1.00
105	Comp Air - Replace 1-5 HP motor	Paper	3%	3%	0.05	1.08	1.05	0.10	17	0	0	0	1604.10	0.51	0.31	40.44
106	Comp Air - ASD (1-5 hp)	Paper	6%	1%	0.08	1.08	1.01	0.10	17	0	0	0	11239.20	0.51	0.47	26.64
107	Comp Air - Motor practices-1 (1-5 HP)	Paper	5%	5%	0.02	1.08	1.02	0.10	17	0	0	0	374.03	2.17	1.34	9.43
108	Comp Air - Replace 6-100 HP motor	Paper	4%	4%	0.03	1.09	1.05	0.10	20	0	0	0	626.02	1.30	0.76	17.96
109	Comp Air - ASD (6-100 hp)	Paper	6%	1%	0.00	1.08	1.01	0.10	20	0	0	0	330.52	17.27	15.38	0.89
110	Comp Air - Motor practices-1 (6-100 HP)	Paper	2%	2%	0.01	1.10	1.07	0.10	20	0	0	0	162.47	5.00	2.94	4.66
111	Comp Air - Replace 100+ HP motor	Paper	3%	3%	0.01	1.10	1.07	0.10	20	0	0	0	209.16	3.88	2.28	6.00
112	Comp Air - ASD (100+ hp)	Paper	6%	1%	0.01	1.10	1.03	0.10	20	0	0	0	722.77	7.90	7.03	1.95
113	Comp Air - Motor practices-1 (100+ HP)	Paper	2%	2%	0.00	1.08	1.06	0.10	20	0	0	0	107.56	7.55	4.44	3.09
200	Base Fans	Paper	0%	0%	0.00	1.08	1.08	0.10	14	0	0	N/A	N/A	N/A	N/A	N/A
201	Fans - O&M	Paper	2%	2%	0.00	1.08	1.06	0.10	2	0	0	0	323.59	2.51	1.86	1.05
202	Fans - Controls	Paper	30%	30%	0.09	1.17	0.82	0.08	10	0	0	0	393.39	2.06	1.37	6.05
203	Fans - System Optimization	Paper	21%	10%	0.06	1.11	0.88	0.09	10	0	0	0	812.71	1.67	1.38	6.04
204	Fans- Improve components	Paper	5%	5%	0.01	1.09	1.04	0.10	10	0	0	0	138.01	5.88	3.91	2.12

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Industrial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Base kWh	Base EUI	EUI	Peak Watts/ Base kWh	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWh	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
205	Fans - Replace 1-5 HP motor	Paper	3%	3%	0.05	1.08	1.05	0.10	17	0	0	0	1609.30	0.50	0.31	40.58
206	Fans - ASD (1-5 hp)	Paper	6%	1%	0.08	1.08	1.01	0.10	17	0	0	0	11237.24	0.51	0.47	26.64
207	Fans - Motor practices-1 (1-5 HP)	Paper	5%	5%	0.02	1.08	1.02	0.10	17	0	0	0	373.97	2.17	1.34	9.43
208	Fans - Replace 6-100 HP motor	Paper	3%	4%	0.03	1.08	1.04	0.10	20	0	0	0	631.87	1.25	0.73	18.90
209	Fans - ASD (6-100 hp)	Paper	5%	1%	0.00	1.08	1.03	0.10	20	0	0	0	329.34	13.86	12.17	1.13
210	Fans - Motor practices-1 (6-100 HP)	Paper	2%	2%	0.01	1.08	1.05	0.10	20	0	0	0	165.46	4.91	2.89	4.75
211	Fans - Replace 100+ HP motor	Paper	3%	3%	0.01	1.08	1.04	0.10	20	0	0	0	213.64	3.80	2.24	6.13
212	Fans - ASD (100+ hp)	Paper	6%	1%	0.01	1.08	1.02	0.10	20	0	0	0	734.58	7.46	6.62	2.07
213	Fans - Motor practices-1 (100+ HP)	Paper	1%	2%	0.00	1.08	1.06	0.10	20	0	0	0	108.14	6.55	3.52	3.90
300	Base Pumps	Paper	0%	0%	0.00	1.08	1.08	0.10	14	0	0	N/A	N/A	N/A	N/A	N/A
301	Pumps - O&M	Paper	10%	10%	0.01	1.17	1.05	0.10	2	0	0	0	303.82	2.67	1.98	0.99
302	Pumps - Controls	Paper	30%	30%	0.03	1.45	1.02	0.09	10	0	0	0	93.01	8.73	5.80	1.43
303	Pumps - System Optimization	Paper	33%	33%	0.07	1.49	1.00	0.09	10	0	0	0	200.85	4.04	2.69	3.09
304	Pumps - Sizing	Paper	20%	20%	0.02	1.28	1.02	0.10	10	0	0	0	117.23	6.92	4.60	1.80
305	Pumps - Replace 1-5 HP motor	Paper	3%	3%	0.05	1.08	1.05	0.10	17	0	0	0	1605.17	0.51	0.31	40.47
306	Pumps - ASD (1-5 hp)	Paper	6%	1%	0.08	1.08	1.01	0.10	17	0	0	0	11239.20	0.51	0.47	26.64
307	Pumps - Motor practices-1 (1-5 HP)	Paper	5%	5%	0.02	1.11	1.05	0.10	17	0	0	0	363.34	2.23	1.38	9.16
308	Pumps - Replace 6-100 HP motor	Paper	4%	4%	0.03	1.08	1.04	0.10	20	0	0	0	633.37	1.28	0.75	18.17
309	Pumps - ASD (6-100 hp)	Paper	6%	1%	0.00	1.08	1.01	0.10	20	0	0	0	330.09	17.30	15.40	0.89
310	Pumps - Motor practices-1 (6-100 HP)	Paper	2%	2%	0.01	1.08	1.06	0.10	20	0	0	0	164.42	4.94	2.91	4.72
311	Pumps - Replace 100+ HP motor	Paper	3%	3%	0.01	1.10	1.06	0.10	20	0	0	0	209.95	3.87	2.28	6.02
312	Pumps - ASD (100+ hp)	Paper	6%	1%	0.01	1.08	1.01	0.10	20	0	0	0	737.32	7.74	6.89	1.99
313	Pumps - Motor practices-1 (100+ HP)	Paper	2%	2%	0.00	1.08	1.06	0.10	20	0	0	0	108.14	7.51	4.42	3.10
400	Base Drives	Paper	0%	0%	0.00	1.08	1.08	0.10	20	0	0	N/A	N/A	N/A	N/A	N/A
405	Drives - EE motor	Paper	3%	3%	0.01	1.09	1.05	0.10	10	0	0	0	248.63	3.26	2.17	3.83
406	Gap Forming papermachine	Paper	8%	8%	0.01	1.16	1.07	0.10	20	0	0	0	69.36	11.70	6.89	1.99
407	High Consistency forming	Paper	8%	8%	0.01	1.15	1.07	0.10	20	0	0	0	69.59	11.66	6.87	2.00
408	Optimization control PM	Paper	5%	5%	0.01	1.10	1.04	0.10	10	0	0	0	341.68	2.38	1.58	5.26
431	Custom Measures--Drives	Paper	3%	3%	0.01	1.08	1.04	0.10	15	0	0	0	311.66	2.60	1.65	7.05
500	Base Process Heating	Paper	0%	0%	0.00	1.08	1.08	0.10	20	0	0	N/A	N/A	N/A	N/A	N/A
512	Custom Measures--Process Heating	Paper	3%	3%	0.01	1.08	1.04	0.10	15	0	0	0	311.66	2.60	1.65	7.05
550	Base Process Cooling	Paper	0%	0%	0.00	1.08	1.08	0.10	20	0	0	N/A	N/A	N/A	N/A	N/A
553	Custom Measures--Process Cooling	Paper	3%	3%	0.01	1.08	1.04	0.10	15	0	0	0	311.66	2.60	1.65	7.05
600	Base Other Process	Paper	0%	0%	0.00	1.08	1.08	0.10	15	0	0	N/A	N/A	N/A	N/A	N/A
605	Custom Measures--Other Process	Paper	3%	3%	0.01	1.08	1.04	0.10	15	0	0	0	311.66	2.60	1.65	7.05
700	Space Cooling Centrifugal Chiller, 0.58 kW/ton, 500	Paper	0%	0%	0.00	1.08	1.08	0.19	20	0	0	N/A	N/A	N/A	N/A	N/A
710	Space Cooling DX Packaged System, EER=10.3, 10	Paper	0%	0%	0.00	1.08	1.08	0.19	15	0	0	N/A	N/A	N/A	N/A	N/A
711	DX Tune Up/ Advanced Diagnostics	Paper	10%	10%	0.07	1.13	1.02	0.18	3	0	0	0	1514.41	0.38	0.21	13.75
712	DX Packaged System, EER=10.9, 10 tons	Paper	6%	6%	0.05	0.93	0.88	0.15	15	0	0	0	475.82	1.21	0.58	20.13
713	Window Film - DX	Paper	10%	10%	0.03	1.16	1.04	0.18	10	0	0	0	225.11	2.56	1.28	6.48
715	Prog. Thermostat - DX	Paper	10%	3%	0.00	1.14	1.03	0.19	10	0	0	0	134.38	10.09	8.32	1.00
800	Base Lighting	Paper	0%	0%	0.00	1.08	1.08	0.10	10	0	0	N/A	N/A	N/A	N/A	N/A
801	RET 2L4' Premium T8, 1EB	Paper	31%	31%	0.10	1.09	0.75	0.07	15	0	0	0	299.65	2.71	1.72	6.78
802	CFL Hardwired, Modular 36W	Paper	72%	72%	0.10	1.08	0.30	0.03	4	0	0	0	463.51	1.75	1.26	2.98
803	Metal Halide, 50W	Paper	58%	58%	0.67	1.27	0.53	0.05	5	0	0	0	2586.18	0.31	0.22	20.62
804	Occupancy Sensor, 4L4' Fluorescent Fixtures	Paper	19%	20%	0.05	1.08	0.87	0.08	9	0	0	0	375.37	2.11	1.40	5.48
900	Base Other	Paper	0%	0%	0.00	1.08	1.08	0.10	15	0	0	N/A	N/A	N/A	N/A	N/A
901	Replace V-belts	Paper	0%	0%	0.00	1.08	1.07	0.10	5	0	0	0	442.13	1.84	1.30	3.52
100	Base Compressed Air	Printing	0%	0%	0.00	1.08	1.08	0.16	14	0	0	N/A	N/A	N/A	N/A	N/A
101	Compressed Air-O&M	Printing	17%	17%	0.01	1.22	1.01	0.15	2	0	0	0	214.28	2.87	1.72	1.14
102	Compressed Air - Controls	Printing	12%	12%	0.02	1.18	1.04	0.16	10	0	0	0	111.56	5.52	2.98	2.79
103	Compressed Air - System Optimization	Printing	20%	20%	0.02	1.19	0.96	0.14	10	0	0	0	61.64	9.99	5.39	1.54
104	Compressed Air- Sizing	Printing	9%	9%	0.00	1.16	1.06	0.16	10	0	0	0	40.01	15.40	8.30	1.00
105	Comp Air - Replace 1-5 HP motor	Printing	3%	3%	0.05	1.08	1.05	0.16	17	0	0	0	986.40	0.62	0.31	40.44
106	Comp Air - ASD (1-5 hp)	Printing	6%	1%	0.08	1.08	1.01	0.16	17	0	0	0	6911.31	0.51	0.46	27.29
107	Comp Air - Motor practices-1 (1-5 HP)	Printing	5%	5%	0.02	1.08	1.02	0.15	17	0	0	0	230.00	2.68	1.34	9.43

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Industrial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Base kWh	Base EUI	EUI	Peak Watts/ Base kWh	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWH	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
108	Comp Air - Replace 6-100 HP motor	Printing	4%	4%	0.03	1.09	1.05	0.16	20	0	0	0	384.96	1.60	0.76	17.96
109	Comp Air - ASD (6-100 hp)	Printing	6%	1%	0.00	1.08	1.01	0.16	20	0	0	0	203.25	17.46	15.01	0.91
110	Comp Air - Motor practices-1 (6-100 HP)	Printing	2%	2%	0.01	1.10	1.07	0.16	20	0	0	0	99.91	6.16	2.94	4.66
111	Comp Air - Replace 100+ HP motor	Printing	3%	3%	0.01	1.10	1.07	0.16	20	0	0	0	128.62	4.79	2.28	6.00
112	Comp Air - ASD (100+ hp)	Printing	6%	1%	0.01	1.10	1.03	0.16	20	0	0	0	444.67	7.98	6.86	2.00
113	Comp Air - Motor practices-1 (100+ HP)	Printing	2%	2%	0.00	1.08	1.06	0.16	20	0	0	0	66.14	9.31	4.44	3.09
200	Base Fans	Printing	0%	0%	0.00	1.08	1.08	0.16	14	0	0	N/A	N/A	N/A	N/A	N/A
201	Fans - O&M	Printing	2%	2%	0.00	1.08	1.06	0.16	2	0	0	0	198.99	3.10	1.86	1.05
202	Fans - Controls	Printing	30%	30%	0.09	1.17	0.82	0.12	10	1	0	0	241.90	2.55	1.37	6.05
203	Fans - System Optimization	Printing	20%	10%	0.06	1.11	0.88	0.15	10	1	0	0	499.96	1.88	1.36	6.12
204	Fans - Improve components	Printing	5%	5%	0.01	1.09	1.04	0.16	10	0	0	0	84.86	7.26	3.91	2.12
205	Fans - Replace 1-5 HP motor	Printing	3%	3%	0.05	1.08	1.05	0.16	17	0	0	0	989.61	0.62	0.31	40.58
206	Fans - ASD (1-5 hp)	Printing	6%	1%	0.08	1.08	1.01	0.16	17	0	0	0	6910.13	0.51	0.46	27.29
207	Fans - Motor practices-1 (1-5 HP)	Printing	5%	5%	0.02	1.08	1.02	0.15	17	0	0	0	229.97	2.68	1.34	9.43
208	Fans - Replace 6-100 HP motor	Printing	3%	4%	0.03	1.08	1.04	0.16	20	0	0	0	388.58	1.54	0.71	19.26
209	Fans - ASD (6-100 hp)	Printing	4%	1%	0.00	1.08	1.03	0.16	20	0	0	0	202.59	13.13	10.93	1.25
210	Fans - Motor practices-1 (6-100 HP)	Printing	2%	2%	0.01	1.08	1.05	0.16	20	0	0	0	101.75	6.05	2.89	4.75
211	Fans - Replace 100+ HP motor	Printing	3%	3%	0.01	1.08	1.04	0.16	20	0	0	0	131.38	4.69	2.24	6.13
212	Fans - ASD (100+ hp)	Printing	6%	1%	0.01	1.08	1.02	0.16	20	0	0	0	451.79	7.41	6.33	2.17
213	Fans - Motor practices-1 (100+ HP)	Printing	1%	2%	0.00	1.08	1.06	0.16	20	0	0	0	66.50	8.05	3.28	4.18
300	Base Pumps	Printing	0%	0%	0.00	1.08	1.08	0.16	14	0	0	N/A	N/A	N/A	N/A	N/A
301	Pumps - O&M	Printing	10%	10%	0.01	1.17	1.05	0.16	2	0	0	0	186.83	3.30	1.98	0.99
302	Pumps - Controls	Printing	30%	30%	0.03	1.45	1.02	0.15	10	0	0	0	57.19	10.77	5.80	1.43
303	Pumps - System Optimization	Printing	33%	33%	0.07	1.49	1.00	0.15	10	0	0	0	123.51	4.99	2.69	3.09
304	Pumps - Sizing	Printing	20%	20%	0.02	1.28	1.02	0.15	10	0	0	0	72.09	8.54	4.60	1.80
305	Pumps - Replace 1-5 HP motor	Printing	3%	3%	0.05	1.08	1.05	0.16	17	0	0	0	987.06	0.62	0.31	40.47
306	Pumps - ASD (1-5 hp)	Printing	6%	1%	0.08	1.08	1.01	0.16	17	0	0	0	6911.31	0.51	0.46	27.29
307	Pumps - Motor practices-1 (1-5 HP)	Printing	5%	5%	0.02	1.11	1.05	0.16	17	0	0	0	223.43	2.76	1.38	9.16
308	Pumps - Replace 6-100 HP motor	Printing	4%	4%	0.03	1.08	1.04	0.16	20	0	0	0	389.47	1.58	0.75	18.17
309	Pumps - ASD (6-100 hp)	Printing	6%	1%	0.00	1.08	1.01	0.16	20	0	0	0	202.99	17.48	15.03	0.91
310	Pumps - Motor practices-1 (6-100 HP)	Printing	2%	2%	0.01	1.08	1.06	0.16	20	0	0	0	101.11	6.09	2.91	4.72
311	Pumps - Replace 100+ HP motor	Printing	3%	3%	0.01	1.10	1.06	0.16	20	0	0	0	129.10	4.77	2.28	6.02
312	Pumps - ASD (100+ hp)	Printing	6%	1%	0.01	1.08	1.01	0.16	20	0	0	0	453.40	7.83	6.73	2.04
313	Pumps - Motor practices-1 (100+ HP)	Printing	2%	2%	0.00	1.08	1.06	0.16	20	0	0	0	66.50	9.26	4.42	3.10
400	Base Drives	Printing	0%	0%	0.00	1.08	1.08	0.16	20	0	0	N/A	N/A	N/A	N/A	N/A
409	Efficient practices printing press	Printing	10%	10%	0.01	1.13	1.02	0.15	20	1	0	0	43.93	14.02	6.69	2.05
410	Efficient Printing press (fewer cylinders)	Printing	20%	20%	0.06	1.28	1.02	0.15	10	1	0	0	216.26	2.85	1.53	5.41
411	Light cylinders	Printing	10%	10%	0.07	1.17	1.05	0.16	10	0	0	0	553.05	1.11	0.60	13.84
412	Efficient drives	Printing	4%	4%	0.01	1.10	1.06	0.16	10	0	0	0	134.32	4.59	2.47	3.36
431	Custom Measures--Drives	Printing	3%	3%	0.01	1.08	1.04	0.16	15	1	0	0	191.65	3.21	1.65	7.05
500	Base Process Heating	Printing	0%	0%	0.00	1.08	1.08	0.16	20	0	0	N/A	N/A	N/A	N/A	N/A
512	Custom Measures--Process Heating	Printing	3%	3%	0.01	1.08	1.04	0.16	15	0	0	0	191.65	3.21	1.65	7.05
550	Base Process Cooling	Printing	0%	0%	0.00	1.08	1.08	0.16	20	0	0	N/A	N/A	N/A	N/A	N/A
553	Custom Measures--Process Cooling	Printing	3%	3%	0.01	1.08	1.04	0.16	15	0	0	0	191.65	3.21	1.65	7.05
600	Base Other Process	Printing	0%	0%	0.00	1.08	1.08	0.16	15	0	0	N/A	N/A	N/A	N/A	N/A
605	Custom Measures--Other Process	Printing	3%	3%	0.01	1.08	1.04	0.16	15	0	0	0	191.65	3.21	1.65	7.05
700	Space Cooling Centrifugal Chiller, 0.58 kW/ton, 500	Printing	0%	0%	0.00	1.08	1.08	0.30	20	0	0	N/A	N/A	N/A	N/A	N/A
701	Centrifugal Chiller, 0.51 kW/ton, 500 tons	Printing	12%	12%	0.03	0.96	0.84	0.24	20	0	0	0	71.57	6.57	2.20	6.24
702	Window Film - Chiller	Printing	10%	10%	0.06	1.13	1.02	0.29	10	0	0	0	242.51	1.94	0.73	11.35
703	EMS - Chiller	Printing	10%	10%	0.09	1.12	1.00	0.28	10	0	0	0	392.94	1.20	0.45	18.38
705	Chiller Tune Up/Diagnostics	Printing	8%	8%	0.05	1.12	1.03	0.29	10	0	0	0	288.88	1.63	0.61	13.52
706	Cooling Circ. Pumps - VSD	Printing	6%	6%	0.10	1.09	1.03	0.29	15	0	0	0	493.68	0.95	0.34	33.97
710	Space Cooling DX Packaged System, EER=10.3, 10	Printing	0%	0%	0.00	1.08	1.08	0.30	15	0	0	N/A	N/A	N/A	N/A	N/A
711	DX Tune Up/ Advanced Diagnostics	Printing	10%	10%	0.07	1.13	1.02	0.29	3	0	0	0	931.25	0.51	0.21	13.75
712	DX Packaged System, EER=10.9, 10 tons	Printing	6%	6%	0.05	0.93	0.88	0.25	15	0	0	0	292.59	1.61	0.58	20.13
713	Window Film - DX	Printing	10%	10%	0.03	1.16	1.04	0.29	10	0	0	0	138.43	3.40	1.28	6.48

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Industrial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Base kWh	Base EUI	EUI	Peak Watts/ Base kWh	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWh	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
715	Prog. Thermostat - DX	Printing	9%	3%	0.00	1.13	1.03	0.31	10	0	0	0	82.73	11.34	8.15	1.02
800	Base Lighting	Printing	0%	0%	0.00	1.08	1.08	0.16	10	0	0	N/A	N/A	N/A	N/A	N/A
801	RET 2L4' Premium T8, 1EB	Printing	31%	31%	0.10	1.09	0.75	0.11	15	1	0	0	184.27	3.34	1.72	6.78
802	CFL Hardwired, Modular 36W	Printing	72%	72%	0.10	1.08	0.30	0.05	4	0	0	0	285.03	2.16	1.26	2.98
803	Metal Halide, 50W	Printing	58%	58%	0.67	1.27	0.53	0.08	5	1	0	0	1590.32	0.39	0.22	20.62
804	Occupancy Sensor, 4L4' Fluorescent Fixtures	Printing	19%	20%	0.05	1.08	0.88	0.13	9	0	0	0	230.85	2.59	1.38	5.58
900	Base Other	Printing	0%	0%	0.00	1.08	1.08	0.16	15	0	0	N/A	N/A	N/A	N/A	N/A
901	Replace V-belts	Printing	0%	0%	0.00	1.08	1.07	0.16	5	0	0	0	271.88	2.27	1.30	3.52
100	Base Compressed Air	Chemicals	0%	0%	0.00	1.08	1.08	0.14	14	0	0	N/A	N/A	N/A	N/A	N/A
101	Compressed Air-O&M	Chemicals	17%	17%	0.01	1.22	1.01	0.13	2	0	0	0	246.17	2.69	1.72	1.14
102	Compressed Air - Controls	Chemicals	12%	12%	0.02	1.18	1.04	0.14	10	0	0	0	128.17	5.17	2.98	2.79
103	Compressed Air - System Optimization	Chemicals	20%	20%	0.02	1.19	0.96	0.13	10	0	0	0	70.81	9.36	5.39	1.54
104	Compressed Air- Sizing	Chemicals	9%	9%	0.00	1.16	1.06	0.14	10	0	0	0	45.96	14.41	8.30	1.00
105	Comp Air - Replace 1-5 HP motor	Chemicals	3%	3%	0.05	1.08	1.05	0.14	17	0	0	0	1133.20	0.58	0.31	40.44
106	Comp Air - ASD (1-5 hp)	Chemicals	6%	1%	0.08	1.08	1.01	0.14	17	0	0	0	7939.86	0.51	0.47	27.06
107	Comp Air - Motor practices-1 (1-5 HP)	Chemicals	5%	5%	0.02	1.08	1.02	0.13	17	0	0	0	264.23	2.51	1.34	9.43
108	Comp Air - Replace 6-100 HP motor	Chemicals	4%	4%	0.03	1.09	1.05	0.14	20	0	0	0	442.25	1.50	0.76	17.96
109	Comp Air - ASD (6-100 hp)	Chemicals	6%	1%	0.00	1.08	1.01	0.14	20	0	0	0	233.50	17.40	15.14	0.91
110	Comp Air - Motor practices-1 (6-100 HP)	Chemicals	2%	2%	0.01	1.10	1.07	0.14	20	0	0	0	114.78	5.77	2.94	4.66
111	Comp Air - Replace 100+ HP motor	Chemicals	3%	3%	0.01	1.10	1.07	0.14	20	0	0	0	147.76	4.48	2.28	6.00
112	Comp Air - ASD (100+ hp)	Chemicals	6%	1%	0.01	1.10	1.03	0.14	20	0	0	0	510.76	7.95	6.92	1.98
113	Comp Air - Motor practices-1 (100+ HP)	Chemicals	2%	2%	0.00	1.08	1.06	0.14	20	0	0	0	75.98	8.72	4.44	3.09
200	Base Fans	Chemicals	0%	0%	0.00	1.08	1.08	0.14	14	0	0	N/A	N/A	N/A	N/A	N/A
201	Fans - O&M	Chemicals	2%	2%	0.00	1.08	1.06	0.14	2	0	0	0	228.60	2.90	1.86	1.05
202	Fans - Controls	Chemicals	30%	30%	0.09	1.17	0.82	0.11	10	1	0	0	277.91	2.38	1.37	6.05
203	Fans - System Optimization	Chemicals	21%	10%	0.06	1.11	0.88	0.13	10	0	0	0	574.29	1.81	1.36	6.09
204	Fans - Improve components	Chemicals	5%	5%	0.01	1.09	1.04	0.14	10	0	0	0	97.49	6.79	3.91	2.12
205	Fans - Replace 1-5 HP motor	Chemicals	3%	3%	0.05	1.08	1.05	0.14	17	0	0	0	1136.88	0.58	0.31	40.58
206	Fans - ASD (1-5 hp)	Chemicals	6%	1%	0.08	1.08	1.01	0.14	17	0	0	0	7938.49	0.51	0.47	27.06
207	Fans - Motor practices-1 (1-5 HP)	Chemicals	5%	5%	0.02	1.08	1.02	0.13	17	0	0	0	264.19	2.51	1.34	9.43
208	Fans - Replace 6-100 HP motor	Chemicals	3%	4%	0.03	1.08	1.04	0.14	20	0	0	0	446.44	1.42	0.70	19.64
209	Fans - ASD (6-100 hp)	Chemicals	4%	1%	0.00	1.08	1.03	0.14	20	0	0	0	232.80	12.13	10.18	1.35
210	Fans - Motor practices-1 (6-100 HP)	Chemicals	2%	2%	0.01	1.08	1.05	0.14	20	0	0	0	116.89	5.67	2.89	4.75
211	Fans - Replace 100+ HP motor	Chemicals	3%	3%	0.01	1.08	1.04	0.14	20	0	0	0	150.93	4.39	2.24	6.13
212	Fans - ASD (100+ hp)	Chemicals	6%	1%	0.01	1.08	1.02	0.14	20	0	0	0	519.05	7.24	6.26	2.19
213	Fans - Motor practices-1 (100+ HP)	Chemicals	1%	2%	0.00	1.08	1.06	0.14	20	0	0	0	76.40	7.20	3.04	4.51
300	Base Pumps	Chemicals	0%	0%	0.00	1.08	1.08	0.14	14	0	0	N/A	N/A	N/A	N/A	N/A
301	Pumps - O&M	Chemicals	10%	10%	0.01	1.17	1.05	0.14	2	0	0	0	214.63	3.09	1.98	0.99
302	Pumps - Controls	Chemicals	30%	30%	0.03	1.45	1.02	0.13	10	1	0	0	65.71	10.08	5.80	1.43
303	Pumps - System Optimization	Chemicals	33%	33%	0.07	1.49	1.00	0.13	10	1	0	0	141.89	4.67	2.69	3.09
304	Pumps - Sizing	Chemicals	20%	20%	0.02	1.28	1.02	0.13	10	1	0	0	82.81	8.00	4.60	1.80
305	Pumps - Replace 1-5 HP motor	Chemicals	3%	3%	0.05	1.08	1.05	0.14	17	0	0	0	1133.96	0.58	0.31	40.47
306	Pumps - ASD (1-5 hp)	Chemicals	6%	1%	0.08	1.08	1.01	0.14	17	0	0	0	7939.86	0.51	0.47	27.06
307	Pumps - Motor practices-1 (1-5 HP)	Chemicals	5%	5%	0.02	1.11	1.05	0.14	17	0	0	0	256.68	2.58	1.38	9.16
308	Pumps - Replace 6-100 HP motor	Chemicals	4%	4%	0.03	1.08	1.04	0.14	20	0	0	0	447.44	1.48	0.75	18.17
309	Pumps - ASD (6-100 hp)	Chemicals	6%	1%	0.00	1.08	1.01	0.14	20	0	0	0	233.20	17.42	15.16	0.90
310	Pumps - Motor practices-1 (6-100 HP)	Chemicals	2%	2%	0.01	1.08	1.06	0.14	20	0	0	0	116.15	5.70	2.91	4.72
311	Pumps - Replace 100+ HP motor	Chemicals	3%	3%	0.01	1.10	1.06	0.14	20	0	0	0	148.32	4.47	2.28	6.02
312	Pumps - ASD (100+ hp)	Chemicals	6%	1%	0.01	1.08	1.01	0.14	20	0	0	0	520.88	7.80	6.79	2.02
313	Pumps - Motor practices-1 (100+ HP)	Chemicals	2%	2%	0.00	1.08	1.06	0.14	20	0	0	0	76.40	8.67	4.42	3.10
400	Base Drives	Chemicals	0%	0%	0.00	1.08	1.08	0.14	20	0	0	N/A	N/A	N/A	N/A	N/A
413	Clean Room - Controls	Chemicals	10%	10%	0.02	1.13	1.02	0.13	10	0	0	0	205.77	3.22	1.85	4.48
414	Clean Room - New Designs	Chemicals	30%	30%	0.13	1.41	0.99	0.13	10	0	0	0	329.48	2.01	1.16	7.18
415	Drives - Process Controls (batch + site)	Chemicals	8%	8%	0.02	1.12	1.03	0.14	10	0	0	0	284.40	2.33	1.34	6.19
416	Process Drives - ASD	Chemicals	1%	1%	0.00	1.08	1.07	0.14	10	0	0	0	301.40	2.20	1.27	6.56
431	Custom Measures--Drives	Chemicals	3%	3%	0.01	1.08	1.04	0.14	15	0	0	0	220.17	3.01	1.65	7.05

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Industrial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Base kWh	Base EUI	EUI	Peak Watts/ Base kWh	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWh	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
500	Base Process Heating	Chemicals	0%	0%	0.00	1.08	1.08	0.14	20	0	0	N/A	N/A	N/A	N/A	N/A
512	Custom Measures--Process Heating	Chemicals	3%	3%	0.01	1.08	1.04	0.14	15	0	0	0	220.17	3.01	1.65	7.05
550	Base Process Cooling	Chemicals	0%	0%	0.00	1.08	1.08	0.14	20	0	0	N/A	N/A	N/A	N/A	N/A
553	Custom Measures--Process Cooling	Chemicals	3%	3%	0.01	1.08	1.04	0.14	15	0	0	0	220.17	3.01	1.65	7.05
600	Base Other Process	Chemicals	0%	0%	0.00	1.08	1.08	0.14	15	0	0	N/A	N/A	N/A	N/A	N/A
601	Other Process Controls (batch + site)	Chemicals	8%	8%	0.02	1.12	1.03	0.14	10	0	0	0	284.40	2.33	1.34	6.19
605	Custom Measures--Other Process	Chemicals	3%	3%	0.01	1.08	1.04	0.14	15	0	0	0	220.17	3.01	1.65	7.05
700	Space Cooling Centrifugal Chiller, 0.58 kW/ton, 500	Chemicals	0%	0%	0.00	1.08	1.08	0.26	20	0	0	N/A	N/A	N/A	N/A	N/A
701	Centrifugal Chiller, 0.51 kW/ton, 500 tons	Chemicals	12%	12%	0.03	0.96	0.84	0.21	20	0	0	0	82.23	6.02	2.20	6.24
702	Window Film - Chiller	Chemicals	10%	10%	0.06	1.13	1.02	0.25	10	0	0	0	278.60	1.78	0.73	11.35
703	EMS - Chiller	Chemicals	10%	10%	0.09	1.12	1.00	0.25	10	0	0	0	451.42	1.10	0.45	18.38
705	Chiller Tune Up/Diagnostics	Chemicals	8%	8%	0.05	1.12	1.03	0.25	10	0	0	0	331.88	1.49	0.61	13.52
706	Cooling Circ. Pumps - VSD	Chemicals	6%	6%	0.10	1.09	1.03	0.25	15	0	0	0	567.15	0.87	0.34	33.97
710	Space Cooling DX Packaged System, EER=10.3, 10	Chemicals	0%	0%	0.00	1.08	1.08	0.26	15	0	0	N/A	N/A	N/A	N/A	N/A
711	DX Tune Up/ Advanced Diagnostics	Chemicals	10%	10%	0.07	1.13	1.02	0.25	3	0	0	0	1069.84	0.46	0.21	13.75
712	DX Packaged System, EER=10.9, 10 tons	Chemicals	6%	6%	0.05	0.93	0.88	0.22	15	0	0	0	336.14	1.47	0.58	20.13
713	Window Film - DX	Chemicals	10%	10%	0.03	1.16	1.04	0.26	10	0	0	0	159.03	3.12	1.28	6.48
715	Prog. Thermostat - DX	Chemicals	10%	3%	0.00	1.13	1.03	0.27	10	0	0	0	95.00	10.92	8.21	1.01
800	Base Lighting	Chemicals	0%	0%	0.00	1.08	1.08	0.14	10	0	0	N/A	N/A	N/A	N/A	N/A
801	RET 2L4' Premium T8, 1EB	Chemicals	31%	31%	0.10	1.09	0.75	0.10	15	0	0	0	211.69	3.13	1.72	6.78
802	CFL Hardwired, Modular 36W	Chemicals	72%	72%	0.10	1.08	0.30	0.04	4	0	0	0	327.44	2.02	1.26	2.98
803	Metal Halide, 50W	Chemicals	58%	58%	0.67	1.27	0.53	0.07	5	0	0	0	1826.99	0.36	0.22	20.62
804	Occupancy Sensor, 4L4' Fluorescent Fixtures	Chemicals	18%	20%	0.05	1.08	0.88	0.11	9	0	0	0	265.24	2.39	1.35	5.70
900	Base Other	Chemicals	0%	0%	0.00	1.08	1.08	0.14	15	0	0	N/A	N/A	N/A	N/A	N/A
100	Base Compressed Air	Petroleum	0%	0%	0.00	1.08	1.08	0.14	14	0	0	N/A	N/A	N/A	N/A	N/A
101	Compressed Air-O&M	Petroleum	17%	17%	0.01	1.22	1.01	0.13	2	0	0	0	246.17	2.69	1.72	1.14
102	Compressed Air - Controls	Petroleum	12%	12%	0.02	1.18	1.04	0.14	10	0	0	0	128.17	5.17	2.98	2.79
103	Compressed Air - System Optimization	Petroleum	20%	20%	0.02	1.19	0.96	0.13	10	0	0	0	70.81	9.36	5.39	1.54
104	Compressed Air- Sizing	Petroleum	9%	9%	0.00	1.16	1.06	0.14	10	0	0	0	45.96	14.41	8.30	1.00
105	Comp Air - Replace 1-5 HP motor	Petroleum	3%	3%	0.05	1.08	1.05	0.14	17	0	0	0	1133.20	0.58	0.31	40.44
106	Comp Air - ASD (1-5 hp)	Petroleum	6%	1%	0.08	1.08	1.01	0.14	17	0	0	0	7939.86	0.51	0.47	27.06
107	Comp Air - Motor practices-1 (1-5 HP)	Petroleum	5%	5%	0.02	1.08	1.02	0.13	17	0	0	0	264.23	2.51	1.34	9.43
108	Comp Air - Replace 6-100 HP motor	Petroleum	4%	4%	0.03	1.09	1.05	0.14	20	0	0	0	442.25	1.50	0.76	17.96
109	Comp Air - ASD (6-100 hp)	Petroleum	6%	1%	0.00	1.08	1.01	0.14	20	0	0	0	233.50	17.40	15.14	0.91
110	Comp Air - Motor practices-1 (6-100 HP)	Petroleum	2%	2%	0.01	1.10	1.07	0.14	20	0	0	0	114.78	5.77	2.94	4.66
111	Comp Air - Replace 100+ HP motor	Petroleum	3%	3%	0.01	1.10	1.07	0.14	20	0	0	0	147.76	4.48	2.28	6.00
112	Comp Air - ASD (100+ hp)	Petroleum	6%	1%	0.01	1.10	1.03	0.14	20	0	0	0	510.76	7.95	6.92	1.98
113	Comp Air - Motor practices-1 (100+ HP)	Petroleum	2%	2%	0.00	1.08	1.06	0.14	20	0	0	0	75.98	8.72	4.44	3.09
114	Power recovery	Petroleum	1%	1%	0.00	1.08	1.07	0.14	10	0	0	0	290.99	2.28	1.31	6.34
200	Base Fans	Petroleum	0%	0%	0.00	1.08	1.08	0.14	14	0	0	N/A	N/A	N/A	N/A	N/A
201	Fans - O&M	Petroleum	2%	2%	0.00	1.08	1.06	0.14	2	0	0	0	228.60	2.90	1.86	1.05
202	Fans - Controls	Petroleum	30%	30%	0.09	1.17	0.82	0.11	10	0	0	0	277.91	2.38	1.37	6.05
203	Fans - System Optimization	Petroleum	21%	10%	0.06	1.11	0.88	0.13	10	0	0	0	574.29	1.81	1.36	6.09
204	Fans- Improve components	Petroleum	5%	5%	0.01	1.09	1.04	0.14	10	0	0	0	97.49	6.79	3.91	2.12
205	Fans - Replace 1-5 HP motor	Petroleum	3%	3%	0.05	1.08	1.05	0.14	17	0	0	0	1136.88	0.58	0.31	40.58
206	Fans - ASD (1-5 hp)	Petroleum	6%	1%	0.08	1.08	1.01	0.14	17	0	0	0	7938.49	0.51	0.47	27.06
207	Fans - Motor practices-1 (1-5 HP)	Petroleum	5%	5%	0.02	1.08	1.02	0.13	17	0	0	0	264.19	2.51	1.34	9.43
208	Fans - Replace 6-100 HP motor	Petroleum	3%	4%	0.03	1.08	1.04	0.14	20	0	0	0	446.44	1.42	0.70	19.64
209	Fans - ASD (6-100 hp)	Petroleum	4%	1%	0.00	1.08	1.03	0.14	20	0	0	0	232.80	12.13	10.18	1.35
210	Fans - Motor practices-1 (6-100 HP)	Petroleum	2%	2%	0.01	1.08	1.05	0.14	20	0	0	0	116.89	5.67	2.89	4.75
211	Fans - Replace 100+ HP motor	Petroleum	3%	3%	0.01	1.08	1.04	0.14	20	0	0	0	150.93	4.39	2.24	6.13
212	Fans - ASD (100+ hp)	Petroleum	6%	1%	0.01	1.08	1.02	0.14	20	0	0	0	519.05	7.24	6.26	2.19
213	Fans - Motor practices-1 (100+ HP)	Petroleum	1%	2%	0.00	1.08	1.06	0.14	20	0	0	0	76.40	7.20	3.04	4.51
300	Base Pumps	Petroleum	0%	0%	0.00	1.08	1.08	0.14	14	0	0	N/A	N/A	N/A	N/A	N/A
301	Pumps - O&M	Petroleum	10%	10%	0.01	1.17	1.05	0.14	2	0	0	0	214.63	3.09	1.98	0.99
302	Pumps - Controls	Petroleum	30%	30%	0.03	1.45	1.02	0.13	10	0	0	0	65.71	10.08	5.80	1.43

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Industrial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Base kWh	Base EUI	EUI	Peak Watts/ Base kWh	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWh	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
303	Pumps - System Optimization	Petroleum	33%	33%	0.07	1.49	1.00	0.13	10	0	0	0	141.89	4.67	2.69	3.09
304	Pumps - Sizing	Petroleum	20%	20%	0.02	1.28	1.02	0.13	10	0	0	0	82.81	8.00	4.60	1.80
305	Pumps - Replace 1-5 HP motor	Petroleum	3%	3%	0.05	1.08	1.05	0.14	17	0	0	0	1133.96	0.58	0.31	40.47
306	Pumps - ASD (1-5 hp)	Petroleum	6%	1%	0.08	1.08	1.01	0.14	17	0	0	0	7939.86	0.51	0.47	27.06
307	Pumps - Motor practices-1 (1-5 HP)	Petroleum	5%	5%	0.02	1.11	1.05	0.14	17	0	0	0	256.68	2.58	1.38	9.16
308	Pumps - Replace 6-100 HP motor	Petroleum	4%	4%	0.03	1.08	1.04	0.14	20	0	0	0	447.44	1.48	0.75	18.17
309	Pumps - ASD (6-100 hp)	Petroleum	6%	1%	0.00	1.08	1.01	0.14	20	0	0	0	233.20	17.42	15.16	0.90
310	Pumps - Motor practices-1 (6-100 HP)	Petroleum	2%	2%	0.01	1.08	1.06	0.14	20	0	0	0	116.15	5.70	2.91	4.72
311	Pumps - Replace 100+ HP motor	Petroleum	3%	3%	0.01	1.10	1.06	0.14	20	0	0	0	148.32	4.47	2.28	6.02
312	Pumps - ASD (100+ hp)	Petroleum	6%	1%	0.01	1.08	1.01	0.14	20	0	0	0	520.88	7.80	6.79	2.02
313	Pumps - Motor practices-1 (100+ HP)	Petroleum	2%	2%	0.00	1.08	1.06	0.14	20	0	0	0	76.40	8.67	4.42	3.10
400	Base Drives	Petroleum	0%	0%	0.00	1.08	1.08	0.14	20	0	0	N/A	N/A	N/A	N/A	N/A
431	Custom Measures--Drives	Petroleum	3%	3%	0.01	1.08	1.04	0.14	15	0	0	0	220.17	3.01	1.65	7.05
500	Base Process Heating	Petroleum	0%	0%	0.00	1.08	1.08	0.14	20	0	0	N/A	N/A	N/A	N/A	N/A
512	Custom Measures--Process Heating	Petroleum	3%	3%	0.01	1.08	1.04	0.14	15	0	0	0	220.17	3.01	1.65	7.05
550	Base Process Cooling	Petroleum	0%	0%	0.00	1.08	1.08	0.14	20	0	0	N/A	N/A	N/A	N/A	N/A
553	Custom Measures--Process Cooling	Petroleum	3%	3%	0.01	1.08	1.04	0.14	15	0	0	0	220.17	3.01	1.65	7.05
600	Base Other Process	Petroleum	0%	0%	0.00	1.08	1.08	0.14	15	0	0	N/A	N/A	N/A	N/A	N/A
602	Efficient desalter	Petroleum	20%	20%	0.04	1.19	0.96	0.13	10	0	0	0	177.46	3.73	2.15	3.86
605	Custom Measures--Other Process	Petroleum	3%	3%	0.01	1.08	1.04	0.14	15	0	0	0	220.17	3.01	1.65	7.05
700	Space Cooling Centrifugal Chiller, 0.58 kW/ton, 500	Petroleum	0%	0%	0.00	1.08	1.08	0.26	20	0	0	N/A	N/A	N/A	N/A	N/A
710	Space Cooling DX Packaged System, EER=10.3, 10	Petroleum	0%	0%	0.00	1.08	1.08	0.26	15	0	0	N/A	N/A	N/A	N/A	N/A
711	DX Tune Up/ Advanced Diagnostics	Petroleum	10%	10%	0.07	1.13	1.02	0.25	3	0	0	0	1069.84	0.46	0.21	13.75
712	DX Packaged System, EER=10.9, 10 tons	Petroleum	6%	6%	0.05	0.93	0.88	0.22	15	0	0	0	336.14	1.47	0.58	20.13
713	Window Film - DX	Petroleum	10%	10%	0.03	1.16	1.04	0.26	10	0	0	0	159.03	3.12	1.28	6.48
715	Prog. Thermostat - DX	Petroleum	10%	3%	0.00	1.13	1.03	0.27	10	0	0	0	95.00	10.92	8.21	1.01
800	Base Lighting	Petroleum	0%	0%	0.00	1.08	1.08	0.14	10	0	0	N/A	N/A	N/A	N/A	N/A
801	RET 2L4' Premium T8, 1EB	Petroleum	31%	31%	0.10	1.09	0.75	0.10	15	0	0	0	211.69	3.13	1.72	6.78
802	CFL Hardwired, Modular 36W	Petroleum	72%	72%	0.10	1.08	0.30	0.04	4	0	0	0	327.44	2.02	1.26	2.98
803	Metal Halide, 50W	Petroleum	58%	58%	0.67	1.27	0.53	0.07	5	0	0	0	1826.99	0.36	0.22	20.62
804	Occupancy Sensor, 4L4' Fluorescent Fixtures	Petroleum	18%	20%	0.05	1.08	0.88	0.11	9	0	0	0	265.24	2.39	1.35	5.70
900	Base Other	Petroleum	0%	0%	0.00	1.08	1.08	0.14	15	0	0	N/A	N/A	N/A	N/A	N/A
901	Replace V-belts	Petroleum	0%	0%	0.00	1.08	1.07	0.14	5	0	0	0	312.34	2.12	1.30	3.52
100	Base Compressed Air	Rubber-Plastics	0%	0%	0.00	1.08	1.08	0.17	14	0	0	N/A	N/A	N/A	N/A	N/A
101	Compressed Air-O&M	Rubber-Plastics	17%	17%	0.01	1.22	1.01	0.16	2	0	0	0	202.20	2.96	1.72	1.14
102	Compressed Air - Controls	Rubber-Plastics	12%	12%	0.02	1.18	1.04	0.17	10	0	0	0	105.27	5.68	2.98	2.79
103	Compressed Air - System Optimization	Rubber-Plastics	20%	20%	0.02	1.19	0.96	0.15	10	0	0	0	58.16	10.29	5.39	1.54
104	Compressed Air- Sizing	Rubber-Plastics	9%	9%	0.00	1.16	1.06	0.17	10	0	0	0	37.75	15.85	8.30	1.00
105	Comp Air - Replace 1-5 HP motor	Rubber-Plastics	3%	3%	0.05	1.08	1.05	0.17	17	0	0	0	930.80	0.64	0.31	40.44
106	Comp Air - ASD (1-5 hp)	Rubber-Plastics	6%	1%	0.08	1.08	1.01	0.17	17	0	0	0	6521.68	0.51	0.46	27.39
107	Comp Air - Motor practices-1 (1-5 HP)	Rubber-Plastics	5%	5%	0.02	1.08	1.02	0.16	17	0	0	0	217.04	2.76	1.34	9.43
108	Comp Air - Replace 6-100 HP motor	Rubber-Plastics	3%	4%	0.03	1.09	1.05	0.17	20	0	0	0	363.26	1.65	0.76	17.96
109	Comp Air - ASD (6-100 hp)	Rubber-Plastics	6%	1%	0.00	1.08	1.01	0.17	20	0	0	0	191.79	17.49	14.96	0.92
110	Comp Air - Motor practices-1 (6-100 HP)	Rubber-Plastics	2%	2%	0.01	1.10	1.07	0.17	20	0	0	0	94.28	6.35	2.94	4.66
111	Comp Air - Replace 100+ HP motor	Rubber-Plastics	3%	3%	0.01	1.10	1.07	0.17	20	0	0	0	121.37	4.93	2.28	6.00
112	Comp Air - ASD (100+ hp)	Rubber-Plastics	6%	1%	0.01	1.10	1.03	0.17	20	0	0	0	419.63	7.99	6.84	2.01
113	Comp Air - Motor practices-1 (100+ HP)	Rubber-Plastics	1%	2%	0.00	1.08	1.06	0.17	20	0	0	0	62.41	9.59	4.44	3.09
200	Base Fans	Rubber-Plastics	0%	0%	0.00	1.08	1.08	0.17	14	0	0	N/A	N/A	N/A	N/A	N/A
201	Fans - O&M	Rubber-Plastics	2%	2%	0.00	1.08	1.06	0.17	2	0	0	0	187.77	3.19	1.86	1.05
202	Fans - Controls	Rubber-Plastics	30%	30%	0.09	1.17	0.82	0.13	10	0	0	0	228.27	2.62	1.37	6.05
203	Fans - System Optimization	Rubber-Plastics	20%	10%	0.06	1.11	0.88	0.16	10	0	0	0	471.81	1.92	1.35	6.14
204	Fans- Improve components	Rubber-Plastics	5%	5%	0.01	1.09	1.04	0.17	10	0	0	0	80.08	7.47	3.91	2.12
205	Fans - Replace 1-5 HP motor	Rubber-Plastics	3%	3%	0.05	1.08	1.05	0.17	17	0	0	0	933.82	0.64	0.31	40.58
206	Fans - ASD (1-5 hp)	Rubber-Plastics	6%	1%	0.08	1.08	1.01	0.17	17	0	0	0	6520.57	0.51	0.46	27.39
207	Fans - Motor practices-1 (1-5 HP)	Rubber-Plastics	5%	5%	0.02	1.08	1.02	0.16	17	0	0	0	217.00	2.76	1.34	9.43
208	Fans - Replace 6-100 HP motor	Rubber-Plastics	3%	4%	0.03	1.08	1.04	0.17	20	0	0	0	366.67	1.58	0.71	19.29

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Industrial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Base kWh	Base EUI	EUI	Peak Watts/ Base kWh	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWH	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
209	Fans - ASD (6-100 hp)	Rubber-Plastics	4%	1%	0.00	1.08	1.03	0.17	20	0	0	0	191.18	13.13	10.85	1.26
210	Fans - Motor practices-1 (6-100 HP)	Rubber-Plastics	2%	2%	0.01	1.08	1.05	0.17	20	0	0	0	96.01	6.23	2.89	4.75
211	Fans - Replace 100+ HP motor	Rubber-Plastics	3%	3%	0.01	1.08	1.04	0.17	20	0	0	0	123.97	4.83	2.24	6.13
212	Fans - ASD (100+ hp)	Rubber-Plastics	6%	1%	0.01	1.08	1.02	0.17	20	0	0	0	426.33	7.41	6.30	2.18
213	Fans - Motor practices-1 (100+ HP)	Rubber-Plastics	1%	2%	0.00	1.08	1.06	0.17	20	0	0	0	62.75	8.32	3.27	4.19
300	Base Pumps	Rubber-Plastics	0%	0%	0.00	1.08	1.08	0.17	14	0	0	N/A	N/A	N/A	N/A	N/A
301	Pumps - O&M	Rubber-Plastics	10%	10%	0.01	1.17	1.05	0.17	2	0	0	0	176.29	3.39	1.98	0.99
302	Pumps - Controls	Rubber-Plastics	30%	30%	0.03	1.45	1.02	0.16	10	0	0	0	53.97	11.09	5.80	1.43
303	Pumps - System Optimization	Rubber-Plastics	33%	33%	0.07	1.49	1.00	0.16	10	0	0	0	116.55	5.13	2.69	3.09
304	Pumps - Sizing	Rubber-Plastics	20%	20%	0.02	1.28	1.02	0.16	10	0	0	0	68.02	8.80	4.60	1.80
305	Pumps - Replace 1-5 HP motor	Rubber-Plastics	3%	3%	0.05	1.08	1.05	0.17	17	0	0	0	931.42	0.64	0.31	40.47
306	Pumps - ASD (1-5 hp)	Rubber-Plastics	6%	1%	0.08	1.08	1.01	0.17	17	0	0	0	6521.68	0.51	0.46	27.39
307	Pumps - Motor practices-1 (1-5 HP)	Rubber-Plastics	5%	5%	0.02	1.11	1.05	0.17	17	0	0	0	210.83	2.84	1.38	9.16
308	Pumps - Replace 6-100 HP motor	Rubber-Plastics	3%	4%	0.03	1.08	1.04	0.17	20	0	0	0	367.52	1.63	0.75	18.17
309	Pumps - ASD (6-100 hp)	Rubber-Plastics	6%	1%	0.00	1.08	1.01	0.17	20	0	0	0	191.55	17.51	14.98	0.92
310	Pumps - Motor practices-1 (6-100 HP)	Rubber-Plastics	2%	2%	0.01	1.08	1.06	0.17	20	0	0	0	95.41	6.27	2.91	4.72
311	Pumps - Replace 100+ HP motor	Rubber-Plastics	3%	3%	0.01	1.10	1.06	0.17	20	0	0	0	121.82	4.91	2.28	6.02
312	Pumps - ASD (100+ hp)	Rubber-Plastics	6%	1%	0.01	1.08	1.01	0.17	20	0	0	0	427.84	7.84	6.70	2.04
313	Pumps - Motor practices-1 (100+ HP)	Rubber-Plastics	1%	2%	0.00	1.08	1.06	0.17	20	0	0	0	62.75	9.54	4.42	3.10
400	Base Drives	Rubber-Plastics	0%	0%	0.00	1.08	1.08	0.17	20	0	0	N/A	N/A	N/A	N/A	N/A
417	O&M - Extruders/Injection Moulding	Rubber-Plastics	10%	10%	0.01	1.12	1.01	0.16	12	0	0	0	32.58	18.36	9.50	1.03
418	Extruders/injection Moulding-multipump	Rubber-Plastics	30%	30%	0.10	1.15	0.80	0.13	12	0	0	0	209.34	2.86	1.48	6.63
419	Direct drive Extruders	Rubber-Plastics	50%	50%	0.31	1.13	0.56	0.09	12	0	0	0	397.32	1.51	0.78	12.59
420	Injection Moulding - Impulse Cooling	Rubber-Plastics	21%	21%	0.07	1.11	0.88	0.14	12	0	0	0	215.83	2.77	1.43	6.84
421	Injection Moulding - Direct drive	Rubber-Plastics	20%	20%	0.10	1.10	0.88	0.14	12	0	0	0	321.09	1.86	0.96	10.18
431	Custom Measures--Drives	Rubber-Plastics	3%	3%	0.01	1.08	1.04	0.17	15	0	0	0	180.84	3.31	1.65	7.05
500	Base Process Heating	Rubber-Plastics	0%	0%	0.00	1.08	1.08	0.17	20	0	0	N/A	N/A	N/A	N/A	N/A
512	Custom Measures--Process Heating	Rubber-Plastics	3%	3%	0.01	1.08	1.04	0.17	15	0	0	0	180.84	3.31	1.65	7.05
550	Base Process Cooling	Rubber-Plastics	0%	0%	0.00	1.08	1.08	0.17	20	0	0	N/A	N/A	N/A	N/A	N/A
553	Custom Measures--Process Cooling	Rubber-Plastics	3%	3%	0.01	1.08	1.04	0.17	15	0	0	0	180.84	3.31	1.65	7.05
600	Base Other Process	Rubber-Plastics	0%	0%	0.00	1.08	1.08	0.17	15	0	0	N/A	N/A	N/A	N/A	N/A
605	Custom Measures--Other Process	Rubber-Plastics	3%	3%	0.01	1.08	1.04	0.17	15	0	0	0	180.84	3.31	1.65	7.05
700	Space Cooling Centrifugal Chiller, 0.58 kW/ton, 500	Rubber-Plastics	0%	0%	0.00	1.08	1.08	0.32	20	0	0	N/A	N/A	N/A	N/A	N/A
701	Centrifugal Chiller, 0.51 kW/ton, 500 tons	Rubber-Plastics	12%	12%	0.03	0.96	0.84	0.25	20	0	0	0	67.54	6.83	2.20	6.24
702	Window Film - Chiller	Rubber-Plastics	10%	10%	0.06	1.13	1.02	0.30	10	0	0	0	228.84	2.02	0.73	11.35
703	EMS - Chiller	Rubber-Plastics	10%	10%	0.09	1.12	1.00	0.30	10	0	0	0	370.79	1.24	0.45	18.38
705	Chiller Tune Up/Diagnostics	Rubber-Plastics	8%	8%	0.05	1.12	1.03	0.31	10	0	0	0	272.60	1.69	0.61	13.52
706	Cooling Circ. Pumps - VSD	Rubber-Plastics	6%	6%	0.10	1.09	1.03	0.31	15	0	0	0	465.84	0.99	0.34	33.97
710	Space Cooling DX Packaged System, EER=10.3, 10	Rubber-Plastics	0%	0%	0.00	1.08	1.08	0.32	15	0	0	N/A	N/A	N/A	N/A	N/A
711	DX Tune Up/ Advanced Diagnostics	Rubber-Plastics	10%	10%	0.07	1.13	1.02	0.30	3	0	0	0	878.75	0.52	0.21	13.75
712	DX Packaged System, EER=10.9, 10 tons	Rubber-Plastics	6%	6%	0.05	0.93	0.88	0.26	15	0	0	0	276.10	1.67	0.58	20.13
713	Window Film - DX	Rubber-Plastics	10%	10%	0.03	1.16	1.04	0.31	10	0	0	0	130.62	3.53	1.28	6.48
715	Prog. Thermostat - DX	Rubber-Plastics	9%	3%	0.00	1.13	1.03	0.33	10	0	0	0	78.07	11.54	8.12	1.02
800	Base Lighting	Rubber-Plastics	0%	0%	0.00	1.08	1.08	0.17	10	0	0	N/A	N/A	N/A	N/A	N/A
801	RET 2L4' Premium T8, 1EB	Rubber-Plastics	31%	31%	0.10	1.09	0.75	0.12	15	0	0	0	173.88	3.44	1.72	6.78
802	CFL Hardwired, Modular 36W	Rubber-Plastics	72%	72%	0.10	1.08	0.30	0.05	4	0	0	0	268.96	2.22	1.26	2.98
803	Metal Halide, 50W	Rubber-Plastics	58%	58%	0.67	1.27	0.53	0.09	5	0	0	0	1500.66	0.40	0.22	20.62
804	Occupancy Sensor, 4L4' Fluorescent Fixtures	Rubber-Plastics	19%	20%	0.05	1.08	0.88	0.14	9	0	0	0	217.84	2.67	1.38	5.59
900	Base Other	Rubber-Plastics	0%	0%	0.00	1.08	1.08	0.17	15	0	0	N/A	N/A	N/A	N/A	N/A
901	Replace V-belts	Rubber-Plastics	0%	0%	0.00	1.08	1.07	0.17	5	0	0	0	256.55	2.33	1.30	3.52
100	Base Compressed Air	Stone-Clay-Glass	0%	0%	0.00	1.08	1.08	0.14	14	0	0	N/A	N/A	N/A	N/A	N/A
101	Compressed Air-O&M	Stone-Clay-Glass	17%	17%	0.01	1.22	1.01	0.13	2	0	0	0	248.23	2.68	1.72	1.14
102	Compressed Air - Controls	Stone-Clay-Glass	12%	12%	0.02	1.18	1.04	0.14	10	0	0	0	129.24	5.15	2.98	2.79
103	Compressed Air - System Optimization	Stone-Clay-Glass	20%	20%	0.02	1.19	0.96	0.12	10	0	0	0	71.40	9.32	5.39	1.54
104	Compressed Air- Sizing	Stone-Clay-Glass	9%	9%	0.00	1.16	1.06	0.14	10	0	0	0	46.34	14.36	8.30	1.00
105	Comp Air - Replace 1-5 HP motor	Stone-Clay-Glass	3%	3%	0.05	1.08	1.05	0.14	17	0	0	0	1142.67	0.58	0.31	40.44

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Industrial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Base kWh	Base EUI	EUI	Peak Watts/ Base kWh	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWh	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
106	Comp Air - ASD (1-5 hp)	Stone-Clay-Glass	6%	1%	0.08	1.08	1.01	0.14	17	0	0	0	8006.19	0.51	0.47	27.05
107	Comp Air - Motor practices-1 (1-5 HP)	Stone-Clay-Glass	5%	5%	0.02	1.08	1.02	0.13	17	0	0	0	266.44	2.50	1.34	9.43
108	Comp Air - Replace 6-100 HP motor	Stone-Clay-Glass	4%	4%	0.03	1.09	1.05	0.14	20	0	0	0	445.94	1.49	0.76	17.96
109	Comp Air - ASD (6-100 hp)	Stone-Clay-Glass	6%	1%	0.00	1.08	1.01	0.14	20	0	0	0	235.45	17.40	15.15	0.91
110	Comp Air - Motor practices-1 (6-100 HP)	Stone-Clay-Glass	2%	2%	0.01	1.10	1.07	0.14	20	0	0	0	115.74	5.75	2.94	4.66
111	Comp Air - Replace 100+ HP motor	Stone-Clay-Glass	3%	3%	0.01	1.10	1.07	0.14	20	0	0	0	148.99	4.47	2.28	6.00
112	Comp Air - ASD (100+ hp)	Stone-Clay-Glass	6%	1%	0.01	1.10	1.03	0.14	20	0	0	0	515.02	7.95	6.92	1.98
113	Comp Air - Motor practices-1 (100+ HP)	Stone-Clay-Glass	2%	2%	0.00	1.08	1.06	0.14	20	0	0	0	76.62	8.69	4.44	3.09
200	Base Fans	Stone-Clay-Glass	0%	0%	0.00	1.08	1.08	0.14	14	0	0	N/A	N/A	N/A	N/A	N/A
201	Fans - O&M	Stone-Clay-Glass	2%	2%	0.00	1.08	1.06	0.14	2	0	0	0	230.51	2.89	1.86	1.05
202	Fans - Controls	Stone-Clay-Glass	30%	30%	0.09	1.17	0.82	0.11	10	0	0	0	280.23	2.37	1.37	6.05
203	Fans - System Optimization	Stone-Clay-Glass	21%	10%	0.06	1.11	0.88	0.13	10	0	0	0	579.08	1.81	1.36	6.09
204	Fans- Improve components	Stone-Clay-Glass	5%	5%	0.01	1.09	1.04	0.14	10	0	0	0	98.31	6.77	3.91	2.12
205	Fans - Replace 1-5 HP motor	Stone-Clay-Glass	3%	3%	0.05	1.08	1.05	0.14	17	0	0	0	1146.38	0.58	0.31	40.58
206	Fans - ASD (1-5 hp)	Stone-Clay-Glass	6%	1%	0.08	1.08	1.01	0.14	17	0	0	0	8004.81	0.51	0.47	27.04
207	Fans - Motor practices-1 (1-5 HP)	Stone-Clay-Glass	5%	5%	0.02	1.08	1.02	0.13	17	0	0	0	266.40	2.50	1.34	9.43
208	Fans - Replace 6-100 HP motor	Stone-Clay-Glass	3%	4%	0.03	1.08	1.04	0.14	20	0	0	0	450.13	1.43	0.71	19.20
209	Fans - ASD (6-100 hp)	Stone-Clay-Glass	4%	1%	0.00	1.08	1.03	0.14	20	0	0	0	234.67	13.26	11.25	1.22
210	Fans - Motor practices-1 (6-100 HP)	Stone-Clay-Glass	2%	2%	0.01	1.08	1.05	0.14	20	0	0	0	117.87	5.65	2.89	4.75
211	Fans - Replace 100+ HP motor	Stone-Clay-Glass	3%	3%	0.01	1.08	1.04	0.14	20	0	0	0	152.19	4.37	2.24	6.13
212	Fans - ASD (100+ hp)	Stone-Clay-Glass	6%	1%	0.01	1.08	1.02	0.14	20	0	0	0	523.34	7.40	6.41	2.14
213	Fans - Motor practices-1 (100+ HP)	Stone-Clay-Glass	1%	2%	0.00	1.08	1.06	0.14	20	0	0	0	77.03	7.48	3.33	4.12
300	Base Pumps	Stone-Clay-Glass	0%	0%	0.00	1.08	1.08	0.14	14	0	0	N/A	N/A	N/A	N/A	N/A
301	Pumps - O&M	Stone-Clay-Glass	10%	10%	0.01	1.17	1.05	0.14	2	0	0	0	216.42	3.07	1.98	0.99
302	Pumps - Controls	Stone-Clay-Glass	30%	30%	0.03	1.45	1.02	0.13	10	0	0	0	66.26	10.04	5.80	1.43
303	Pumps - System Optimization	Stone-Clay-Glass	33%	33%	0.07	1.49	1.00	0.13	10	0	0	0	143.08	4.65	2.69	3.09
304	Pumps - Sizing	Stone-Clay-Glass	20%	20%	0.02	1.28	1.02	0.13	10	0	0	0	83.51	7.97	4.60	1.80
305	Pumps - Replace 1-5 HP motor	Stone-Clay-Glass	3%	3%	0.05	1.08	1.05	0.14	17	0	0	0	1143.43	0.58	0.31	40.47
306	Pumps - ASD (1-5 hp)	Stone-Clay-Glass	6%	1%	0.08	1.08	1.01	0.14	17	0	0	0	8006.19	0.51	0.47	27.05
307	Pumps - Motor practices-1 (1-5 HP)	Stone-Clay-Glass	5%	5%	0.02	1.11	1.05	0.14	17	0	0	0	258.82	2.57	1.38	9.16
308	Pumps - Replace 6-100 HP motor	Stone-Clay-Glass	4%	4%	0.03	1.08	1.04	0.14	20	0	0	0	451.18	1.47	0.75	18.17
309	Pumps - ASD (6-100 hp)	Stone-Clay-Glass	6%	1%	0.00	1.08	1.01	0.14	20	0	0	0	235.14	17.42	15.17	0.90
310	Pumps - Motor practices-1 (6-100 HP)	Stone-Clay-Glass	2%	2%	0.01	1.08	1.06	0.14	20	0	0	0	117.12	5.68	2.91	4.72
311	Pumps - Replace 100+ HP motor	Stone-Clay-Glass	3%	3%	0.01	1.10	1.06	0.14	20	0	0	0	149.55	4.45	2.28	6.02
312	Pumps - ASD (100+ hp)	Stone-Clay-Glass	6%	1%	0.01	1.08	1.01	0.14	20	0	0	0	525.23	7.80	6.79	2.02
313	Pumps - Motor practices-1 (100+ HP)	Stone-Clay-Glass	2%	2%	0.00	1.08	1.06	0.14	20	0	0	0	77.03	8.64	4.42	3.10
400	Base Drives	Stone-Clay-Glass	0%	0%	0.00	1.08	1.08	0.14	20	0	0	N/A	N/A	N/A	N/A	N/A
405	Drives - EE motor	Stone-Clay-Glass	4%	4%	0.01	1.09	1.05	0.14	10	0	0	0	147.27	4.52	2.61	3.18
415	Drives - Process Controls (batch + site)	Stone-Clay-Glass	2%	2%	0.02	1.09	1.06	0.14	10	0	0	0	1182.96	0.56	0.33	25.55
422	Efficient grinding	Stone-Clay-Glass	21%	21%	0.23	1.29	1.02	0.13	15	0	0	0	619.04	1.07	0.59	19.66
423	Process control	Stone-Clay-Glass	2%	2%	0.00	1.09	1.06	0.14	10	0	0	0	96.96	6.86	3.97	2.09
424	Process optimization	Stone-Clay-Glass	10%	10%	0.03	1.16	1.05	0.14	10	0	0	0	276.32	2.41	1.39	5.97
431	Custom Measures--Drives	Stone-Clay-Glass	3%	3%	0.01	1.08	1.04	0.14	15	0	0	0	222.01	3.00	1.65	7.05
500	Base Process Heating	Stone-Clay-Glass	0%	0%	0.00	1.08	1.08	0.14	20	0	0	N/A	N/A	N/A	N/A	N/A
504	Top-heating (glass)	Stone-Clay-Glass	4%	4%	0.00	1.10	1.05	0.14	8	0	0	0	120.64	5.52	3.29	2.12
512	Custom Measures--Process Heating	Stone-Clay-Glass	3%	3%	0.01	1.08	1.04	0.14	15	0	0	0	222.01	3.00	1.65	7.05
550	Base Process Cooling	Stone-Clay-Glass	0%	0%	0.00	1.08	1.08	0.14	20	0	0	N/A	N/A	N/A	N/A	N/A
553	Custom Measures--Process Cooling	Stone-Clay-Glass	3%	3%	0.01	1.08	1.04	0.14	15	0	0	0	222.01	3.00	1.65	7.05
600	Base Other Process	Stone-Clay-Glass	0%	0%	0.00	1.08	1.08	0.14	15	0	0	N/A	N/A	N/A	N/A	N/A
605	Custom Measures--Other Process	Stone-Clay-Glass	3%	3%	0.01	1.08	1.04	0.14	15	0	0	0	222.01	3.00	1.65	7.05
700	Space Cooling Centrifugal Chiller, 0.58 kW/ton, 500	Stone-Clay-Glass	0%	0%	0.00	1.08	1.08	0.26	20	0	0	N/A	N/A	N/A	N/A	N/A
710	Space Cooling DX Packaged System, EER=10.3, 10	Stone-Clay-Glass	0%	0%	0.00	1.08	1.08	0.26	15	0	0	N/A	N/A	N/A	N/A	N/A
711	DX Tune Up/ Advanced Diagnostics	Stone-Clay-Glass	10%	10%	0.07	1.13	1.02	0.25	3	0	0	0	1078.78	0.46	0.21	13.75
712	DX Packaged System, EER=10.9, 10 tons	Stone-Clay-Glass	6%	6%	0.05	0.93	0.88	0.21	15	0	0	0	338.95	1.47	0.58	20.13
713	Window Film - DX	Stone-Clay-Glass	10%	10%	0.03	1.16	1.04	0.25	10	0	0	0	160.36	3.10	1.28	6.48
715	Prog. Thermostat - DX	Stone-Clay-Glass	10%	3%	0.00	1.13	1.03	0.27	10	0	0	0	95.79	10.90	8.21	1.01

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Industrial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Base kWh	Base EUI	EUI	Peak Watts/ Base kWh	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWh	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
800	Base Lighting	Stone-Clay-Glass	0%	0%	0.00	1.08	1.08	0.14	10	0	0	N/A	N/A	N/A	N/A	N/A
801	RET 2L4' Premium T8, 1EB	Stone-Clay-Glass	31%	31%	0.10	1.09	0.75	0.10	15	0	0	0	213.46	3.12	1.72	6.78
802	CFL Hardwired, Modular 36W	Stone-Clay-Glass	72%	72%	0.10	1.08	0.30	0.04	4	0	0	0	330.18	2.02	1.26	2.98
803	Metal Halide, 50W	Stone-Clay-Glass	58%	58%	0.67	1.27	0.53	0.07	5	0	0	0	1842.25	0.36	0.22	20.62
804	Occupancy Sensor, 4L4' Fluorescent Fixtures	Stone-Clay-Glass	19%	20%	0.05	1.08	0.88	0.11	9	0	0	0	267.42	2.41	1.38	5.57
900	Base Other	Stone-Clay-Glass	0%	0%	0.00	1.08	1.08	0.14	15	0	0	N/A	N/A	N/A	N/A	N/A
901	Replace V-belts	Stone-Clay-Glass	0%	0%	0.00	1.08	1.07	0.14	5	0	0	0	314.95	2.11	1.30	3.52
100	Base Compressed Air	Fab Metals	0%	0%	0.00	1.08	1.08	0.17	14	0	0	N/A	N/A	N/A	N/A	N/A
101	Compressed Air-O&M	Fab Metals	17%	17%	0.01	1.24	1.03	0.16	2	0	0	0	204.99	2.96	1.75	1.12
102	Compressed Air - Controls	Fab Metals	12%	12%	0.02	1.18	1.04	0.16	10	0	0	0	108.58	5.60	2.98	2.79
103	Compressed Air - System Optimization	Fab Metals	20%	20%	0.02	1.19	0.96	0.15	10	0	0	0	59.99	10.13	5.39	1.54
104	Compressed Air- Sizing	Fab Metals	9%	9%	0.00	1.08	0.98	0.15	10	0	0	0	42.03	14.46	7.69	1.08
105	Comp Air - Replace 1-5 HP motor	Fab Metals	3%	3%	0.05	1.08	1.05	0.16	17	0	0	0	960.02	0.63	0.31	40.44
106	Comp Air - ASD (1-5 hp)	Fab Metals	6%	1%	0.08	1.08	1.01	0.17	17	0	0	0	6726.45	0.51	0.46	27.36
107	Comp Air - Motor practices-1 (1-5 HP)	Fab Metals	5%	5%	0.02	1.08	1.02	0.16	17	0	0	0	223.85	2.71	1.34	9.43
108	Comp Air - Replace 6-100 HP motor	Fab Metals	3%	4%	0.03	1.11	1.07	0.17	20	0	0	0	368.98	1.65	0.78	17.69
109	Comp Air - ASD (6-100 hp)	Fab Metals	6%	1%	0.00	1.08	1.01	0.17	20	0	0	0	197.81	17.46	14.97	0.92
110	Comp Air - Motor practices-1 (6-100 HP)	Fab Metals	2%	2%	0.01	1.08	1.05	0.16	20	0	0	0	99.29	6.12	2.88	4.76
111	Comp Air - Replace 100+ HP motor	Fab Metals	3%	3%	0.01	1.10	1.06	0.16	20	0	0	0	125.65	4.84	2.28	6.02
112	Comp Air - ASD (100+ hp)	Fab Metals	6%	1%	0.01	1.08	1.01	0.17	20	0	0	0	441.27	7.83	6.71	2.04
113	Comp Air - Motor practices-1 (100+ HP)	Fab Metals	1%	2%	0.00	1.09	1.07	0.17	20	0	0	0	64.13	9.47	4.46	3.07
200	Base Fans	Fab Metals	0%	0%	0.00	1.08	1.08	0.17	14	0	0	N/A	N/A	N/A	N/A	N/A
201	Fans - O&M	Fab Metals	2%	2%	0.00	1.09	1.07	0.17	2	0	0	0	190.88	3.18	1.88	1.04
202	Fans - Controls	Fab Metals	30%	30%	0.09	1.41	0.99	0.15	10	0	0	0	196.26	3.10	1.65	5.05
203	Fans - System Optimization	Fab Metals	20%	10%	0.06	1.28	1.02	0.18	10	0	0	0	421.28	2.19	1.56	5.31
204	Fans- Improve components	Fab Metals	5%	5%	0.01	1.11	1.06	0.16	10	0	0	0	81.23	7.48	3.98	2.09
205	Fans - Replace 1-5 HP motor	Fab Metals	3%	3%	0.05	1.08	1.05	0.16	17	0	0	0	960.02	0.63	0.31	40.44
206	Fans - ASD (1-5 hp)	Fab Metals	6%	1%	0.08	1.09	1.02	0.17	17	0	0	0	6653.47	0.52	0.47	27.07
207	Fans - Motor practices-1 (1-5 HP)	Fab Metals	5%	5%	0.02	1.08	1.02	0.16	17	0	0	0	223.85	2.71	1.34	9.43
208	Fans - Replace 6-100 HP motor	Fab Metals	3%	4%	0.03	1.09	1.06	0.16	20	0	0	0	372.82	1.59	0.73	18.85
209	Fans - ASD (6-100 hp)	Fab Metals	4%	1%	0.00	1.08	1.03	0.17	20	0	0	0	197.10	13.42	11.17	1.23
210	Fans - Motor practices-1 (6-100 HP)	Fab Metals	2%	2%	0.01	1.09	1.06	0.17	20	0	0	0	97.89	6.21	2.92	4.69
211	Fans - Replace 100+ HP motor	Fab Metals	3%	3%	0.01	1.08	1.05	0.16	20	0	0	0	127.71	4.76	2.24	6.12
212	Fans - ASD (100+ hp)	Fab Metals	6%	1%	0.01	1.13	1.07	0.17	20	0	0	0	418.96	7.83	6.68	2.05
213	Fans - Motor practices-1 (100+ HP)	Fab Metals	1%	2%	0.00	1.08	1.06	0.16	20	0	0	0	64.72	8.26	3.36	4.08
300	Base Pumps	Fab Metals	0%	0%	0.00	1.08	1.08	0.17	14	0	0	N/A	N/A	N/A	N/A	N/A
301	Pumps - O&M	Fab Metals	10%	10%	0.01	1.13	1.01	0.16	2	0	0	0	189.30	3.21	1.90	1.03
302	Pumps - Controls	Fab Metals	30%	30%	0.03	1.39	0.97	0.15	10	0	0	0	58.03	10.47	5.57	1.49
303	Pumps - System Optimization	Fab Metals	33%	33%	0.07	1.15	0.77	0.12	10	0	0	0	155.66	3.90	2.08	4.00
304	Pumps - Sizing	Fab Metals	20%	20%	0.02	1.28	1.02	0.16	10	0	0	0	70.16	8.66	4.60	1.80
305	Pumps - Replace 1-5 HP motor	Fab Metals	3%	3%	0.05	1.08	1.05	0.16	17	0	0	0	961.58	0.63	0.31	40.51
306	Pumps - ASD (1-5 hp)	Fab Metals	6%	1%	0.08	1.09	1.02	0.17	17	0	0	0	6647.34	0.52	0.47	27.04
307	Pumps - Motor practices-1 (1-5 HP)	Fab Metals	5%	5%	0.02	1.10	1.05	0.16	17	0	0	0	218.89	2.78	1.37	9.22
308	Pumps - Replace 6-100 HP motor	Fab Metals	3%	4%	0.03	1.08	1.04	0.16	20	0	0	0	378.02	1.61	0.76	18.12
309	Pumps - ASD (6-100 hp)	Fab Metals	6%	1%	0.00	1.11	1.04	0.17	20	0	0	0	191.47	18.04	15.47	0.89
310	Pumps - Motor practices-1 (6-100 HP)	Fab Metals	2%	2%	0.01	1.08	1.05	0.16	20	0	0	0	98.83	6.15	2.89	4.74
311	Pumps - Replace 100+ HP motor	Fab Metals	3%	3%	0.01	1.10	1.06	0.16	20	0	0	0	125.65	4.84	2.28	6.02
312	Pumps - ASD (100+ hp)	Fab Metals	6%	1%	0.01	1.08	1.01	0.17	20	0	0	0	440.68	7.84	6.72	2.04
313	Pumps - Motor practices-1 (100+ HP)	Fab Metals	1%	2%	0.00	1.08	1.06	0.16	20	0	0	0	64.72	9.39	4.42	3.10
400	Base Drives	Fab Metals	0%	0%	0.00	1.08	1.08	0.17	20	0	0	N/A	N/A	N/A	N/A	N/A
427	Drives - Optimization process (M&T)	Fab Metals	10%	10%	0.01	1.13	1.02	0.16	10	0	0	0	63.32	9.60	5.10	1.63
428	Drives - Scheduling	Fab Metals	5%	1%	0.01	1.12	1.06	0.17	10	0	0	0	808.59	2.32	2.06	4.03
429	Machinery	Fab Metals	7%	7%	0.01	1.13	1.06	0.16	10	0	0	0	142.57	4.26	2.27	3.66
431	Custom Measures--Drives	Fab Metals	3%	3%	0.01	1.08	1.04	0.16	15	0	0	0	186.52	3.26	1.65	7.05
500	Base Process Heating	Fab Metals	0%	0%	0.00	1.08	1.08	0.17	20	0	0	N/A	N/A	N/A	N/A	N/A
509	Efficient Curing ovens	Fab Metals	20%	20%	0.08	1.27	1.01	0.16	15	0	0	0	193.10	3.15	1.60	7.30

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Industrial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Base kWh	Base EUI	EUI	Peak Watts/ Base kWh	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWh	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
510	Heating - Optimization process (M&T)	Fab Metals	10%	10%	0.01	1.13	1.02	0.16	10	0	0	0	63.32	9.60	5.10	1.63
511	Heating - Scheduling	Fab Metals	5%	1%	0.01	1.12	1.06	0.17	10	0	0	0	809.03	2.31	2.06	4.03
512	Custom Measures--Process Heating	Fab Metals	3%	3%	0.01	1.08	1.04	0.16	15	0	0	0	186.52	3.26	1.65	7.05
550	Base Process Cooling	Fab Metals	0%	0%	0.00	1.08	1.08	0.17	20	0	0	N/A	N/A	N/A	N/A	N/A
553	Custom Measures--Process Cooling	Fab Metals	3%	3%	0.01	1.08	1.04	0.16	15	0	0	0	186.52	3.26	1.65	7.05
600	Base Other Process	Fab Metals	0%	0%	0.00	1.08	1.08	0.17	15	0	0	N/A	N/A	N/A	N/A	N/A
603	New transformers welding	Fab Metals	25%	25%	0.05	1.23	0.92	0.14	15	0	0	0	99.49	6.11	3.10	3.76
605	Custom Measures--Other Process	Fab Metals	3%	3%	0.01	1.08	1.04	0.16	15	0	0	0	186.52	3.26	1.65	7.05
700	Space Cooling Centrifugal Chiller, 0.58 kW/ton, 500	Fab Metals	0%	0%	0.00	1.08	1.08	0.31	20	0	0	N/A	N/A	N/A	N/A	N/A
701	Centrifugal Chiller, 0.51 kW/ton, 500 tons	Fab Metals	12%	12%	0.03	0.96	0.84	0.24	20	0	0	0	69.66	6.69	2.20	6.24
702	Window Film - Chiller	Fab Metals	10%	10%	0.06	1.13	1.02	0.29	10	0	0	0	236.02	1.97	0.73	11.35
703	EMS - Chiller	Fab Metals	10%	10%	0.09	1.12	1.00	0.29	10	0	0	0	382.43	1.22	0.45	18.38
705	Chiller Tune Up/Diagnostics	Fab Metals	8%	8%	0.05	1.12	1.03	0.30	10	0	0	0	281.16	1.66	0.61	13.52
706	Cooling Circ. Pumps - VSD	Fab Metals	6%	6%	0.10	1.09	1.03	0.30	15	0	0	0	480.47	0.97	0.34	33.97
710	Space Cooling DX Packaged System, EER=10.3, 10	Fab Metals	0%	0%	0.00	1.08	1.08	0.31	15	0	0	N/A	N/A	N/A	N/A	N/A
711	DX Tune Up/ Advanced Diagnostics	Fab Metals	10%	10%	0.07	1.13	1.02	0.30	3	0	0	0	906.34	0.51	0.21	13.75
712	DX Packaged System, EER=10.9, 10 tons	Fab Metals	6%	6%	0.05	0.93	0.88	0.25	15	0	0	0	284.77	1.64	0.58	20.13
713	Window Film - DX	Fab Metals	10%	10%	0.03	1.16	1.04	0.30	10	0	0	0	134.73	3.46	1.28	6.48
715	Prog. Thermostat - DX	Fab Metals	9%	3%	0.00	1.13	1.03	0.32	10	0	0	0	80.52	11.42	8.13	1.02
800	Base Lighting	Fab Metals	0%	0%	0.00	1.08	1.08	0.17	10	0	0	N/A	N/A	N/A	N/A	N/A
801	RET 2L4' Premium T8, 1EB	Fab Metals	31%	31%	0.10	1.09	0.75	0.12	15	0	0	0	179.34	3.39	1.72	6.78
802	CFL Hardwired, Modular 36W	Fab Metals	72%	72%	0.10	1.08	0.30	0.05	4	0	0	0	277.40	2.19	1.26	2.98
803	Metal Halide, 50W	Fab Metals	58%	58%	0.67	1.27	0.53	0.08	5	0	0	0	1547.78	0.39	0.22	20.62
804	Occupancy Sensor, 4L4' Fluorescent Fixtures	Fab Metals	19%	20%	0.05	1.08	0.88	0.13	9	0	0	0	224.67	2.63	1.39	5.54
900	Base Other	Fab Metals	0%	0%	0.00	1.08	1.08	0.17	15	0	0	N/A	N/A	N/A	N/A	N/A
901	Replace V-belts	Fab Metals	0%	0%	0.00	1.08	1.07	0.17	5	0	0	0	264.60	2.30	1.30	3.52
100	Base Compressed Air	Ind Mach	0%	0%	0.00	1.08	1.08	0.27	14	0	0	N/A	N/A	N/A	N/A	N/A
101	Compressed Air-O&M	Ind Mach	17%	17%	0.01	1.24	1.03	0.26	2	1	0	0	124.64	3.92	1.75	1.12
102	Compressed Air - Controls	Ind Mach	12%	12%	0.02	1.18	1.04	0.27	10	0	0	0	66.02	7.40	2.98	2.79
103	Compressed Air - System Optimization	Ind Mach	20%	20%	0.02	1.19	0.96	0.24	10	1	0	0	36.47	13.39	5.39	1.54
104	Compressed Air- Sizing	Ind Mach	9%	9%	0.00	1.08	0.98	0.25	10	1	0	0	25.56	19.11	7.69	1.08
105	Comp Air - Replace 1-5 HP motor	Ind Mach	3%	3%	0.05	1.08	1.05	0.27	17	0	0	0	583.73	0.84	0.31	40.44
106	Comp Air - ASD (1-5 hp)	Ind Mach	6%	1%	0.08	1.08	1.01	0.27	17	0	0	0	4089.94	0.52	0.44	28.57
107	Comp Air - Motor practices-1 (1-5 HP)	Ind Mach	5%	5%	0.02	1.08	1.02	0.26	17	0	0	0	136.11	3.59	1.34	9.43
108	Comp Air - Replace 6-100 HP motor	Ind Mach	4%	4%	0.03	1.11	1.07	0.27	20	0	0	0	224.35	2.18	0.78	17.69
109	Comp Air - ASD (6-100 hp)	Ind Mach	6%	1%	0.00	1.08	1.01	0.27	20	0	0	0	120.28	17.77	14.34	0.96
110	Comp Air - Motor practices-1 (6-100 HP)	Ind Mach	2%	2%	0.01	1.08	1.05	0.27	20	0	0	0	60.37	8.09	2.88	4.76
111	Comp Air - Replace 100+ HP motor	Ind Mach	3%	3%	0.01	1.10	1.06	0.27	20	0	0	0	76.40	6.39	2.28	6.02
112	Comp Air - ASD (100+ hp)	Ind Mach	6%	1%	0.01	1.08	1.01	0.27	20	1	0	0	268.31	7.97	6.43	2.13
113	Comp Air - Motor practices-1 (100+ HP)	Ind Mach	2%	2%	0.00	1.09	1.07	0.27	20	0	0	0	39.00	12.52	4.46	3.07
200	Base Fans	Ind Mach	0%	0%	0.00	1.08	1.08	0.27	14	0	0	N/A	N/A	N/A	N/A	N/A
201	Fans - O&M	Ind Mach	2%	2%	0.00	1.09	1.07	0.27	2	0	0	0	116.06	4.21	1.88	1.04
202	Fans - Controls	Ind Mach	30%	30%	0.09	1.41	0.99	0.25	10	0	0	0	119.33	4.09	1.65	5.05
203	Fans - System Optimization	Ind Mach	20%	10%	0.06	1.27	1.02	0.29	10	0	0	0	257.31	2.61	1.52	5.46
204	Fans- Improve components	Ind Mach	5%	5%	0.01	1.11	1.06	0.27	10	0	0	0	49.39	9.89	3.98	2.09
205	Fans - Replace 1-5 HP motor	Ind Mach	3%	3%	0.05	1.08	1.05	0.27	17	0	0	0	583.73	0.84	0.31	40.44
206	Fans - ASD (1-5 hp)	Ind Mach	6%	1%	0.08	1.09	1.02	0.28	17	0	0	0	4047.44	0.53	0.45	28.28
207	Fans - Motor practices-1 (1-5 HP)	Ind Mach	5%	5%	0.02	1.08	1.02	0.26	17	0	0	0	136.11	3.59	1.34	9.43
208	Fans - Replace 6-100 HP motor	Ind Mach	3%	4%	0.03	1.10	1.06	0.27	20	0	0	0	226.57	2.14	0.75	18.30
209	Fans - ASD (6-100 hp)	Ind Mach	5%	1%	0.00	1.08	1.03	0.27	20	0	0	0	119.82	15.20	11.91	1.15
210	Fans - Motor practices-1 (6-100 HP)	Ind Mach	2%	2%	0.01	1.09	1.06	0.27	20	0	0	0	59.52	8.21	2.92	4.69
211	Fans - Replace 100+ HP motor	Ind Mach	3%	3%	0.01	1.08	1.05	0.27	20	0	0	0	77.65	6.29	2.24	6.12
212	Fans - ASD (100+ hp)	Ind Mach	6%	1%	0.01	1.13	1.07	0.29	20	0	0	0	254.93	8.19	6.59	2.08
213	Fans - Motor practices-1 (100+ HP)	Ind Mach	1%	2%	0.00	1.08	1.06	0.27	20	0	0	0	39.35	11.68	3.73	3.67
300	Base Pumps	Ind Mach	0%	0%	0.00	1.08	1.08	0.27	14	0	0	N/A	N/A	N/A	N/A	N/A
301	Pumps - O&M	Ind Mach	10%	10%	0.01	1.13	1.01	0.26	2	0	0	0	115.10	4.24	1.90	1.03

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Industrial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Base kWh	Base EUI	EUI	Peak Watts/ Base kWh	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWH	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
302	Pumps - Controls	Ind Mach	30%	30%	0.03	1.39	0.97	0.25	10	0	0	0	35.29	13.84	5.57	1.49
303	Pumps - System Optimization	Ind Mach	33%	33%	0.07	1.15	0.77	0.20	10	1	0	0	94.65	5.16	2.08	4.00
304	Pumps - Sizing	Ind Mach	20%	20%	0.02	1.28	1.02	0.26	10	0	0	0	42.66	11.45	4.60	1.80
305	Pumps - Replace 1-5 HP motor	Ind Mach	3%	3%	0.05	1.08	1.05	0.27	17	0	0	0	584.68	0.84	0.31	40.51
306	Pumps - ASD (1-5 hp)	Ind Mach	6%	1%	0.08	1.09	1.02	0.28	17	0	0	0	4043.87	0.53	0.45	28.25
307	Pumps - Motor practices-1 (1-5 HP)	Ind Mach	5%	5%	0.02	1.10	1.05	0.27	17	0	0	0	133.10	3.67	1.37	9.22
308	Pumps - Replace 6-100 HP motor	Ind Mach	4%	4%	0.03	1.08	1.04	0.27	20	0	0	0	229.85	2.12	0.76	18.12
309	Pumps - ASD (6-100 hp)	Ind Mach	6%	1%	0.00	1.11	1.05	0.28	20	0	0	0	116.58	18.34	14.79	0.93
310	Pumps - Motor practices-1 (6-100 HP)	Ind Mach	2%	2%	0.01	1.08	1.05	0.27	20	0	0	0	60.09	8.13	2.89	4.74
311	Pumps - Replace 100+ HP motor	Ind Mach	3%	3%	0.01	1.10	1.06	0.27	20	0	0	0	76.40	6.39	2.28	6.02
312	Pumps - ASD (100+ hp)	Ind Mach	6%	1%	0.01	1.08	1.01	0.27	20	0	0	0	267.96	7.98	6.44	2.13
313	Pumps - Motor practices-1 (100+ HP)	Ind Mach	2%	2%	0.00	1.08	1.06	0.27	20	0	0	0	39.35	12.41	4.42	3.10
400	Base Drives	Ind Mach	0%	0%	0.00	1.08	1.08	0.27	20	0	0	N/A	N/A	N/A	N/A	N/A
427	Drives - Optimization process (M&T)	Ind Mach	10%	10%	0.01	1.13	1.02	0.26	10	0	0	0	38.50	12.68	5.10	1.63
428	Drives - Scheduling	Ind Mach	5%	1%	0.01	1.11	1.06	0.28	10	0	0	0	492.36	2.48	1.98	4.19
429	Machinery	Ind Mach	7%	7%	0.01	1.13	1.06	0.27	10	0	0	0	86.69	5.63	2.27	3.66
431	Custom Measures--Drives	Ind Mach	3%	3%	0.01	1.08	1.04	0.27	15	0	0	0	113.41	4.31	1.65	7.05
500	Base Process Heating	Ind Mach	0%	0%	0.00	1.08	1.08	0.27	20	0	0	N/A	N/A	N/A	N/A	N/A
509	Efficient Curing ovens	Ind Mach	20%	20%	0.08	1.27	1.01	0.26	15	0	0	0	117.42	4.16	1.60	7.30
510	Heating - Optimization process (M&T)	Ind Mach	10%	10%	0.01	1.13	1.02	0.26	10	0	0	0	38.50	12.68	5.10	1.63
511	Heating - Scheduling	Ind Mach	5%	1%	0.01	1.11	1.06	0.28	10	0	0	0	492.62	2.48	1.98	4.20
512	Custom Measures--Process Heating	Ind Mach	3%	3%	0.01	1.08	1.04	0.27	15	0	0	0	113.41	4.31	1.65	7.05
550	Base Process Cooling	Ind Mach	0%	0%	0.00	1.08	1.08	0.27	20	0	0	N/A	N/A	N/A	N/A	N/A
553	Custom Measures--Process Cooling	Ind Mach	3%	3%	0.01	1.08	1.04	0.27	15	0	0	0	113.41	4.31	1.65	7.05
600	Base Other Process	Ind Mach	0%	0%	0.00	1.08	1.08	0.27	15	0	0	N/A	N/A	N/A	N/A	N/A
603	New transformers welding	Ind Mach	25%	25%	0.05	1.23	0.92	0.24	15	0	0	0	60.49	8.07	3.10	3.76
605	Custom Measures--Other Process	Ind Mach	3%	3%	0.01	1.08	1.04	0.27	15	0	0	0	113.41	4.31	1.65	7.05
700	Space Cooling Centrifugal Chiller, 0.58 kW/ton, 500	Ind Mach	0%	0%	0.00	1.08	1.08	0.51	20	0	0	N/A	N/A	N/A	N/A	N/A
701	Centrifugal Chiller, 0.51 kW/ton, 500 tons	Ind Mach	12%	12%	0.03	0.96	0.84	0.40	20	0	0	0	42.36	9.50	2.20	6.24
702	Window Film - Chiller	Ind Mach	10%	10%	0.06	1.13	1.02	0.48	10	0	0	0	143.51	2.80	0.73	11.35
703	EMS - Chiller	Ind Mach	10%	10%	0.09	1.12	1.00	0.48	10	0	0	0	232.53	1.73	0.45	18.38
705	Chiller Tune Up/Diagnostics	Ind Mach	8%	8%	0.05	1.12	1.03	0.49	10	0	0	0	170.95	2.35	0.61	13.52
706	Cooling Circ. Pumps - VSD	Ind Mach	6%	6%	0.10	1.09	1.03	0.49	15	0	0	0	292.14	1.38	0.34	33.97
710	Space Cooling DX Packaged System, EER=10.3, 10	Ind Mach	0%	0%	0.00	1.08	1.08	0.51	15	0	0	N/A	N/A	N/A	N/A	N/A
711	DX Tune Up/ Advanced Diagnostics	Ind Mach	10%	10%	0.07	1.13	1.02	0.49	3	1	0	0	551.09	0.73	0.21	13.75
712	DX Packaged System, EER=10.9, 10 tons	Ind Mach	6%	6%	0.05	0.93	0.88	0.42	15	1	0	0	173.15	2.32	0.58	20.13
713	Window Film - DX	Ind Mach	10%	10%	0.03	1.16	1.04	0.50	10	0	0	0	81.92	4.91	1.28	6.48
715	Prog. Thermostat - DX	Ind Mach	9%	3%	0.00	1.13	1.03	0.53	10	1	0	0	49.05	13.56	7.84	1.06
800	Base Lighting	Ind Mach	0%	0%	0.00	1.08	1.08	0.27	10	0	0	N/A	N/A	N/A	N/A	N/A
801	RET 2L4' Premium T8, 1EB	Ind Mach	31%	31%	0.10	1.09	0.75	0.19	15	2	0	0	109.04	4.48	1.72	6.78
802	CFL Hardwired, Modular 36W	Ind Mach	72%	72%	0.10	1.08	0.30	0.08	4	0	0	0	168.67	2.90	1.26	2.98
803	Metal Halide, 50W	Ind Mach	58%	58%	0.67	1.27	0.53	0.14	5	3	1	0	941.11	0.52	0.22	20.62
804	Occupancy Sensor, 4L4' Fluorescent Fixtures	Ind Mach	20%	20%	0.05	1.08	0.87	0.22	9	0	0	0	136.58	3.54	1.43	5.38
900	Base Other	Ind Mach	0%	0%	0.00	1.08	1.08	0.27	15	0	0	N/A	N/A	N/A	N/A	N/A
901	Replace V-belts	Ind Mach	0%	0%	0.00	1.08	1.07	0.27	5	0	0	0	160.89	3.04	1.30	3.52
100	Base Compressed Air	Electronics	0%	0%	0.00	1.08	1.08	0.15	14	0	0	N/A	N/A	N/A	N/A	N/A
101	Compressed Air-O&M	Electronics	17%	17%	0.01	1.24	1.03	0.15	2	7	1	0	223.09	2.84	1.75	1.12
102	Compressed Air - Controls	Electronics	12%	12%	0.02	1.18	1.04	0.15	10	6	1	0	118.17	5.37	2.98	2.79
103	Compressed Air - System Optimization	Electronics	20%	20%	0.02	1.19	0.96	0.14	10	19	3	0	65.29	9.72	5.39	1.54
104	Compressed Air- Sizing	Electronics	9%	9%	0.00	1.08	0.98	0.14	10	7	1	0	45.74	13.87	7.69	1.08
105	Comp Air - Replace 1-5 HP motor	Electronics	3%	3%	0.05	1.08	1.05	0.15	17	0	0	0	1044.80	0.61	0.31	40.44
106	Comp Air - ASD (1-5 hp)	Electronics	6%	1%	0.08	1.08	1.01	0.15	17	0	0	0	7320.48	0.51	0.46	27.21
107	Comp Air - Motor practices-1 (1-5 HP)	Electronics	5%	5%	0.02	1.08	1.02	0.15	17	0	0	0	243.62	2.60	1.34	9.43
108	Comp Air - Replace 6-100 HP motor	Electronics	3%	4%	0.03	1.11	1.07	0.15	20	0	0	0	401.57	1.58	0.78	17.69
109	Comp Air - ASD (6-100 hp)	Electronics	6%	1%	0.00	1.08	1.01	0.15	20	4	0	0	215.28	17.42	15.06	0.91
110	Comp Air - Motor practices-1 (6-100 HP)	Electronics	2%	2%	0.01	1.08	1.05	0.15	20	1	0	0	108.05	5.87	2.88	4.76

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Industrial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Base kWh	Base EUI	EUI	Peak Watts/ Base kWh	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWh	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
111	Comp Air - Replace 100+ HP motor	Electronics	3%	3%	0.01	1.10	1.06	0.15	20	1	0	0	136.75	4.64	2.28	6.02
112	Comp Air - ASD (100+ hp)	Electronics	6%	1%	0.01	1.08	1.01	0.15	20	10	0	0	480.24	7.81	6.75	2.03
113	Comp Air - Motor practices-1 (100+ HP)	Electronics	1%	2%	0.00	1.09	1.07	0.15	20	1	0	0	69.80	9.09	4.46	3.07
200	Base Fans	Electronics	0%	0%	0.00	1.08	1.08	0.15	14	0	0	N/A	N/A	N/A	N/A	N/A
201	Fans - O&M	Electronics	2%	2%	0.00	1.09	1.07	0.15	2	0	0	0	207.74	3.05	1.88	1.04
202	Fans - Controls	Electronics	30%	30%	0.09	1.41	0.99	0.14	10	4	1	0	213.59	2.97	1.65	5.05
203	Fans - System Optimization	Electronics	20%	10%	0.06	1.28	1.02	0.16	10	2	0	0	458.21	2.14	1.57	5.29
204	Fans - Improve components	Electronics	5%	5%	0.01	1.11	1.06	0.15	10	1	0	0	88.41	7.18	3.98	2.09
205	Fans - Replace 1-5 HP motor	Electronics	3%	3%	0.05	1.08	1.05	0.15	17	0	0	0	1044.80	0.61	0.31	40.44
206	Fans - ASD (1-5 hp)	Electronics	6%	1%	0.08	1.09	1.02	0.15	17	0	0	0	7240.61	0.52	0.47	26.91
207	Fans - Motor practices-1 (1-5 HP)	Electronics	5%	5%	0.02	1.08	1.02	0.15	17	0	0	0	243.62	2.60	1.34	9.43
208	Fans - Replace 6-100 HP motor	Electronics	3%	4%	0.03	1.09	1.06	0.15	20	0	0	0	405.77	1.52	0.73	18.89
209	Fans - ASD (6-100 hp)	Electronics	4%	1%	0.00	1.08	1.03	0.15	20	1	0	0	214.51	13.30	11.17	1.23
210	Fans - Motor practices-1 (6-100 HP)	Electronics	2%	2%	0.01	1.09	1.06	0.15	20	0	0	0	106.53	5.96	2.92	4.69
211	Fans - Replace 100+ HP motor	Electronics	3%	3%	0.01	1.08	1.05	0.15	20	1	0	0	138.99	4.56	2.24	6.12
212	Fans - ASD (100+ hp)	Electronics	6%	1%	0.01	1.13	1.07	0.16	20	0	0	0	455.88	7.79	6.70	2.05
213	Fans - Motor practices-1 (100+ HP)	Electronics	1%	2%	0.00	1.08	1.06	0.15	20	0	0	0	70.44	7.85	3.33	4.11
300	Base Pumps	Electronics	0%	0%	0.00	1.08	1.08	0.15	14	0	0	N/A	N/A	N/A	N/A	N/A
301	Pumps - O&M	Electronics	10%	10%	0.01	1.13	1.01	0.14	2	4	1	0	206.02	3.08	1.90	1.03
302	Pumps - Controls	Electronics	30%	30%	0.03	1.39	0.97	0.14	10	5	1	0	63.16	10.05	5.57	1.49
303	Pumps - System Optimization	Electronics	33%	33%	0.07	1.15	0.77	0.11	10	14	2	0	169.40	3.75	2.08	4.00
304	Pumps - Sizing	Electronics	20%	20%	0.02	1.28	1.02	0.15	10	3	0	0	76.35	8.31	4.60	1.80
305	Pumps - Replace 1-5 HP motor	Electronics	3%	3%	0.05	1.08	1.05	0.15	17	0	0	0	1046.50	0.61	0.31	40.51
306	Pumps - ASD (1-5 hp)	Electronics	6%	1%	0.08	1.09	1.02	0.15	17	0	0	0	7233.90	0.52	0.47	26.89
307	Pumps - Motor practices-1 (1-5 HP)	Electronics	5%	5%	0.02	1.10	1.05	0.15	17	0	0	0	238.22	2.66	1.37	9.22
308	Pumps - Replace 6-100 HP motor	Electronics	3%	4%	0.03	1.08	1.04	0.15	20	1	0	0	411.40	1.54	0.76	18.12
309	Pumps - ASD (6-100 hp)	Electronics	6%	1%	0.00	1.11	1.04	0.16	20	1	0	0	208.34	18.00	15.56	0.88
310	Pumps - Motor practices-1 (6-100 HP)	Electronics	2%	2%	0.01	1.08	1.05	0.15	20	0	0	0	107.56	5.90	2.89	4.74
311	Pumps - Replace 100+ HP motor	Electronics	3%	3%	0.01	1.10	1.06	0.15	20	0	0	0	136.75	4.64	2.28	6.02
312	Pumps - ASD (100+ hp)	Electronics	6%	1%	0.01	1.08	1.01	0.15	20	2	0	0	479.59	7.82	6.76	2.03
313	Pumps - Motor practices-1 (100+ HP)	Electronics	1%	2%	0.00	1.08	1.06	0.15	20	1	0	0	70.44	9.01	4.42	3.10
400	Base Drives	Electronics	0%	0%	0.00	1.08	1.08	0.15	20	0	0	N/A	N/A	N/A	N/A	N/A
413	Clean Room - Controls	Electronics	10%	10%	0.03	1.13	1.02	0.15	10	4	1	0	237.15	2.68	1.48	5.60
428	Drives - Scheduling	Electronics	5%	1%	0.01	1.11	1.06	0.16	10	1	0	0	965.78	2.09	1.89	4.40
429	Machinery	Electronics	3%	4%	0.01	1.10	1.07	0.15	10	1	0	0	159.46	3.98	2.20	3.77
431	Custom Measures--Drives	Electronics	3%	3%	0.01	1.08	1.04	0.15	15	4	1	0	202.99	3.13	1.65	7.05
500	Base Process Heating	Electronics	0%	0%	0.00	1.08	1.08	0.15	20	0	0	N/A	N/A	N/A	N/A	N/A
509	Efficient Curing ovens	Electronics	20%	20%	0.08	1.27	1.01	0.14	15	7	1	0	210.16	3.02	1.60	7.30
512	Custom Measures--Process Heating	Electronics	3%	3%	0.01	1.08	1.04	0.15	15	7	1	0	202.99	3.13	1.65	7.05
550	Base Process Cooling	Electronics	0%	0%	0.00	1.08	1.08	0.15	20	0	0	N/A	N/A	N/A	N/A	N/A
553	Custom Measures--Process Cooling	Electronics	3%	3%	0.01	1.08	1.04	0.15	15	3	0	0	202.99	3.13	1.65	7.05
600	Base Other Process	Electronics	0%	0%	0.00	1.08	1.08	0.15	15	0	0	N/A	N/A	N/A	N/A	N/A
604	Efficient processes (welding, etc.)	Electronics	25%	25%	0.05	1.23	0.92	0.13	15	18	3	0	108.28	5.86	3.10	3.76
605	Custom Measures--Other Process	Electronics	3%	3%	0.01	1.08	1.04	0.15	15	4	1	0	202.99	3.13	1.65	7.05
700	Space Cooling Centrifugal Chiller, 0.58 kW/ton, 500	Electronics	0%	0%	0.00	1.08	1.08	0.29	20	0	0	N/A	N/A	N/A	N/A	N/A
701	Centrifugal Chiller, 0.51 kW/ton, 500 tons	Electronics	12%	12%	0.03	0.96	0.84	0.22	20	32	9	0	75.81	6.34	2.20	6.24
702	Window Film - Chiller	Electronics	10%	10%	0.06	1.13	1.02	0.27	10	12	3	0	256.86	1.87	0.73	11.35
703	EMS - Chiller	Electronics	10%	10%	0.09	1.12	1.00	0.27	10	19	5	0	416.21	1.15	0.45	18.38
705	Chiller Tune Up/Diagnostics	Electronics	8%	8%	0.05	1.12	1.03	0.27	10	3	1	0	305.99	1.57	0.61	13.52
706	Cooling Circ. Pumps - VSD	Electronics	6%	6%	0.10	1.09	1.03	0.27	15	10	3	0	522.90	0.92	0.34	33.97
710	Space Cooling DX Packaged System, EER=10.3, 10	Electronics	0%	0%	0.00	1.08	1.08	0.29	15	0	0	N/A	N/A	N/A	N/A	N/A
711	DX Tune Up/ Advanced Diagnostics	Electronics	10%	10%	0.07	1.13	1.02	0.27	3	4	1	0	986.39	0.49	0.21	13.75
712	DX Packaged System, EER=10.9, 10 tons	Electronics	6%	6%	0.05	0.93	0.88	0.23	15	5	1	0	309.92	1.55	0.58	20.13
713	Window Film - DX	Electronics	10%	10%	0.03	1.16	1.04	0.28	10	3	1	0	146.62	3.28	1.28	6.48
715	Prog. Thermostat - DX	Electronics	10%	3%	0.00	1.13	1.03	0.29	10	3	0	0	87.61	11.16	8.17	1.02
800	Base Lighting	Electronics	0%	0%	0.00	1.08	1.08	0.15	10	0	0	N/A	N/A	N/A	N/A	N/A

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Industrial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Base kWh	Base EUI	EUI	Peak Watts/ Base kWh	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWh	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
801	RET 2L4' Premium T8, 1EB	Electronics	31%	31%	0.10	1.09	0.75	0.11	15	27	4	0	195.18	3.25	1.72	6.78
802	CFL Hardwired, Modular 36W	Electronics	72%	72%	0.10	1.08	0.30	0.04	4	0	0	0	301.90	2.10	1.26	2.98
803	Metal Halide, 50W	Electronics	58%	58%	0.67	1.27	0.53	0.08	5	39	6	0	1684.47	0.38	0.22	20.62
804	Occupancy Sensor, 4L4' Fluorescent Fixtures	Electronics	19%	20%	0.05	1.08	0.88	0.12	9	4	1	0	244.51	2.52	1.38	5.56
900	Base Other	Electronics	0%	0%	0.00	1.08	1.08	0.15	15	0	0	N/A	N/A	N/A	N/A	N/A
901	Replace V-belts	Electronics	0%	0%	0.00	1.08	1.07	0.15	5	0	0	0	287.97	2.20	1.30	3.52
100	Base Compressed Air	Transp Equip	0%	0%	0.00	1.08	1.08	0.17	14	0	0	N/A	N/A	N/A	N/A	N/A
101	Compressed Air-O&M	Transp Equip	17%	17%	0.01	1.24	1.03	0.16	2	0	0	0	205.45	2.96	1.75	1.12
102	Compressed Air - Controls	Transp Equip	12%	12%	0.02	1.18	1.04	0.16	10	0	0	0	108.82	5.59	2.98	2.79
103	Compressed Air - System Optimization	Transp Equip	20%	20%	0.02	1.19	0.96	0.15	10	0	0	0	60.12	10.12	5.39	1.54
104	Compressed Air- Sizing	Transp Equip	9%	9%	0.00	1.08	0.98	0.15	10	0	0	0	42.13	14.44	7.69	1.08
105	Comp Air - Replace 1-5 HP motor	Transp Equip	3%	3%	0.05	1.08	1.05	0.16	17	0	0	0	962.20	0.63	0.31	40.44
106	Comp Air - ASD (1-5 hp)	Transp Equip	6%	1%	0.08	1.08	1.01	0.17	17	0	0	0	6741.70	0.51	0.46	27.40
107	Comp Air - Motor practices-1 (1-5 HP)	Transp Equip	5%	5%	0.02	1.08	1.02	0.16	17	0	0	0	224.36	2.71	1.34	9.43
108	Comp Air - Replace 6-100 HP motor	Transp Equip	3%	4%	0.03	1.11	1.07	0.17	20	0	0	0	369.82	1.64	0.78	17.69
109	Comp Air - ASD (6-100 hp)	Transp Equip	6%	1%	0.00	1.08	1.01	0.17	20	0	0	0	198.26	17.43	14.95	0.92
110	Comp Air - Motor practices-1 (6-100 HP)	Transp Equip	2%	2%	0.01	1.08	1.05	0.16	20	0	0	0	99.51	6.11	2.88	4.76
111	Comp Air - Replace 100+ HP motor	Transp Equip	3%	3%	0.01	1.10	1.06	0.16	20	0	0	0	125.93	4.83	2.28	6.02
112	Comp Air - ASD (100+ hp)	Transp Equip	6%	1%	0.01	1.08	1.01	0.17	20	0	0	0	442.27	7.81	6.70	2.05
113	Comp Air - Motor practices-1 (100+ HP)	Transp Equip	1%	2%	0.00	1.09	1.07	0.17	20	0	0	0	64.28	9.46	4.46	3.07
200	Base Fans	Transp Equip	0%	0%	0.00	1.08	1.08	0.17	14	0	0	N/A	N/A	N/A	N/A	N/A
201	Fans - O&M	Transp Equip	2%	2%	0.00	1.09	1.07	0.17	2	0	0	0	191.32	3.18	1.88	1.04
202	Fans - Controls	Transp Equip	30%	30%	0.09	1.41	0.99	0.15	10	0	0	0	196.70	3.09	1.65	5.05
203	Fans - System Optimization	Transp Equip	20%	10%	0.06	1.28	1.02	0.18	10	0	0	0	422.29	2.19	1.56	5.31
204	Fans - Improve components	Transp Equip	5%	5%	0.01	1.11	1.06	0.16	10	0	0	0	81.42	7.47	3.98	2.09
205	Fans - Replace 1-5 HP motor	Transp Equip	3%	3%	0.05	1.08	1.05	0.16	17	0	0	0	962.20	0.63	0.31	40.44
206	Fans - ASD (1-5 hp)	Transp Equip	6%	1%	0.08	1.09	1.02	0.17	17	0	0	0	6668.65	0.52	0.47	27.10
207	Fans - Motor practices-1 (1-5 HP)	Transp Equip	5%	5%	0.02	1.08	1.02	0.16	17	0	0	0	224.36	2.71	1.34	9.43
208	Fans - Replace 6-100 HP motor	Transp Equip	3%	4%	0.03	1.09	1.06	0.16	20	0	0	0	373.64	1.59	0.73	18.78
209	Fans - ASD (6-100 hp)	Transp Equip	5%	1%	0.00	1.08	1.03	0.17	20	0	0	0	197.54	13.55	11.29	1.21
210	Fans - Motor practices-1 (6-100 HP)	Transp Equip	2%	2%	0.01	1.09	1.06	0.16	20	0	0	0	98.11	6.20	2.92	4.69
211	Fans - Replace 100+ HP motor	Transp Equip	3%	3%	0.01	1.08	1.05	0.16	20	0	0	0	128.00	4.75	2.24	6.12
212	Fans - ASD (100+ hp)	Transp Equip	6%	1%	0.01	1.13	1.07	0.17	20	0	0	0	419.86	7.84	6.69	2.05
213	Fans - Motor practices-1 (100+ HP)	Transp Equip	1%	2%	0.00	1.08	1.06	0.16	20	0	0	0	64.87	8.29	3.40	4.04
300	Base Pumps	Transp Equip	0%	0%	0.00	1.08	1.08	0.17	14	0	0	N/A	N/A	N/A	N/A	N/A
301	Pumps - O&M	Transp Equip	10%	10%	0.01	1.13	1.01	0.16	2	0	0	0	189.73	3.21	1.90	1.03
302	Pumps - Controls	Transp Equip	30%	30%	0.03	1.39	0.97	0.15	10	0	0	0	58.17	10.46	5.57	1.49
303	Pumps - System Optimization	Transp Equip	33%	33%	0.07	1.15	0.77	0.12	10	0	0	0	156.01	3.90	2.08	4.00
304	Pumps - Sizing	Transp Equip	20%	20%	0.02	1.28	1.02	0.16	10	0	0	0	70.32	8.65	4.60	1.80
305	Pumps - Replace 1-5 HP motor	Transp Equip	3%	3%	0.05	1.08	1.05	0.16	17	0	0	0	963.76	0.63	0.31	40.51
306	Pumps - ASD (1-5 hp)	Transp Equip	6%	1%	0.08	1.09	1.02	0.17	17	0	0	0	6662.52	0.52	0.47	27.08
307	Pumps - Motor practices-1 (1-5 HP)	Transp Equip	5%	5%	0.02	1.10	1.05	0.16	17	0	0	0	219.39	2.77	1.37	9.22
308	Pumps - Replace 6-100 HP motor	Transp Equip	3%	4%	0.03	1.08	1.04	0.16	20	0	0	0	378.88	1.61	0.76	18.12
309	Pumps - ASD (6-100 hp)	Transp Equip	6%	1%	0.00	1.11	1.04	0.17	20	0	0	0	191.91	18.01	15.45	0.89
310	Pumps - Motor practices-1 (6-100 HP)	Transp Equip	2%	2%	0.01	1.08	1.05	0.16	20	0	0	0	99.06	6.14	2.89	4.74
311	Pumps - Replace 100+ HP motor	Transp Equip	3%	3%	0.01	1.10	1.06	0.16	20	0	0	0	125.93	4.83	2.28	6.02
312	Pumps - ASD (100+ hp)	Transp Equip	6%	1%	0.01	1.08	1.01	0.17	20	0	0	0	441.68	7.83	6.71	2.04
313	Pumps - Motor practices-1 (100+ HP)	Transp Equip	1%	2%	0.00	1.08	1.06	0.16	20	0	0	0	64.87	9.38	4.42	3.10
400	Base Drives	Transp Equip	0%	0%	0.00	1.08	1.08	0.17	20	0	0	N/A	N/A	N/A	N/A	N/A
427	Drives - Optimization process (M&T)	Transp Equip	10%	10%	0.01	1.14	1.03	0.16	10	0	0	0	62.80	9.69	5.16	1.61
428	Drives - Scheduling	Transp Equip	5%	1%	0.01	1.12	1.06	0.17	10	0	0	0	810.46	2.31	2.06	4.03
429	Machinery	Transp Equip	11%	11%	0.02	1.18	1.05	0.16	10	0	0	0	137.79	4.41	2.35	3.53
431	Custom Measures--Drives	Transp Equip	3%	3%	0.01	1.08	1.04	0.16	15	0	0	0	186.94	3.25	1.65	7.05
500	Base Process Heating	Transp Equip	0%	0%	0.00	1.08	1.08	0.17	20	0	0	N/A	N/A	N/A	N/A	N/A
509	Efficient Curing ovens	Transp Equip	20%	20%	0.08	1.27	1.01	0.16	15	0	0	0	193.54	3.14	1.60	7.30
510	Heating - Optimization process (M&T)	Transp Equip	10%	10%	0.01	1.14	1.03	0.16	10	0	0	0	62.80	9.69	5.16	1.61

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Industrial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Base kWh	Base EUI	EUI	Peak Watts/ Base kWh	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWh	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
512	Custom Measures--Process Heating	Transp Equip	3%	3%	0.01	1.08	1.04	0.16	15	0	0	0	186.94	3.25	1.65	7.05
550	Base Process Cooling	Transp Equip	0%	0%	0.00	1.08	1.08	0.17	20	0	0	N/A	N/A	N/A	N/A	N/A
553	Custom Measures--Process Cooling	Transp Equip	3%	3%	0.01	1.08	1.04	0.16	15	0	0	0	186.94	3.25	1.65	7.05
600	Base Other Process	Transp Equip	0%	0%	0.00	1.08	1.08	0.17	15	0	0	N/A	N/A	N/A	N/A	N/A
603	New transformers welding	Transp Equip	25%	25%	0.05	1.23	0.92	0.14	15	0	0	0	99.72	6.10	3.10	3.76
605	Custom Measures--Other Process	Transp Equip	3%	3%	0.01	1.08	1.04	0.16	15	0	0	0	186.94	3.25	1.65	7.05
700	Space Cooling Centrifugal Chiller, 0.58 kW/ton, 500	Transp Equip	0%	0%	0.00	1.08	1.08	0.31	20	0	0	N/A	N/A	N/A	N/A	N/A
701	Centrifugal Chiller, 0.51 kW/ton, 500 tons	Transp Equip	12%	12%	0.03	0.96	0.84	0.24	20	0	0	0	69.82	6.68	2.20	6.24
702	Window Film - Chiller	Transp Equip	10%	10%	0.06	1.13	1.02	0.29	10	0	0	0	236.56	1.97	0.73	11.35
703	EMS - Chiller	Transp Equip	10%	10%	0.09	1.12	1.00	0.29	10	0	0	0	383.30	1.22	0.45	18.38
705	Chiller Tune Up/Diagnostics	Transp Equip	8%	8%	0.05	1.12	1.03	0.30	10	0	0	0	281.80	1.66	0.61	13.52
706	Cooling Circ. Pumps - VSD	Transp Equip	6%	6%	0.10	1.09	1.03	0.30	15	0	0	0	481.56	0.97	0.34	33.97
710	Space Cooling DX Packaged System, EER=10.3, 10	Transp Equip	0%	0%	0.00	1.08	1.08	0.31	15	0	0	N/A	N/A	N/A	N/A	N/A
711	DX Tune Up/ Advanced Diagnostics	Transp Equip	10%	10%	0.07	1.13	1.02	0.29	3	0	0	0	908.40	0.51	0.21	13.75
712	DX Packaged System, EER=10.9, 10 tons	Transp Equip	6%	6%	0.05	0.93	0.88	0.25	15	0	0	0	285.41	1.63	0.58	20.13
713	Window Film - DX	Transp Equip	10%	10%	0.03	1.16	1.04	0.30	10	0	0	0	135.03	3.45	1.28	6.48
715	Prog. Thermostat - DX	Transp Equip	9%	3%	0.00	1.13	1.03	0.32	10	0	0	0	80.71	11.41	8.12	1.02
800	Base Lighting	Transp Equip	0%	0%	0.00	1.08	1.08	0.17	10	0	0	N/A	N/A	N/A	N/A	N/A
801	RET 2L4' Premium T8, 1EB	Transp Equip	31%	31%	0.10	1.09	0.75	0.12	15	1	0	0	179.74	3.38	1.72	6.78
802	CFL Hardwired, Modular 36W	Transp Equip	72%	72%	0.10	1.08	0.30	0.05	4	0	0	0	278.03	2.19	1.26	2.98
803	Metal Halide, 50W	Transp Equip	58%	58%	0.67	1.27	0.53	0.08	5	1	0	0	1551.29	0.39	0.22	20.62
804	Occupancy Sensor, 4L4' Fluorescent Fixtures	Transp Equip	19%	20%	0.05	1.08	0.88	0.13	9	0	0	0	225.17	2.64	1.39	5.52
900	Base Other	Transp Equip	0%	0%	0.00	1.08	1.08	0.17	15	0	0	N/A	N/A	N/A	N/A	N/A
901	Replace V-belts	Transp Equip	0%	0%	0.00	1.08	1.07	0.17	5	0	0	0	265.20	2.29	1.30	3.52
100	Base Compressed Air	Misc Ind	0%	0%	0.00	1.08	1.08	0.14	14	0	0	N/A	N/A	N/A	N/A	N/A
101	Compressed Air-O&M	Misc Ind	17%	17%	0.01	1.24	1.03	0.13	2	0	0	0	243.37	2.73	1.75	1.12
102	Compressed Air - Controls	Misc Ind	12%	12%	0.02	1.18	1.04	0.14	10	0	0	0	128.91	5.16	2.98	2.79
103	Compressed Air - System Optimization	Misc Ind	20%	20%	0.02	1.19	0.96	0.12	10	0	0	0	71.22	9.33	5.39	1.54
104	Compressed Air- Sizing	Misc Ind	9%	9%	0.00	1.08	0.98	0.13	10	0	0	0	49.90	13.32	7.69	1.08
105	Comp Air - Replace 1-5 HP motor	Misc Ind	3%	3%	0.05	1.08	1.05	0.14	17	0	0	0	1139.78	0.58	0.31	40.44
106	Comp Air - ASD (1-5 hp)	Misc Ind	6%	1%	0.08	1.08	1.01	0.14	17	0	0	0	7985.96	0.51	0.47	27.05
107	Comp Air - Motor practices-1 (1-5 HP)	Misc Ind	5%	5%	0.02	1.08	1.02	0.13	17	0	0	0	265.77	2.50	1.34	9.43
108	Comp Air - Replace 6-100 HP motor	Misc Ind	4%	4%	0.03	1.11	1.07	0.14	20	0	0	0	438.07	1.52	0.78	17.69
109	Comp Air - ASD (6-100 hp)	Misc Ind	6%	1%	0.00	1.08	1.01	0.14	20	0	0	0	234.85	17.40	15.14	0.91
110	Comp Air - Motor practices-1 (6-100 HP)	Misc Ind	2%	2%	0.01	1.08	1.05	0.14	20	0	0	0	117.88	5.64	2.88	4.76
111	Comp Air - Replace 100+ HP motor	Misc Ind	3%	3%	0.01	1.10	1.06	0.14	20	0	0	0	149.18	4.45	2.28	6.02
112	Comp Air - ASD (100+ hp)	Misc Ind	6%	1%	0.01	1.08	1.01	0.14	20	0	0	0	523.90	7.80	6.79	2.02
113	Comp Air - Motor practices-1 (100+ HP)	Misc Ind	2%	2%	0.00	1.09	1.07	0.14	20	0	0	0	76.14	8.73	4.46	3.07
200	Base Fans	Misc Ind	0%	0%	0.00	1.08	1.08	0.14	14	0	0	N/A	N/A	N/A	N/A	N/A
201	Fans - O&M	Misc Ind	2%	2%	0.00	1.09	1.07	0.14	2	0	0	0	226.63	2.93	1.88	1.04
202	Fans - Controls	Misc Ind	30%	30%	0.09	1.41	0.99	0.13	10	0	0	0	233.01	2.85	1.65	5.05
203	Fans - System Optimization	Misc Ind	21%	10%	0.06	1.28	1.02	0.15	10	0	0	0	499.55	2.09	1.58	5.27
204	Fans- Improve components	Misc Ind	5%	5%	0.01	1.11	1.06	0.14	10	0	0	0	96.45	6.89	3.98	2.09
205	Fans - Replace 1-5 HP motor	Misc Ind	3%	3%	0.05	1.08	1.05	0.14	17	0	0	0	1139.78	0.58	0.31	40.44
206	Fans - ASD (1-5 hp)	Misc Ind	6%	1%	0.08	1.09	1.02	0.14	17	0	0	0	7898.32	0.52	0.47	26.76
207	Fans - Motor practices-1 (1-5 HP)	Misc Ind	5%	5%	0.02	1.08	1.02	0.13	17	0	0	0	265.77	2.50	1.34	9.43
208	Fans - Replace 6-100 HP motor	Misc Ind	3%	4%	0.03	1.09	1.06	0.14	20	0	0	0	442.65	1.46	0.73	18.88
209	Fans - ASD (6-100 hp)	Misc Ind	5%	1%	0.00	1.08	1.03	0.14	20	0	0	0	234.00	13.33	11.32	1.21
210	Fans - Motor practices-1 (6-100 HP)	Misc Ind	2%	2%	0.01	1.09	1.06	0.14	20	0	0	0	116.22	5.72	2.92	4.69
211	Fans - Replace 100+ HP motor	Misc Ind	3%	3%	0.01	1.08	1.05	0.14	20	0	0	0	151.63	4.38	2.24	6.12
212	Fans - ASD (100+ hp)	Misc Ind	6%	1%	0.01	1.13	1.07	0.15	20	0	0	0	497.14	7.79	6.75	2.03
213	Fans - Motor practices-1 (100+ HP)	Misc Ind	1%	2%	0.00	1.08	1.06	0.14	20	0	0	0	76.84	7.51	3.35	4.09
300	Base Pumps	Misc Ind	0%	0%	0.00	1.08	1.08	0.14	14	0	0	N/A	N/A	N/A	N/A	N/A
301	Pumps - O&M	Misc Ind	10%	10%	0.01	1.13	1.01	0.13	2	0	0	0	224.74	2.96	1.90	1.03
302	Pumps - Controls	Misc Ind	30%	30%	0.03	1.39	0.97	0.13	10	0	0	0	68.90	9.64	5.57	1.49
303	Pumps - System Optimization	Misc Ind	33%	33%	0.07	1.15	0.77	0.10	10	0	0	0	184.80	3.60	2.08	4.00

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Industrial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Base kWh	Base EUI	EUI	Peak Watts/ Base kWh	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWH	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
304	Pumps - Sizing	Misc Ind	20%	20%	0.02	1.28	1.02	0.13	10	0	0	0	83.30	7.98	4.60	1.80
305	Pumps - Replace 1-5 HP motor	Misc Ind	3%	3%	0.05	1.08	1.05	0.14	17	0	0	0	1141.63	0.58	0.31	40.51
306	Pumps - ASD (1-5 hp)	Misc Ind	6%	1%	0.08	1.09	1.02	0.14	17	0	0	0	7890.95	0.52	0.47	26.73
307	Pumps - Motor practices-1 (1-5 HP)	Misc Ind	5%	5%	0.02	1.10	1.05	0.14	17	0	0	0	259.88	2.56	1.37	9.22
308	Pumps - Replace 6-100 HP motor	Misc Ind	4%	4%	0.03	1.08	1.04	0.14	20	0	0	0	448.80	1.48	0.76	18.12
309	Pumps - ASD (6-100 hp)	Misc Ind	6%	1%	0.00	1.11	1.04	0.14	20	0	0	0	227.23	17.98	15.65	0.88
310	Pumps - Motor practices-1 (6-100 HP)	Misc Ind	2%	2%	0.01	1.08	1.05	0.14	20	0	0	0	117.34	5.66	2.89	4.74
311	Pumps - Replace 100+ HP motor	Misc Ind	3%	3%	0.01	1.10	1.06	0.14	20	0	0	0	149.18	4.45	2.28	6.02
312	Pumps - ASD (100+ hp)	Misc Ind	6%	1%	0.01	1.08	1.01	0.14	20	0	0	0	523.19	7.81	6.80	2.02
313	Pumps - Motor practices-1 (100+ HP)	Misc Ind	2%	2%	0.00	1.08	1.06	0.14	20	0	0	0	76.84	8.65	4.42	3.10
400	Base Drives	Misc Ind	0%	0%	0.00	1.08	1.08	0.14	20	0	0	N/A	N/A	N/A	N/A	N/A
428	Drives - Scheduling	Misc Ind	5%	1%	0.01	1.11	1.06	0.14	10	0	0	0	1053.39	2.07	1.90	4.38
430	Efficient Machinery	Misc Ind	4%	4%	0.01	1.10	1.07	0.14	10	0	0	0	173.95	3.82	2.20	3.77
431	Custom Measures--Drives	Misc Ind	3%	3%	0.01	1.08	1.04	0.14	15	0	0	0	221.45	3.00	1.65	7.05
500	Base Process Heating	Misc Ind	0%	0%	0.00	1.08	1.08	0.14	20	0	0	N/A	N/A	N/A	N/A	N/A
509	Efficient Curing ovens	Misc Ind	20%	20%	0.08	1.27	1.01	0.13	15	0	0	0	229.26	2.90	1.60	7.30
512	Custom Measures--Process Heating	Misc Ind	3%	3%	0.01	1.08	1.04	0.14	15	0	0	0	221.45	3.00	1.65	7.05
550	Base Process Cooling	Misc Ind	0%	0%	0.00	1.08	1.08	0.14	20	0	0	N/A	N/A	N/A	N/A	N/A
553	Custom Measures--Process Cooling	Misc Ind	3%	3%	0.01	1.08	1.04	0.14	15	0	0	0	221.45	3.00	1.65	7.05
600	Base Other Process	Misc Ind	0%	0%	0.00	1.08	1.08	0.14	15	0	0	N/A	N/A	N/A	N/A	N/A
700	Space Cooling Centrifugal Chiller, 0.58 kW/ton, 500	Misc Ind	0%	0%	0.00	1.08	1.08	0.26	20	0	0	N/A	N/A	N/A	N/A	N/A
701	Centrifugal Chiller, 0.51 kW/ton, 500 tons	Misc Ind	12%	12%	0.03	0.96	0.84	0.21	20	0	0	0	82.70	6.00	2.20	6.24
702	Window Film - Chiller	Misc Ind	10%	10%	0.06	1.13	1.02	0.25	10	0	0	0	280.21	1.77	0.73	11.35
703	EMS - Chiller	Misc Ind	10%	10%	0.09	1.12	1.00	0.25	10	0	0	0	454.04	1.09	0.45	18.38
705	Chiller Tune Up/Diagnostics	Misc Ind	8%	8%	0.05	1.12	1.03	0.25	10	0	0	0	333.80	1.49	0.61	13.52
706	Cooling Circ. Pumps - VSD	Misc Ind	6%	6%	0.10	1.09	1.03	0.25	15	0	0	0	570.44	0.87	0.34	33.97
710	Space Cooling DX Packaged System, EER=10.3, 10	Misc Ind	0%	0%	0.00	1.08	1.08	0.26	15	0	0	N/A	N/A	N/A	N/A	N/A
711	DX Tune Up/ Advanced Diagnostics	Misc Ind	10%	10%	0.07	1.13	1.02	0.25	3	0	0	0	1076.06	0.46	0.21	13.75
712	DX Packaged System, EER=10.9, 10 tons	Misc Ind	6%	6%	0.05	0.93	0.88	0.21	15	0	0	0	338.09	1.47	0.58	20.13
713	Window Film - DX	Misc Ind	10%	10%	0.03	1.16	1.04	0.25	10	0	0	0	159.95	3.10	1.28	6.48
715	Prog. Thermostat - DX	Misc Ind	10%	3%	0.00	1.13	1.03	0.27	10	0	0	0	95.55	10.91	8.21	1.01
800	Base Lighting	Misc Ind	0%	0%	0.00	1.08	1.08	0.14	10	0	0	N/A	N/A	N/A	N/A	N/A
801	RET 2L4' Premium T8, 1EB	Misc Ind	31%	31%	0.10	1.09	0.75	0.10	15	0	0	0	212.92	3.12	1.72	6.78
802	CFL Hardwired, Modular 36W	Misc Ind	72%	72%	0.10	0.63	0.18	0.02	4	0	0	0	566.47	1.17	0.73	5.12
803	Metal Halide, 50W	Misc Ind	58%	58%	0.67	1.27	0.53	0.07	5	1	0	0	1837.60	0.36	0.22	20.62
804	Occupancy Sensor, 4L4' Fluorescent Fixtures	Misc Ind	19%	20%	0.05	1.08	0.88	0.11	9	0	0	0	266.74	2.42	1.39	5.55
900	Base Other	Misc Ind	0%	0%	0.00	1.08	1.08	0.14	15	0	0	N/A	N/A	N/A	N/A	N/A
901	Replace V-belts	Misc Ind	0%	0%	0.00	1.08	1.07	0.14	5	0	0	0	314.15	2.12	1.30	3.52
100	Base Compressed Air	Water/WW	0%	0%	0.00	1.08	1.08	0.14	14	0	0	N/A	N/A	N/A	N/A	N/A
101	Compressed Air-O&M	Water/WW	17%	17%	0.01	1.22	1.01	0.13	2	0	0	0	247.60	2.68	1.72	1.14
102	Compressed Air - Controls	Water/WW	12%	12%	0.02	1.18	1.04	0.14	10	0	0	0	128.91	5.16	2.98	2.79
103	Compressed Air - System Optimization	Water/WW	20%	20%	0.02	1.19	0.96	0.12	10	0	0	0	71.22	9.33	5.39	1.54
104	Compressed Air- Sizing	Water/WW	9%	9%	0.00	1.16	1.06	0.14	10	0	0	0	46.23	14.38	8.30	1.00
105	Comp Air - Replace 1-5 HP motor	Water/WW	3%	3%	0.05	1.08	1.05	0.14	17	0	0	0	1139.78	0.58	0.31	40.44
106	Comp Air - ASD (1-5 hp)	Water/WW	6%	1%	0.08	1.08	1.01	0.14	17	0	0	0	7985.96	0.51	0.47	27.05
107	Comp Air - Motor practices-1 (1-5 HP)	Water/WW	5%	5%	0.02	1.08	1.02	0.13	17	0	0	0	265.77	2.50	1.34	9.43
108	Comp Air - Replace 6-100 HP motor	Water/WW	4%	4%	0.03	1.09	1.05	0.14	20	0	0	0	444.82	1.49	0.76	17.96
109	Comp Air - ASD (6-100 hp)	Water/WW	6%	1%	0.00	1.08	1.01	0.14	20	0	0	0	234.85	17.40	15.14	0.91
110	Comp Air - Motor practices-1 (6-100 HP)	Water/WW	2%	2%	0.01	1.10	1.07	0.14	20	0	0	0	115.45	5.76	2.94	4.66
111	Comp Air - Replace 100+ HP motor	Water/WW	3%	3%	0.01	1.10	1.07	0.14	20	0	0	0	148.62	4.47	2.28	6.00
112	Comp Air - ASD (100+ hp)	Water/WW	6%	1%	0.01	1.10	1.03	0.14	20	0	0	0	513.72	7.95	6.92	1.98
113	Comp Air - Motor practices-1 (100+ HP)	Water/WW	2%	2%	0.00	1.08	1.06	0.14	20	0	0	0	76.43	8.70	4.44	3.09
200	Base Fans	Water/WW	0%	0%	0.00	1.08	1.08	0.14	14	0	0	N/A	N/A	N/A	N/A	N/A
201	Fans - O&M	Water/WW	2%	2%	0.00	1.08	1.06	0.14	2	1	0	0	229.93	2.89	1.86	1.05
202	Fans - Controls	Water/WW	30%	30%	0.09	1.17	0.82	0.11	10	14	2	0	279.52	2.38	1.37	6.05
203	Fans - System Optimization	Water/WW	21%	10%	0.06	1.11	0.88	0.13	10	10	1	0	577.62	1.81	1.36	6.09

APPENDIX F

NON-ADDITIVE MEASURE LEVEL RESULTS

Industrial Electric Existing Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Base kWh	Base EUI	EUI	Peak Watts/ Base kWh	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWh	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
204	Fans - Improve components	Water/WW	5%	5%	0.01	1.09	1.04	0.14	10	2	0	0	98.06	6.78	3.91	2.12
205	Fans - Replace 1-5 HP motor	Water/WW	3%	3%	0.05	1.08	1.05	0.14	17	0	0	0	1143.48	0.58	0.31	40.58
206	Fans - ASD (1-5 hp)	Water/WW	6%	1%	0.08	1.08	1.01	0.14	17	0	0	0	7984.58	0.51	0.47	27.05
207	Fans - Motor practices-1 (1-5 HP)	Water/WW	5%	5%	0.02	1.08	1.02	0.13	17	0	0	0	265.72	2.50	1.34	9.43
208	Fans - Replace 6-100 HP motor	Water/WW	3%	4%	0.03	1.08	1.04	0.14	20	1	0	0	448.99	1.44	0.72	19.15
209	Fans - ASD (6-100 hp)	Water/WW	5%	1%	0.00	1.08	1.03	0.14	20	1	0	0	234.07	13.33	11.32	1.21
210	Fans - Motor practices-1 (6-100 HP)	Water/WW	2%	2%	0.01	1.08	1.05	0.14	20	0	0	0	117.57	5.65	2.89	4.75
211	Fans - Replace 100+ HP motor	Water/WW	3%	3%	0.01	1.08	1.04	0.14	20	1	0	0	151.80	4.38	2.24	6.13
212	Fans - ASD (100+ hp)	Water/WW	6%	1%	0.01	1.08	1.02	0.14	20	2	0	0	522.01	7.42	6.43	2.13
213	Fans - Motor practices-1 (100+ HP)	Water/WW	1%	2%	0.00	1.08	1.06	0.14	20	0	0	0	76.84	7.51	3.35	4.09
300	Base Pumps	Water/WW	0%	0%	0.00	1.08	1.08	0.14	14	0	0	N/A	N/A	N/A	N/A	N/A
301	Pumps - O&M	Water/WW	10%	10%	0.01	1.17	1.05	0.14	2	2	0	0	215.88	3.08	1.98	0.99
302	Pumps - Controls	Water/WW	30%	30%	0.03	1.45	1.02	0.13	10	7	1	0	66.09	10.06	5.80	1.43
303	Pumps - System Optimization	Water/WW	33%	33%	0.07	1.49	1.00	0.13	10	8	1	0	142.72	4.66	2.69	3.09
304	Pumps - Sizing	Water/WW	20%	20%	0.02	1.28	1.02	0.13	10	6	1	0	83.30	7.98	4.60	1.80
305	Pumps - Replace 1-5 HP motor	Water/WW	3%	3%	0.05	1.08	1.05	0.14	17	0	0	0	1140.55	0.58	0.31	40.47
306	Pumps - ASD (1-5 hp)	Water/WW	6%	1%	0.08	1.08	1.01	0.14	17	0	0	0	7985.96	0.51	0.47	27.05
307	Pumps - Motor practices-1 (1-5 HP)	Water/WW	5%	5%	0.02	1.11	1.05	0.14	17	0	0	0	258.17	2.57	1.38	9.16
308	Pumps - Replace 6-100 HP motor	Water/WW	4%	4%	0.03	1.08	1.04	0.14	20	1	0	0	450.03	1.48	0.75	18.17
309	Pumps - ASD (6-100 hp)	Water/WW	6%	1%	0.00	1.08	1.01	0.14	20	3	0	0	234.55	17.42	15.16	0.90
310	Pumps - Motor practices-1 (6-100 HP)	Water/WW	2%	2%	0.01	1.08	1.06	0.14	20	1	0	0	116.83	5.69	2.91	4.72
311	Pumps - Replace 100+ HP motor	Water/WW	3%	3%	0.01	1.10	1.06	0.14	20	1	0	0	149.18	4.45	2.28	6.02
312	Pumps - ASD (100+ hp)	Water/WW	6%	1%	0.01	1.08	1.01	0.14	20	4	0	0	523.90	7.80	6.79	2.02
313	Pumps - Motor practices-1 (100+ HP)	Water/WW	2%	2%	0.00	1.08	1.06	0.14	20	1	0	0	76.84	8.65	4.42	3.10
400	Base Drives	Water/WW	0%	0%	0.00	1.08	1.08	0.14	20	0	0	N/A	N/A	N/A	N/A	N/A
500	Base Process Heating	Water/WW	0%	0%	0.00	1.08	1.08	0.14	20	0	0	N/A	N/A	N/A	N/A	N/A
512	Custom Measures--Process Heating	Water/WW	3%	3%	0.01	1.08	1.04	0.14	15	0	0	0	221.45	3.00	1.65	7.05
550	Base Process Cooling	Water/WW	0%	0%	0.00	1.08	1.08	0.14	20	0	0	N/A	N/A	N/A	N/A	N/A
553	Custom Measures--Process Cooling	Water/WW	3%	3%	0.01	1.08	1.04	0.14	15	0	0	0	221.45	3.00	1.65	7.05
600	Base Other Process	Water/WW	0%	0%	0.00	1.08	1.08	0.14	15	0	0	N/A	N/A	N/A	N/A	N/A
700	Space Cooling Centrifugal Chiller, 0.58 kW/ton, 500	Water/WW	0%	0%	0.00	1.08	1.08	0.26	20	0	0	N/A	N/A	N/A	N/A	N/A
701	Centrifugal Chiller, 0.51 kW/ton, 500 tons	Water/WW	12%	12%	0.03	0.96	0.84	0.21	20	0	0	0	82.70	6.00	2.20	6.24
702	Window Film - Chiller	Water/WW	10%	10%	0.06	1.13	1.02	0.25	10	0	0	0	280.21	1.77	0.73	11.35
703	EMS - Chiller	Water/WW	10%	10%	0.09	1.12	1.00	0.25	10	0	0	0	454.04	1.09	0.45	18.38
705	Chiller Tune Up/Diagnostics	Water/WW	8%	8%	0.05	1.12	1.03	0.25	10	0	0	0	333.80	1.49	0.61	13.52
706	Cooling Circ. Pumps - VSD	Water/WW	6%	6%	0.10	1.09	1.03	0.25	15	0	0	0	570.44	0.87	0.34	33.97
710	Space Cooling DX Packaged System, EER=10.3, 10	Water/WW	0%	0%	0.00	1.08	1.08	0.26	15	0	0	N/A	N/A	N/A	N/A	N/A
711	DX Tune Up/ Advanced Diagnostics	Water/WW	10%	10%	0.07	1.13	1.02	0.25	3	0	0	0	1076.06	0.46	0.21	13.75
712	DX Packaged System, EER=10.9, 10 tons	Water/WW	6%	6%	0.05	0.93	0.88	0.21	15	0	0	0	338.09	1.47	0.58	20.13
713	Window Film - DX	Water/WW	10%	10%	0.03	1.16	1.04	0.25	10	0	0	0	159.95	3.10	1.28	6.48
715	Prog. Thermostat - DX	Water/WW	10%	3%	0.00	1.13	1.03	0.27	10	0	0	0	95.55	10.91	8.21	1.01
800	Base Lighting	Water/WW	0%	0%	0.00	1.08	1.08	0.14	10	0	0	N/A	N/A	N/A	N/A	N/A
801	RET 2L4' Premium T8, 1EB	Water/WW	31%	31%	0.10	1.09	0.75	0.10	15	1	0	0	212.92	3.12	1.72	6.78
802	CFL Hardwired, Modular 36W	Water/WW	72%	72%	0.10	0.44	0.12	0.02	4	0	0	0	803.60	0.83	0.52	7.26
803	Metal Halide, 50W	Water/WW	58%	58%	0.67	1.27	0.53	0.07	5	0	0	0	1837.60	0.36	0.22	20.62
804	Occupancy Sensor, 4L4' Fluorescent Fixtures	Water/WW	19%	20%	0.05	1.08	0.88	0.11	9	0	0	0	266.74	2.42	1.39	5.55
900	Base Other	Water/WW	0%	0%	0.00	1.08	1.08	0.14	15	0	0	N/A	N/A	N/A	N/A	N/A

Industrial Electric New Construction

DSM ASSYST SUMMARY

Measure Number	Measure	Building Type	Energy Savings Fraction	Peak Reduction Fraction	Total Costs/ Base kWh	Base EUI	EUI	Peak Watts/ Base kWh	Service Life (yrs)	Technical Potential GWH	System Peak Tech. Potential MW	Levelized Cost of Conserved Energy \$/kWH	Levelized Cost of Avoided Peak Capacity \$/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)	Revenue Test
100	Base Industrial Building	Food	0%	0%	0.00	1.08	1.08	0.15	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	High Performance Building/Efficient Processes	Food	24%	24%	0.04	1.08	0.82	0.11	20	0	0	0.01	79.77	7.93	4.00	3.32	1.98
100	Base Industrial Building	Textiles-Apparel	0%	0%	0.00	1.08	1.08	0.27	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	High Performance Building/Efficient Processes	Textiles-Apparel	12%	12%	0.04	1.08	0.94	0.24	20	0	0	0.02	83.32	5.75	2.07	6.41	2.78
100	Base Industrial Building	Lumber-Furniture	0%	0%	0.00	1.08	1.08	0.18	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	High Performance Building/Efficient Processes	Lumber-Furniture	14%	14%	0.04	1.08	0.92	0.15	20	0	0	0.02	108.32	5.29	2.42	5.48	2.19
100	Base Industrial Building	Paper	0%	0%	0.00	1.08	1.08	0.10	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	High Performance Building/Efficient Processes	Paper	17%	17%	0.04	1.08	0.89	0.08	20	0	0	0.02	165.72	4.80	2.86	4.64	1.68
100	Base Industrial Building	Printing	0%	0%	0.00	1.08	1.08	0.16	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	High Performance Building/Efficient Processes	Printing	15%	15%	0.04	1.08	0.92	0.14	20	0	0	0.02	116.40	5.19	2.50	5.30	2.07
100	Base Industrial Building	Chemicals	0%	0%	0.00	1.08	1.08	0.14	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	High Performance Building/Efficient Processes	Chemicals	14%	14%	0.04	1.08	0.92	0.12	20	0	0	0.02	136.19	4.77	2.46	5.40	1.94
100	Base Industrial Building	Petroleum	0%	0%	0.00	1.08	1.08	0.14	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	High Performance Building/Efficient Processes	Petroleum	20%	20%	0.04	1.08	0.86	0.11	20	0	0	0.01	98.36	6.60	3.40	3.90	1.94
100	Base Industrial Building	Rubber-Plastics	0%	0%	0.00	1.08	1.08	0.17	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	High Performance Building/Efficient Processes	Rubber-Plastics	21%	21%	0.04	1.08	0.85	0.14	20	0	0	0.01	78.24	7.50	3.52	3.77	2.13
100	Base Industrial Building	Stone-Clay-Glass	0%	0%	0.00	1.08	1.08	0.14	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	High Performance Building/Efficient Processes	Stone-Clay-Glass	15%	15%	0.04	1.08	0.91	0.12	20	0	0	0.02	130.72	4.99	2.58	5.14	1.93
100	Base Industrial Building	Fab Metals	0%	0%	0.00	1.08	1.08	0.17	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	High Performance Building/Efficient Processes	Fab Metals	15%	15%	0.04	1.08	0.92	0.14	20	0	0	0.02	114.37	5.21	2.48	5.35	2.10
100	Base Industrial Building	Ind Mach	0%	0%	0.00	1.08	1.08	0.27	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	High Performance Building/Efficient Processes	Ind Mach	14%	14%	0.04	1.08	0.92	0.23	20	0	0	0.02	70.22	6.82	2.46	5.40	2.78
100	Base Industrial Building	Electronics	0%	0%	0.00	1.08	1.08	0.15	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	High Performance Building/Efficient Processes	Electronics	13%	13%	0.04	1.08	0.94	0.13	20	8	1	0.02	143.46	4.34	2.15	6.16	2.01
100	Base Industrial Building	Transp Equip	0%	0%	0.00	1.08	1.08	0.17	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	High Performance Building/Efficient Processes	Transp Equip	14%	14%	0.04	1.08	0.92	0.14	20	0	0	0.02	117.02	5.10	2.43	5.46	2.10
100	Base Industrial Building	Misc Ind	0%	0%	0.00	1.08	1.08	0.14	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	High Performance Building/Efficient Processes	Misc Ind	13%	13%	0.04	1.08	0.94	0.12	20	0	0	0.02	157.57	4.14	2.14	6.21	1.93
100	Base Industrial Building	Water/WW	0%	0%	0.00	1.08	1.08	0.14	20	0	0	N/A	N/A	N/A	N/A	N/A	N/A
101	High Performance Building/Efficient Processes	Water/WW	30%	30%	0.04	1.08	0.76	0.10	20	2	0	0.01	67.01	9.72	5.03	2.64	1.93

G. Appendix G: Supply Curve Data

APPENDIX G

Residential Electric Existing Construction

Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost \$/kWh
301	CFL 15W (base HE incandescent<1.15 hrs/day)	19.2	19.2	\$0.001
331	CFL 15W (base HE incandescent >5 hrs/day)	54.3	73.5	\$0.002
321	CFL 15W (base HE incandescent 2.15-5 hrs/day)	35.9	109.4	\$0.002
311	CFL 15W (base HE incandescent 1.15-2.15 hrs/day)	82.8	192.2	\$0.002
931	Energy Star Set-Top Box	17.1	209.3	\$0.002
901	Energy Star Plasma TV	5.3	214.6	\$0.002
951	Energy Star Desktop PC	35.0	249.5	\$0.002
506	Pipe Wrap	10.7	260.2	\$0.003
911	Energy Star LCD TV	4.9	265.1	\$0.004
921	Energy Star LCD TV	20.8	285.9	\$0.005
171	Energy Star Dehumidifier (ROB)	3.0	288.9	\$0.007
212	Self Install Weatherization (base space heating)	0.2	289.1	\$0.007
116	Programmable Thermostat (base split-system)	49.1	338.1	\$0.007
941	Energy Star DVD Player	3.1	341.3	\$0.010
211	Comprehensive Shell Air Sealing - Inf. Reduction (base space heating)	8.1	349.4	\$0.014
961	Energy Star Laptop PC	6.2	355.7	\$0.015
381	ROB 2L4' Premium T8	11.5	367.2	\$0.018
262	Self Install Weatherization (base ASHP)	0.1	367.3	\$0.018
118	Proper Sizing and Quality Install	108.1	475.4	\$0.022
217	Programmable Thermostat (base space heating)	3.2	478.6	\$0.023
120	Self Install Weatherization (base split-system)	1.0	479.6	\$0.025
421	Refrigerator Recycling - second refrigerator	55.6	535.2	\$0.031
991	Indirect feedback	79.1	614.3	\$0.038
153	Self Install Weatherization (base RAC)	0.0	614.3	\$0.041
202	Ceiling R-0 to R-38 Insulation (base space heating)	1.3	615.7	\$0.043
333	LEDs (base HE incandescent >5 hrs/day)	31.6	647.2	\$0.045
505	Low Flow Showerhead 1.5 Gal/Min	27.2	674.4	\$0.045
161	EER 8.5 AC Early Replacement, CEE Tier 1 EER 11.3	0.4	674.9	\$0.047
261	Comprehensive Shell Air Sealing - Inf. Reduction (base ASHP)	3.9	678.7	\$0.047
155	Ductless Split Heat Pump	0.3	679.0	\$0.048
323	LEDs (base HE incandescent 2.15-5 hrs/day)	20.9	699.9	\$0.054
142	HE Room Air Conditioner - CEE Tier 1 EER 11.3	1.6	701.5	\$0.056
504	Heat Pump Water Heater - Energy Star	41.1	742.6	\$0.056
265	Programmable Thermostat (base ASHP)	1.5	744.1	\$0.056
503	HE Water Heater (EF=0.93)	21.5	765.5	\$0.061
117	Proper Refrigerant Charging and Air Flow	41.2	806.7	\$0.066
401	HE Refrigerator (Energy Star)	41.7	848.3	\$0.066
431	Freezer (Energy Star)	4.9	853.2	\$0.068
371	LEDs (base CFL >5 hrs/day)	11.1	864.3	\$0.072
502	Faucet Aerators (1.5 GPM)	11.2	875.5	\$0.076
508	Tankless Water Heater	75.3	950.8	\$0.080
441	Freezer - Early Replacement (Energy Star)	1.1	951.9	\$0.082
312	CFL 15W - Specialty (base HE incandescent 1.15-2.15 hrs/day)	3.6	955.5	\$0.082
361	LEDs (base CFL 2.15-5 hrs/day)	7.4	962.9	\$0.087
204	Ceiling R-11 to R-38 Insulation (base space heating)	0.9	963.8	\$0.088
551	Early Replacement Water Heating to Heat Pump Water Heater	3.3	967.2	\$0.089
313	LEDs (base HE incandescent 1.15-2.15 hrs/day)	44.9	1,012.1	\$0.090
801	Variable Speed Pool Pump (1.5 hp)	8.0	1,020.1	\$0.094
208	Wall Blow-in R-0 to R-13 Insulation (base space heating)	5.2	1,025.2	\$0.097
252	Ceiling R-0 to R-38 Insulation (base ASHP)	0.7	1,025.9	\$0.101
114	Duct Insulation	17.4	1,043.3	\$0.112

SUPPLY CURVE DATA

Residential Electric Existing Construction

Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost \$/kW
301	CFL 15W (base HE incandescent<1.15 hrs/day)	38.3	38.3	\$10
331	CFL 15W (base HE incandescent >5 hrs/day)	2.0	40.3	\$14
321	CFL 15W (base HE incandescent 2.15-5 hrs/day)	2.4	42.7	\$16
311	CFL 15W (base HE incandescent 1.15-2.15 hrs/day)	0.7	43.4	\$16
931	Energy Star Set-Top Box	4.9	48.3	\$17
901	Energy Star Plasma TV	5.5	53.9	\$19
951	Energy Star Desktop PC	3.7	57.5	\$19
506	Pipe Wrap	8.5	66.0	\$20
911	Energy Star LCD TV	1.4	67.3	\$22
921	Energy Star LCD TV	91.0	158.4	\$26
171	Energy Star Dehumidifier (ROB)	0.7	159.1	\$32
212	Self Install Weatherization (base space heating)	2.9	162.0	\$33
116	Programmable Thermostat (base split-system)	0.6	162.6	\$38
941	Energy Star DVD Player	0.4	163.0	\$51
211	Comprehensive Shell Air Sealing - Inf. Reduction (base space heating)	0.0	163.1	\$63
961	Energy Star Laptop PC	0.4	163.5	\$70
381	ROB 2L4' Premium T8	0.3	163.8	\$73
262	Self Install Weatherization (base ASHP)	0.2	164.0	\$74
118	Proper Sizing and Quality Install	1.1	165.0	\$86
217	Programmable Thermostat (base space heating)	31.6	196.6	\$94
120	Self Install Weatherization (base split-system)	26.7	223.3	\$101
421	Refrigerator Recycling - second refrigerator	0.9	224.2	\$110
991	Indirect feedback	10.3	234.5	\$168
153	Self Install Weatherization (base RAC)	11.3	245.8	\$172
202	Ceiling R-0 to R-38 Insulation (base space heating)	1.2	247.0	\$172
333	LEDs (base HE incandescent >5 hrs/day)	79.0	325.9	\$196
505	Low Flow Showerhead 1.5 Gal/Min	21.6	347.6	\$198
161	EER 8.5 AC Early Replacement, CEE Tier 1 EER 11.3	4.7	352.2	\$216
261	Comprehensive Shell Air Sealing - Inf. Reduction (base ASHP)	57.2	409.4	\$244
155	Ductless Split Heat Pump	0.1	409.5	\$252
323	LEDs (base HE incandescent 2.15-5 hrs/day)	0.1	409.6	\$256
142	HE Room Air Conditioner - CEE Tier 1 EER 11.3	27.0	436.6	\$259
504	Heat Pump Water Heater - Energy Star	10.2	446.9	\$308
265	Programmable Thermostat (base ASHP)	15.2	462.1	\$345
503	HE Water Heater (EF=0.93)	3.5	465.6	\$351
117	Proper Refrigerant Charging and Air Flow	7.7	473.3	\$356
401	HE Refrigerator (Energy Star)	5.3	478.5	\$437
431	Freezer (Energy Star)	3.2	481.8	\$438
371	LEDs (base CFL >5 hrs/day)	2.7	484.5	\$479
502	Faucet Aerators (1.5 GPM)	0.7	485.2	\$484
508	Tankless Water Heater	0.1	485.3	\$503
441	Freezer - Early Replacement (Energy Star)	5.7	491.0	\$507
312	CFL 15W - Specialty (base HE incandescent 1.15-2.15 hrs/day)	2.1	493.1	\$528
361	LEDs (base CFL 2.15-5 hrs/day)	0.2	493.3	\$543
204	Ceiling R-11 to R-38 Insulation (base space heating)	0.2	493.4	\$585
551	Early Replacement Water Heating to Heat Pump Water Heater	1.4	494.9	\$597
313	LEDs (base HE incandescent 1.15-2.15 hrs/day)	9.6	504.5	\$622
801	Variable Speed Pool Pump (1.5 hp)	0.4	504.9	\$698
208	Wall Blow-in R-0 to R-13 Insulation (base space heating)	1.1	506.1	\$708
252	Ceiling R-0 to R-38 Insulation (base ASHP)	0.3	506.3	\$795
114	Duct Insulation	0.4	506.7	\$806

APPENDIX G

Residential Electric Existing Construction

Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost \$/kWh
302	CFL 15W - Specialty (base HE incandescent<1.15 hrs/day)	0.8	1,044.1	\$0.115
206	Ceiling R-19 to R-38 Insulation (base space heating)	2.1	1,046.2	\$0.126
101	15 SEER (12.72 EER) Split-System Air Conditioner w/ quality install	121.8	1,168.0	\$0.127
131	15 SEER (12.72 EER) Split-System Air Conditioner--early replacement	33.3	1,201.3	\$0.129
351	LEDs (base CFL 1.15-2.15 hrs/day)	8.5	1,209.8	\$0.136
107	Ceiling R-0 to R-38 Insulation (base split-system)	7.2	1,217.0	\$0.140
203	Ceiling R-0 to R-49 Insulation (base space heating)	0.1	1,217.0	\$0.151
102	17 SEER (12.28 EER) Split-System Air Conditioner w/ quality install	88.2	1,305.2	\$0.158
612	High Efficiency CD (EF=3.01 w/moisture sensor)	29.6	1,334.8	\$0.160
152	Wall 2x4 R-0 to Blow-In R-13 Insulation (base RAC)	0.1	1,334.9	\$0.163
146	Ceiling R-0 to R-38 Insulation (base RAC)	0.2	1,335.1	\$0.166
121	Wall Blow-in R-0 to R-13 Insulation (base split-system)	41.6	1,376.7	\$0.168
214	Double Pane Windows to ENERGY STAR (base space heating)	1.8	1,378.5	\$0.180
104	AC Maintenance (Outdoor Coil Cleaning)	15.8	1,394.3	\$0.200
254	Ceiling R-11 to R-38 Insulation (base ASHP)	0.5	1,394.7	\$0.202
115	Duct Repair	23.4	1,418.2	\$0.224
303	LEDs (base HE incandescent<1.15 hrs/day)	10.4	1,428.6	\$0.224
981	Plug Load Controls - Smart Power Strip	9.5	1,438.1	\$0.227
205	Ceiling R-11 to R-49 Insulation (base space heating)	0.1	1,438.2	\$0.239
411	Refrigerator - Early Replacement (Energy Star)	13.0	1,451.2	\$0.250
256	Ceiling R-19 to R-38 Insulation (base ASHP)	1.0	1,452.3	\$0.289
207	Ceiling R-19 to R-49 Insulation (base space heating)	0.3	1,452.5	\$0.295
509	Energy Star CW CEE Tier 2 (MEF=2.0) (base WH)	6.4	1,458.9	\$0.300
148	Ceiling R-11 to R-38 Insulation (base RAC)	0.1	1,459.0	\$0.326
105	AC Maintenance and/or tune-up	8.8	1,467.8	\$0.329
611	Heat Pump Dryer	126.7	1,594.5	\$0.330
402	HE Refrigerator (CEE Tier 2)	11.6	1,606.2	\$0.334
507	Solar Domestic Water Heating	137.6	1,743.8	\$0.335
341	LEDs (base CFL < 1.15 hrs/day)	1.0	1,744.8	\$0.338
372	Photocell/timerlock (outdoor) (base CFL >5 hrs/day)	1.1	1,745.9	\$0.341
253	Ceiling R-0 to R-49 Insulation (base ASHP)	0.0	1,746.0	\$0.351
144	Single Pane Windows to ENERGY STAR (base RAC)	0.3	1,746.2	\$0.352
258	Wall Blow-in R-0 to R-13 Insulation (base ASHP)	2.8	1,749.0	\$0.365
811	Variable Speed Pool Pump (1.5 hp)	1.8	1,750.8	\$0.399
511	Energy Star Dishwasher (EF=0.72) (base WH)	2.6	1,753.4	\$0.437
601	Energy Star CW CEE Tier 2 (MEF=2.0) (base CW)	7.4	1,760.9	\$0.468
108	Ceiling R-0 to R-49 Insulation (base split-system)	0.4	1,761.3	\$0.516
255	Ceiling R-11 to R-49 Insulation (base ASHP)	0.1	1,761.3	\$0.548
147	Ceiling R-0 to R-49 Insulation (base RAC)	0.0	1,761.3	\$0.559
151	Ceiling R-19 to R-49 Insulation (base RAC)	0.2	1,761.5	\$0.567
213	Single Pane Windows to ENERGY STAR(base space heating)	3.8	1,765.4	\$0.577
143	Ceiling Fans (base RAC)	0.2	1,765.5	\$0.583
362	Photocell/timerlock (outdoor) (base CFL 2.15-5 hrs/day)	0.7	1,766.3	\$0.584
982	Energy Star Ventilating Fans	3.3	1,769.6	\$0.594
109	Ceiling R-11 to R-38 Insulation (base split-system)	2.2	1,771.8	\$0.626
149	Ceiling R-11 to R-49 Insulation (base RAC)	0.0	1,771.8	\$0.647
257	Ceiling R-19 to R-49 Insulation (base ASHP)	0.1	1,772.0	\$0.652
264	Double Pane Windows to ENERGY STAR (base ASHP)	0.8	1,772.8	\$0.703
103	AC Maintenance (Indoor Coil Cleaning)	7.4	1,780.1	\$0.760
332	CFL 15W - Specialty (base HE incandescent >5 hrs/day)	0.2	1,780.4	\$0.772
122	Single Pane Windows to ENERGY STAR (base split-system)	3.7	1,784.1	\$0.785

SUPPLY CURVE DATA

Residential Electric Existing Construction

Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost \$/kW
302	CFL 15W - Specialty (base HE incandescent<1.15 hrs/day)	0.8	507.5	\$854
206	Ceiling R-19 to R-38 Insulation (base space heating)	0.0	507.5	\$862
101	15 SEER (12.72 EER) Split-System Air Conditioner w/ quality install	0.1	507.6	\$875
131	15 SEER (12.72 EER) Split-System Air Conditioner--early replacement	4.6	512.2	\$885
351	LEDs (base CFL 1.15-2.15 hrs/day)	0.1	512.3	\$900
107	Ceiling R-0 to R-38 Insulation (base split-system)	1.4	513.7	\$964
203	Ceiling R-0 to R-49 Insulation (base space heating)	0.0	513.8	\$997
102	17 SEER (12.28 EER) Split-System Air Conditioner w/ quality install	0.7	514.5	\$1,015
612	High Efficiency CD (EF=3.01 w/moisture sensor)	0.1	514.6	\$1,127
152	Wall 2x4 R-0 to Blow-In R-13 Insulation (base RAC)	4.8	519.4	\$1,171
146	Ceiling R-0 to R-38 Insulation (base RAC)	4.0	523.3	\$1,197
121	Wall Blow-in R-0 to R-13 Insulation (base split-system)	2.4	525.8	\$1,210
214	Double Pane Windows to ENERGY STAR (base space heating)	0.9	526.6	\$1,335
104	AC Maintenance (Outdoor Coil Cleaning)	2.4	529.0	\$1,352
254	Ceiling R-11 to R-38 Insulation (base ASHP)	0.1	529.1	\$1,442
115	Duct Repair	1.3	530.4	\$1,627
303	LEDs (base HE incandescent<1.15 hrs/day)	2.2	532.6	\$1,802
981	Plug Load Controls - Smart Power Strip	0.6	533.2	\$1,871
205	Ceiling R-11 to R-49 Insulation (base space heating)	0.9	534.1	\$2,045
411	Refrigerator - Early Replacement (Energy Star)	1.1	535.2	\$2,195
256	Ceiling R-19 to R-38 Insulation (base ASHP)	17.0	552.1	\$2,468
207	Ceiling R-19 to R-49 Insulation (base space heating)	17.6	569.8	\$2,613
509	Energy Star CW CEE Tier 2 (MEF=2.0) (base WH)	0.1	569.9	\$2,781
148	Ceiling R-11 to R-38 Insulation (base RAC)	1.4	571.3	\$2,826
105	AC Maintenance and/or tune-up	1.1	572.4	\$3,188
611	Heat Pump Dryer	0.1	572.5	\$3,222
402	HE Refrigerator (CEE Tier 2)	0.1	572.6	\$3,310
507	Solar Domestic Water Heating	0.1	572.7	\$3,789
341	LEDs (base CFL < 1.15 hrs/day)	0.5	573.2	\$4,256
372	Photocell/timerlock (outdoor) (base CFL >5 hrs/day)	0.2	573.3	\$4,326
253	Ceiling R-0 to R-49 Insulation (base ASHP)	0.8	574.2	\$4,420
144	Single Pane Windows to ENERGY STAR (base RAC)	0.1	574.3	\$4,758
258	Wall Blow-in R-0 to R-13 Insulation (base ASHP)	0.6	574.9	\$4,952
811	Variable Speed Pool Pump (1.5 hp)	1.0	575.9	\$5,678
511	Energy Star Dishwasher (EF=0.72) (base WH)	0.0	575.9	\$7,553
601	Energy Star CW CEE Tier 2 (MEF=2.0) (base CW)	0.0	575.9	\$7,754
108	Ceiling R-0 to R-49 Insulation (base split-system)	0.1	576.1	\$8,970
255	Ceiling R-11 to R-49 Insulation (base ASHP)	0.1	576.1	\$15,263
147	Ceiling R-0 to R-49 Insulation (base RAC)	0.6	576.8	\$15,678
151	Ceiling R-19 to R-49 Insulation (base RAC)	0.0	576.8	\$24,484
213	Single Pane Windows to ENERGY STAR(base space heating)	0.0	576.8	\$122,137
143	Ceiling Fans (base RAC)	0.0	576.8	N/A
362	Photocell/timerlock (outdoor) (base CFL 2.15-5 hrs/day)	0.0	576.8	N/A
982	Energy Star Ventilating Fans	0.0	576.8	N/A
109	Ceiling R-11 to R-38 Insulation (base split-system)	0.0	576.8	N/A
149	Ceiling R-11 to R-49 Insulation (base RAC)	0.0	576.8	N/A
257	Ceiling R-19 to R-49 Insulation (base ASHP)	0.0	576.8	N/A
264	Double Pane Windows to ENERGY STAR (base ASHP)	0.0	576.8	N/A
103	AC Maintenance (Indoor Coil Cleaning)	0.0	576.8	N/A
332	CFL 15W - Specialty (base HE incandescent >5 hrs/day)	0.0	576.8	N/A
122	Single Pane Windows to ENERGY STAR (base split-system)	0.0	576.8	N/A

APPENDIX G

Residential Electric Existing Construction

Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost \$/kWh
322	CFL 15W - Specialty (base HE incandescent 2.15-5 hrs/day)	0.2	1,784.3	\$0.792
602	Tier 3 CW (MEF=2.20) (base CW)	7.1	1,791.4	\$0.834
154	Infiltration Reduction (base RAC)	0.1	1,791.5	\$0.935
209	Basement insulation R-11 (base space heating)	0.1	1,791.6	\$0.989
251	High Efficiency Air Source Heat Pump, 15 SEER, 8.2 HSPF	1.4	1,793.0	\$1.042
352	Photocell/timeclock (outdoor) (base CFL 1.15-2.15 hrs/day)	0.8	1,793.8	\$1.100
112	Ceiling R-19 to R-49 Insulation (base split-system)	2.2	1,796.0	\$1.833
110	Ceiling R-11 to R-49 Insulation (base split-system)	0.2	1,796.2	\$2.090
145	Double Pane with Glazing to Energy Star (base RAC)	0.1	1,796.3	\$2.457
263	Single Pane Windows to ENERGY STAR(base ASHP)	1.7	1,798.0	\$2.641
119	Sealed Attic w/Sprayed Foam Insulated Roof Deck (base split-system)	1.3	1,799.3	\$2.867
259	Basement insulation R-11 (base ASHP)	0.1	1,799.3	\$2.870
342	Photocell/timeclock (outdoor) (base CFL < 1.15 hrs/day)	0.1	1,799.4	\$3.003
113	Comprehensive Shell Air Sealing - Inf. Reduction (base split-system)	0.9	1,800.4	\$3.212
701	Energy Star Dishwasher (EF=0.72) (base DW)	0.4	1,800.8	\$3.565
123	Double Pane Windows to ENERGY STAR (base split-system)	1.0	1,801.8	\$10.169
510	Tier 3 CW (MEF=2.20) (base WH)	0.2	1,802.0	\$17.934

SUPPLY CURVE DATA

Residential Electric Existing Construction

Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost \$/kW
322	CFL 15W - Specialty (base HE incandescent 2.15-5 hrs/day)	0.0	576.8	N/A
602	Tier 3 CW (MEF=2.20) (base CW)	0.0	576.8	N/A
154	Infiltration Reduction (base RAC)	0.0	576.8	N/A
209	Basement insulation R-11 (base space heating)	0.0	576.8	N/A
251	High Efficiency Air Source Heat Pump, 15 SEER, 8.2 HSPF	0.0	576.8	N/A
352	Photocell/timeclock (outdoor) (base CFL 1.15-2.15 hrs/day)	0.0	576.8	N/A
112	Ceiling R-19 to R-49 Insulation (base split-system)	0.0	576.8	N/A
110	Ceiling R-11 to R-49 Insulation (base split-system)	0.0	576.8	N/A
145	Double Pane with Glazing to Energy Star (base RAC)	0.0	576.8	N/A
263	Single Pane Windows to ENERGY STAR(base ASHP)	0.0	576.8	N/A
119	Sealed Attic w/Sprayed Foam Insulated Roof Deck (base split-system)	0.0	576.8	N/A
259	Basement insulation R-11 (base ASHP)	0.0	576.8	N/A
342	Photocell/timeclock (outdoor) (base CFL < 1.15 hrs/day)	0.0	576.8	N/A
113	Comprehensive Shell Air Sealing - Inf. Reduction (base split-system)	0.0	576.8	N/A
701	Energy Star Dishwasher (EF=0.72) (base DW)	0.0	576.8	N/A
123	Double Pane Windows to ENERGY STAR (base split-system)	0.0	576.8	N/A
510	Tier 3 CW (MEF=2.20) (base WH)	0.0	576.8	N/A

APPENDIX G

SUPPLY CURVE DATA

Residential Electric New Construction

Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost \$/kWH
101	2011 Austin Green Building Home	44.8	44.8	\$0.057

Residential Electric New Construction

Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost \$/kW
101	2011 Austin Green Building Home	17.9	17.9	\$142

APPENDIX G

SUPPLY CURVE DATA

Commercial Electric Existing Construction

Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost \$/kWh
528	Energy-Star Refrigerator, glass door	1.0	1.0	\$0.000
529	Energy-Star Freezer, glass door	5.8	6.8	\$0.000
651	Data Center Improved Operations	10.2	17.0	\$0.001
530	Energy Star Ice Machines	0.6	17.6	\$0.003
132	Cold Cathode Lamps	2.7	20.2	\$0.003
652	Data Center Best Practices	11.5	31.7	\$0.003
131	CFL Screw-in 18W	49.3	81.1	\$0.004
523	Freezer-Cooler Replacement Gaskets (self-contained)	1.7	82.8	\$0.004
509	Demand Defrost Electric	0.0	82.8	\$0.004
105	Occupancy Sensor, 4L4' Fluorescent Fixtures	63.1	145.9	\$0.006
653	Data Center State of the Art practices	4.4	150.3	\$0.007
504	Efficient compressor motor retrofit	0.0	150.4	\$0.007
506	Floating head pressure controls	0.0	150.4	\$0.008
201	Outdoor Lighting Controls (Photocell/Timeclock)	28.9	179.3	\$0.008
115	Occupancy Sensor, 2L4' Fluorescent Fixtures	25.6	204.9	\$0.008
401	Fan Motor, 5hp, 1800rpm, 89.5%	7.6	212.5	\$0.010
602	PC Network Power Management Enabling	73.9	286.4	\$0.010
527	Energy-Star Freezer, solid door	2.2	288.6	\$0.010
522	Night covers for display cases (self-contained)	0.4	289.0	\$0.011
526	Energy-Star Refrigerator, solid door	0.8	289.8	\$0.012
703	Efficient Steamer	19.2	309.1	\$0.012
123	Occupancy Sensor, 4L8' Fluorescent Fixtures	2.9	312.0	\$0.013
511	Freezer-Cooler Replacement Gaskets (built-up systems)	1.2	313.2	\$0.013
508	Demand Hot Gas Defrost	0.8	314.0	\$0.015
161	High Bay T5	9.5	323.5	\$0.015
186	Parking Garage Low Wattage T8 Lamps replacing 32W lamps	0.6	324.1	\$0.016
510	Anti-sweat (humidistat) controls	0.1	324.2	\$0.016
631	Energy Star or Better Copier	0.6	324.8	\$0.016
181	High-efficiency fluorescent parking garage fixture (Base MH)	0.4	325.2	\$0.017
702	Efficient Fryer	2.9	328.1	\$0.017
402	Variable Speed Drive Control, 5 HP	106.3	434.4	\$0.017
114	Lighting Control Tuneup	10.6	445.0	\$0.018
611	Energy Star or Better Monitor-CRT	0.6	445.6	\$0.021
165	Occupancy Sensor, High Bay T5	0.8	446.4	\$0.021
667	Heat Trap	2.3	448.8	\$0.021
107	High Performance Lighting R/R - 25% Savings, Base 4L4'T8	54.9	503.7	\$0.023
413	Electronically Commutated Motors (ECM) on an Air Handler Unit	9.9	513.6	\$0.024
621	Energy Star or Better Monitor--LCD	23.7	537.3	\$0.025
104	Lighting Control Tuneup	23.4	560.7	\$0.027
603	Energy Star or Better PC	19.7	580.4	\$0.028
332	Aerosol Duct Sealing - DX	12.6	593.0	\$0.028
141	CFL Hardwired, Modular 18W	66.8	659.7	\$0.029
666	Heat Recovery Unit	5.0	664.7	\$0.029
503	Night covers for display cases (built-up systems)	0.5	665.2	\$0.030
412	Variable Speed Drive Control, 15 HP	15.3	680.5	\$0.031
411	Fan Motor, 15hp, 1800rpm, 92.4%	0.8	681.2	\$0.033
422	Variable Speed Drive Control, 40 HP	1.3	682.6	\$0.033
424	Demand Controlled Ventilation	14.1	696.7	\$0.033
322	DX Packaged System, EER=10.3, 10 tons, with Automated Fault Detection and Diagnostics	39.0	735.7	\$0.036
641	Printer Power Management Enabling	3.4	739.1	\$0.037
112	Delamping 1L4' F32T8	53.8	792.9	\$0.038
662	High Efficiency Water Heater (electric)	0.9	793.7	\$0.039
117	High Performance Lighting R/R - 25% Savings, Base 2L4'T8	18.4	812.1	\$0.041
102	Delamping 3L4' F32T8	66.0	878.1	\$0.043
514	Fiber Optic Case Lighting (built-up systems)	4.2	882.3	\$0.043
106	Continuous Dimming, 4L4' Fluorescent Fixtures	72.8	955.2	\$0.044
612	Monitor Power Management Enabling--CRT	0.2	955.3	\$0.046
301	Centrifugal Chiller, 0.51 kW/ton, 500 tons	19.4	974.8	\$0.048
423	Air Handler Tuneups	5.2	980.0	\$0.048
191	LED Exit Sign	2.9	982.9	\$0.053
622	Monitor Power Management Enabling--LCD	8.6	991.5	\$0.054
517	Oversized Air Cooled Condenser	1.4	992.9	\$0.054
421	Fan Motor, 40hp, 1800rpm, 94.1%	0.2	993.1	\$0.055

Commercial Electric Existing Construction

Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost \$/kW
528	Energy-Star Refrigerator, glass door	0.1	0.1	\$2
529	Energy-Star Freezer, glass door	0.8	0.9	\$3
651	Data Center Improved Operations	0.8	1.7	\$18
530	Energy Star Ice Machines	0.1	1.8	\$20
132	Cold Cathode Lamps	0.4	2.2	\$21
652	Data Center Best Practices	7.6	9.8	\$23
523	Freezer-Cooler Replacement Gaskets (self-contained)	0.2	10.1	\$26
509	Demand Defrost Electric	0.0	10.1	\$32
652	Data Center Best Practices	1.0	11.1	\$39
401	Fan Motor, 5hp, 1800rpm, 89.5%	1.7	12.8	\$43
504	Efficient compressor motor retrofit	0.0	12.8	\$48
332	Aerosol Duct Sealing - DX	6.6	19.3	\$54
653	Data Center State of the Art practices	0.5	19.9	\$56
703	Efficient Steamer	3.8	23.6	\$62
322	DX Packaged System, EER=10.3, 10 tons, with Automated Fault Detection and Diagnostics	20.4	44.1	\$68
527	Energy-Star Freezer, solid door	0.3	44.4	\$74
702	Efficient Fryer	0.6	45.0	\$84
526	Energy-Star Refrigerator, solid door	0.1	45.1	\$88
181	High-efficiency fluorescent parking garage fixture (Base MH)	0.1	45.2	\$92
511	Freezer-Cooler Replacement Gaskets (built-up systems)	0.2	45.3	\$95
161	High Bay T5	1.5	46.8	\$99
301	Centrifugal Chiller, 0.51 kW/ton, 500 tons	9.2	56.0	\$101
508	Demand Hot Gas Defrost	0.1	56.1	\$107
186	Parking Garage Low Wattage T8 Lamps replacing 32W lamps	0.1	56.2	\$108
306	VSD for Chiller Pumps and Towers	0.2	56.4	\$108
333	Ceiling/roof Insulation - DX	0.9	57.3	\$116
402	Variable Speed Drive Control, 5 HP	14.7	71.9	\$126
105	Occupancy Sensor, 4L4' Fluorescent Fixtures	2.7	74.6	\$134
602	PC Network Power Management Enabling	5.5	80.2	\$138
303	EMS - Chiller	2.6	82.8	\$142
311	High Efficiency Chiller Motors	0.1	82.8	\$150
309	Ceiling/roof Insulation - Chiller	0.4	83.2	\$159
667	Heat Trap	0.3	83.5	\$164
115	Occupancy Sensor, 2L4' Fluorescent Fixtures	1.2	84.7	\$170
631	Energy Star or Better Copier	0.1	84.8	\$172
411	Fan Motor, 15hp, 1800rpm, 92.4%	0.1	84.9	\$176
341	HE PTAC, EER=9.6, 1 ton	2.6	87.5	\$180
141	CFL Hardwired, Modular 18W	10.4	97.9	\$187
666	Heat Recovery Unit	0.7	98.6	\$198
506	Floating head pressure controls	0.0	98.6	\$205
611	Energy Star or Better Monitor-CRT	0.1	98.7	\$206
413	Electronically Commutated Motors (ECM) on an Air Handler Unit	1.1	99.8	\$214
422	Variable Speed Drive Control, 40 HP	0.2	100.0	\$223
510	Anti-sweat (humidistat) controls	0.0	100.0	\$224
423	Air Handler Tuneups	1.1	101.1	\$227
330	Optimize Controls - DX	1.8	102.9	\$231
421	Fan Motor, 40hp, 1800rpm, 94.1%	0.1	103.0	\$232
112	Delamping 1L4' F32T8	8.7	111.7	\$233
335	DX Coil Cleaning	5.7	117.4	\$234
342	Hotel Room Controllers	2.4	119.8	\$253
424	Demand Controlled Ventilation	1.7	121.6	\$272
123	Occupancy Sensor, 4L8' Fluorescent Fixtures	0.1	121.7	\$276
331	Economizer - DX	11.4	133.1	\$276
412	Variable Speed Drive Control, 15 HP	1.7	134.8	\$276
201	Outdoor Lighting Controls (Photocell/Timeclock)	0.8	135.6	\$279
621	Energy Star or Better Monitor--LCD	2.1	137.7	\$283
102	Delamping 3L4' F32T8	9.8	147.6	\$286
662	High Efficiency Water Heater (electric)	0.1	147.7	\$300
107	High Performance Lighting R/R - 25% Savings, Base 4L4'T8	4.1	151.7	\$313
514	Fiber Optic Case Lighting (built-up systems)	0.6	152.3	\$315
603	Energy Star or Better PC	1.7	154.0	\$324
191	LED Exit Sign	0.4	154.5	\$371
114	Lighting Control Tuneup	0.5	155.0	\$380

APPENDIX G

SUPPLY CURVE DATA

Commercial Electric Existing Construction

Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost \$/kWh
306	VSD for Chiller Pumps and Towers	0.5	993.6	\$0.057
125	High Performance Lighting R/R - 25% Savings, Base Other Fluorescent	2.6	996.2	\$0.060
311	High Efficiency Chiller Motors	0.1	996.3	\$0.064
664	Tankless Water Heater	2.3	998.6	\$0.064
501	High-efficiency fan motors	1.7	1,000.3	\$0.064
505	Compressor VSD retrofit	1.8	1,002.1	\$0.066
122	Lighting Control Tuneup	1.1	1,003.2	\$0.067
121	ROB Premium T8 (base other fluorescent)	5.2	1,008.4	\$0.068
303	EMS - Chiller	5.4	1,013.8	\$0.068
333	Ceiling/roof Insulation - DX	1.4	1,015.1	\$0.073
116	Continuous Dimming, 2L4' Fluorescent Fixtures	27.7	1,042.8	\$0.074
668	Solar Water Heater	8.9	1,051.7	\$0.074
330	Optimize Controls - DX	5.4	1,057.1	\$0.075
309	Ceiling/roof Insulation - Chiller	0.7	1,057.8	\$0.080
331	Economizer - DX	35.1	1,092.9	\$0.089
516	Multiplex Compressor System	0.1	1,093.0	\$0.091
632	Copier Power Management Enabling	0.2	1,093.2	\$0.091
524	Bi-level LED Case Lighting (self-contained units)	0.5	1,093.6	\$0.095
341	HE PTAC, EER=9.6, 1 ton	4.9	1,098.5	\$0.097
202	LED Outdoor Area Lighting	100.3	1,198.8	\$0.098
124	Continuous Dimming, 4L8' Fluorescent Fixtures	3.2	1,202.0	\$0.102
133	LED screw-in PAR replacement (base incandescent)	25.6	1,227.6	\$0.104
335	DX Coil Cleaning	11.0	1,238.5	\$0.122
342	Hotel Room Controllers	4.8	1,243.4	\$0.128
143	LED fixture replacement (base incandescent flood)	23.7	1,267.1	\$0.133
151	LED screw-in replacement (base CFL)	14.7	1,281.8	\$0.138
305	Chiller Tune Up/Diagnostics	0.3	1,282.1	\$0.141
507	Refrigeration Commissioning	0.2	1,282.3	\$0.150
671	Vending Misers	0.8	1,283.1	\$0.151
326	Prog. Thermostat - DX	7.7	1,290.7	\$0.154
321	DX Tune Up/ Advanced Diagnostics	3.4	1,294.2	\$0.157
414	Energy Recovery Ventilation (ERV)	6.1	1,300.3	\$0.170
337	Geothermal Heat Pump, EER=13, 10 tons - DX	6.6	1,306.9	\$0.223
704	Energy Star Hot Food Holding Cabinets	1.7	1,308.6	\$0.227
663	Hot Water Pipe Insulation	0.3	1,308.9	\$0.240
661	Demand controlled circulating systems	0.6	1,309.5	\$0.250
302	Window Film (Standard) - Chiller	0.3	1,309.8	\$0.365
701	Convection Oven	0.4	1,310.2	\$0.561
325	Window Film (Standard) - DX	5.1	1,315.3	\$0.573
512	High R-Value Glass Doors	0.1	1,315.4	\$0.749
203	Bi-Level LED Outdoor Lighting	16.9	1,332.3	\$0.795
324	DX Packaged System, EER=13.4, 10 tons	70.1	1,402.3	\$1.224
334	Duct/Pipe Insulation - DX	2.3	1,404.7	\$1.785
521	Strip curtains for walk-ins	0.2	1,404.9	\$1.822
310	Duct/Pipe Insulation - Chiller	0.5	1,405.4	\$2.588
182	Bi-Level LED Parking Garage Fixtures (Base MH)	0.0	1,405.4	N/A
901	XMisc	0.0	1,405.4	N/A

Commercial Electric Existing Construction

Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost \$/kW
321	DX Tune Up/ Advanced Diagnostics	1.4	156.4	\$380
517	Oversized Air Cooled Condenser	0.2	156.6	\$393
305	Chiller Tune Up/Diagnostics	0.1	156.7	\$406
337	Geothermal Heat Pump, EER=13, 10 tons - DX	3.5	160.2	\$424
121	ROB Premium T8 (base other fluorescent)	0.8	161.0	\$437
326	Prog. Thermostat - DX	2.7	163.7	\$438
641	Printer Power Management Enabling	0.3	163.9	\$452
165	Occupancy Sensor, High Bay T5	0.0	164.0	\$461
501	High-efficiency fan motors	0.2	164.2	\$470
117	High Performance Lighting R/R - 25% Savings, Base 2L4T8	1.5	165.7	\$503
664	Tankless Water Heater	0.3	166.0	\$508
612	Monitor Power Management Enabling--CRT	0.0	166.0	\$529
104	Lighting Control Tuneup	1.0	167.0	\$610
668	Solar Water Heater	1.0	168.1	\$637
516	Multiplex Compressor System	0.0	168.1	\$641
133	LED screw-in PAR replacement (base incandescent)	4.0	172.1	\$666
622	Monitor Power Management Enabling--LCD	0.6	172.7	\$716
302	Window Film (Standard) - Chiller	0.1	172.8	\$741
125	High Performance Lighting R/R - 25% Savings, Base Other Fluorescent	0.2	173.0	\$760
414	Energy Recovery Ventilation (ERV)	1.2	174.3	\$841
143	LED fixture replacement (base incandescent flood)	3.7	178.0	\$856
202	LED Outdoor Area Lighting	11.5	189.5	\$857
151	LED screw-in replacement (base CFL)	2.3	191.7	\$891
524	Bi-level LED Case Lighting (self-contained units)	0.0	191.8	\$894
505	Compressor VSD retrofit	0.1	191.9	\$965
106	Continuous Dimming, 4L4' Fluorescent Fixtures	3.2	195.1	\$1,005
632	Copier Power Management Enabling	0.0	195.1	\$1,082
507	Refrigeration Commissioning	0.0	195.1	\$1,085
325	Window Film (Standard) - DX	2.6	197.7	\$1,121
122	Lighting Control Tuneup	0.1	197.8	\$1,459
116	Continuous Dimming, 2L4' Fluorescent Fixtures	1.3	199.1	\$1,559
663	Hot Water Pipe Insulation	0.0	199.1	\$1,797
704	Energy Star Hot Food Holding Cabinets	0.2	199.3	\$1,879
671	Vending Misers	0.1	199.4	\$1,958
124	Continuous Dimming, 4L8' Fluorescent Fixtures	0.1	199.5	\$2,215
324	DX Packaged System, EER=13.4, 10 tons	36.9	236.4	\$2,324
334	Duct/Pipe Insulation - DX	1.2	237.7	\$3,348
661	Demand controlled circulating systems	0.0	237.7	\$4,351
701	Convection Oven	0.1	237.8	\$4,889
512	High R-Value Glass Doors	0.0	237.8	\$5,310
310	Duct/Pipe Insulation - Chiller	0.2	238.0	\$5,656
203	Bi-Level LED Outdoor Lighting	2.0	240.0	\$6,837
521	Strip curtains for walk-ins	0.0	240.0	\$13,769
182	Bi-Level LED Parking Garage Fixtures (Base MH)	0.0	240.0	N/A
503	Night covers for display cases (built-up systems)	0.0	240.0	N/A
522	Night covers for display cases (self-contained)	0.0	240.0	N/A
901	XMisc	0.0	240.0	N/A

APPENDIX G

Commercial Electric New Construction

Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost \$/kWh
206	High Performance Building/Int Design - Tier 2 30% - Grocery	9.1	9.1	\$0.007
306	High Performance Building/Int Design - Tier 3 50% - Grocery	3.4	12.5	\$0.007
406	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Grocery	0.5	13.0	\$0.008
106	High Performance Building/Int Design - Tier 1 15% - Grocery	5.7	18.7	\$0.010
203	High Performance Building/Int Design - Tier 2 30% - Restaurant	15.1	33.8	\$0.022
303	High Performance Building/Int Design - Tier 3 50% - Restaurant	5.7	39.4	\$0.023
403	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Restaurant	0.9	40.3	\$0.025
202	High Performance Building/Int Design - Tier 2 30% - Office	82.3	122.6	\$0.030
103	High Performance Building/Int Design - Tier 1 15% - Restaurant	9.4	132.0	\$0.030
302	High Performance Building/Int Design - Tier 3 50% - Office	30.9	162.9	\$0.031
402	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Office	4.8	167.7	\$0.035
209	High Performance Building/Int Design - Tier 2 30% - College	18.0	185.6	\$0.039
309	High Performance Building/Int Design - Tier 3 50% - College	6.7	192.4	\$0.040
102	High Performance Building/Int Design - Tier 1 15% - Office	51.4	243.8	\$0.042
212	High Performance Building/Int Design - Tier 2 30% - City of Austin	7.5	251.3	\$0.042
312	High Performance Building/Int Design - Tier 3 50% - City of Austin	2.8	254.1	\$0.044
409	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - College	1.0	255.2	\$0.045
210	High Performance Building/Int Design - Tier 2 30% - Health	8.9	264.1	\$0.046
310	High Performance Building/Int Design - Tier 3 50% - Health	3.3	267.4	\$0.048
412	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - City of Austin	0.4	267.8	\$0.049
410	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Health	0.5	268.4	\$0.054
109	High Performance Building/Int Design - Tier 1 15% - College	11.2	279.6	\$0.054
211	High Performance Building/Int Design - Tier 2 30% - Lodging	5.4	285.0	\$0.055
311	High Performance Building/Int Design - Tier 3 50% - Lodging	2.0	287.0	\$0.058
112	High Performance Building/Int Design - Tier 1 15% - City of Austin	4.7	291.7	\$0.058
110	High Performance Building/Int Design - Tier 1 15% - Health	5.5	297.2	\$0.064
411	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Lodging	0.3	297.5	\$0.065
208	High Performance Building/Int Design - Tier 2 30% - School	10.8	308.3	\$0.067
308	High Performance Building/Int Design - Tier 3 50% - School	4.0	312.4	\$0.070
205	High Performance Building/Int Design - Tier 2 30% - Retail	27.8	340.1	\$0.070
207	High Performance Building/Int Design - Tier 2 30% - Warehouse	3.9	344.1	\$0.070
213	High Performance Building/Int Design - Tier 2 30% - Miscellaneous	16.6	360.6	\$0.072
305	High Performance Building/Int Design - Tier 3 50% - Retail	10.4	371.0	\$0.074
307	High Performance Building/Int Design - Tier 3 50% - Warehouse	1.5	372.5	\$0.074
313	High Performance Building/Int Design - Tier 3 50% - Miscellaneous	6.2	378.7	\$0.075
111	High Performance Building/Int Design - Tier 1 15% - Lodging	3.4	382.1	\$0.077
408	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - School	0.6	382.7	\$0.079
405	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Retail	1.6	384.3	\$0.083
407	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Warehouse	0.2	384.6	\$0.083
413	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Miscellaneous	1.0	385.5	\$0.084
108	High Performance Building/Int Design - Tier 1 15% - School	6.7	392.3	\$0.093
105	High Performance Building/Int Design - Tier 1 15% - Retail	17.3	409.6	\$0.098
107	High Performance Building/Int Design - Tier 1 15% - Warehouse	2.5	412.1	\$0.099
113	High Performance Building/Int Design - Tier 1 15% - Miscellaneous	10.4	422.4	\$0.100

SUPPLY CURVE DATA

Commercial Electric New Construction

Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost \$/kW
206	High Performance Building/Int Design - Tier 2 30% - Grocery	1.5	1.5	\$43
306	High Performance Building/Int Design - Tier 3 50% - Grocery	0.6	2.0	\$45
406	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Grocery	0.1	2.1	\$51
106	High Performance Building/Int Design - Tier 1 15% - Grocery	0.9	3.1	\$60
203	High Performance Building/Int Design - Tier 2 30% - Restaurant	3.1	6.2	\$103
303	High Performance Building/Int Design - Tier 3 50% - Restaurant	1.2	7.4	\$109
403	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Restaurant	0.2	7.6	\$122
103	High Performance Building/Int Design - Tier 1 15% - Restaurant	2.0	9.5	\$145
202	High Performance Building/Int Design - Tier 2 30% - Office	14.7	24.2	\$167
302	High Performance Building/Int Design - Tier 3 50% - Office	5.5	29.8	\$175
209	High Performance Building/Int Design - Tier 2 30% - College	3.6	33.4	\$192
402	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Office	0.9	34.2	\$196
309	High Performance Building/Int Design - Tier 3 50% - College	1.4	35.6	\$202
409	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - College	0.2	35.8	\$226
102	High Performance Building/Int Design - Tier 1 15% - Office	9.2	45.0	\$233
212	High Performance Building/Int Design - Tier 2 30% - City of Austin	1.3	46.3	\$234
312	High Performance Building/Int Design - Tier 3 50% - City of Austin	0.5	46.8	\$246
210	High Performance Building/Int Design - Tier 2 30% - Health	1.5	48.4	\$263
109	High Performance Building/Int Design - Tier 1 15% - College	2.3	50.6	\$269
412	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - City of Austin	0.1	50.7	\$276
310	High Performance Building/Int Design - Tier 3 50% - Health	0.6	51.3	\$276
211	High Performance Building/Int Design - Tier 2 30% - Lodging	1.1	52.3	\$279
311	High Performance Building/Int Design - Tier 3 50% - Lodging	0.4	52.7	\$293
410	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Health	0.1	52.8	\$310
205	High Performance Building/Int Design - Tier 2 30% - Retail	6.0	58.8	\$325
112	High Performance Building/Int Design - Tier 1 15% - City of Austin	0.8	59.7	\$328
411	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Lodging	0.1	59.7	\$329
305	High Performance Building/Int Design - Tier 3 50% - Retail	2.3	62.0	\$341
110	High Performance Building/Int Design - Tier 1 15% - Health	1.0	62.9	\$368
405	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Retail	0.4	63.3	\$383
111	High Performance Building/Int Design - Tier 1 15% - Lodging	0.7	64.0	\$391
213	High Performance Building/Int Design - Tier 2 30% - Miscellaneous	2.9	66.9	\$402
207	High Performance Building/Int Design - Tier 2 30% - Warehouse	0.7	67.6	\$416
313	High Performance Building/Int Design - Tier 3 50% - Miscellaneous	1.1	68.7	\$422
307	High Performance Building/Int Design - Tier 3 50% - Warehouse	0.2	68.9	\$437
105	High Performance Building/Int Design - Tier 1 15% - Retail	3.8	72.7	\$455
413	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Miscellaneous	0.2	72.8	\$474
407	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Warehouse	0.0	72.9	\$491
113	High Performance Building/Int Design - Tier 1 15% - Miscellaneous	1.8	74.7	\$563
107	High Performance Building/Int Design - Tier 1 15% - Warehouse	0.4	75.1	\$583
208	High Performance Building/Int Design - Tier 2 30% - School	1.1	76.3	\$642
308	High Performance Building/Int Design - Tier 3 50% - School	0.4	76.7	\$674
408	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - School	0.1	76.8	\$756
108	High Performance Building/Int Design - Tier 1 15% - School	0.7	77.5	\$899

APPENDIX G

SUPPLY CURVE DATA

Industrial Existing Construction

Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost \$/kWh
309	Pumps - ASD (6-100 hp)	3.8	3.8	\$0.003
109	Comp Air - ASD (6-100 hp)	4.3	8.1	\$0.003
209	Fans - ASD (6-100 hp)	1.9	9.9	\$0.004
417	O&M - Extruders/Injection Moulding	0.0	10.0	\$0.005
715	Prog. Thermostat - DX	4.9	14.9	\$0.006
401	Bakery - Process (Mixing) - O&M	0.1	15.0	\$0.006
406	Gap Forming papermachine	0.0	15.0	\$0.006
403	Air conveying systems	0.0	15.1	\$0.006
407	High Consistency forming	0.0	15.1	\$0.007
409	Efficient practices printing press	1.0	16.1	\$0.007
104	Compressed Air- Sizing	7.7	23.7	\$0.007
212	Fans - ASD (100+ hp)	2.3	26.0	\$0.007
312	Pumps - ASD (100+ hp)	6.7	32.8	\$0.008
551	Efficient Refrigeration - Operations	0.4	33.2	\$0.008
112	Comp Air - ASD (100+ hp)	9.4	42.6	\$0.008
302	Pumps - Controls	13.2	55.8	\$0.009
501	Bakery - Process	0.3	56.1	\$0.010
510	Heating - Optimization process (M&T)	0.2	56.3	\$0.010
427	Drives - Optimization process (M&T)	0.4	56.7	\$0.010
103	Compressed Air - System Optimization	19.9	76.6	\$0.010
313	Pumps - Motor practices-1 (100+ HP)	1.8	78.4	\$0.011
304	Pumps - Sizing	9.5	87.8	\$0.012
113	Comp Air - Motor practices-1 (100+ HP)	0.6	88.4	\$0.012
423	Process control	0.0	88.4	\$0.013
204	Fans- Improve components	3.3	91.7	\$0.013
213	Fans - Motor practices-1 (100+ HP)	0.8	92.5	\$0.013
603	New transformers welding	0.3	92.8	\$0.015
604	Efficient processes (welding, etc.)	18.4	111.2	\$0.015
504	Top-heating (glass)	0.0	111.2	\$0.016
210	Fans - Motor practices-1 (6-100 HP)	0.7	111.9	\$0.017
701	Centrifugal Chiller, 0.51 kW/ton, 500 tons	36.1	148.0	\$0.018
310	Pumps - Motor practices-1 (6-100 HP)	1.1	149.1	\$0.018
110	Comp Air - Motor practices-1 (6-100 HP)	1.3	150.4	\$0.020
405	Drives - EE motor	0.0	150.4	\$0.020
211	Fans - Replace 100+ HP motor	2.0	152.4	\$0.021
412	Efficient drives	0.2	152.6	\$0.021
102	Compressed Air - Controls	4.9	157.4	\$0.022
429	Machinery	0.8	158.3	\$0.023
430	Efficient Machinery	0.0	158.3	\$0.023
602	Efficient desalter	0.0	158.3	\$0.023

Industrial Existing Construction

Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost \$/kW
417	O&M - Extruders/Injection Moulding	0.0	0.0	\$33
427	Drives - Optimization process (M&T)	0.1	0.1	\$41
409	Efficient practices printing press	0.1	0.2	\$44
104	Compressed Air- Sizing	1.2	1.4	\$44
510	Heating - Optimization process (M&T)	0.0	1.4	\$45
401	Bakery - Process (Mixing) - O&M	0.0	1.5	\$46
551	Efficient Refrigeration - Operations	0.1	1.5	\$55
302	Pumps - Controls	1.8	3.4	\$64
103	Compressed Air - System Optimization	3.0	6.4	\$66
701	Centrifugal Chiller, 0.51 kW/ton, 500 tons	9.7	16.0	\$67
406	Gap Forming papermachine	0.0	16.0	\$69
407	High Consistency forming	0.0	16.0	\$70
501	Bakery - Process	0.0	16.1	\$70
213	Fans - Motor practices-1 (100+ HP)	0.2	16.2	\$72
603	New transformers welding	0.1	16.3	\$74
313	Pumps - Motor practices-1 (100+ HP)	0.2	16.5	\$78
715	Prog. Thermostat - DX	0.4	16.9	\$79
113	Comp Air - Motor practices-1 (100+ HP)	0.1	17.0	\$80
304	Pumps - Sizing	1.3	18.3	\$86
402	O&M/drives spinning machines	0.0	18.3	\$92
204	Fans- Improve components	0.5	18.8	\$96
423	Process control	0.0	18.8	\$97
604	Efficient processes (welding, etc.)	2.6	21.4	\$108
902	Membranes for wastewater	0.0	21.4	\$111
210	Fans - Motor practices-1 (6-100 HP)	0.1	21.5	\$120
504	Top-heating (glass)	0.0	21.5	\$121
310	Pumps - Motor practices-1 (6-100 HP)	0.2	21.6	\$130
110	Comp Air - Motor practices-1 (6-100 HP)	0.2	21.8	\$130
713	Window Film - DX	1.1	22.9	\$137
429	Machinery	0.1	23.0	\$139
412	Efficient drives	0.0	23.1	\$142
102	Compressed Air - Controls	0.7	23.8	\$145
403	Air conveying systems	0.0	23.8	\$150
211	Fans - Replace 100+ HP motor	0.3	24.1	\$151
405	Drives - EE motor	0.0	24.1	\$161
111	Comp Air - Replace 100+ HP motor	0.2	24.2	\$173
430	Efficient Machinery	0.0	24.2	\$174
311	Pumps - Replace 100+ HP motor	0.2	24.4	\$176
602	Efficient desalter	0.0	24.4	\$177
303	Pumps - System Optimization	3.1	27.5	\$185

APPENDIX G

SUPPLY CURVE DATA

Industrial Existing Construction

Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost \$/kWh
402	O&M/drives spinning machines	0.1	158.3	\$0.023
311	Pumps - Replace 100+ HP motor	1.2	159.6	\$0.024
111	Comp Air - Replace 100+ HP motor	1.0	160.6	\$0.026
303	Pumps - System Optimization	21.7	182.3	\$0.027
511	Heating - Scheduling	0.0	182.3	\$0.027
801	RET 2L4' Premium T8, 1EB	32.9	215.2	\$0.028
428	Drives - Scheduling	0.9	216.1	\$0.028
902	Membranes for wastewater	0.0	216.1	\$0.028
512	Custom Measures--Process Heating	7.9	223.9	\$0.029
553	Custom Measures--Process Cooling	3.8	227.7	\$0.029
431	Custom Measures--Drives	5.7	233.4	\$0.029
509	Efficient Curing ovens	7.6	241.0	\$0.031
605	Custom Measures--Other Process	3.6	244.6	\$0.033
201	Fans - O&M	1.2	245.7	\$0.033
408	Optimization control PM	0.0	245.8	\$0.034
413	Clean Room - Controls	4.5	250.3	\$0.035
410	Efficient Printing press (fewer cylinders)	0.8	251.0	\$0.036
214	Optimize drying process	0.0	251.1	\$0.036
418	Extruders/injection Moulding-multipump	0.1	251.2	\$0.037
424	Process optimization	0.0	251.2	\$0.038
601	Other Process Controls (batch + site)	0.2	251.4	\$0.039
202	Fans - Controls	17.5	269.0	\$0.040
207	Fans - Motor practices-1 (1-5 HP)	0.3	269.2	\$0.040
713	Window Film - DX	3.6	272.8	\$0.040
502	Drying (UV/IR)	0.0	272.8	\$0.041
901	Replace V-belts	0.0	272.8	\$0.041
301	Pumps - O&M	4.9	277.8	\$0.042
552	Optimization Refrigeration	0.8	278.6	\$0.042
101	Compressed Air-O&M	6.1	284.7	\$0.043
804	Occupancy Sensor, 4L4' Fluorescent Fixture	4.1	288.8	\$0.043
416	Process Drives - ASD	0.0	288.8	\$0.043
415	Drives - Process Controls (batch + site)	0.3	289.2	\$0.044
414	Clean Room - New Designs	0.2	289.4	\$0.047
307	Pumps - Motor practices-1 (1-5 HP)	0.2	289.6	\$0.049
107	Comp Air - Motor practices-1 (1-5 HP)	0.3	289.9	\$0.049
420	Injection Moulding - Impulse Cooling	0.0	289.9	\$0.051
203	Fans - System Optimization	10.3	300.2	\$0.051
802	CFL Hardwired, Modular 36W	0.5	300.7	\$0.052
114	Power recovery	0.0	300.7	\$0.053
503	Heat Pumps - Drying	0.0	300.7	\$0.060

Industrial Existing Construction

Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost \$/kW
801	RET 2L4' Premium T8, 1EB	4.9	32.4	\$187
431	Custom Measures--Drives	0.9	33.3	\$194
512	Custom Measures--Process Heating	1.1	34.4	\$200
553	Custom Measures--Process Cooling	0.5	35.0	\$201
109	Comp Air - ASD (6-100 hp)	0.1	35.0	\$206
509	Efficient Curing ovens	1.1	36.1	\$212
214	Optimize drying process	0.0	36.1	\$214
209	Fans - ASD (6-100 hp)	0.0	36.2	\$216
309	Pumps - ASD (6-100 hp)	0.0	36.2	\$224
418	Extruders/injection Moulding-multipump	0.0	36.2	\$229
605	Custom Measures--Other Process	0.5	36.8	\$232
410	Efficient Printing press (fewer cylinders)	0.1	36.9	\$238
413	Clean Room - Controls	0.6	37.5	\$244
201	Fans - O&M	0.2	37.7	\$249
712	DX Packaged System, EER=10.9, 10 tons	2.2	39.9	\$257
502	Drying (UV/IR)	0.0	39.9	\$259
804	Occupancy Sensor, 4L4' Fluorescent Fixtures	0.6	40.5	\$273
901	Replace V-belts	0.0	40.5	\$276
207	Fans - Motor practices-1 (1-5 HP)	0.0	40.6	\$282
101	Compressed Air-O&M	0.9	41.5	\$285
301	Pumps - O&M	0.7	42.2	\$290
202	Fans - Controls	2.4	44.6	\$290
702	Window Film - Chiller	2.9	47.5	\$291
424	Process optimization	0.0	47.5	\$293
601	Other Process Controls (batch + site)	0.0	47.5	\$294
552	Optimization Refrigeration	0.1	47.6	\$302
420	Injection Moulding - Impulse Cooling	0.0	47.6	\$317
107	Comp Air - Motor practices-1 (1-5 HP)	0.0	47.7	\$325
416	Process Drives - ASD	0.0	47.7	\$328
415	Drives - Process Controls (batch + site)	0.0	47.7	\$336
802	CFL Hardwired, Modular 36W	0.1	47.8	\$349
307	Pumps - Motor practices-1 (1-5 HP)	0.0	47.8	\$349
503	Heat Pumps - Drying	0.0	47.8	\$355
414	Clean Room - New Designs	0.0	47.9	\$359
705	Chiller Tune Up/Diagnostics	0.7	48.6	\$362
408	Optimization control PM	0.0	48.6	\$364
114	Power recovery	0.0	48.6	\$406
703	EMS - Chiller	4.4	52.9	\$497
421	Injection Moulding - Direct drive	0.0	52.9	\$513
212	Fans - ASD (100+ hp)	0.0	53.0	\$519

APPENDIX G

SUPPLY CURVE DATA

Industrial Existing Construction

Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost \$/kWh
712	DX Packaged System, EER=10.9, 10 tons	7.5	308.2	\$0.076
702	Window Film - Chiller	10.8	319.0	\$0.078
108	Comp Air - Replace 6-100 HP motor	0.4	319.4	\$0.081
421	Injection Moulding - Direct drive	0.0	319.4	\$0.082
308	Pumps - Replace 6-100 HP motor	1.8	321.2	\$0.083
422	Efficient grinding	0.1	321.3	\$0.086
411	Light cylinders	0.3	321.7	\$0.096
208	Fans - Replace 6-100 HP motor	0.7	322.3	\$0.096
705	Chiller Tune Up/Diagnostics	2.6	324.9	\$0.097
419	Direct drive Extruders	0.1	325.0	\$0.111
703	EMS - Chiller	16.4	341.4	\$0.133
306	Pumps - ASD (1-5 hp)	0.4	341.8	\$0.142
106	Comp Air - ASD (1-5 hp)	0.4	342.2	\$0.142
206	Fans - ASD (1-5 hp)	0.2	342.4	\$0.151
706	Cooling Circ. Pumps - VSD	8.0	350.4	\$0.179
105	Comp Air - Replace 1-5 HP motor	0.2	350.6	\$0.210
305	Pumps - Replace 1-5 HP motor	0.2	350.8	\$0.214
205	Fans - Replace 1-5 HP motor	0.1	350.9	\$0.224
803	Metal Halide, 50W	37.6	388.5	\$0.286
711	DX Tune Up/ Advanced Diagnostics	5.1	393.6	\$0.295

Industrial Existing Construction

Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost \$/kW
108	Comp Air - Replace 6-100 HP motor	0.1	53.0	\$539
112	Comp Air - ASD (100+ hp)	0.1	53.2	\$548
511	Heating - Scheduling	0.0	53.2	\$549
312	Pumps - ASD (100+ hp)	0.1	53.3	\$567
308	Pumps - Replace 6-100 HP motor	0.2	53.5	\$603
411	Light cylinders	0.1	53.6	\$639
208	Fans - Replace 6-100 HP motor	0.1	53.7	\$651
422	Efficient grinding	0.0	53.7	\$661
706	Cooling Circ. Pumps - VSD	2.1	55.8	\$669
419	Direct drive Extruders	0.0	55.8	\$693
203	Fans - System Optimization	0.7	56.5	\$762
428	Drives - Scheduling	0.0	56.5	\$937
711	DX Tune Up/ Advanced Diagnostics	1.5	58.0	\$1,002
105	Comp Air - Replace 1-5 HP motor	0.0	58.1	\$1,399
305	Pumps - Replace 1-5 HP motor	0.0	58.1	\$1,552
205	Fans - Replace 1-5 HP motor	0.0	58.1	\$1,568
803	Metal Halide, 50W	5.6	63.7	\$1,915
106	Comp Air - ASD (1-5 hp)	0.0	63.7	\$9,816
306	Pumps - ASD (1-5 hp)	0.0	63.7	\$10,797
206	Fans - ASD (1-5 hp)	0.0	63.7	\$11,023

Industrial New Construction

Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost \$/kWH
101	High Performance Building/Efficient Processi	11.0	11.0	\$0.018

Industrial New Construction

Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost \$/kW
101	High Performance Building/Efficient Processes	1.6	1.6	\$123

H. **Appendix H: Achievable Program Potential**

APPENDIX H

ELECTRIC

ASSYST OUTPUT FILES

Electricity
All Segments
Total
Base

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cumulative Gross Energy - kWh	205,508,259	440,316,689	673,616,914	877,254,861	1,047,873,567	1,190,212,466	1,307,328,455	1,403,671,763	1,482,154,395	1,547,642,919
Cumulative Gross Peak Demand - kW	31,230	69,088	109,016	144,874	176,051	203,120	226,363	246,260	263,151	277,706
Cumulative Net Energy Savings - kWh	124,006,688	286,426,246	455,386,848	602,278,172	727,445,275	832,460,893	920,408,152	994,007,529	1,055,934,366	1,108,489,178
Cumulative Net Peak Demand Savings - kW	20,987	49,677	81,388	109,891	135,024	156,908	175,834	192,054	205,995	218,046
New Net Energy Savings - kWh	124,006,688	162,419,558	168,960,603	146,891,323	125,167,103	105,015,618	87,947,259	73,599,377	61,926,837	52,554,812
New Net Peak Demand Savings - kW	20,987	28,690	31,712	28,503	25,133	21,884	18,926	16,220	13,941	12,052

Administration Costs	1,834,262	2,281,681	2,537,732	2,416,491	2,258,219	2,098,030	1,946,520	1,809,481	1,688,342	1,583,374
Marketing Costs	2,446,211	2,446,211	2,446,211	2,446,211	2,446,211	2,446,211	2,446,211	2,446,211	2,446,211	2,446,211
Incentives Costs	12,495,306	17,626,909	20,505,491	19,291,889	17,606,773	15,774,664	13,972,038	12,304,604	10,815,704	9,518,251
Total	16,775,779	22,354,801	25,489,434	24,154,592	22,311,203	20,318,906	18,364,770	16,560,297	14,950,258	13,547,836

PV Net Avoided Cost Benefits	165,888,136	218,994,308	231,958,051	203,158,839	173,974,986	147,002,057	123,686,170	103,473,878	86,903,566	73,502,119
PV Annual Program Marketing and Admin Costs	4,280,473	4,659,702	4,841,212	4,655,318	4,438,837	4,225,850	4,026,037	3,844,182	3,680,890	3,535,697
PV Net Measure Costs	38,613,977	55,427,241	64,347,280	60,403,083	55,135,496	49,370,113	43,805,880	38,313,633	33,374,152	29,090,569
TRC Ratio	3.87	3.64	3.35	3.12	2.92	2.74	2.59	2.45	2.35	2.25

Free Riders - kWh	81,501,572	153,890,443	218,230,065	274,976,690	320,428,293	357,751,573	386,920,303	409,664,233	426,220,029	439,153,741
Free Riders - kW	10,244	19,412	27,627	34,983	41,028	46,212	50,529	54,206	57,156	59,660
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.14	\$0.14	\$0.15	\$0.16	\$0.18	\$0.19	\$0.21	\$0.23	\$0.24	\$0.26
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PV Annual Program Costs	16,775,779	22,032,376	24,759,464	23,114,048	21,041,357	18,885,172	16,821,784	14,949,213	13,300,262	11,877,932
PV Lost Revenue	129,330,277	168,110,935	173,037,704	150,696,776	126,737,237	104,977,791	86,887,048	71,758,468	59,522,044	49,813,333
RIM	1.14	1.15	1.17	1.17	1.18	1.19	1.19	1.19	1.19	1.19

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Cumulative Gross Energy - kWh	2,568,524,307	2,649,198,011	2,717,559,046	2,776,663,179	2,828,268,089	2,873,645,879	2,913,517,568	2,949,002,641	2,980,447,114	3,008,562,757
Cumulative Gross Peak Demand - kW	354,781	368,885	381,113	391,905	401,522	410,160	417,944	425,037	431,491	437,417
Cumulative Net Energy Savings - kWh	1,940,846,623	2,010,541,771	2,070,602,903	2,123,023,674	2,169,125,528	2,209,989,006	2,246,333,486	2,279,015,702	2,308,259,701	2,334,613,896
Cumulative Net Peak Demand Savings - kW	291,284	303,803	314,765	324,477	333,153	340,973	348,076	354,587	360,548	366,046
New Net Energy Savings - kWh	80,643,647	69,695,149	60,061,132	52,420,771	46,101,854	40,863,478	36,344,479	32,682,216	29,244,000	26,354,194
New Net Peak Demand Savings - kW	14,326	12,519	10,962	9,712	8,675	7,821	7,102	6,511	5,960	5,499
Program Costs - Real										
Administration Costs	2,190,659	2,114,592	2,049,283	1,993,986	1,947,153	1,904,524	1,868,618	1,837,830	1,804,583	1,777,132
Marketing Costs	2,632,278	2,632,278	2,632,278	2,632,278	2,632,278	2,632,278	2,632,278	2,632,278	2,632,278	2,632,278
Incentives Costs	10,278,343	9,092,093	8,077,714	7,217,759	6,490,311	5,860,669	5,329,485	4,878,330	4,460,275	4,106,770
Total	15,101,279	13,838,963	12,759,274	11,844,022	11,069,742	10,397,470	9,830,380	9,348,437	8,897,135	8,516,179

PV Net Avoided Cost Benefits	96,474,260	82,682,082	70,860,800	61,480,000	53,775,957	47,444,618	42,101,059	37,743,867	33,742,996	30,396,265
PV Annual Program Marketing and Admin Costs	4,170,775	4,045,788	3,932,575	3,830,075	3,736,619	3,648,444	3,567,363	3,491,861	3,415,901	3,345,803
PV Net Measure Costs	37,737,648	33,153,766	29,132,195	25,755,357	22,900,640	20,490,860	18,433,723	16,728,964	15,176,819	13,855,153
TRC Ratio	2.30	2.22	2.14	2.08	2.02	1.97	1.91	1.87	1.81	1.77

Free Riders - kWh	627,677,685	638,656,239	646,956,142	653,639,505	659,142,560	663,656,873	667,184,082	669,986,939	672,187,413	673,948,861
Free Riders - kW	63,497	65,081	66,348	67,428	68,370	69,187	69,868	70,450	70,943	71,371
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.19	\$0.20	\$0.21	\$0.23	\$0.24	\$0.25	\$0.27	\$0.29	\$0.30	\$0.32
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PV Annual Program Costs	13,058,651	11,794,488	10,717,474	9,805,202	9,032,037	8,361,163	7,791,124	7,302,301	6,849,544	6,461,703
PV Lost Revenue	83,225,063	70,915,251	60,263,178	51,864,738	44,978,673	39,313,865	34,482,180	30,576,470	26,983,727	23,982,599
RIM	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

APPENDIX H

ELECTRIC

ASSYST OUTPUT FILES

Electricity
Commercial
Total
Base

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cumulative Gross Energy - kWh	92,593,165	206,415,384	323,470,421	434,721,782	531,716,723	614,347,507	683,093,873	739,871,344	786,101,689	824,455,933
Cumulative Gross Peak Demand - kW	10,814	24,648	39,429	54,171	67,602	79,583	89,994	98,915	106,424	112,831
Cumulative Net Energy Savings - kWh	60,171,188	143,593,188	232,694,107	317,950,952	391,608,859	453,916,245	506,669,399	551,019,095	588,336,795	620,067,658
Cumulative Net Peak Demand Savings - kW	7,806	18,767	30,880	43,093	54,230	64,147	72,859	80,345	86,766	92,319
New Net Energy Savings - kWh	60,171,188	83,422,000	89,100,918	85,256,845	73,657,908	62,307,386	52,753,154	44,349,695	37,317,700	31,730,864
New Net Peak Demand Savings - kW	7,806	10,961	12,113	12,213	11,137	9,917	8,712	7,486	6,422	5,553

Administration Costs	695,340	827,870	902,563	930,196	924,376	899,380	864,976	828,281	792,689	760,421
Marketing Costs	877,426	877,426	877,426	877,426	877,426	877,426	877,426	877,426	877,426	877,426
Incentives Costs	3,754,491	5,533,548	6,492,528	6,780,203	6,599,098	6,148,811	5,575,305	4,976,536	4,405,105	3,888,645
Total Costs	5,327,256	7,238,844	8,272,517	8,587,825	8,400,900	7,925,617	7,317,707	6,682,243	6,075,220	5,526,492

PV Net Avoided Cost Benefits	70,701,312	97,145,314	103,847,625	100,994,574	88,316,108	75,589,075	64,338,328	53,933,778	45,181,137	38,201,361
PV Annual Program Marketing and Admin Costs	1,572,766	1,680,700	1,729,013	1,730,530	1,700,079	1,652,314	1,596,950	1,540,771	1,486,862	1,437,103
PV Net Measure Costs	15,938,585	22,188,750	25,306,559	25,991,917	25,025,681	23,267,121	21,259,833	18,826,045	16,480,919	14,402,000
TRC Ratio	4.04	4.07	3.84	3.64	3.30	3.03	2.81	2.65	2.51	2.41

Free Riders - kWh	32,421,977	62,822,195	90,776,315	116,770,830	140,107,863	160,431,262	176,424,474	188,852,249	197,764,894	204,388,274
Free Riders - kW	3,009	5,881	8,549	11,078	13,372	15,436	17,136	18,571	19,658	20,512
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.09	\$0.09	\$0.09	\$0.10	\$0.11	\$0.13	\$0.14	\$0.15	\$0.16	\$0.17
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PV Annual Program Costs	5,327,256	7,134,438	8,035,607	8,221,199	7,926,252	7,369,949	6,706,489	6,035,779	5,408,344	4,848,898
PV Lost Revenue	71,025,259	97,049,960	102,161,549	96,887,739	82,572,572	68,922,002	57,590,662	47,750,909	39,616,042	33,210,213
RIM	0.93	0.93	0.94	0.96	0.98	0.99	1.00	1.00	1.00	1.00

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Cumulative Gross Energy - kWh	856,174,769	883,066,004	905,853,015	925,554,393	942,756,030	957,881,960	971,172,523	983,000,880	993,482,371	1,002,854,252
Cumulative Gross Peak Demand - kW	118,260	122,962	127,038	130,635	133,841	136,720	139,315	141,679	143,830	145,806
Cumulative Net Energy Savings - kWh	646,948,874	670,180,590	690,200,968	707,674,558	723,041,843	736,663,002	748,777,829	759,671,901	769,419,900	778,204,632
Cumulative Net Peak Demand Savings - kW	97,095	101,268	104,922	108,159	111,051	113,658	116,025	118,196	120,183	122,015
New Net Energy Savings - kWh	26,881,216	23,231,716	20,020,377	17,473,590	15,367,285	13,621,159	12,114,826	10,894,072	9,748,000	8,784,731
New Net Peak Demand Savings - kW	4,775	4,173	3,654	3,237	2,892	2,607	2,367	2,170	1,987	1,833

Administration Costs	730,220	704,864	683,094	664,662	649,051	634,841	622,873	612,610	601,528	592,377
Marketing Costs	877,426	877,426	877,426	877,426	877,426	877,426	877,426	877,426	877,426	877,426
Incentives Costs	3,426,114	3,030,698	2,692,571	2,405,920	2,163,437	1,953,556	1,776,495	1,626,110	1,486,758	1,368,923
Total Costs	5,033,760	4,612,988	4,253,091	3,948,007	3,689,914	3,465,823	3,276,793	3,116,146	2,965,712	2,838,726

PV Net Avoided Cost Benefits	32,158,087	27,560,694	23,620,267	20,493,333	17,925,319	15,814,873	14,033,686	12,581,289	11,247,665	10,132,088
PV Annual Program Marketing and Admin Costs	1,390,258	1,348,596	1,310,858	1,276,692	1,245,540	1,216,148	1,189,121	1,163,954	1,138,634	1,115,268
PV Net Measure Costs	12,579,216	11,051,255	9,710,732	8,585,119	7,633,547	6,830,287	6,144,574	5,576,321	5,058,940	4,618,384
TRC Ratio	2.30	2.22	2.14	2.08	2.02	1.97	1.91	1.87	1.81	1.77

Free Riders - kWh	209,225,895	212,885,413	215,652,047	217,879,835	219,714,187	221,218,958	222,394,694	223,328,980	224,062,471	224,649,620
Free Riders - kW	21,166	21,694	22,116	22,476	22,790	23,062	23,289	23,483	23,648	23,790
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.19	\$0.20	\$0.21	\$0.23	\$0.24	\$0.25	\$0.27	\$0.29	\$0.30	\$0.32
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PV Annual Program Costs	4,352,884	3,931,496	3,572,491	3,268,401	3,010,679	2,787,054	2,597,041	2,434,100	2,283,181	2,153,901
PV Lost Revenue	27,741,688	23,638,417	20,087,726	17,288,246	14,992,891	13,104,622	11,494,060	10,192,157	8,994,576	7,994,200
RIM	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

APPENDIX H

ELECTRIC

ASSYST OUTPUT FILES

Electricity
Residential
Total
Base

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cumulative Gross Energy - kWh	94,503,827	190,461,335	278,604,255	343,544,341	391,310,936	428,099,120	456,667,146	479,271,481	496,980,537	511,552,786
Cumulative Gross Peak Demand - kW	18,188	39,094	60,628	78,105	92,298	104,135	114,077	122,518	129,685	135,892
Cumulative Net Energy Savings - kWh	49,812,228	107,567,973	162,876,589	200,784,832	229,770,997	252,652,181	270,902,203	285,599,254	297,512,170	307,266,552
Cumulative Net Peak Demand Savings - kW	11,405	26,390	42,723	55,754	66,530	75,561	83,186	89,665	95,198	99,951
New Net Energy Savings - kWh	49,812,228	57,755,745	55,308,616	37,908,243	28,986,165	22,881,184	18,250,022	14,697,051	11,912,916	9,754,381
New Net Peak Demand Savings - kW	11,405	14,984	16,334	13,031	10,776	9,032	7,625	6,479	5,533	4,752

Administration Costs	1,011,082	1,290,088	1,451,167	1,290,044	1,141,301	1,018,662	916,756	831,551	759,934	699,451
Marketing Costs	1,395,425	1,395,425	1,395,425	1,395,425	1,395,425	1,395,425	1,395,425	1,395,425	1,395,425	1,395,425
Incentives Costs	7,573,647	10,270,277	11,826,518	10,212,186	8,772,171	7,584,787	6,598,047	5,772,957	5,079,390	4,493,606
Total Costs	9,980,154	12,955,790	14,673,109	12,897,654	11,308,896	9,998,874	8,910,227	7,999,933	7,234,749	6,588,482

PV Net Avoided Cost Benefits	78,956,933	97,379,855	99,853,882	74,750,937	59,503,713	48,319,632	39,587,032	32,690,739	27,158,215	22,727,895
PV Annual Program Marketing and Admin Costs	2,406,507	2,646,779	2,765,070	2,570,938	2,393,512	2,244,944	2,119,166	2,011,635	1,918,862	1,838,117
PV Net Measure Costs	18,984,801	27,433,843	32,087,259	27,061,649	22,832,660	19,424,274	16,640,056	14,352,384	12,460,983	10,892,664
TRC Ratio	3.69	3.24	2.87	2.52	2.36	2.23	2.11	2.00	1.89	1.79

Free Riders - kWh	44,691,599	82,893,362	115,727,666	142,759,508	161,539,939	175,446,939	185,764,942	193,672,227	199,468,367	204,286,234
Free Riders - kW	6,782	12,704	17,904	22,351	25,768	28,573	30,890	32,853	34,486	35,941
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.20	\$0.22	\$0.27	\$0.34	\$0.39	\$0.44	\$0.49	\$0.54	\$0.61	\$0.68
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PV Annual Program Costs	9,980,154	12,768,928	14,252,899	12,337,632	10,660,622	9,288,628	8,156,887	7,216,968	6,431,653	5,771,832
PV Lost Revenue	46,744,158	53,788,987	51,195,937	35,003,924	26,564,092	20,781,809	16,427,855	13,111,557	10,534,683	8,548,135
RIM	1.39	1.46	1.53	1.58	1.60	1.61	1.61	1.61	1.60	1.59

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Cumulative Gross Energy - kWh	856,174,769	883,066,004	905,853,015	925,554,393	942,756,030	957,881,960	971,172,523	983,000,880	993,482,371	1,002,854,252
Cumulative Gross Peak Demand - kW	118,260	122,962	127,038	130,635	133,841	136,720	139,315	141,679	143,830	145,806
Cumulative Net Energy Savings - kWh	646,948,874	670,180,590	690,200,968	707,674,558	723,041,843	736,663,002	748,777,829	759,671,901	769,419,900	778,204,632
Cumulative Net Peak Demand Savings - kW	97,095	101,268	104,922	108,159	111,051	113,658	116,025	118,196	120,183	122,015
New Net Energy Savings - kWh	26,881,216	23,231,716	20,020,377	17,473,590	15,367,285	13,621,159	12,114,826	10,894,072	9,748,000	8,784,731
New Net Peak Demand Savings - kW	4,775	4,173	3,654	3,237	2,892	2,607	2,367	2,170	1,987	1,833
Program Costs - Real										
Administration Costs	730,220	704,864	683,094	664,662	649,051	634,841	622,873	612,610	601,528	592,377
Marketing Costs	877,426	877,426	877,426	877,426	877,426	877,426	877,426	877,426	877,426	877,426
Incentives Costs	3,426,114	3,030,698	2,692,571	2,405,920	2,163,437	1,953,556	1,776,495	1,626,110	1,486,758	1,368,923
Total Costs	5,033,760	4,612,988	4,253,091	3,948,007	3,689,914	3,465,823	3,276,793	3,116,146	2,965,712	2,838,726

PV Net Avoided Cost Benefits	32,158,087	27,560,694	23,620,267	20,493,333	17,925,319	15,814,873	14,033,686	12,581,289	11,247,665	10,132,088
PV Annual Program Marketing and Admin Costs	1,390,258	1,348,596	1,310,858	1,276,692	1,245,540	1,216,148	1,189,121	1,163,954	1,138,634	1,115,268
PV Net Measure Costs	12,579,216	11,051,255	9,710,732	8,585,119	7,633,547	6,830,287	6,144,574	5,576,321	5,058,940	4,618,384
TRC Ratio	2.30	2.22	2.14	2.08	2.02	1.97	1.91	1.87	1.81	1.77

Free Riders - kWh	209,225,895	212,885,413	215,652,047	217,879,835	219,714,187	221,218,958	222,394,694	223,328,980	224,062,471	224,649,620
Free Riders - kW	21,166	21,694	22,116	22,476	22,790	23,062	23,289	23,483	23,648	23,790
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.19	\$0.20	\$0.21	\$0.23	\$0.24	\$0.25	\$0.27	\$0.29	\$0.30	\$0.32
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PV Annual Program Costs	4,352,884	3,931,496	3,572,491	3,268,401	3,010,679	2,787,054	2,597,041	2,434,100	2,283,181	2,153,901
PV Lost Revenue	27,741,688	23,638,417	20,087,726	17,288,246	14,992,891	13,104,622	11,494,060	10,192,157	8,994,576	7,994,200
RIM	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

APPENDIX H

ELECTRIC

ASSYST OUTPUT FILES

Electricity
Industrial
Total
Base

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cumulative Gross Energy - kWh	18,411,267	43,439,970	71,542,238	98,988,739	124,845,908	147,765,839	167,567,436	184,528,937	199,072,169	211,634,201
Cumulative Gross Peak Demand - kW	2,228	5,346	8,959	12,598	16,151	19,402	22,291	24,826	27,042	28,983
Cumulative Net Energy Savings - kWh	14,023,271	35,265,084	59,816,153	83,542,388	106,065,418	125,892,466	142,836,549	157,389,180	170,085,401	181,154,968
Cumulative Net Peak Demand Savings - kW	1,776	4,520	7,785	11,044	14,264	17,200	19,789	22,043	24,030	25,776
New Net Energy Savings - kWh	14,023,271	21,241,813	24,551,069	23,726,235	22,523,031	19,827,048	16,944,083	14,552,631	12,696,221	11,069,567
New Net Peak Demand Savings - kW	1,776	2,744	3,265	3,259	3,220	2,936	2,589	2,255	1,986	1,747

Administration Costs	127,839	163,723	184,002	196,252	192,543	179,988	164,788	149,649	135,719	123,502
Marketing Costs	173,361	173,361	173,361	173,361	173,361	173,361	173,361	173,361	173,361	173,361
Incentives Costs	1,167,168	1,823,083	2,186,445	2,299,500	2,235,503	2,041,066	1,798,686	1,555,111	1,331,209	1,136,000
Total Costs	1,468,368	2,160,167	2,543,808	2,669,113	2,601,407	2,394,415	2,136,836	1,878,121	1,640,289	1,432,862

PV Net Avoided Cost Benefits	16,229,891	24,469,140	28,256,544	27,413,328	26,155,165	23,093,351	19,760,810	16,849,361	14,564,214	12,572,862
PV Annual Program Marketing and Admin Costs	301,200	332,222	347,129	353,850	345,246	328,592	309,921	291,776	275,166	260,478
PV Net Measure Costs	3,690,592	5,804,647	6,953,462	7,349,517	7,277,155	6,678,718	5,905,991	5,135,204	4,432,250	3,795,905
TRC Ratio	4.07	3.99	3.87	3.56	3.43	3.30	3.18	3.10	3.09	3.10

Free Riders - kWh	4,387,996	8,174,886	11,726,085	15,446,351	18,780,490	21,873,372	24,730,886	27,139,757	28,986,768	30,479,233
Free Riders - kW	452	826	1,174	1,554	1,887	2,202	2,503	2,783	3,012	3,207
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.10	\$0.10	\$0.10	\$0.11	\$0.12	\$0.12	\$0.13	\$0.13	\$0.13	\$0.13
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PV Annual Program Costs	1,468,368	2,129,011	2,470,958	2,555,217	2,454,482	2,226,596	1,958,408	1,696,467	1,460,265	1,257,203
PV Lost Revenue	11,560,860	17,271,988	19,680,218	18,805,113	17,600,572	15,273,980	12,868,531	10,896,002	9,371,319	8,054,985
RIM	1.25	1.26	1.28	1.28	1.30	1.32	1.33	1.34	1.34	1.35

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Cumulative Gross Energy - kWh	856,174,769	883,066,004	905,853,015	925,554,393	942,756,030	957,881,960	971,172,523	983,000,880	993,482,371	1,002,854,252
Cumulative Gross Peak Demand - kW	118,260	122,962	127,038	130,635	133,841	136,720	139,315	141,679	143,830	145,806
Cumulative Net Energy Savings - kWh	646,948,874	670,180,590	690,200,968	707,674,558	723,041,843	736,663,002	748,777,829	759,671,901	769,419,900	778,204,632
Cumulative Net Peak Demand Savings - kW	97,095	101,268	104,922	108,159	111,051	113,658	116,025	118,196	120,183	122,015
New Net Energy Savings - kWh	26,881,216	23,231,716	20,020,377	17,473,590	15,367,285	13,621,159	12,114,826	10,894,072	9,748,000	8,784,731
New Net Peak Demand Savings - kW	4,775	4,173	3,654	3,237	2,892	2,607	2,367	2,170	1,987	1,833
Program Costs - Real										
Administration Costs	730,220	704,864	683,094	664,662	649,051	634,841	622,873	612,610	601,528	592,377
Marketing Costs	877,426	877,426	877,426	877,426	877,426	877,426	877,426	877,426	877,426	877,426
Incentives Costs	3,426,114	3,030,698	2,692,571	2,405,920	2,163,437	1,953,556	1,776,495	1,626,110	1,486,758	1,368,923
Total Costs	5,033,760	4,612,988	4,253,091	3,948,007	3,689,914	3,465,823	3,276,793	3,116,146	2,965,712	2,838,726

PV Net Avoided Cost Benefits	32,158,087	27,560,694	23,620,267	20,493,333	17,925,319	15,814,873	14,033,686	12,581,289	11,247,665	10,132,088
PV Annual Program Marketing and Admin Costs	1,390,258	1,348,596	1,310,858	1,276,692	1,245,540	1,216,148	1,189,121	1,163,954	1,138,634	1,115,268
PV Net Measure Costs	12,579,216	11,051,255	9,710,732	8,585,119	7,633,547	6,830,287	6,144,574	5,576,321	5,058,940	4,618,384
TRC Ratio	2.30	2.22	2.14	2.08	2.02	1.97	1.91	1.87	1.81	1.77

Free Riders - kWh	209,225,895	212,885,413	215,652,047	217,879,835	219,714,187	221,218,958	222,394,694	223,328,980	224,062,471	224,649,620
Free Riders - kW	21,166	21,694	22,116	22,476	22,790	23,062	23,289	23,483	23,648	23,790
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.19	\$0.20	\$0.21	\$0.23	\$0.24	\$0.25	\$0.27	\$0.29	\$0.30	\$0.32
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PV Annual Program Costs	4,352,884	3,931,496	3,572,491	3,268,401	3,010,679	2,787,054	2,597,041	2,434,100	2,283,181	2,153,901
PV Lost Revenue	27,741,688	23,638,417	20,087,726	17,288,246	14,992,891	13,104,622	11,494,060	10,192,157	8,994,576	7,994,200
RIM	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

APPENDIX H

ELECTRIC

ASSYST OUTPUT FILES

Electricity
All Segments
Total
Constant Budget

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cumulative Gross Energy - kWh	205,508,259	438,597,029	668,262,075	869,080,706	1,036,392,527	1,175,796,992	1,289,547,481	1,382,559,085	1,457,993,338	1,520,663,693
Cumulative Gross Peak Demand - kW	31,230	68,793	108,055	143,547	174,254	200,870	223,533	242,822	259,133	273,138
Cumulative Net Energy Savings - kWh	124,006,688	284,706,585	450,032,006	593,988,903	715,746,865	817,723,921	902,091,685	972,022,364	1,030,443,538	1,079,691,962
Cumulative Net Peak Demand Savings - kW	20,987	49,382	80,427	108,552	133,204	154,626	172,955	188,542	201,862	213,314
New Net Energy Savings - kWh	124,006,688	160,699,898	165,325,421	143,956,897	121,757,962	101,977,056	84,367,764	69,930,679	58,421,173	49,248,424
New Net Peak Demand Savings - kW	20,987	28,395	31,046	28,125	24,651	21,423	18,329	15,586	13,320	11,452

Administration Costs	1,834,262	2,266,314	2,500,470	2,400,677	2,234,314	2,071,651	1,918,484	1,780,962	1,659,889	1,555,094
Marketing Costs	2,446,211	2,386,548	2,328,339	2,271,551	2,216,147	2,162,095	2,109,361	2,057,913	2,007,720	1,958,751
Incentives Costs	12,495,306	17,456,088	20,091,806	19,052,410	17,294,577	15,446,378	13,643,757	11,993,942	10,530,740	9,260,356
Total	16,775,779	22,108,950	24,920,616	23,724,638	21,745,038	19,680,123	17,671,602	15,832,816	14,198,348	12,774,201

PV Net Avoided Cost Benefits	165,888,136	216,711,464	227,033,416	199,875,820	170,047,055	143,427,810	119,285,063	98,927,587	82,556,202	69,405,511
PV Annual Program Marketing and Admin Costs	4,280,473	4,585,753	4,690,521	4,472,966	4,199,205	3,937,108	3,691,610	3,467,669	3,265,181	3,083,169
PV Net Measure Costs	38,613,977	54,859,502	62,994,792	59,558,790	53,995,088	48,174,787	42,216,498	36,646,984	31,755,247	27,561,751
TRC Ratio	3.87	3.65	3.35	3.12	2.92	2.75	2.60	2.47	2.36	2.26

Free Riders - kWh	81,501,572	153,890,443	218,230,069	275,091,802	320,645,661	358,073,070	387,455,796	410,536,721	427,549,800	440,971,731
Free Riders - kW	10,244	19,412	27,627	34,995	41,050	46,244	50,578	54,281	57,272	59,824
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.14	\$0.14	\$0.15	\$0.16	\$0.18	\$0.19	\$0.21	\$0.23	\$0.24	\$0.26
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PV Annual Program Costs	16,775,779	21,790,071	24,206,936	22,702,431	20,507,159	18,291,151	16,186,520	14,292,189	12,631,058	11,199,421
PV Lost Revenue	129,330,277	166,339,991	169,335,591	147,562,534	123,229,904	101,858,896	83,159,302	67,942,509	55,904,231	46,424,085
RIM	1.14	1.15	1.17	1.17	1.18	1.19	1.20	1.20	1.20	1.20

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Cumulative Gross Energy - kWh	2,497,491,876	2,571,121,903	2,632,598,832	2,684,931,129	2,729,805,471	2,768,517,735	2,801,807,308	2,830,792,707	2,855,877,852	2,877,766,094
Cumulative Gross Peak Demand - kW	342,808	355,545	366,431	375,896	384,183	391,490	397,942	403,706	408,841	413,458
Cumulative Net Energy Savings - kWh	1,864,886,087	1,926,406,201	1,978,657,626	2,023,495,108	2,062,205,604	2,095,694,940	2,124,787,806	2,150,297,703	2,172,537,539	2,192,080,157
Cumulative Net Peak Demand Savings - kW	278,852	289,879	299,395	307,688	314,959	321,360	327,041	332,130	336,676	340,774
New Net Energy Savings - kWh	72,185,201	61,520,114	52,251,425	44,837,482	38,710,496	33,489,335	29,092,866	25,509,897	22,239,836	19,542,618
New Net Peak Demand Savings - kW	12,789	11,027	9,516	8,293	7,271	6,401	5,682	5,088	4,546	4,099
Program Costs - Real										
Administration Costs	2,116,549	2,039,872	1,973,303	1,916,084	1,866,686	1,821,629	1,783,181	1,749,797	1,715,617	1,686,939
Marketing Costs	2,056,331	2,006,177	1,957,245	1,909,508	1,862,934	1,817,497	1,773,168	1,729,920	1,687,727	1,646,563
Incentives Costs	9,627,729	8,491,067	7,516,881	6,687,156	5,980,208	5,365,781	4,843,953	4,397,320	3,988,383	3,641,818
Total	13,800,610	12,537,116	11,447,430	10,512,749	9,709,829	9,004,907	8,400,302	7,877,036	7,391,726	6,975,320

PV Net Avoided Cost Benefits	86,123,134	72,792,382	61,468,217	52,435,596	45,007,972	38,761,686	33,600,229	29,397,275	25,625,391	22,536,276
PV Annual Program Marketing and Admin Costs	3,608,620	3,448,473	3,301,715	3,167,200	3,043,211	2,926,544	2,818,725	2,718,209	2,620,205	2,529,418
PV Net Measure Costs	33,889,295	29,519,871	25,719,341	22,519,232	19,816,446	17,497,924	15,527,838	13,886,508	12,412,989	11,185,235
TRC Ratio	2.30	2.21	2.12	2.04	1.97	1.90	1.83	1.77	1.70	1.64

Free Riders - kWh	632,605,789	644,715,703	653,941,206	661,436,021	667,599,866	672,822,796	677,019,501	680,495,004	683,340,313	685,685,937
Free Riders - kW	63,957	65,666	67,037	68,208	69,225	70,130	70,901	71,576	72,166	72,683
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.19	\$0.20	\$0.22	\$0.23	\$0.25	\$0.27	\$0.29	\$0.31	\$0.33	\$0.36
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PV Annual Program Costs	11,933,980	10,685,034	9,615,621	8,703,154	7,922,513	7,241,384	6,657,760	6,153,001	5,690,637	5,292,611
PV Lost Revenue	74,411,136	62,516,521	52,350,966	44,290,956	37,701,846	32,160,995	27,549,585	23,819,288	20,478,981	17,746,199
RIM	1.00	0.99	0.99	0.99	0.99	0.98	0.98	0.98	0.98	0.98

Electricity
Commercial
Total
Constant Budget

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cumulative Gross Energy - kWh	92,593,165	205,550,184	320,741,283	429,498,029	523,895,214	604,150,687	670,038,774	723,904,860	767,415,850	803,207,017
Cumulative Gross Peak Demand - kW	10,814	24,540	39,078	53,476	66,522	78,122	88,027	96,409	103,399	109,311
Cumulative Net Energy Savings - kWh	60,171,188	142,727,989	229,964,968	312,727,198	383,790,877	443,684,529	493,413,993	534,576,969	568,806,454	597,566,962
Cumulative Net Peak Demand Savings - kW	7,806	18,659	30,529	42,397	53,150	62,683	70,875	77,800	83,670	88,687
New Net Energy Savings - kWh	60,171,188	82,556,801	87,236,979	82,762,230	71,063,679	59,893,651	49,729,465	41,162,976	34,229,484	28,760,508
New Net Peak Demand Savings - kW	7,806	10,853	11,870	11,869	10,753	9,533	8,192	6,925	5,870	5,017
Administration Costs	695,340	823,691	892,371	914,285	904,206	876,596	840,888	803,694	767,985	735,675
Marketing Costs	877,426	856,025	835,147	814,777	794,905	775,517	756,602	738,148	720,144	702,580
Incentives Costs	3,754,491	5,476,734	6,355,686	6,570,695	6,340,672	5,867,592	5,291,557	4,703,613	4,149,623	3,652,480
Total Costs	5,327,256	7,156,450	8,083,203	8,299,757	8,039,782	7,519,704	6,889,046	6,245,455	5,637,752	5,090,735
PV Net Avoided Cost Benefits	70,701,312	96,161,548	101,716,936	98,109,207	85,260,314	72,689,652	60,561,471	49,941,513	41,333,748	34,530,969
PV Annual Program Marketing and Admin Costs	1,572,766	1,655,489	1,678,045	1,655,321	1,603,185	1,536,357	1,464,135	1,392,752	1,324,845	1,261,974
PV Net Measure Costs	15,938,585	21,983,110	24,819,178	25,256,386	24,132,421	22,305,337	19,903,222	17,376,574	15,056,972	13,041,677
TRC Ratio	4.04	4.07	3.84	3.65	3.31	3.05	2.83	2.66	2.52	2.41
Free Riders - kWh	32,421,977	62,822,195	90,776,315	116,770,830	140,104,336	160,466,158	176,624,781	189,327,890	198,609,397	205,640,055
Free Riders - kW	3,009	5,881	8,549	11,078	13,372	15,439	17,152	18,609	19,729	20,624
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										
Cost per First-Year Net kWh	\$0.09	\$0.09	\$0.09	\$0.10	\$0.11	\$0.13	\$0.14	\$0.15	\$0.16	\$0.18
PV Annual Program Costs	5,327,256	7,053,232	7,851,715	7,945,416	7,585,521	6,992,477	6,313,642	5,641,266	5,018,919	4,466,591
PV Lost Revenue	71,025,259	96,043,420	100,024,389	94,068,711	79,683,259	66,272,487	54,278,286	44,293,997	36,308,858	30,072,334
RIM	0.93	0.93	0.94	0.96	0.98	0.99	1.00	1.00	1.00	1.00
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Cumulative Gross Energy - kWh	832,497,292	857,040,634	877,532,944	894,977,043	909,935,157	922,839,245	933,935,769	943,597,569	951,959,284	959,255,365
Cumulative Gross Peak Demand - kW	114,269	118,515	122,144	125,299	128,061	130,497	132,647	134,569	136,280	137,819
Cumulative Net Energy Savings - kWh	621,628,696	642,135,400	659,552,542	674,498,369	687,401,868	698,564,980	708,262,602	716,765,901	724,179,180	730,693,386
Cumulative Net Peak Demand Savings - kW	92,951	96,626	99,798	102,563	104,986	107,120	109,014	110,710	112,225	113,591
New Net Energy Savings - kWh	24,061,734	20,506,705	17,417,142	14,945,827	12,903,499	11,163,112	9,697,622	8,503,299	7,413,279	6,514,206
New Net Peak Demand Savings - kW	4,263	3,676	3,172	2,764	2,424	2,134	1,894	1,696	1,515	1,366
Administration Costs	705,516	679,957	657,768	638,695	622,229	607,210	594,394	583,266	571,872	562,313
Marketing Costs	685,444	668,726	652,415	636,503	620,978	605,832	591,056	576,640	562,576	548,854
Incentives Costs	3,209,243	2,830,356	2,505,627	2,229,052	1,993,403	1,788,594	1,614,651	1,465,773	1,329,461	1,213,939
Total Costs	4,600,203	4,179,039	3,815,810	3,504,250	3,236,610	3,001,636	2,800,101	2,625,679	2,463,909	2,325,107
PV Net Avoided Cost Benefits	28,707,711	24,264,127	20,489,406	17,478,532	15,002,657	12,920,562	11,200,076	9,799,092	8,541,797	7,512,092
PV Annual Program Marketing and Admin Costs	1,202,873	1,149,491	1,100,572	1,055,733	1,014,404	975,515	939,575	906,070	873,402	843,139
PV Net Measure Costs	11,296,432	9,839,957	8,573,114	7,506,411	6,605,482	5,832,641	5,175,946	4,628,836	4,137,663	3,728,412
TRC Ratio	2.30	2.21	2.12	2.04	1.97	1.90	1.83	1.77	1.70	1.64
Free Riders - kWh	210,868,596	214,905,234	217,980,402	220,478,674	222,533,289	224,274,265	225,673,167	226,831,668	227,780,104	228,561,979
Free Riders - kW	21,319	21,889	22,346	22,736	23,075	23,377	23,634	23,859	24,055	24,228
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										
Cost per First-Year Net kWh	\$0.19	\$0.20	\$0.22	\$0.23	\$0.25	\$0.27	\$0.29	\$0.31	\$0.33	\$0.36
PV Annual Program Costs	3,977,993	3,561,678	3,205,207	2,901,051	2,640,838	2,413,795	2,219,253	2,051,000	1,896,879	1,764,204
PV Lost Revenue	24,803,712	20,838,840	17,450,322	14,763,652	12,567,282	10,720,332	9,183,195	7,939,763	6,826,327	5,915,400
RIM	1.00	0.99	0.99	0.99	0.99	0.98	0.98	0.98	0.98	0.98

APPENDIX H

ELECTRIC

ASSYST OUTPUT FILES

Electricity
Residential
Total
Constant Budget

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cumulative Gross Energy - kWh	94,503,827	189,868,259	276,831,220	342,193,293	390,242,219	427,216,139	455,902,716	478,572,695	496,306,739	510,866,793
Cumulative Gross Peak Demand - kW	18,188	38,941	60,132	77,693	91,946	103,826	113,795	122,251	129,420	135,617
Cumulative Net Energy Savings - kWh	49,812,228	106,974,897	161,103,550	199,318,672	228,481,384	251,484,350	269,814,681	284,554,586	296,479,565	306,213,298
Cumulative Net Peak Demand Savings - kW	11,405	26,237	42,228	55,330	66,156	75,223	82,872	89,363	94,897	99,639
New Net Energy Savings - kWh	49,812,228	57,162,669	54,128,653	38,215,122	29,162,712	23,002,965	18,330,331	14,739,905	11,924,978	9,733,733
New Net Peak Demand Savings - kW	11,405	14,832	15,991	13,103	10,826	9,067	7,649	6,491	5,534	4,742

Administration Costs	1,011,082	1,280,384	1,427,543	1,294,489	1,144,829	1,021,416	918,841	833,051	760,912	699,959
Marketing Costs	1,395,425	1,361,390	1,328,185	1,295,791	1,264,186	1,233,352	1,203,270	1,173,922	1,145,290	1,117,356
Incentives Costs	7,573,647	10,176,381	11,597,912	10,254,956	8,805,930	7,610,884	6,617,417	5,785,491	5,085,259	4,493,037
Total Costs	9,980,154	12,818,155	14,353,640	12,845,235	11,214,945	9,865,652	8,739,529	7,792,464	6,991,461	6,310,352

PV Net Avoided Cost Benefits	78,956,933	96,383,815	97,745,480	75,223,739	59,804,864	48,529,708	39,724,589	32,759,838	27,167,390	22,676,875
PV Annual Program Marketing and Admin Costs	2,406,507	2,603,672	2,676,809	2,479,809	2,273,011	2,096,788	1,944,963	1,812,906	1,697,044	1,594,575
PV Net Measure Costs	18,984,801	27,144,656	31,393,623	27,188,533	22,929,379	19,497,491	16,693,278	14,385,340	12,474,763	10,887,807
TRC Ratio	3.69	3.24	2.87	2.54	2.37	2.25	2.13	2.02	1.92	1.82

Free Riders - kWh	44,691,599	82,893,362	115,727,670	142,874,621	161,760,835	175,731,790	186,088,035	194,018,108	199,827,175	204,653,495
Free Riders - kW	6,782	12,704	17,904	22,363	25,790	28,602	30,923	32,888	34,522	35,978
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.20	\$0.22	\$0.27	\$0.34	\$0.38	\$0.43	\$0.48	\$0.53	\$0.59	\$0.65
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PV Annual Program Costs	9,980,154	12,633,278	13,942,579	12,287,448	10,571,975	9,164,739	8,000,444	7,029,627	6,215,214	5,528,046
PV Lost Revenue	46,744,158	53,237,053	50,104,817	35,279,530	26,722,321	20,889,703	16,498,054	13,148,250	10,544,156	8,529,657
RIM	1.39	1.46	1.53	1.58	1.60	1.61	1.62	1.62	1.62	1.61

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Cumulative Gross Energy - kWh	832,497,292	857,040,634	877,532,944	894,977,043	909,935,157	922,839,245	933,935,769	943,597,569	951,959,284	959,255,365
Cumulative Gross Peak Demand - kW	114,269	118,515	122,144	125,299	128,061	130,497	132,647	134,569	136,280	137,819
Cumulative Net Energy Savings - kWh	621,628,696	642,135,400	659,552,542	674,498,369	687,401,868	698,564,980	708,262,602	716,765,901	724,179,180	730,693,386
Cumulative Net Peak Demand Savings - kW	92,951	96,626	99,798	102,563	104,986	107,120	109,014	110,710	112,225	113,591
New Net Energy Savings - kWh	24,061,734	20,506,705	17,417,142	14,945,827	12,903,499	11,163,112	9,697,622	8,503,299	7,413,279	6,514,206
New Net Peak Demand Savings - kW	4,263	3,676	3,172	2,764	2,424	2,134	1,894	1,696	1,515	1,366
Program Costs - Real										
Administration Costs	705,516	679,957	657,768	638,695	622,229	607,210	594,394	583,266	571,872	562,313
Marketing Costs	685,444	668,726	652,415	636,503	620,978	605,832	591,056	576,640	562,576	548,854
Incentives Costs	3,209,243	2,830,356	2,505,627	2,229,052	1,993,403	1,788,594	1,614,651	1,465,773	1,329,461	1,213,939
Total Costs	4,600,203	4,179,039	3,815,810	3,504,250	3,236,610	3,001,636	2,800,101	2,625,679	2,463,909	2,325,107

PV Net Avoided Cost Benefits	28,707,711	24,264,127	20,489,406	17,478,532	15,002,657	12,920,562	11,200,076	9,799,092	8,541,797	7,512,092
PV Annual Program Marketing and Admin Costs	1,202,873	1,149,491	1,100,572	1,055,733	1,014,404	975,515	939,575	906,070	873,402	843,139
PV Net Measure Costs	11,296,432	9,839,957	8,573,114	7,506,411	6,605,482	5,832,641	5,175,946	4,628,836	4,137,663	3,728,412
TRC Ratio	2.30	2.21	2.12	2.04	1.97	1.90	1.83	1.77	1.70	1.64

Free Riders - kWh	210,868,596	214,905,234	217,980,402	220,478,674	222,533,289	224,274,265	225,673,167	226,831,668	227,780,104	228,561,979
Free Riders - kW	21,319	21,889	22,346	22,736	23,075	23,377	23,634	23,859	24,055	24,228
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.19	\$0.20	\$0.22	\$0.23	\$0.25	\$0.27	\$0.29	\$0.31	\$0.33	\$0.36
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PV Annual Program Costs	3,977,993	3,561,678	3,205,207	2,901,051	2,640,838	2,413,795	2,219,253	2,051,000	1,896,879	1,764,204
PV Lost Revenue	24,803,712	20,838,840	17,450,322	14,763,652	12,567,282	10,720,332	9,183,195	7,939,763	6,826,327	5,915,400
RIM	1.00	0.99	0.99	0.99	0.99	0.98	0.98	0.98	0.98	0.98

APPENDIX H

ELECTRIC

ASSYST OUTPUT FILES

Electricity
Industrial
Total
Constant Budget

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cumulative Gross Energy - kWh	18,411,267	43,178,585	70,689,573	97,389,384	122,255,094	144,430,166	163,605,991	180,081,531	194,270,748	206,589,884
Cumulative Gross Peak Demand - kW	2,228	5,312	8,845	12,379	15,785	18,923	21,711	24,163	26,314	28,210
Cumulative Net Energy Savings - kWh	14,023,271	35,003,699	58,963,487	81,943,033	103,474,604	122,555,043	138,863,011	152,890,808	165,157,519	175,911,702
Cumulative Net Peak Demand Savings - kW	1,776	4,486	7,671	10,825	13,898	16,720	19,208	21,378	23,294	24,988
New Net Energy Savings - kWh	14,023,271	20,980,428	23,959,789	22,979,545	21,531,571	19,080,439	16,307,967	14,027,798	12,266,711	10,754,183
New Net Peak Demand Savings - kW	1,776	2,710	3,185	3,154	3,073	2,823	2,487	2,170	1,916	1,694
Administration Costs	127,839	162,239	180,556	191,903	185,279	173,639	158,755	144,217	130,992	119,461
Marketing Costs	173,361	169,133	165,007	160,983	157,056	153,226	149,489	145,843	142,285	138,815
Incentives Costs	1,167,168	1,802,973	2,138,209	2,226,760	2,147,976	1,967,902	1,734,784	1,504,838	1,295,858	1,114,839
Total Costs	1,468,368	2,134,344	2,483,772	2,579,646	2,490,311	2,294,767	2,043,027	1,794,897	1,569,135	1,373,114
PV Net Avoided Cost Benefits	16,229,891	24,166,101	27,571,001	26,542,874	24,981,877	22,208,450	18,999,002	16,226,237	14,055,064	12,197,667
PV Annual Program Marketing and Admin Costs	301,200	326,592	335,667	337,836	323,009	303,963	282,512	262,012	243,292	226,620
PV Net Measure Costs	3,690,592	5,731,736	6,781,990	7,113,871	6,933,288	6,371,958	5,619,999	4,885,070	4,223,512	3,632,267
TRC Ratio	4.07	3.99	3.87	3.56	3.44	3.33	3.22	3.15	3.15	3.16
Free Riders - kWh	4,387,996	8,174,886	11,726,085	15,446,351	18,780,490	21,875,123	24,742,980	27,190,722	29,113,229	30,678,182
Free Riders - kW	452	826	1,174	1,554	1,887	2,202	2,503	2,785	3,020	3,222
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										
Cost per First-Year Net kWh	\$0.10	\$0.10	\$0.10	\$0.11	\$0.12	\$0.12	\$0.13	\$0.13	\$0.13	\$0.13
PV Annual Program Costs	1,468,368	2,103,561	2,412,642	2,469,566	2,349,663	2,133,935	1,872,435	1,621,296	1,396,924	1,204,784
PV Lost Revenue	11,560,860	17,059,517	19,206,384	18,214,293	16,824,324	14,696,706	12,382,963	10,500,262	9,051,218	7,822,095
RIM	1.25	1.26	1.28	1.28	1.30	1.32	1.33	1.34	1.35	1.35
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Cumulative Gross Energy - kWh	832,497,292	857,040,634	877,532,944	894,977,043	909,935,157	922,839,245	933,935,769	943,597,569	951,959,284	959,255,365
Cumulative Gross Peak Demand - kW	114,269	118,515	122,144	125,299	128,061	130,497	132,647	134,569	136,280	137,819
Cumulative Net Energy Savings - kWh	621,628,696	642,135,400	659,552,542	674,498,369	687,401,868	698,564,980	708,262,602	716,765,901	724,179,180	730,693,386
Cumulative Net Peak Demand Savings - kW	92,951	96,626	99,798	102,563	104,986	107,120	109,014	110,710	112,225	113,591
New Net Energy Savings - kWh	24,061,734	20,506,705	17,417,142	14,945,827	12,903,499	11,163,112	9,697,622	8,503,299	7,413,279	6,514,206
New Net Peak Demand Savings - kW	4,263	3,676	3,172	2,764	2,424	2,134	1,894	1,696	1,515	1,366
Program Costs - Real										
Administration Costs	705,516	679,957	657,768	638,695	622,229	607,210	594,394	583,266	571,872	562,313
Marketing Costs	685,444	668,726	652,415	636,503	620,978	605,832	591,056	576,640	562,576	548,854
Incentives Costs	3,209,243	2,830,356	2,505,627	2,229,052	1,993,403	1,788,594	1,614,651	1,465,773	1,329,461	1,213,939
Total Costs	4,600,203	4,179,039	3,815,810	3,504,250	3,236,610	3,001,636	2,800,101	2,625,679	2,463,909	2,325,107
PV Net Avoided Cost Benefits	28,707,711	24,264,127	20,489,406	17,478,532	15,002,657	12,920,562	11,200,076	9,799,092	8,541,797	7,512,092
PV Annual Program Marketing and Admin Costs	1,202,873	1,149,491	1,100,572	1,055,733	1,014,404	975,515	939,575	906,070	873,402	843,139
PV Net Measure Costs	11,296,432	9,839,957	8,573,114	7,506,411	6,605,482	5,832,641	5,175,946	4,628,836	4,137,663	3,728,412
TRC Ratio	2.30	2.21	2.12	2.04	1.97	1.90	1.83	1.77	1.70	1.64
Free Riders - kWh	210,868,596	214,905,234	217,980,402	220,478,674	222,533,289	224,274,265	225,673,167	226,831,668	227,780,104	228,561,979
Free Riders - kW	21,319	21,889	22,346	22,736	23,075	23,377	23,634	23,859	24,055	24,228
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										
Cost per First-Year Net kWh	\$0.19	\$0.20	\$0.22	\$0.23	\$0.25	\$0.27	\$0.29	\$0.31	\$0.33	\$0.36
PV Annual Program Costs	3,977,993	3,561,678	3,205,207	2,901,051	2,640,838	2,413,795	2,219,253	2,051,000	1,896,879	1,764,204
PV Lost Revenue	24,803,712	20,838,840	17,450,322	14,763,652	12,567,282	10,720,332	9,183,195	7,939,763	6,826,327	5,915,400
RIM	1.00	0.99	0.99	0.99	0.99	0.98	0.98	0.98	0.98	0.98

APPENDIX H

ELECTRIC

ASSYST OUTPUT FILES

Electricity
All Segments
Total
75 percent

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cumulative Gross Energy - kWh	331,427,611	692,194,488	1,020,308,788	1,284,011,948	1,488,050,101	1,645,053,907	1,765,439,957	1,859,208,076	1,932,406,660	1,991,991,282
Cumulative Gross Peak Demand - kW	58,770	125,533	188,554	239,451	279,933	312,266	338,132	359,042	375,964	390,039
Cumulative Net Energy Savings - kWh	249,926,040	538,304,044	806,980,670	1,024,072,166	1,191,738,241	1,321,154,245	1,422,133,442	1,502,551,245	1,566,924,394	1,619,795,138
Cumulative Net Peak Demand Savings - kW	48,527	106,121	161,428	206,124	241,671	269,957	292,660	311,115	326,193	338,743
New Net Energy Savings - kWh	249,926,040	288,378,005	268,676,626	217,091,496	167,666,075	129,416,005	100,979,197	80,417,803	64,373,149	52,870,744
New Net Peak Demand Savings - kW	48,527	57,594	55,306	44,697	35,547	28,286	22,703	18,455	15,078	12,550

Administration Costs	4,519,499	5,688,283	6,058,144	5,454,952	4,844,227	4,278,772	3,794,450	3,400,892	3,090,336	2,850,158
Marketing Costs	2,568,522	2,568,522	2,568,522	2,568,522	2,568,522	2,568,522	2,568,522	2,568,522	2,568,522	2,568,522
Incentives Costs	50,743,574	66,305,761	71,223,832	65,014,350	56,883,850	48,784,390	41,662,522	35,268,397	29,798,724	25,430,573
Total	57,831,596	74,562,566	79,850,498	73,037,825	64,296,598	55,631,684	48,025,494	41,237,811	35,457,582	30,849,253

PV Net Avoided Cost Benefits	359,948,578	415,794,216	388,323,968	310,844,686	240,897,853	186,818,279	146,351,891	116,482,039	93,168,520	76,130,322
PV Annual Program Marketing and Admin Costs	7,088,021	8,137,717	8,379,615	7,681,288	6,994,254	6,367,539	5,831,807	5,392,192	5,037,940	4,754,537
PV Net Measure Costs	82,112,514	110,530,817	117,523,594	102,472,706	86,660,204	71,838,836	59,326,770	48,739,107	39,966,437	33,127,184
TRC Ratio	4.04	3.50	3.08	2.82	2.57	2.39	2.25	2.15	2.07	2.01

Free Riders - kWh	81,501,572	153,890,443	213,328,117	259,939,782	296,311,860	323,899,662	343,306,515	356,656,831	365,482,266	372,196,144
Free Riders - kW	10,244	19,412	27,127	33,326	38,262	42,309	45,472	47,927	49,771	51,295
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.23	\$0.26	\$0.30	\$0.34	\$0.38	\$0.43	\$0.48	\$0.51	\$0.55	\$0.58
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PV Annual Program Costs	57,831,596	73,487,145	77,563,729	69,123,899	59,879,189	50,963,581	43,262,589	36,547,648	30,934,287	26,501,116
PV Lost Revenue	259,398,571	299,513,782	277,562,300	224,523,741	171,361,352	130,871,682	101,017,203	79,491,032	62,769,422	50,825,840
RIM	1.13	1.11	1.09	1.06	1.04	1.03	1.01	1.00	0.99	0.98

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Cumulative Gross Energy - kWh	3,343,571,234	3,418,317,205	3,482,344,007	3,538,669,018	3,589,025,932	3,634,496,902	3,675,790,917	3,713,839,570	3,748,092,185	3,779,324,042
Cumulative Gross Peak Demand - kW	483,500	498,692	511,985	523,872	534,658	544,544	553,686	562,238	570,129	577,492
Cumulative Net Energy Savings - kWh	2,797,664,123	2,868,864,526	2,930,715,758	2,985,537,283	3,034,847,862	3,079,586,483	3,120,428,875	3,158,166,920	3,192,218,369	3,223,316,059
Cumulative Net Peak Demand Savings - kW	427,213	441,613	454,319	465,734	476,130	485,684	494,545	502,842	510,500	517,644
New Net Energy Savings - kWh	83,221,219	71,200,403	61,851,231	54,821,526	49,310,579	44,738,621	40,842,392	37,738,045	34,051,449	31,097,690
New Net Peak Demand Savings - kW	16,567	14,399	12,706	11,415	10,396	9,555	8,860	8,298	7,658	7,143
Program Costs - Real										
Administration Costs	3,466,811	3,339,917	3,243,831	3,170,487	3,113,069	3,062,260	3,024,831	2,995,808	2,914,598	2,854,971
Marketing Costs	2,763,891	2,763,891	2,763,891	2,763,891	2,763,891	2,763,891	2,763,891	2,763,891	2,763,891	2,763,891
Incentives Costs	33,664,265	29,334,193	26,011,156	23,435,065	21,416,968	19,786,813	18,494,481	17,445,554	16,224,082	15,245,756
Total	39,894,968	35,438,001	32,018,879	29,369,444	27,293,929	25,612,965	24,283,203	23,205,253	21,902,571	20,864,618

PV Net Avoided Cost Benefits	107,292,138	91,403,555	79,061,524	69,677,970	62,268,639	56,143,079	51,012,851	46,846,886	42,263,590	38,555,221
PV Annual Program Marketing and Admin Costs	5,388,182	5,202,315	5,046,569	4,913,060	4,795,348	4,685,324	4,588,081	4,499,236	4,371,820	4,263,521
PV Net Measure Costs	42,304,891	35,900,184	30,983,713	27,243,713	24,326,246	21,972,292	20,057,085	18,526,883	16,884,014	15,557,963
TRC Ratio	2.25	2.22	2.19	2.17	2.14	2.11	2.07	2.03	1.99	1.95

Free Riders - kWh	545,907,111	549,452,679	551,628,250	553,131,735	554,178,069	554,910,419	555,362,042	555,672,651	555,873,816	556,007,983
Free Riders - kW	56,287	57,080	57,666	58,138	58,528	58,860	59,141	59,395	59,629	59,849
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.48	\$0.50	\$0.52	\$0.54	\$0.55	\$0.57	\$0.59	\$0.61	\$0.64	\$0.67
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PV Annual Program Costs	33,369,453	29,198,996	25,995,432	23,500,836	21,529,629	19,918,696	18,621,010	17,547,656	16,323,806	15,328,764
PV Lost Revenue	86,979,017	73,434,386	62,944,370	55,034,581	48,823,218	43,687,044	39,333,789	35,837,338	31,912,609	28,756,671
RIM	0.89	0.89	0.89	0.89	0.89	0.88	0.88	0.88	0.88	0.87

APPENDIX H

ELECTRIC

ASSYST OUTPUT FILES

Electricity
Commercial
Total
75 percent

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cumulative Gross Energy - kWh	142,896,189	319,303,877	494,259,446	650,064,672	774,936,212	872,003,469	946,472,608	1,004,295,829	1,049,115,126	1,085,160,243
Cumulative Gross Peak Demand - kW	17,301	39,364	62,164	83,688	102,025	117,266	129,759	140,020	148,365	155,324
Cumulative Net Energy Savings - kWh	110,474,212	256,481,682	403,483,131	533,293,842	635,633,284	716,087,527	779,614,913	830,578,078	871,351,951	904,814,301
Cumulative Net Peak Demand Savings - kW	14,292	33,482	53,615	72,610	88,704	102,136	113,305	122,630	130,363	136,882
New Net Energy Savings - kWh	110,474,212	146,007,469	147,001,449	129,810,711	102,339,442	80,454,243	63,527,386	50,963,165	40,773,872	33,462,351
New Net Peak Demand Savings - kW	14,292	19,190	20,133	18,995	16,094	13,432	11,169	9,325	7,733	6,519

Administration Costs	1,515,061	1,937,885	2,103,894	2,071,509	1,923,790	1,737,526	1,559,439	1,412,094	1,298,907	1,216,954
Marketing Costs	921,297	921,297	921,297	921,297	921,297	921,297	921,297	921,297	921,297	921,297
Incentives Costs	23,445,954	30,427,729	32,887,830	32,328,541	29,290,278	25,611,197	22,135,934	18,701,851	15,607,648	13,135,829
Total Costs	25,882,311	33,286,910	35,913,021	35,321,348	32,135,364	28,270,020	24,616,671	21,035,242	17,827,853	15,274,081

PV Net Avoided Cost Benefits	129,660,138	170,061,407	171,931,475	155,677,567	125,516,106	100,464,372	80,542,955	65,199,379	52,517,312	43,178,898
PV Annual Program Marketing and Admin Costs	2,436,358	2,817,943	2,938,555	2,865,168	2,684,464	2,472,533	2,273,651	2,107,760	1,976,592	1,876,176
PV Net Measure Costs	35,557,052	47,794,999	51,629,150	49,025,202	43,225,853	36,751,318	30,839,185	25,397,419	20,661,573	16,957,288
TRC Ratio	3.41	3.36	3.15	3.00	2.73	2.56	2.43	2.37	2.32	2.29

Free Riders - kWh	32,421,977	62,822,195	90,776,315	116,770,830	139,302,927	155,915,941	166,857,694	173,717,751	177,763,175	180,345,941
Free Riders - kW	3,009	5,881	8,549	11,078	13,321	15,130	16,454	17,389	18,002	18,442
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.23	\$0.23	\$0.24	\$0.27	\$0.31	\$0.35	\$0.39	\$0.41	\$0.44	\$0.46
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PV Annual Program Costs	25,882,311	32,806,811	34,884,539	33,194,528	29,709,646	25,686,622	21,967,765	18,451,277	15,384,895	12,974,511
PV Lost Revenue	130,402,270	169,859,498	168,549,282	147,801,037	115,073,791	89,390,718	69,788,731	55,326,509	43,722,131	35,424,520
RIM	0.83	0.84	0.85	0.86	0.87	0.87	0.88	0.88	0.89	0.89

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Cumulative Gross Energy - kWh	1,114,523,745	1,139,439,068	1,160,781,336	1,179,556,339	1,196,341,977	1,211,498,967	1,225,263,639	1,237,946,523	1,249,364,062	1,259,774,681
Cumulative Gross Peak Demand - kW	161,167	166,231	170,662	174,624	178,219	181,515	184,562	187,413	190,043	192,497
Cumulative Net Energy Savings - kWh	932,554,708	956,288,175	976,905,253	995,179,094	1,011,615,954	1,026,528,828	1,040,142,958	1,052,722,307	1,064,072,790	1,074,438,686
Cumulative Net Peak Demand Savings - kW	142,404	147,204	151,440	155,245	158,710	161,895	164,848	167,614	170,167	172,548
New Net Energy Savings - kWh	27,740,406	23,733,468	20,617,077	18,273,842	16,436,860	14,912,874	13,614,131	12,579,348	11,350,483	10,365,897
New Net Peak Demand Savings - kW	5,522	4,800	4,235	3,805	3,465	3,185	2,953	2,766	2,553	2,381

Administration Costs	1,155,604	1,113,306	1,081,277	1,056,829	1,037,690	1,020,753	1,008,277	998,603	971,533	951,657
Marketing Costs	921,297	921,297	921,297	921,297	921,297	921,297	921,297	921,297	921,297	921,297
Incentives Costs	11,221,422	9,778,064	8,670,385	7,811,688	7,138,989	6,595,604	6,164,827	5,815,185	5,408,027	5,081,919
Total Costs	13,298,323	11,812,667	10,672,960	9,789,815	9,097,976	8,537,655	8,094,401	7,735,084	7,300,857	6,954,873

PV Net Avoided Cost Benefits	35,764,046	30,467,852	26,353,841	23,225,990	20,756,213	18,714,360	17,004,284	15,615,629	14,087,863	12,851,740
PV Annual Program Marketing and Admin Costs	1,796,061	1,734,105	1,682,190	1,637,687	1,598,449	1,561,775	1,529,360	1,499,745	1,457,273	1,421,174
PV Net Measure Costs	14,101,630	11,966,728	10,327,904	9,081,238	8,108,749	7,324,097	6,685,695	6,175,628	5,628,005	5,185,988
TRC Ratio	2.25	2.22	2.19	2.17	2.14	2.11	2.07	2.03	1.99	1.95

Free Riders - kWh	181,969,037	183,150,893	183,876,083	184,377,245	184,726,023	184,970,140	185,120,681	185,224,217	185,291,272	185,335,994
Free Riders - kW	18,762	19,027	19,222	19,379	19,509	19,620	19,714	19,798	19,876	19,950
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.48	\$0.50	\$0.52	\$0.54	\$0.55	\$0.57	\$0.59	\$0.61	\$0.64	\$0.67
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PV Annual Program Costs	11,123,151	9,732,999	8,665,144	7,833,612	7,176,543	6,639,565	6,207,003	5,849,219	5,441,269	5,109,588
PV Lost Revenue	28,993,006	24,478,129	20,981,457	18,344,860	16,274,406	14,562,348	13,111,263	11,945,779	10,637,536	9,585,557
RIM	0.89	0.89	0.89	0.89	0.89	0.88	0.88	0.88	0.88	0.87

APPENDIX H

ELECTRIC

ASSYST OUTPUT FILES

Electricity
Residential
Total
75 percent

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cumulative Gross Energy - kWh	161,342,915	308,916,273	422,109,420	492,725,263	538,976,522	571,662,123	595,407,350	613,205,090	626,395,385	636,823,947
Cumulative Gross Peak Demand - kW	37,977	77,834	112,656	136,854	154,293	167,381	177,412	185,269	191,472	196,519
Cumulative Net Energy Savings - kWh	116,651,317	226,022,911	311,283,702	365,002,663	400,748,079	425,497,667	443,252,812	456,353,096	466,166,582	473,640,789
Cumulative Net Peak Demand Savings - kW	31,195	65,130	95,252	116,160	131,239	142,402	150,870	157,424	162,578	166,701
New Net Energy Savings - kWh	116,651,317	109,371,594	85,260,791	53,718,961	35,745,416	24,749,588	17,755,145	13,100,284	9,813,486	7,474,207
New Net Peak Demand Savings - kW	31,195	33,935	30,122	20,908	15,080	11,163	8,468	6,554	5,154	4,122

Administration Costs	2,774,587	3,439,902	3,608,137	3,034,534	2,597,241	2,258,278	1,991,604	1,779,312	1,608,674	1,470,400
Marketing Costs	1,465,196	1,465,196	1,465,196	1,465,196	1,465,196	1,465,196	1,465,196	1,465,196	1,465,196	1,465,196
Incentives Costs	23,242,248	30,191,482	31,946,087	25,649,614	21,076,448	17,531,225	14,741,760	12,520,870	10,735,487	9,288,505
Total Costs	27,482,031	35,096,579	37,019,420	30,149,344	25,138,885	21,254,699	18,198,560	15,765,379	13,809,357	12,224,101

PV Net Avoided Cost Benefits	203,285,857	206,900,047	173,662,285	115,582,223	80,390,085	57,667,550	42,548,489	32,115,664	24,638,015	19,236,601
PV Annual Program Marketing and Admin Costs	4,239,783	4,834,351	4,928,042	4,307,825	3,833,088	3,462,589	3,168,235	2,930,776	2,736,590	2,575,793
PV Net Measure Costs	40,142,662	53,113,486	54,959,373	42,110,083	33,043,931	26,301,849	21,250,108	17,411,673	14,428,165	12,094,042
TRC Ratio	4.58	3.57	2.90	2.49	2.18	1.94	1.74	1.58	1.44	1.31

Free Riders - kWh	44,691,599	82,893,362	110,825,718	127,722,601	138,228,443	146,164,456	152,154,538	156,851,993	160,228,803	163,183,158
Free Riders - kW	6,782	12,704	17,404	20,694	23,054	24,978	26,542	27,844	28,894	29,819
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.24	\$0.32	\$0.43	\$0.56	\$0.70	\$0.86	\$1.02	\$1.20	\$1.41	\$1.64
PV Annual Program Costs	27,482,031	34,590,378	35,959,253	28,798,302	23,655,354	19,702,130	16,616,945	14,179,376	12,233,468	10,666,065
PV Lost Revenue	110,214,855	102,840,117	79,841,483	50,077,813	33,124,261	22,781,053	16,222,536	11,874,152	8,827,903	6,675,663
RIM	1.48	1.51	1.50	1.47	1.42	1.36	1.30	1.23	1.17	1.11

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Cumulative Gross Energy - kWh	1,114,523,745	1,139,439,068	1,160,781,336	1,179,556,339	1,196,341,977	1,211,498,967	1,225,263,639	1,237,946,523	1,249,364,062	1,259,774,681
Cumulative Gross Peak Demand - kW	161,167	166,231	170,662	174,624	178,219	181,515	184,562	187,413	190,043	192,497
Cumulative Net Energy Savings - kWh	932,554,708	956,288,175	976,905,253	995,179,094	1,011,615,954	1,026,528,828	1,040,142,958	1,052,722,307	1,064,072,790	1,074,438,686
Cumulative Net Peak Demand Savings - kW	142,404	147,204	151,440	155,245	158,710	161,895	164,848	167,614	170,167	172,548
New Net Energy Savings - kWh	27,740,406	23,733,468	20,617,077	18,273,842	16,436,860	14,912,874	13,614,131	12,579,348	11,350,483	10,365,897
New Net Peak Demand Savings - kW	5,522	4,800	4,235	3,805	3,465	3,185	2,953	2,766	2,553	2,381
Program Costs - Real										
Administration Costs	1,155,604	1,113,306	1,081,277	1,056,829	1,037,690	1,020,753	1,008,277	998,603	971,533	951,657
Marketing Costs	921,297	921,297	921,297	921,297	921,297	921,297	921,297	921,297	921,297	921,297
Incentives Costs	11,221,422	9,778,064	8,670,385	7,811,688	7,138,989	6,595,604	6,164,827	5,815,185	5,408,027	5,081,919
Total Costs	13,298,323	11,812,667	10,672,960	9,789,815	9,097,976	8,537,655	8,094,401	7,735,084	7,300,857	6,954,873

PV Net Avoided Cost Benefits	35,764,046	30,467,852	26,353,841	23,225,990	20,756,213	18,714,360	17,004,284	15,615,629	14,087,863	12,851,740
PV Annual Program Marketing and Admin Costs	1,796,061	1,734,105	1,682,190	1,637,687	1,598,449	1,561,775	1,529,360	1,499,745	1,457,273	1,421,174
PV Net Measure Costs	14,101,630	11,966,728	10,327,904	9,081,238	8,108,749	7,324,097	6,685,695	6,175,628	5,628,005	5,185,988
TRC Ratio	2.25	2.22	2.19	2.17	2.14	2.11	2.07	2.03	1.99	1.95

Free Riders - kWh	181,969,037	183,150,893	183,876,083	184,377,245	184,726,023	184,970,140	185,120,681	185,224,217	185,291,272	185,335,994
Free Riders - kW	18,762	19,027	19,222	19,379	19,509	19,620	19,714	19,798	19,876	19,950
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.48	\$0.50	\$0.52	\$0.54	\$0.55	\$0.57	\$0.59	\$0.61	\$0.64	\$0.67
PV Annual Program Costs	11,123,151	9,732,999	8,665,144	7,833,612	7,176,543	6,639,565	6,207,003	5,849,219	5,441,269	5,109,588
PV Lost Revenue	28,993,006	24,478,129	20,981,457	18,344,860	16,274,406	14,562,348	13,111,263	11,945,779	10,637,536	9,585,557
RIM	0.89	0.89	0.89	0.89	0.89	0.88	0.88	0.88	0.88	0.87

APPENDIX H

ELECTRIC

ASSYST OUTPUT FILES

Electricity
Industrial
Total
75 percent

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cumulative Gross Energy - kWh	27,188,507	63,974,338	103,939,922	141,222,012	174,137,367	201,388,315	223,559,999	241,707,157	256,896,149	270,007,092
Cumulative Gross Peak Demand - kW	3,492	8,335	13,734	18,909	23,615	27,620	30,961	33,754	36,127	38,195
Cumulative Net Energy Savings - kWh	22,800,511	55,799,452	92,213,837	125,775,661	155,356,877	179,569,051	199,265,717	215,620,071	229,405,862	241,340,048
Cumulative Net Peak Demand Savings - kW	3,040	7,509	12,560	17,355	21,728	25,419	28,485	31,061	33,252	35,161
New Net Energy Savings - kWh	22,800,511	32,998,941	36,414,385	33,561,824	29,581,216	24,212,173	19,696,666	16,354,354	13,785,791	11,934,186
New Net Peak Demand Savings - kW	3,040	4,469	5,051	4,795	4,373	3,692	3,066	2,576	2,191	1,908

Administration Costs	229,852	310,497	346,113	348,909	323,196	282,969	243,407	209,485	182,755	162,804
Marketing Costs	182,029	182,029	182,029	182,029	182,029	182,029	182,029	182,029	182,029	182,029
Incentives Costs	4,055,373	5,686,551	6,389,915	7,036,195	6,517,124	5,641,968	4,784,827	4,045,676	3,455,589	3,006,238
Total Costs	4,467,254	6,179,077	6,918,058	7,567,133	7,022,349	6,106,965	5,210,263	4,437,190	3,820,373	3,351,072

PV Net Avoided Cost Benefits	27,002,583	38,832,762	42,730,209	39,584,897	34,991,663	28,686,357	23,260,447	19,166,996	16,013,193	13,714,824
PV Annual Program Marketing and Admin Costs	411,881	485,423	513,017	508,295	476,702	432,418	389,922	353,656	324,758	302,569
PV Net Measure Costs	6,412,800	9,622,332	10,935,071	11,337,421	10,390,419	8,785,669	7,237,476	5,930,015	4,876,698	4,075,854
TRC Ratio	3.96	3.84	3.73	3.34	3.22	3.11	3.05	3.05	3.08	3.13

Free Riders - kWh	4,387,996	8,174,886	11,726,085	15,446,351	18,780,490	21,819,265	24,294,282	26,087,086	27,490,287	28,667,045
Free Riders - kW	452	826	1,174	1,554	1,887	2,200	2,476	2,693	2,875	3,035
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.20	\$0.19	\$0.19	\$0.23	\$0.24	\$0.25	\$0.26	\$0.27	\$0.28	\$0.28
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PV Annual Program Costs	4,467,254	6,089,956	6,719,938	7,131,068	6,514,189	5,574,829	4,677,880	3,916,994	3,315,923	2,860,539
PV Lost Revenue	18,781,446	26,814,166	29,171,535	26,644,891	23,163,300	18,699,911	15,005,936	12,290,371	10,219,389	8,725,657
RIM	1.16	1.18	1.19	1.17	1.18	1.18	1.18	1.18	1.18	1.18

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Cumulative Gross Energy - kWh	1,114,523,745	1,139,439,068	1,160,781,336	1,179,556,339	1,196,341,977	1,211,498,967	1,225,263,639	1,237,946,523	1,249,364,062	1,259,774,681
Cumulative Gross Peak Demand - kW	161,167	166,231	170,662	174,624	178,219	181,515	184,562	187,413	190,043	192,497
Cumulative Net Energy Savings - kWh	932,554,708	956,288,175	976,905,253	995,179,094	1,011,615,954	1,026,528,828	1,040,142,958	1,052,722,307	1,064,072,790	1,074,438,686
Cumulative Net Peak Demand Savings - kW	142,404	147,204	151,440	155,245	158,710	161,895	164,848	167,614	170,167	172,548
New Net Energy Savings - kWh	27,740,406	23,733,468	20,617,077	18,273,842	16,436,860	14,912,874	13,614,131	12,579,348	11,350,483	10,365,897
New Net Peak Demand Savings - kW	5,522	4,800	4,235	3,805	3,465	3,185	2,953	2,766	2,553	2,381
Program Costs - Real										
Administration Costs	1,155,604	1,113,306	1,081,277	1,056,829	1,037,690	1,020,753	1,008,277	998,603	971,533	951,657
Marketing Costs	921,297	921,297	921,297	921,297	921,297	921,297	921,297	921,297	921,297	921,297
Incentives Costs	11,221,422	9,778,064	8,670,385	7,811,688	7,138,989	6,595,604	6,164,827	5,815,185	5,408,027	5,081,919
Total Costs	13,298,323	11,812,667	10,672,960	9,789,815	9,097,976	8,537,655	8,094,401	7,735,084	7,300,857	6,954,873

PV Net Avoided Cost Benefits	35,764,046	30,467,852	26,353,841	23,225,990	20,756,213	18,714,360	17,004,284	15,615,629	14,087,863	12,851,740
PV Annual Program Marketing and Admin Costs	1,796,061	1,734,105	1,682,190	1,637,687	1,598,449	1,561,775	1,529,360	1,499,745	1,457,273	1,421,174
PV Net Measure Costs	14,101,630	11,966,728	10,327,904	9,081,238	8,108,749	7,324,097	6,685,695	6,175,628	5,628,005	5,185,988
TRC Ratio	2.25	2.22	2.19	2.17	2.14	2.11	2.07	2.03	1.99	1.95

Free Riders - kWh	181,969,037	183,150,893	183,876,083	184,377,245	184,726,023	184,970,140	185,120,681	185,224,217	185,291,272	185,335,994
Free Riders - kW	18,762	19,027	19,222	19,379	19,509	19,620	19,714	19,798	19,876	19,950
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.48	\$0.50	\$0.52	\$0.54	\$0.55	\$0.57	\$0.59	\$0.61	\$0.64	\$0.67
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PV Annual Program Costs	11,123,151	9,732,999	8,665,144	7,833,612	7,176,543	6,639,565	6,207,003	5,849,219	5,441,269	5,109,588
PV Lost Revenue	28,993,006	24,478,129	20,981,457	18,344,860	16,274,406	14,562,348	13,111,263	11,945,779	10,637,536	9,585,557
RIM	0.89	0.89	0.89	0.89	0.89	0.88	0.88	0.88	0.88	0.87

APPENDIX H

ELECTRIC

ASSYST OUTPUT FILES

Electricity
All Segments
Total
100 Percent

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cumulative Gross Energy - kWh	503,393,307	1,039,199,462	1,455,694,202	1,742,229,496	1,929,669,001	2,057,243,504	2,152,765,577	2,234,478,538	2,306,925,607	2,374,169,768
Cumulative Gross Peak Demand - kW	110,901	228,041	312,143	366,437	402,132	427,527	447,662	465,586	481,994	497,513
Cumulative Net Energy Savings - kWh	421,891,735	885,309,019	1,244,408,380	1,486,254,487	1,642,199,263	1,749,519,104	1,833,109,584	1,907,459,601	1,975,374,913	2,038,889,823
Cumulative Net Peak Demand Savings - kW	100,657	208,629	285,361	333,842	365,462	388,004	406,247	422,859	438,352	453,085
New Net Energy Savings - kWh	421,891,735	463,417,283	359,099,361	241,846,107	155,944,776	107,319,841	83,590,480	74,350,017	67,915,313	63,514,909
New Net Peak Demand Savings - kW	100,657	107,972	76,732	48,481	31,621	22,542	18,243	16,611	15,494	14,732

Administration Costs	15,612,265	17,492,641	13,601,195	9,952,920	7,808,744	6,631,331	6,073,398	5,860,364	5,770,255	5,739,962
Marketing Costs	2,690,833	2,690,833	2,690,833	2,690,833	2,690,833	2,690,833	2,690,833	2,690,833	2,690,833	2,690,833
Incentives Costs	168,999,495	197,139,351	153,645,322	108,931,480	77,542,992	58,787,372	49,339,657	45,323,176	42,215,827	39,917,488
Total	187,302,592	217,322,825	169,937,350	121,575,233	88,042,569	68,109,535	58,103,888	53,874,372	50,676,915	48,348,282

PV Net Avoided Cost Benefits	684,652,995	730,505,406	529,970,164	341,845,725	219,621,827	152,835,772	120,543,806	107,402,725	97,938,811	91,125,527
PV Annual Program Marketing and Admin Costs	18,303,097	19,892,366	15,825,455	12,104,520	9,906,812	8,669,007	8,032,615	7,724,325	7,532,696	7,397,470
PV Net Measure Costs	214,494,235	249,924,435	188,294,139	124,245,961	83,140,134	59,229,680	47,397,295	42,389,800	38,891,158	36,382,773
TRC Ratio	2.94	2.71	2.60	2.51	2.36	2.25	2.17	2.14	2.11	2.08

Free Riders - kWh	81,501,572	153,890,443	211,285,822	255,975,009	287,469,738	307,724,399	319,655,994	327,018,937	331,550,693	335,279,945
Free Riders - kW	10,244	19,412	26,782	32,595	36,670	39,523	41,415	42,727	43,641	44,428
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.44	\$0.47	\$0.47	\$0.50	\$0.56	\$0.63	\$0.70	\$0.72	\$0.75	\$0.76
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PV Annual Program Costs	187,302,592	214,188,362	165,070,663	114,469,665	81,179,120	61,472,377	51,419,894	46,870,708	43,457,454	40,908,271
PV Lost Revenue	438,669,460	481,151,012	372,522,618	251,795,897	160,847,124	109,705,794	84,626,384	74,440,918	66,816,355	61,288,838
RIM	1.09	1.05	0.99	0.93	0.91	0.89	0.89	0.89	0.89	0.89

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Cumulative Gross Energy - kWh	3,934,408,354	4,034,979,124	4,127,081,307	4,212,555,524	4,292,440,597	4,367,081,109	4,436,949,169	4,502,844,935	4,562,415,812	4,616,912,459
Cumulative Gross Peak Demand - kW	600,316	620,796	639,781	657,572	674,353	690,166	705,122	719,353	732,501	744,770
Cumulative Net Energy Savings - kWh	3,447,412,583	3,546,064,059	3,636,948,140	3,721,484,965	3,800,624,424	3,874,668,142	3,944,078,057	4,009,572,486	4,068,793,708	4,122,973,607
Cumulative Net Peak Demand Savings - kW	550,367	570,369	588,984	606,450	622,936	638,477	653,185	667,175	680,093	692,137
New Net Energy Savings - kWh	107,397,563	98,651,476	90,884,081	84,536,825	79,139,459	74,043,718	69,409,915	65,494,429	59,221,222	54,179,899
New Net Peak Demand Savings - kW	21,603	20,002	18,615	17,466	16,486	15,541	14,707	13,991	12,917	12,044
Program Costs - Real										
Administration Costs	5,577,517	5,544,559	5,516,290	5,493,317	5,472,186	5,410,134	5,359,827	5,315,825	5,062,063	4,862,245
Marketing Costs	2,895,505	2,895,505	2,895,505	2,895,505	2,895,505	2,895,505	2,895,505	2,895,505	2,895,505	2,895,505
Incentives Costs	62,892,892	58,446,209	54,716,608	51,591,013	48,938,656	46,393,430	44,222,937	42,335,832	39,295,207	36,766,927
Total	71,365,914	66,886,274	63,128,403	59,979,835	57,306,347	54,699,069	52,478,269	50,547,163	47,252,775	44,524,678

PV Net Avoided Cost Benefits	140,862,366	128,050,834	116,909,075	107,677,289	99,790,857	92,410,067	85,846,703	80,208,717	72,437,008	66,109,445
PV Annual Program Marketing and Admin Costs	7,327,294	7,193,522	7,066,022	6,945,089	6,827,678	6,679,300	6,543,091	6,414,348	6,126,463	5,886,482
PV Net Measure Costs	53,752,759	49,277,738	45,419,605	42,206,614	39,457,782	36,813,980	34,471,321	32,448,091	29,555,761	27,155,135
TRC Ratio	2.31	2.27	2.23	2.19	2.16	2.12	2.09	2.06	2.03	2.00

Free Riders - kWh	486,995,771	488,915,065	490,133,167	491,070,559	491,816,173	492,412,967	492,871,112	493,272,449	493,622,104	493,938,852
Free Riders - kW	49,949	50,427	50,797	51,122	51,417	51,688	51,938	52,177	52,408	52,634
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.66	\$0.68	\$0.69	\$0.71	\$0.72	\$0.74	\$0.76	\$0.77	\$0.80	\$0.82
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PV Annual Program Costs	58,774,331	54,365,035	50,636,748	47,475,663	44,756,041	42,136,949	39,873,497	37,879,330	34,873,882	32,368,029
PV Lost Revenue	113,231,060	102,481,905	93,039,864	85,278,195	78,669,124	72,545,563	67,035,318	62,347,959	55,652,717	50,251,973
RIM	0.82	0.82	0.81	0.81	0.81	0.81	0.80	0.80	0.80	0.80

APPENDIX H

ELECTRIC

ASSYST OUTPUT FILES

Electricity
Commercial
Total
100 Percent

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cumulative Gross Energy - kWh	207,648,357	461,018,340	692,498,673	871,763,010	993,224,080	1,075,584,218	1,136,510,644	1,188,587,804	1,233,958,628	1,274,848,839
Cumulative Gross Peak Demand - kW	27,520	62,197	94,943	121,518	140,620	154,582	165,698	175,655	184,570	192,717
Cumulative Net Energy Savings - kWh	175,226,380	398,196,145	601,722,358	754,992,180	856,315,141	926,517,355	981,189,384	1,030,000,008	1,073,636,801	1,113,338,340
Cumulative Net Peak Demand Savings - kW	24,512	56,316	86,393	110,440	127,477	140,019	150,298	159,747	168,349	176,255
New Net Energy Savings - kWh	175,226,380	222,969,765	203,526,214	153,269,821	101,322,961	70,202,214	54,672,029	48,810,624	43,636,794	39,701,539
New Net Peak Demand Savings - kW	24,512	31,804	30,077	24,047	17,037	12,543	10,279	9,449	8,602	7,906

Administration Costs	3,194,408	4,112,520	4,075,158	3,460,425	2,758,454	2,261,706	2,014,250	1,934,113	1,892,912	1,876,322
Marketing Costs	965,168	965,168	965,168	965,168	965,168	965,168	965,168	965,168	965,168	965,168
Incentives Costs	58,526,352	74,292,700	72,085,212	59,702,254	45,231,724	34,875,523	29,432,471	27,206,139	24,794,425	22,747,178
Total Costs	62,685,929	79,370,389	77,125,539	64,127,848	48,955,347	38,102,398	32,411,890	30,105,420	27,652,505	25,588,669

PV Net Avoided Cost Benefits	212,983,213	269,474,947	246,554,424	190,595,621	129,345,817	91,844,596	72,923,884	65,416,595	58,273,112	52,538,466
PV Annual Program Marketing and Admin Costs	4,159,576	5,004,452	4,895,981	4,236,850	3,513,401	3,000,784	2,730,705	2,618,931	2,544,477	2,493,222
PV Net Measure Costs	69,597,535	90,074,911	85,915,558	66,791,588	47,261,836	33,938,483	27,152,690	24,361,855	21,792,307	19,726,564
TRC Ratio	2.89	2.83	2.72	2.68	2.55	2.49	2.44	2.42	2.39	2.36

Free Riders - kWh	32,421,977	62,822,195	90,776,315	116,770,830	136,908,939	149,066,864	155,321,260	158,587,796	160,321,827	161,510,499
Free Riders - kW	3,009	5,881	8,549	11,078	13,144	14,563	15,400	15,908	16,221	16,462
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.36	\$0.36	\$0.38	\$0.42	\$0.48	\$0.54	\$0.59	\$0.62	\$0.63	\$0.64
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PV Annual Program Costs	62,685,929	78,225,623	74,916,808	59,955,869	44,775,200	34,036,866	28,330,471	25,844,498	23,389,712	21,354,677
PV Lost Revenue	206,834,856	259,394,485	233,359,585	174,969,769	114,591,062	78,777,250	60,839,333	53,702,780	47,365,709	42,465,335
RIM	0.79	0.80	0.80	0.81	0.81	0.81	0.82	0.82	0.82	0.82

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Cumulative Gross Energy - kWh	1,311,469,451	1,344,993,041	1,375,693,769	1,404,185,175	1,430,813,532	1,455,693,703	1,478,983,056	1,500,948,312	1,520,805,271	1,538,970,820
Cumulative Gross Peak Demand - kW	200,105	206,932	213,260	219,191	224,784	230,055	235,041	239,784	244,167	248,257
Cumulative Net Energy Savings - kWh	1,149,137,528	1,182,021,353	1,212,316,047	1,240,494,988	1,266,874,808	1,291,556,047	1,314,692,686	1,336,524,162	1,356,264,569	1,374,324,536
Cumulative Net Peak Demand Savings - kW	183,456	190,123	196,328	202,150	207,645	212,826	217,728	222,392	226,698	230,712
New Net Energy Savings - kWh	35,799,188	32,883,825	30,294,694	28,178,942	26,379,820	24,681,239	23,136,638	21,831,476	19,740,407	18,059,966
New Net Peak Demand Savings - kW	7,201	6,667	6,205	5,822	5,495	5,180	4,902	4,664	4,306	4,015

Administration Costs	1,859,172	1,848,186	1,838,763	1,831,106	1,824,062	1,803,378	1,786,609	1,771,942	1,687,354	1,620,748
Marketing Costs	965,168	965,168	965,168	965,168	965,168	965,168	965,168	965,168	965,168	965,168
Incentives Costs	20,964,297	19,482,070	18,238,869	17,197,004	16,312,885	15,464,477	14,740,979	14,111,944	13,098,402	12,255,642
Total Costs	23,788,638	22,295,425	21,042,801	19,993,278	19,102,116	18,233,023	17,492,756	16,849,054	15,750,925	14,841,559

PV Net Avoided Cost Benefits	46,954,122	42,683,611	38,969,692	35,892,430	33,263,619	30,803,356	28,615,568	26,736,239	24,145,669	22,036,482
PV Annual Program Marketing and Admin Costs	2,442,431	2,397,841	2,355,341	2,315,030	2,275,893	2,226,433	2,181,030	2,138,116	2,042,154	1,962,161
PV Net Measure Costs	17,917,586	16,425,913	15,139,868	14,068,871	13,152,594	12,271,327	11,490,440	10,816,030	9,851,920	9,051,712
TRC Ratio	2.31	2.27	2.23	2.19	2.16	2.12	2.09	2.06	2.03	2.00

Free Riders - kWh	162,331,924	162,971,688	163,377,722	163,690,186	163,938,724	164,137,656	164,290,371	164,424,150	164,540,701	164,646,284
Free Riders - kW	16,650	16,809	16,932	17,041	17,139	17,229	17,313	17,392	17,469	17,545
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.66	\$0.68	\$0.69	\$0.71	\$0.72	\$0.74	\$0.76	\$0.77	\$0.80	\$0.82
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PV Annual Program Costs	19,591,444	18,121,678	16,878,916	15,825,221	14,918,680	14,045,650	13,291,166	12,626,443	11,624,627	10,789,343
PV Lost Revenue	37,743,687	34,160,635	31,013,288	28,426,065	26,223,041	24,181,854	22,345,106	20,782,653	18,550,906	16,750,658
RIM	0.82	0.82	0.81	0.81	0.81	0.81	0.80	0.80	0.80	0.80

APPENDIX H

ELECTRIC

ASSYST OUTPUT FILES

Electricity
Residential
Total
100 Percent

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cumulative Gross Energy - kWh	253,349,573	479,048,323	607,627,093	668,199,214	699,563,728	719,297,002	733,779,591	745,997,748	756,761,838	767,316,163
Cumulative Gross Peak Demand - kW	77,604	152,158	195,507	216,477	227,981	235,590	241,536	246,808	251,760	256,664
Cumulative Net Energy Savings - kWh	208,657,974	396,154,961	498,843,670	544,441,386	567,743,252	581,919,321	592,390,004	601,452,438	610,040,925	618,571,365
Cumulative Net Peak Demand Savings - kW	70,822	139,454	178,448	196,514	206,341	212,794	217,887	222,473	226,906	231,334
New Net Energy Savings - kWh	208,657,974	187,496,987	102,688,709	45,597,716	23,301,865	14,176,069	10,470,684	9,062,434	8,588,487	8,530,439
New Net Peak Demand Savings - kW	70,822	68,632	38,994	18,066	9,827	6,453	5,092	4,586	4,433	4,427

Administration Costs	11,935,252	12,734,513	8,873,146	5,933,041	4,619,833	4,038,329	3,786,062	3,681,615	3,643,044	3,633,295
Marketing Costs	1,534,967	1,534,967	1,534,967	1,534,967	1,534,967	1,534,967	1,534,967	1,534,967	1,534,967	1,534,967
Incentives Costs	100,943,412	109,660,115	68,239,703	35,911,993	21,873,205	15,693,823	13,046,391	11,980,705	11,616,264	11,555,275
Total Costs	114,413,632	123,929,595	78,647,816	43,380,001	28,028,004	21,267,119	18,367,420	17,197,287	16,794,275	16,723,536

PV Net Avoided Cost Benefits	425,578,220	397,219,118	220,055,399	99,563,796	52,608,550	33,479,794	25,680,952	22,611,936	21,454,908	21,090,749
PV Annual Program Marketing and Admin Costs	13,470,220	14,063,671	10,110,045	7,149,511	5,807,324	5,182,803	4,876,843	4,712,157	4,609,854	4,534,811
PV Net Measure Costs	132,516,158	142,128,834	84,677,455	41,512,608	24,126,492	16,731,217	13,554,786	12,223,532	11,687,621	11,486,186
TRC Ratio	2.92	2.32	2.32	2.05	1.76	1.53	1.39	1.34	1.32	1.32

Free Riders - kWh	44,691,599	82,893,362	108,783,423	123,757,827	131,820,476	137,377,681	141,389,586	144,545,309	146,720,913	148,744,799
Free Riders - kW	6,782	12,704	17,059	19,963	21,639	22,796	23,649	24,335	24,854	25,330
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.55	\$0.66	\$0.77	\$0.95	\$1.20	\$1.50	\$1.75	\$1.90	\$1.96	\$1.96
PV Annual Program Costs	114,413,632	122,142,149	76,395,490	41,328,582	26,247,214	19,581,464	16,641,400	15,344,395	14,764,290	14,489,275
PV Lost Revenue	200,512,876	178,720,558	96,799,626	42,650,365	21,658,136	13,123,125	9,644,108	8,274,528	7,750,585	7,592,236
RIM	1.35	1.32	1.27	1.19	1.10	1.02	0.98	0.96	0.95	0.96

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Cumulative Gross Energy - kWh	1,311,469,451	1,344,993,041	1,375,693,769	1,404,185,175	1,430,813,532	1,455,693,703	1,478,983,056	1,500,948,312	1,520,805,271	1,538,970,820
Cumulative Gross Peak Demand - kW	200,105	206,932	213,260	219,191	224,784	230,055	235,041	239,784	244,167	248,257
Cumulative Net Energy Savings - kWh	1,149,137,528	1,182,021,353	1,212,316,047	1,240,494,988	1,266,874,808	1,291,556,047	1,314,692,686	1,336,524,162	1,356,264,569	1,374,324,536
Cumulative Net Peak Demand Savings - kW	183,456	190,123	196,328	202,150	207,645	212,826	217,728	222,392	226,698	230,712
New Net Energy Savings - kWh	35,799,188	32,883,825	30,294,694	28,178,942	26,379,820	24,681,239	23,136,638	21,831,476	19,740,407	18,059,966
New Net Peak Demand Savings - kW	7,201	6,667	6,205	5,822	5,495	5,180	4,902	4,664	4,306	4,015
Program Costs - Real										
Administration Costs	1,859,172	1,848,186	1,838,763	1,831,106	1,824,062	1,803,378	1,786,609	1,771,942	1,687,354	1,620,748
Marketing Costs	965,168	965,168	965,168	965,168	965,168	965,168	965,168	965,168	965,168	965,168
Incentives Costs	20,964,297	19,482,070	18,238,869	17,197,004	16,312,885	15,464,477	14,740,979	14,111,944	13,098,402	12,255,642
Total Costs	23,788,638	22,295,425	21,042,801	19,993,278	19,102,116	18,233,023	17,492,756	16,849,054	15,750,925	14,841,559

PV Net Avoided Cost Benefits	46,954,122	42,683,611	38,969,692	35,892,430	33,263,619	30,803,356	28,615,568	26,736,239	24,145,669	22,036,482
PV Annual Program Marketing and Admin Costs	2,442,431	2,397,841	2,355,341	2,315,030	2,275,893	2,226,433	2,181,030	2,138,116	2,042,154	1,962,161
PV Net Measure Costs	17,917,586	16,425,913	15,139,868	14,068,871	13,152,594	12,271,327	11,490,440	10,816,030	9,851,920	9,051,712
TRC Ratio	2.31	2.27	2.23	2.19	2.16	2.12	2.09	2.06	2.03	2.00

Free Riders - kWh	162,331,924	162,971,688	163,377,722	163,690,186	163,938,724	164,137,656	164,290,371	164,424,150	164,540,701	164,646,284
Free Riders - kW	16,650	16,809	16,932	17,041	17,139	17,229	17,313	17,392	17,469	17,545
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.66	\$0.68	\$0.69	\$0.71	\$0.72	\$0.74	\$0.76	\$0.77	\$0.80	\$0.82
PV Annual Program Costs	19,591,444	18,121,678	16,878,916	15,825,221	14,918,680	14,045,650	13,291,166	12,626,443	11,624,627	10,789,343
PV Lost Revenue	37,743,687	34,160,635	31,013,288	28,426,065	26,223,041	24,181,854	22,345,106	20,782,653	18,550,906	16,750,658
RIM	0.82	0.82	0.81	0.81	0.81	0.81	0.80	0.80	0.80	0.80

APPENDIX H

ELECTRIC

ASSYST OUTPUT FILES

Electricity
Industrial
Total
100 Percent

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cumulative Gross Energy - kWh	42,395,377	99,132,800	155,568,437	202,267,272	236,881,193	262,362,283	282,475,343	299,892,986	316,205,141	332,004,766
Cumulative Gross Peak Demand - kW	5,776	13,685	21,694	28,441	33,531	37,355	40,428	43,123	45,664	48,132
Cumulative Net Energy Savings - kWh	38,007,381	90,957,913	143,842,352	186,820,921	218,140,871	241,082,429	259,530,195	276,007,155	291,697,187	306,980,118
Cumulative Net Peak Demand Savings - kW	5,324	12,859	20,520	26,888	31,644	35,190	38,063	40,639	43,097	45,497
New Net Energy Savings - kWh	38,007,381	52,950,532	52,884,438	42,978,570	31,319,949	22,941,558	18,447,766	16,476,959	15,690,032	15,282,931
New Net Peak Demand Savings - kW	5,324	7,536	7,661	6,368	4,757	3,546	2,873	2,576	2,459	2,399

Administration Costs	482,604	645,608	652,891	559,454	430,458	331,296	273,086	244,635	234,299	230,345
Marketing Costs	190,697	190,697	190,697	190,697	190,697	190,697	190,697	190,697	190,697	190,697
Incentives Costs	9,529,731	13,186,537	13,320,408	13,317,233	10,438,063	8,218,026	6,860,795	6,136,333	5,805,139	5,615,035
Total Costs	10,203,032	14,022,842	14,163,995	14,067,385	11,059,218	8,740,019	7,324,578	6,571,665	6,230,135	6,036,077

PV Net Avoided Cost Benefits	46,091,562	63,811,341	63,360,341	51,686,308	37,667,461	27,511,382	21,938,970	19,374,193	18,210,791	17,496,311
PV Annual Program Marketing and Admin Costs	673,301	824,243	819,429	718,159	586,087	485,420	425,067	393,237	378,364	369,437
PV Net Measure Costs	12,380,543	17,720,690	17,701,126	15,941,765	11,751,806	8,559,981	6,689,819	5,804,413	5,411,230	5,170,023
TRC Ratio	3.53	3.44	3.42	3.10	3.05	3.04	3.08	3.13	3.15	3.16

Free Riders - kWh	4,387,996	8,174,886	11,726,085	15,446,351	18,740,323	21,279,854	22,945,148	23,885,832	24,507,954	25,024,648
Free Riders - kW	452	826	1,174	1,554	1,887	2,164	2,365	2,484	2,566	2,636
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.27	\$0.26	\$0.27	\$0.33	\$0.35	\$0.38	\$0.40	\$0.40	\$0.40	\$0.39
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PV Annual Program Costs	10,203,032	13,820,589	13,758,365	13,185,214	10,156,705	7,854,047	6,448,023	5,681,815	5,303,452	5,064,319
PV Lost Revenue	31,321,728	43,035,969	42,363,408	34,175,763	24,597,925	17,805,419	14,142,943	12,463,610	11,700,061	11,231,267
RIM	1.11	1.12	1.13	1.09	1.08	1.07	1.07	1.07	1.07	1.07

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Cumulative Gross Energy - kWh	1,311,469,451	1,344,993,041	1,375,693,769	1,404,185,175	1,430,813,532	1,455,693,703	1,478,983,056	1,500,948,312	1,520,805,271	1,538,970,820
Cumulative Gross Peak Demand - kW	200,105	206,932	213,260	219,191	224,784	230,055	235,041	239,784	244,167	248,257
Cumulative Net Energy Savings - kWh	1,149,137,528	1,182,021,353	1,212,316,047	1,240,494,988	1,266,874,808	1,291,556,047	1,314,692,686	1,336,524,162	1,356,264,569	1,374,324,536
Cumulative Net Peak Demand Savings - kW	183,456	190,123	196,328	202,150	207,645	212,826	217,728	222,392	226,698	230,712
New Net Energy Savings - kWh	35,799,188	32,883,825	30,294,694	28,178,942	26,379,820	24,681,239	23,136,638	21,831,476	19,740,407	18,059,966
New Net Peak Demand Savings - kW	7,201	6,667	6,205	5,822	5,495	5,180	4,902	4,664	4,306	4,015

Program Costs - Real										
Administration Costs	1,859,172	1,848,186	1,838,763	1,831,106	1,824,062	1,803,378	1,786,609	1,771,942	1,687,354	1,620,748
Marketing Costs	965,168	965,168	965,168	965,168	965,168	965,168	965,168	965,168	965,168	965,168
Incentives Costs	20,964,297	19,482,070	18,238,869	17,197,004	16,312,885	15,464,477	14,740,979	14,111,944	13,098,402	12,255,642
Total Costs	23,788,638	22,295,425	21,042,801	19,993,278	19,102,116	18,233,023	17,492,756	16,849,054	15,750,925	14,841,559

PV Net Avoided Cost Benefits	46,954,122	42,683,611	38,969,692	35,892,430	33,263,619	30,803,356	28,615,568	26,736,239	24,145,669	22,036,482
PV Annual Program Marketing and Admin Costs	2,442,431	2,397,841	2,355,341	2,315,030	2,275,893	2,226,433	2,181,030	2,138,116	2,042,154	1,962,161
PV Net Measure Costs	17,917,586	16,425,913	15,139,868	14,068,871	13,152,594	12,271,327	11,490,440	10,816,030	9,851,920	9,051,712
TRC Ratio	2.31	2.27	2.23	2.19	2.16	2.12	2.09	2.06	2.03	2.00

Free Riders - kWh	162,331,924	162,971,688	163,377,722	163,690,186	163,938,724	164,137,656	164,290,371	164,424,150	164,540,701	164,646,284
Free Riders - kW	16,650	16,809	16,932	17,041	17,139	17,229	17,313	17,392	17,469	17,545
Other Naturally Occurring - kWh										
Other Naturally Occurring - kW										

Cost per First-Year Net kWh	\$0.66	\$0.68	\$0.69	\$0.71	\$0.72	\$0.74	\$0.76	\$0.77	\$0.80	\$0.82
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PV Annual Program Costs	19,591,444	18,121,678	16,878,916	15,825,221	14,918,680	14,045,650	13,291,166	12,626,443	11,624,627	10,789,343
PV Lost Revenue	37,743,687	34,160,635	31,013,288	28,426,065	26,223,041	24,181,854	22,345,106	20,782,653	18,550,906	16,750,658
RIM	0.82	0.82	0.81	0.81	0.81	0.81	0.80	0.80	0.80	0.80