FINAL REPORT

Virginia Energy Efficiency Potential Study 2024 to 2033

Virginia Electric and Power Company (Dominion Energy Virginia)

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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.

Base+: Denotes an achievable potential scenario where budgets are maintained as in the BAU scenario, but unlike the BAU scenario all measures that passed the economic screening are included in the analysis, not just measures currently in programs. Added measures receive an incentive level comparable to existing program measures.

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.

CBECS: US Energy Information Agency (EIA) Commercial Buildings Energy Consumption Survey

CFL: Compact fluorescent lamp.

CDA: Conditional Demand Analysis. This type of statistical analysis matches the survey data for a sample of customers with their utility billing data and, factoring in weather data, estimates the amount of energy used by various end uses or equipment types.

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.

DOE: U.S. Department of Energy.

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'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 savings do not include savings that the program did not pay for (spillover).

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.

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.

NAICS: The North American Industry Classification System is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.

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.

REUS: Residential Energy Use Survey.

RECS: EIA Residential Energy Consumption Survey.

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.

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.

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.

UEC: Unit energy consumption.

1 EXECUTIVE SUMMARY

The Dominion Energy Efficiency Potential Study (2024-2033) assessed the potential for electric energy (kWh) and demand (kW) savings from company-sponsored demand side management (DSM) programs over 10 years starting in 2024 for Dominion Energy's Virginia service territory. The assessment produced:

- Estimates of technical potential, economic potential, and achievable savings potential under two program scenarios: One offering incentives of at least 50% of incremental measure cost and another offering 75% incentives. Both achievable scenarios increase marketing budgets by 10% over 2023 levels.
- Estimates of the magnitude of potential savings on an annual basis
- Estimates of the costs associated with achieving those savings
- Calculation of the cost-effectiveness of the programs based on the estimates above

DNV used our proprietary model, DSM ASSYST™, to produce these outputs.

DNV based our forecasts on building characteristic data collected in 2023 using mail surveys of residential and commercial customers. Data development included a residential conditional demand analysis and review, interpretation, and analysis of data provided to DNV by Dominion Energy staff.

1.1 Key findings

1.1.1 Energy savings potential

Figure 1-1 below presents the electric energy savings potential found by the study. These savings reflect cumulative annual savings potential over a 10-year period, which is the annual savings potential in 2033 of all installations from 2024 through 2033. The estimates do not include 1) persistent savings for measures installed in prior years, 2) savings for opt-out customers, or 3) savings from voltage optimization. We add these three savings components to our potential estimates for purposes of comparing our results to savings targets under the Virginia Clean Economy Act of 2020, but otherwise reported potential is only for energy-efficiency program activity from 2024 onward.

Technical energy savings potential is estimated at 28,926 GWh by 2033 and economic potential is estimated at 16,283 GWh.

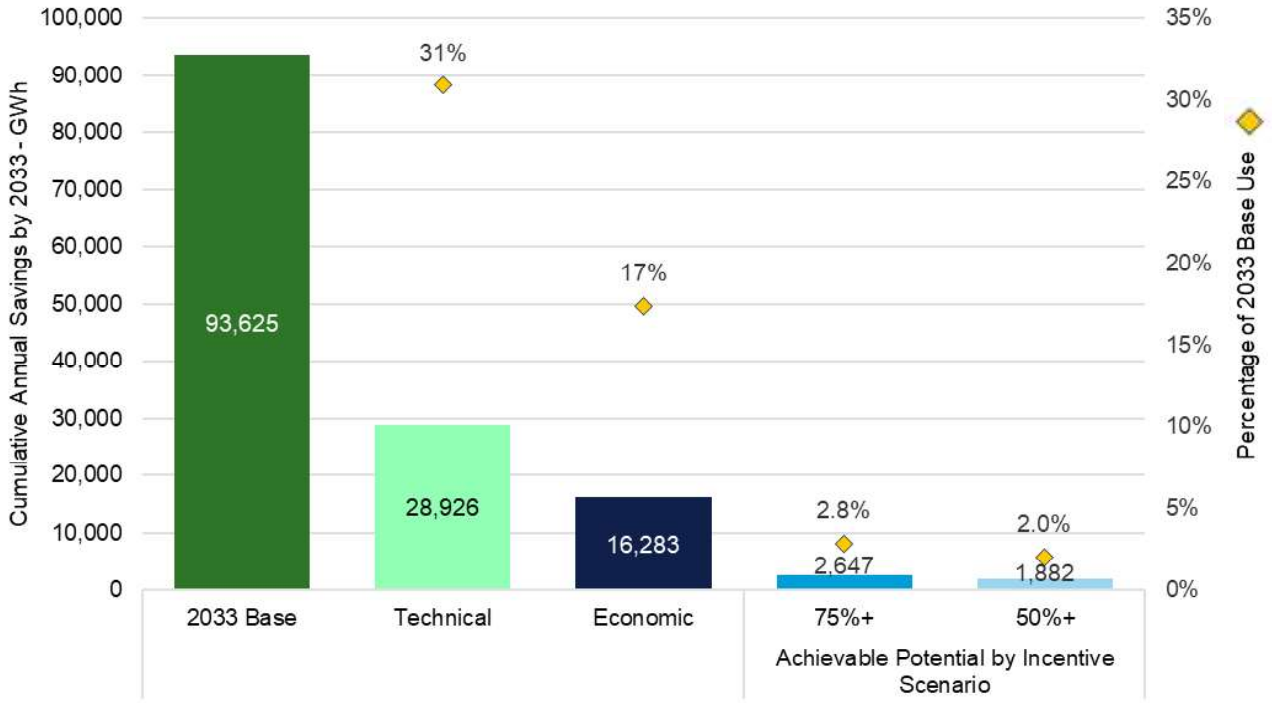
Achievable program potential is 1,882 GWh in the 50%+ incentive scenario and 2,647 GWh in the 75%+ incentive scenario.

Economic potential for peak demand savings is estimated to be 17% of base 2033 projected energy use.

Achievable potentials are 2.0% of base energy consumption in the 50%+ scenario and 2.8% of base energy consumption in the 75%+ scenario.

All results include line losses.

Figure 1-1. Estimated base consumption and net electric energy savings potential from customer energy efficiency programs, 2024-2033



Note: Excludes Virginial non-jurisdictional, federal, opt-out customers, voltage optimization, and persistent savings from program years prior to 2024.

1.1.2 Demand savings potential from energy efficiency programs

Dominion Energy's Virginia service territory's winter peak usage has been trending upward with the increased use of heat pumps for heating. Recent years' annual peaks have occurred in summer or winter with roughly equal probability, but the trend indicates that winter peaks are more likely in the future. As a result, we report peak demand reductions assuming a winter peak. Figure 1-2 shows cumulative 10-year winter peak demand savings potential estimates. The study estimated peak demand potential from the installation of energy efficiency measures only and did not assess demand savings from demand response technologies such as direct load control or dynamic pricing.

Technical potential for demand savings is estimated at 3,914 MW and economic potential is estimated at 1,784 MW.

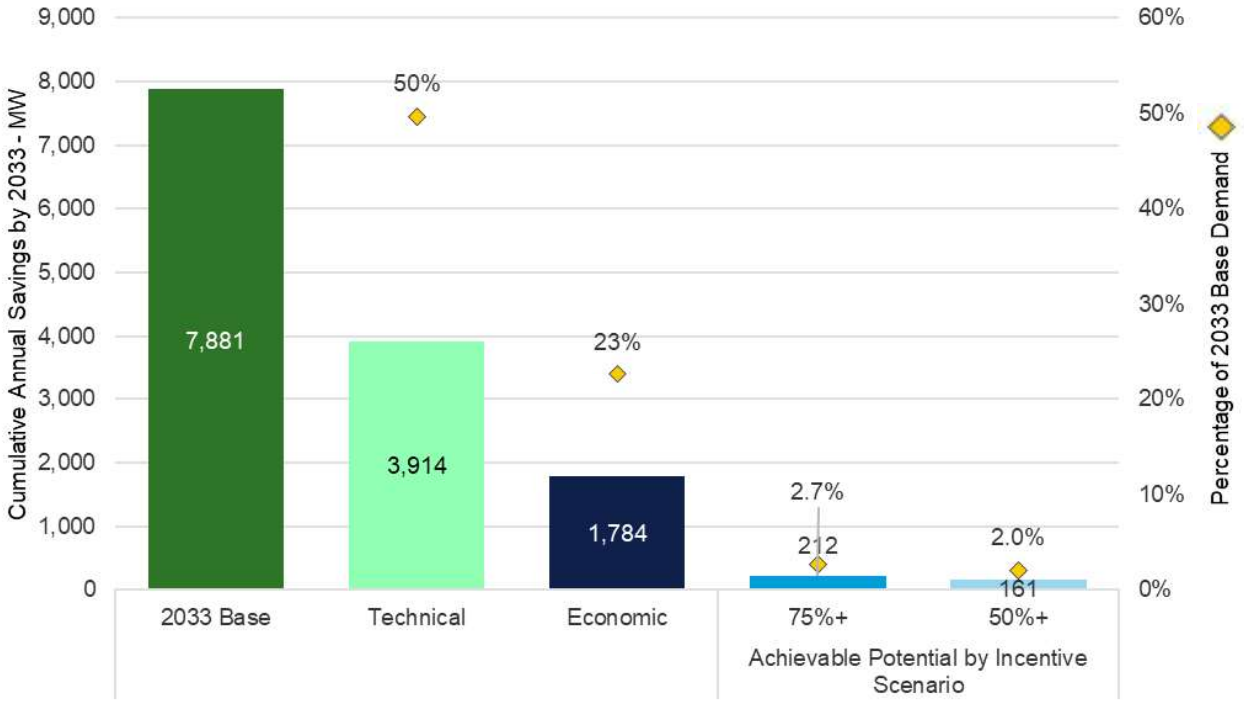
Achievable program potential is 173 MW in the 50%+ incentive scenario and 229 MW in the 75%+ incentive scenario.

Economic potential for peak demand savings is estimated to be 23% of base 2033 peak demand.

Achievable potentials are 2.0% of base peak demand in the 50%+ scenario and 2.7% of base peak demand in the 75%+ scenario.

All results include line losses.

Figure 1-2. Estimated base demand and net winter peak demand savings potential from customer energy efficiency programs, 2024-2033

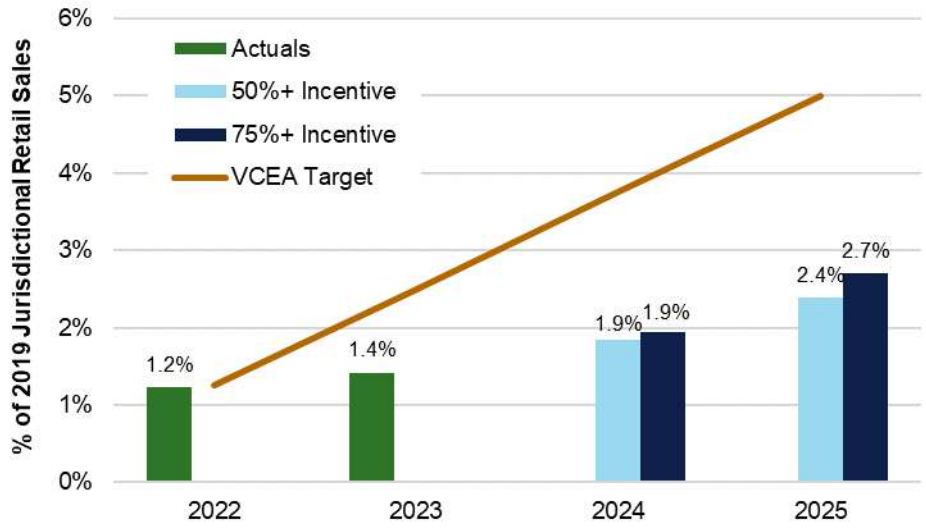


Note: Excludes Virginia non-jurisdictional, federal, and opt-out customers, voltage optimization, and persistent savings from program years prior to 2024.

Figure 1-3 combines achievable potential found in this study with persistent impacts from previous program years, opt-out savings, and projected savings from voltage optimization, and compares the total savings against 2022 – 2025 savings targets set under the Virginia Clean Economy Act of 2020 (VCEA). The estimated achievable potential, which takes into account the Company's expanded program offerings and increased marketing efforts, under the 50%+ and 75%+ scenarios is below the 2024 and 2025 VCEA targets. Despite these estimates of potential, the Company remains committed to maximize savings from its programs in an effort to meet the VCEA savings targets.

Note that the VCEA targets are set as a percentage of 2019 base consumption (excluding non-jurisdictional and federal customers); the achievable potentials are expressed relative to this base for this chart only. Elsewhere, achievable potentials are presented as a percentage of projected base consumption in 2033, excluding non-jurisdictional, federal, and opt-out customers.

Figure 1-3. Projected savings compared to VCEA targets by scenario through 2025, including persistent savings from previous program years, opt-out savings and voltage optimization savings, as a percentage of 2019 base consumption*



*Note that the base consumption for the VCEA targets (2019 jurisdictional sales without federal customers) differs from the base consumption used elsewhere in the report (projected 2033 no-energy-efficiency jurisdictional retail sales excluding federal customers and opt-out customers.) Achievable savings are net savings.

1.1.3 Cost-effectiveness

The TRC benefit-cost ratios for Dominion Energy's Virginia service territory are 0.93 under the 50%+ scenario and 1.00 under the 75%+ scenario. TRCs less than 1.00 indicate that the costs of the program exceed the benefits as measured by energy and demand avoided costs. This test does not consider the societal cost of carbon and other greenhouse gases, nor non-energy impacts (benefits or cost) accruing from the program. There are two factors causing the low program TRC. The first is that the overall results include costs and savings for income and age qualifying (IAQ) programs, which are not required to be cost-effective. This is, in part, an acknowledgement that such programs have non-energy benefits not captured by the TRC. Second, program marketing and administrative costs can make a modeled program cost-ineffective even when individual measures are cost-effective. The achievable potential analysis for non-IAQ segment includes only measures that are individually cost-effective, but when combined with IAQ programs and with the addition of program costs, the portfolio's costs exceed (or in the case of the 75%+ scenario, just equal) its avoided cost benefits.

Key results of our efficiency scenario forecasts from 2024 to 2033 are summarized in Table 1-1.

Table 1-1. Summary of achievable potential results—2024-2033 *†

Result - programs	Program scenario	
	50% Incentives	75% Incentives
Total Market Energy Savings - GWh (year 10 annual)	2,263	3,028
Total Market Peak Demand Savings - MW (year 10 annual)	491	643
Program Energy Savings - GWh (year 10 annual)	1,882	2,647
Program Peak Demand Savings - MW (year 10 annual)	396	547
Program Costs - Real, $ Million		
Administration (10-year total)	$270	$339
Marketing (10-year total)	$222	$220
Incentives (10-year total)	$589	$941
Total Program Costs (10-year total)	$1,081	$1,501
PV Avoided Costs (PV 10-year cost)	$925	$1,304
PV Annual Program Costs (Adm/Mkt) (PV 10-year cost)	$403	$464
PV Net Measure Costs (PV 10-year cost)	$589	$841
Net Benefits (PV 10-year cost)	-$67	-$1
TRC Ratio‡	0.93	1.00

*PV (present value) of benefits and costs is calculated over the measure life for 2020-2029 program years, customer discount rate = 7.307%, utility discount rate = 6.307%, inflation rate = 1.98%; GWh and MW savings are cumulative through 2029.
†Excludes Virginia non-jurisdictional, federal, and opt-out customers as well as voltage optimization and persistent savings from program activities prior to 2024
‡TRCs less than one indicate that the program, with the added burden of marketing and administrative costs, is not cost-effective, even though the individual measures in the program are cost-effective based on measure costs and savings alone.

1.2 General observations and conclusions

Other takeaways from this study include:

- This Dominion Energy potential study shows a lower range of program savings potential (achievable potential) as a percentage of base load than other potential studies conducted by DNV. This is mainly driven by Dominion Energy's low avoided costs. Low avoided costs create a challenging environment for DSM programs and measures to demonstrate cost-effectiveness in terms of the TRC. Low avoided costs also lead to low customer retail rates, which means less cost-effectiveness in terms of the participant test and a less compelling value proposition for customer adoption.
- Compared to the 2020 Dominion Energy potential study conducted by DNV, technical and economic potential are higher as a proportion of the base; however, achievable potential for both the 50%+ and 75%+ incentive scenarios is lower than in 2020. The lower achievable results reflect a 99% drop in residential lighting potential due to market transformation and lighting standards. Other factors that reduced achievable potential include Dominion Energy's program experience with its residential behavioral programs that tempered expectations for future savings, the impacts of codes and standards (with some impactful changes happening in 2028 and 2029), as well as evaluation findings on net-to-gross ratios that were factored in when calibrating the models to recent program performance.

- Among residential measures targeting existing buildings, the largest share of savings come from measures that reduce heating and cooling use in homes with electric heating, accounting for about 70% of savings in both scenarios. These measures include heat pumps, shell measures, and weatherization. Water heating ranks second, representing 11 to 12% of potential. Refrigerators and pool pumps each contribute 5 to 6% of potential. Lighting potential has fallen compared to 2020, reflecting the transformation of the lighting market to LEDs, and makes up less than 2% of residential potential.
- Because fluorescent and high-intensity discharge lighting have lagged behind screw-based incandescent and CFL lighting in being displaced by LEDs, indoor and outdoor lighting remain a significant share of commercial potential for existing buildings, representing about 32% of commercial potential in both the 50%+ and 75%+ scenarios. Compressed air, not included in previous DNV potential studies for Dominion Energy, accounts for 23% of commercial potential in the 50%+ scenario and 18% in the 75%+ scenario. Refrigeration and cooling are also key areas of potential energy savings in the commercial sector.
- Commercial new construction potential exceeds the potential for existing buildings, making up just over half of total commercial potential in the 53% scenario and 58% in the 75% scenario.

A key challenge for any potential study is modeling future measure adoption in ways that reflect the realities of a given market. A best practice applied in this study is to calibrate the adoption parameters of the achievable potential model to historic programs, including marketing budgets, incentive budgets, net and gross energy savings, and net and gross demand savings. Once the adoption parameters are calibrated to reflect the customer base's willingness to adopt at different levels of cost-effectiveness (participant cost test), we use the calibrated model with new budgets, measures, and incentive levels to create new program scenarios. In the case of this study, the scenarios assumed higher marketing activity driving greater customer awareness than has been true historically. The assumed marketing increase is higher than that being undertaken by Dominion Energy, so that the potential effect of these increases is not constrained by the current plans. The scenarios also include some recently launched programs that do not have historical adoption for calibration; for these programs, the calibration assumes that the filed plans are achieved for all future years. Key uncertainties for the historic calibration are:

- Program years (PY) 2020 and 2021 were substantially affected by the pandemic. As a result, only PY2023 was available as a basis for empirical calibration.
- The Customer Engagement program (a residential behavioral program) faced major launch challenges in PY2021-2023 resulting in substantial underachievement relative to plan. The calibration assumes that the current program forecasts—which factor in the past underperformance—will be met going forward, starting in 2024. However, achievement is declining across the country for programs of this type. Given that this program represents almost 7% of the estimated achievable potential, the lack of a Dominion-specific basis for calibrating this program represents an important uncertainty in the overall estimate. The addition of two more behavioral programs (for low income and small business customers) brings the total behavioral share of potential to 8.2%.

2 INTRODUCTION

Dominion Energy retained DNV to conduct a demand-side management (DSM) market potential study based on existing and proposed customer end-use energy efficiency measures and programs. This study provides estimates of potential electricity and peak demand savings from energy efficiency measures in Dominion Energy's Virginia service territory, including technical, economic, and achievable program potential. The analysis also presents the technical and economic potential associated with opt-out and non-jurisdictional customers in Dominion Energy's service territory. These customers were not included in the estimation of program achievable potential as they do not participate in Dominion Energy-sponsored programs. The study does not address natural gas equipment usage or savings.

2.1 Overview

The scope of this study includes new and existing residential and non-residential commercial buildings and covers a 10-year period spanning 2024-2033. Given the near- to mid-term focus, the base potential analysis was restricted to DSM measures that are presently commercially available, and only included codes and standards that are currently in place or will be effective within the next year. We did not predict the impact of future codes and standards.

Data for the study came from a number of different sources including the commercial saturation, residential saturation, and residential conditional demand studies all conducted by DNV in 2023, internal Dominion Energy data, DNV's extensive energy efficiency database, and a variety of information from third-party sources.

2.2 Study approach

DNV calculated the energy efficiency potential elements of this study after first identifying and developing baseline end-use and measure data, then developing estimates of future energy efficiency impacts under varying levels of program effort.

DNV performed a baseline characterization to identify the types and approximate sizes of the various market segments that are the most likely sources of DSM potential in Dominion Energy's service territory. These characteristics served as inputs to a modeling process that incorporated Dominion 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.

We used DNV's DSM ASSYST model to aid in the analysis. This model provides a thorough, clear, 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 and non-residential sectors, with a focus on energy efficiency impacts through 2033.

2.3 Organization of the report

Section 3 provides an overview of the data collection conducted for this study. Additional, detailed results are provided in the attached appendices. The remainder of the report is structured as follows:

- Section 3 reviews and summarizes the data collection and development process.
- Section 4 discusses the methodology and concepts used to develop the technical, economic, and achievable potential estimates.
- Section 5.1 provides baseline results developed for the study.
- Sections 5.2 and 5.3 discuss the results of the electric energy efficiency potential analysis by sector and over time, including technical and economic potential, as well as achievable or program results.

The report includes the following appendices:

- Appendix A, Detailed methodology and model description

- Appendix B, Measure descriptions
- Appendix C, Economic inputs
- Appendix D, Building and time-of-use factor inputs
- Appendix E, Measure inputs
- Appendix F, Non-additive measure level results (not adjusted to remove double counting)
- Appendix G, Supply curve data
- Appendix H, Measure level rankings by economic savings potential
- Appendix I, Achievable program potential by sector

3 DATA COLLECTION AND DEVELOPMENT

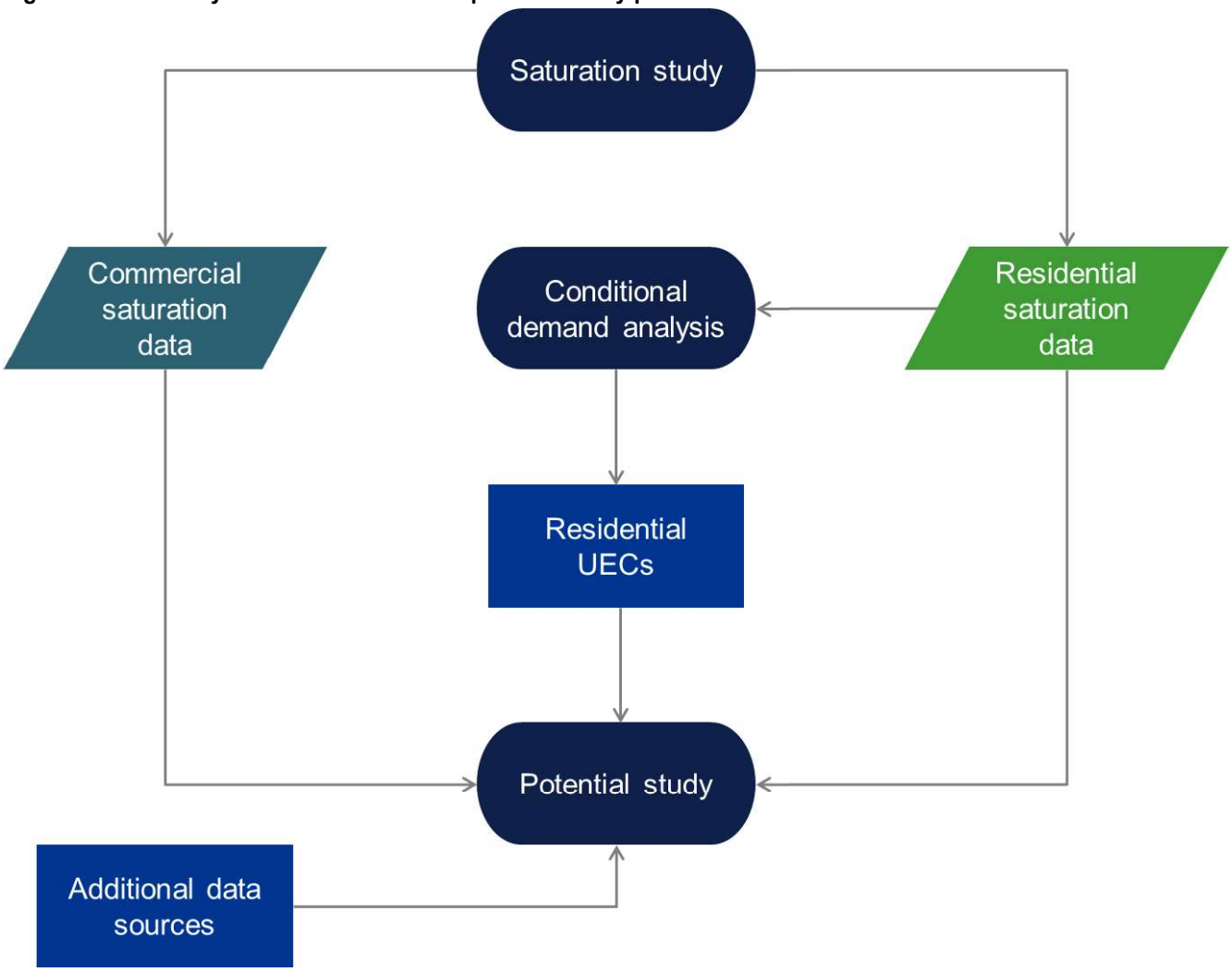
This section describes how DNV developed data inputs for this potential study. The main sources of this data were the residential and commercial saturation surveys, the residential conditional demand analysis (CDA), data provided by Dominion Energy staff, and secondary data sources.

3.1 Dominion Energy-specific data collection efforts

Dominion Energy engaged DNV to collect end-use saturation and consumption data from residential and non-residential customers. Data developed from the resulting studies were used as direct inputs for the DSM Potential Study. The residential and commercial customer saturation surveys used for these efforts collected information on building characteristics, occupant characteristics, and the penetration and usage of various end uses throughout Dominion Energy's service territory. The residential saturation survey data was then fed into the residential CDA model, which produced estimates of annual electricity consumption for many end-use categories. The CDA estimates, along with data from the saturation studies, were then used as inputs in the DSM ASSYST™ model. These data were combined with other data from Dominion Energy and secondary data sources to fully populate the data inputs required for the modeling effort.

Figure 3-1 illustrates the relationship between the saturation studies, conditional demand analysis, additional data sources, and the DSM potential study.

Figure 3-1. Summary flow chart for the DSM potential study process



3.1.1 Residential and commercial energy use surveys

This 2024 study used the results of the 2023 DNV Residential Home Energy Use Survey and 2023 DNV Commercial Energy Use Survey, and also considered or benchmarked against prior study versions that were previously completed by DNV. The goal of these studies was to estimate the saturation of end uses of electricity associated with appliances, HVAC, and electronics, as well as the usage patterns and related household and building characteristics. DNV also used the data gathered from the residential saturation study in a conditional demand analysis, which provided unit energy consumption (UEC) estimates for a range of electric end uses and market segments for the DSM Potential Study.

The sections below describe the sample selection, data collection and response rates for the residential and commercial saturation studies.

3.1.1.1 Residential Home Energy Use Survey

Sample selection

DNV obtained a billing data file from Dominion Energy at the design phase of this project which served as the sample frame for the study. The billing data file represented a complete census of all active accounts from October 1, 2021, to December 1, 2022. The initial sample was selected from among those accounts on the sample frame with an email address and annualized usage greater than 1,200 kWh/year. Any accounts that were flagged as "do not contact" were removed. Using a minimum annualized usage greater than 1,200 kWh/year ensures that premises such as well-houses and partially vacant residences are excluded.

DNV stratified the sample frame according to 7 regions defined by Dominion Energy, and annualized usage (3 levels). The usage levels are assigned based on the distribution of annualized consumption within each region. The 2023 regional assignments are consistent with regional assignments used in the 2020 and 2016 residential studies. Once stratification was applied to the sample frame, a sample was randomly selected from within each stratum.

The 7 regions are:

- Northern Virginia
- Shenandoah Valley / Western Piedmont
- Richmond / Tri-Cities
- Southside
- Gloucester / Northern Neck
- Southeastern
- North Carolina

The 3 annual usage levels are:

- Low consumption (below 33rd percentile)
- Medium consumption (33rd – 65th percentile)
- High consumption (66th percentile and above)

Data collection and response rates

The survey was open for two weeks from September 14–28, 2023. The majority of popular email service providers use a constantly evolving variety of techniques to detect spam. DNV collaborated with Dominion Energy's information technology (IT) team to register the "from" email address with the online survey platform to reduce the likelihood that emails would be identified as spam. DNV also:

- Followed the "CAN-SPAM" anti-spam laws compliance guide
- Carefully crafted the email message content and subject line
- Used a proven domain name for the email campaign

As a general rule, the data collection team avoided distribution on Friday through Monday afternoons with the thought that email received over the weekend could become buried deep in a recipient's inbox with a lower likelihood of response.

A total of 7,008 households responded to the survey. A total of 196 respondents were considered ineligible for not passing the two screener questions signalling 1) an active account, and 2) residential occupancy. Data from the remaining 6,812 eligible respondents was used in the analysis to develop final study estimates. Table 3-1 below presents the survey count metrics.

Table 3-1. Survey count metrics

Households emailed	**156,437**
Total responses	7,008
Failed screener questions	196
Completed survey	5,712
Partially completed survey	1,100
Total number of eligible respondents	6,812
Response rate	**4.4%**

3.1.1.2 Commercial Energy Use Survey

DNV used data from our 2023 Commercial Energy Use Survey to provide data for this study's commercial sector analysis.

Sample selection

The study sample design featured a two-dimensional stratification based on the Dominion Energy operating region and customer annualized consumption. The first dimension included 6 mutually exclusive operating regions within the Company's service territory. This dimension was used to control for the geographic influences that may exist throughout the Dominion Energy service territory. The second dimension was based on customer annualized electric energy usage. Dominion Energy's commercial sector is diverse, spanning customers with an extensive range of annual electric energy usage. The annual usage dimension was used to control for differences in types and magnitude of end uses, and the variation of firmographic characteristics.

During the project's development, a target sample size of 1,500 completes was qualitatively set to meet budget constraints and to be consistent with the 2020 study. On a simple random sampling basis, this sample size would provide a ±2.5% confidence interval at the 95% confidence level for saturations of 50%.

The first step in the sample design was to define the population frame. Dominion Energy provided DNV with a billing file that included 248,941 customer premises in 6 regions with 35 different rate codes. DNV examined these customers for data completeness. Customers with inactive accounts, low annualized usage (less than 1,200 kWh/year), or an insufficient number of bills to estimate annualized usage (less than 270 billing days during the last 365 days) were excluded from the final sampling frame. The sampling frame based on these criteria resulted in a population of 213,437 customers.

Next, DNV examined the distribution of annualized energy usage. The largest customer used 567,846 times more energy than the smallest customer in the dataset. To control for this large variability, the top 341 customers by annualized energy usages (greater than 90 GWh/year) were placed in a "certainty stratum," i.e., a stratum where every customer is included in the sample. The remaining 213,102 customers were allocated into 4 strata. The boundaries of the usage strata were qualitatively set.

The 1,500-target sample, less the 341 customers in the certainty stratum (1,159), was equally distributed among the 4 non-certainty usage strata in each geographic region (24 strata). The final sample consisted of over 78,000 customers.

Finally, DNV calculated the expected precision by usage stratum and region stratum. Stratification and the inclusion of certainty strata help reduce the overall expected variability. Ultimately the expected confidence interval at a 95% confidence level for a saturation of 50% would be ±2% at the region level and ±1% for the population.

Data collection and response rates

The survey launched on October 23, 2023, with a wave of 15,103 mailed letters followed by approximately 2,262 emails. As a rule, the data collection team avoided distributing emails on Friday through Monday afternoon with the thought that email could become buried deep in a recipient's inbox with a lower likelihood of response. In November, a second wave of 16,554 letters was distributed followed by a third and final wave of 44,139 letters. The combined email and print mail outreach resulted in a total of 1,990 respondents. Data from these customers was used in the analysis. Table 2-1 shows the breakdown of survey responses by mode of delivery.

Table 2-1. Survey response rate

	Email	Print	Total
Surveys distributed	2,262	75,796	78,058
Completed survey	93	1,577	1,670
Partially completed survey	44	276	320
Total number of respondents	137	1,853	1,990
Response rate	6.1%	2.4%	2.5%

3.1.2 Residential Conditional Demand Analysis

The objective of a conditional demand analysis is to estimate a breakdown of energy consumption into different end-use categories, such as water heaters or refrigerators, accounting for weather and a number of customer and end-use attributes such as square footage of the home and vintage of the electrical end-use device.

The key data sources for CDA models are:

- Customer survey data – This study utilized the RASS conducted by DNV in 2023.
- Customer billing data – The study used monthly electricity consumption data from recent years specific to each RASS respondent from Dominion Energy's customer billing database.
- Weather data – Hourly interval temperature data from the National Oceanic and Atmospheric Administration (NOAA) was matched to the closest WBAN1 station for each Home Energy Use Survey respondent. Data from a total of 10 weather stations was used.

DNV used the billing data and weather data to estimate normalized annual consumptions (NAC) for each respondent. DNV combined the NAC with the survey responses to develop statistical relationships between these data, through regression models.

Properly specified CDA models can account for major classes of end uses by residential customers, which include space heating, space cooling, and water heating, among other major end uses. Importantly, properly specified CDA models can also produce statistically significant data for end-use combinations. However, there are some limiting factors for this CDA model that warrants further discussion, as noted below:

CDA limiting factors:

- Near-saturation of the end-use across households (e.g., refrigerators or lighting)

[1] WBAN is a five-digit station identifier used for digital data storage and general station identification purposes.

- Collinearity among certain end uses across households (i.e., groups of two or more types of end uses which are found in those groups more often than individually); for example, set top boxes and TVs together, as opposed to TVs alone
- Consumption that is not discernible in monthly billing consumption data among usage behavior variation across households (e.g., printers or toasters)
- Low saturation of the relatively newer end-use across households (e.g., LED tubes)

If some important end-use categories are not typically meaningful to estimate through a CDA alone, they are typically combined with relevant secondary source studies (e.g., refrigerators). CDA-based estimates on their own can give valuable insight into end-use consumption distributions across groups of customers, as is shown in several figures in this report.

3.2 Additional data sources

In addition to the saturation studies and CDA described above, DNV used additional data sources to inform certain inputs of the potential study model that could not be ascertained through the data collection efforts. This section outlines those sources and how they were used in the modeling process. Sources marked with an asterisk (*) in the following section are specific to Dominion Energy's service territory.

3.2.1 Measure data

Several secondary data sources provided insight on measure-level energy usage and savings potential, measure costs and lifetimes, and the current penetration of various efficiency measures. DNV reviewed a variety of data sources for this information seeking data that was specific to Dominion Energy's service territory or geographic location as much as possible. The sources listed below provided information for these inputs:

- Dominion Energy Standard Tracking Engineering Protocols (STEP) Manual*
- U.S. Energy Information Administration (EIA) Commercial Buildings Energy Consumption Survey (CBECS)
- EIA Residential Energy Consumption Survey (RECS)
- ENERGY STAR Calculators
- EIA Data for Mid-Atlantic
- Mid-Atlantic Technical Reference Manual (TRM)
- Professional judgment of DNV engineers with experience in Dominion Energy's service territory*
- Dominion's EM&V results*

3.2.2 Economic data

Economic inputs from Dominion's service territory were used to provide a more accurate picture of the monetary cost and benefits associated with energy efficiency. Dominion provided data to support the following model requirements:

- Customer discount rate
- Inflation rate
- Utility discount rate
- Avoided cost and retail rate forecasts for low, base, and high avoided cost scenarios
- Line-loss estimates

3.2.3 Building data

Dominion Energy provided information pertaining to customers as well as system load data:

- Billing data to identify consumption residential and commercial customers
- System load data
- EIA data for Virginia Electric & Power Co., Virginia to determine number of customers

3.2.4 Program budgets

As part of the potential modeling process, past and projected program budgets were used to as a starting point for the achievable potential analysis, which estimates the market penetration of measures as a function of marketing, incentive levels, and other factors.[2] Dominion Energy provided past and planned program budgets and savings that we used to help calibrate the achievable modeling efforts. Specifically, marketing and administrative dollars were two inputs into the model that were derived from the indicator tables DNV compiled for Dominion Energy.

[2] The methodology of calculation measure penetration is described in more detail in Section 4 and Appendix A

4 METHODOLOGY

4.1 Energy efficiency potential methods

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.

4.1.1 Characterizing the energy efficiency resource

Energy efficiency has long been characterized 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 making the energy saved available to meet other demands, and could therefore be thought of as a resource and plotted on an energy supply curve. The energy efficiency resource paradigm argued simply that the more energy efficiency or "nega-watts"[3] produced, the fewer new plants would be needed to meet end-users' power demands.

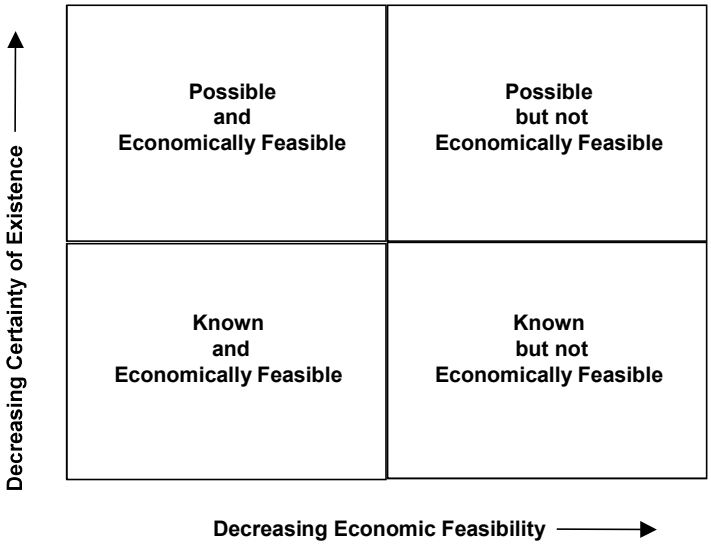
4.1.2 Defining energy efficiency potential

Energy efficiency potential studies became 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 the resource availability and value of energy efficiency within the overall resource planning process.

There are several ways in which the 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 like coal, oil, or 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 economical. This relationship is conceptualized in Figure 4-1.

[3] Term coined by environmental scientist Amory Lovins in 1989.

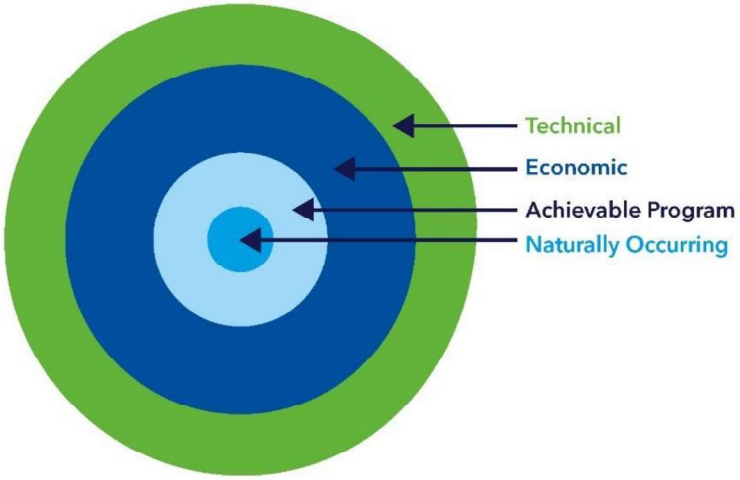
Figure 4-1. Conceptual framework for estimates of fossil fuel resources



Somewhat analogously, this energy efficiency potential study defines several different *types* of energy efficiency *potential*, namely technical, economic, achievable program, and naturally occurring. These types of potential are conceptualized in Figure 4-2 and described below:

- Technical potential is defined in this study as the complete penetration of all measures analyzed 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 4-2. Conceptual relationship among energy efficiency potential definitions



One metric of savings potential that we use is “cumulative annual savings.” These are savings that occur in a year due to program activities from previous years that are still generating energy savings, demonstrated below in a hypothetical example in Table 4-1. In this example, the Widget Installation Program begins in 2024 and installs energy-saving widgets with a 5-year effective useful life. The following conditions make up the entire scenario:

- In 2024 (Year 1), widgets with total annual savings of 1.00 GWh are installed. There are no previous year program savings, so cumulative annual savings are equal to 2024 savings, or 1.00 GWh.
- In 2025 (Year 2), widgets with total annual savings of 1.50 GWh are installed. Widgets from 2024 are still installed, cumulative annual savings are 2024 and 2025 annual savings, or 2.50 GWh.
- In 2026 (Year 3), widgets with total annual savings of 1.75 GWh are installed. Widgets from 2024 and 2025 are still installed, cumulative annual savings are 2026, 2025, and 2024 annual savings, or 4.25 GWh.
- In 2029 (Year 6), widgets with total annual savings of 1.75 GWh are installed. Widgets from previous years are still installed. However, in Year 6 the widgets from Year 1 have passed their 5-year effective useful life and are no longer generating energy savings. Cumulative annual savings include savings from widgets installed in 2029, 2028, 2027, 2026, and 2025, *but not* those installed in 2024.

Cumulative annual savings accounting for equipment retirement is a performance metric and not an accounting metric. In the example, widgets are assumed to have an effective useful life of five years; 2029 savings include those measures generating savings in 2029 and do not include 2024 installations that have passed their effective useful life.

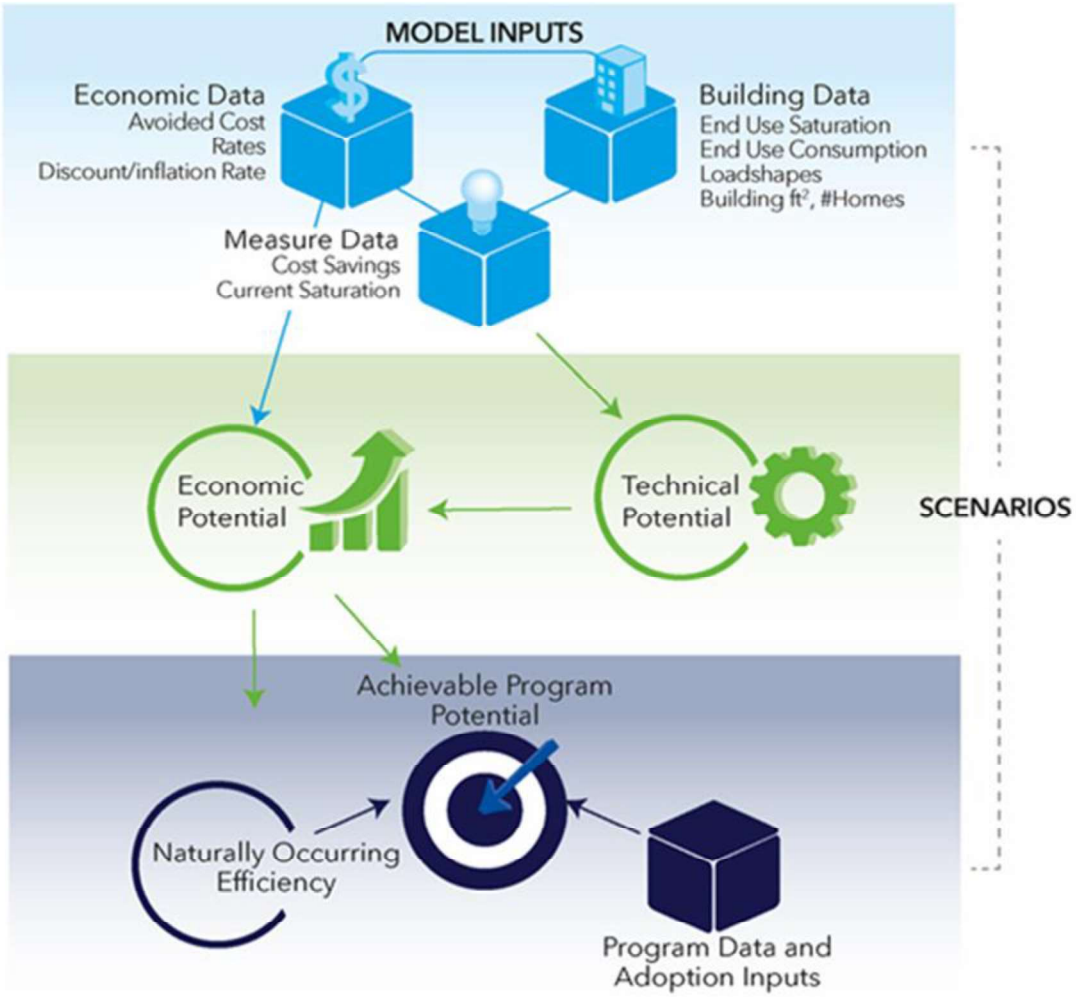
Table 4-1. Example of cumulative annual savings for widget installation program

Installation year	Energy savings year (GWh)									
	2024	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**
2024	1.00	1.00	1.00	1.00	1.00					
2025		1.50	1.50	1.50	1.50	1.50				
2026			1.75	1.75	1.75	1.75	1.75			
2027				1.75	1.75	1.75	1.75	1.75		
2028					1.75	1.75	1.75	1.75	1.75	
2029						1.75	1.75	1.75	1.75	1.75
2030							1.50	1.50	1.50	1.50
2031								1.25	1.25	1.25
2032									1.00	1.00
2033										0.50
Cumulative Annual Savings (GWh)	**1.00**	**2.50**	**4.25**	**6.00**	**7.75**	**8.50**	**8.5**	**7.00**	**7.25**	**6.00**
Total Accounting Savings (GWh)	**1.00**	**3.50**	**7.75**	**13.75**	**21.50**	**30.00**	**38.50**	**45.50**	**52.75**	**58.75**

4.1.3 Summary of analytical steps used to calculate energy efficiency potential

The crux of this study involves carrying out several 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 4-3. The bulk of the analytical process for this study was carried out in a model developed by DNV 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 4-3. Conceptual overview of study process



The key steps implemented in this study are:

1. Develop Initial Input Data

    a) Develop a list of energy efficiency measure opportunities to include in scope. In this step, an initial draft measure list was developed and provided to Dominion Energy. The final measure list was developed after incorporating comments.
    b) Gather and develop technical data (costs and savings) on efficient measure opportunities. Data on measures were gathered from a variety of sources. Measure descriptions are provided in Appendix B and detail on measure inputs is provided in Appendix E.
    c) 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 5.1 of this report describes the baseline data developed for this study.
    d) Collect data on economic parameters: avoided costs, electricity rates, discount rates, and inflation rate. These inputs are provided in Appendix C of this report.

2. Estimate Technical Potential and Develop Supply Curves

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

3. Estimate Economic Potential

    a) Match and integrate measure and building data with economic assumptions to produce indicators of costs from different viewpoints (e.g., societal and consumer).
    b) Estimate total economic potential. (Note that at this stage of the analysis, program-related costs are not factored into the cost-effectiveness screening. Thus, the results reflect the theoretical estimate of the measure impacts, while disregarding the mode of delivery.)

4. Estimate Achievable Program and Naturally Occurring Potentials

    a) Screen initial measures for inclusion in the program analysis. This screening may take into account 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, with the exclusion of program costs and while considering only electric avoided-cost benefits.
    b) Gather and develop estimates of program costs (e.g., for administration and marketing) and historic program savings.
    c) Develop estimates of customer adoption of energy efficiency measures as a function of the economic attractiveness of the measures, barriers to their adoption, and the effects of program intervention.
    d) Estimate achievable program and naturally occurring potentials and associated program costs.

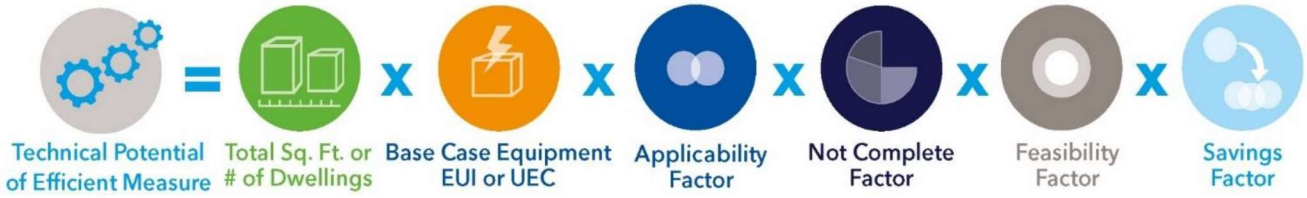
5. Scenario Analyses

    a) Recalculate potentials under alternate program scenarios.

4.2 Technical potential

In our bottom-up modeling approach, DNV first estimates technical potential for energy savings by integrating key measure and market segment parameters using Equation 1:

Equation 1. Technical potential of an efficient measure



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 energy use intensity** (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 and were developed as part of the Conditional Demand Analysis.
- **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. This input was developed through results of the 2013 residential and commercial energy use surveys and the Conditional Demand Analysis and Baseline Analysis.
- **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, one minus the fraction of floor space that already has the energy efficiency measure installed. DNV relied on the results of Dominion Energy's energy use surveys to estimate this value when possible and utilized other recent energy use surveys and internal databases for other measures not included in the energy use surveys.
- **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. DNV engineers familiar with Dominion Energy's service territory reviewed these values to ensure they were consistent with Dominion Energy's building stock.
- **Savings factor** is the reduction in energy consumption resulting from application of the efficient technology. DNV estimated energy savings through the use of sources including the STEP manual, LBNL Home Energy Savers Model, and other engineering calculations.

Technical potential for peak demand reduction is calculated analogously.

4.3 Economic potential

Economic potential is then assessed by first developing a supply-curve analysis. This analysis eliminates double counting of measure savings. On a market segment and end-use/technology basis, measures are stacked in order of cost-effectiveness, and the energy consumption of the system being affected by the efficiency measures reduces as each measure is applied. As a result, the savings attributable to each subsequent measure decrease if the measures are interactive. After eliminating double counting of savings, the benefits and costs associated with a given measure and market segment are compared using the Total Resource Cost (TRC) test or other cost-relevant cost-effectiveness test. Measures with a TRC ratio greater than 1.0 will be passed on to our achievable potential analysis.

5 RESULTS

5.1 Energy efficiency baseline analysis

This section presents a baseline analysis of energy use in Dominion Energy's Virginia service territory. The purpose of this analysis is to break out energy use by sector, building type, and end use to provide a foundation for estimating DSM or energy efficiency potential.

DNV completed a conditional demand analysis of the residential sector using the energy use survey results and billing data to develop energy consumption values for various end uses. That data was incorporated into this analysis.

The non-residential analysis was based on engineering calculations calibrated to Dominion Energy's non-residential energy consumption (there was no non-residential conditional demand analysis) and used the best data available to inform those calculations. However, in some cases we used regional data, such as South Atlantic Census Division data from the U.S. Department of Energy (DOE) Commercial Buildings Energy Consumption Survey (CBECS), rather than those specific to Dominion Energy's service territory. It was necessary to rely on such sources for inputs that could not be determined from the Commercial Energy Use Survey data or other Dominion Energy data sources.

5.1.1 Summary of baseline energy use by sector

Energy usage by sector and business type was developed from the data reported by the EIA. These data are presented in Table 5-1.

Table 5-1. Summary of Dominion Energy MWh and customers by sector

Sector	MWh	# of Customers
Residential	29,753,922	2,332,881
Commercial	49,327,301	266,167
Industrial	5,312,012	540
Total	84,393,235	2,599,588

Note that these values include non-jurisdictional, exempt, and opt-out customers. Exempt and opt-out customers will be broken out later.

5.1.2 Residential baseline

We used the population weights from the applicable Dominion Energy Residential Energy Use Survey to divide residential customers into single-family, multifamily, and manufactured home households—the three residential segments being examined in this study. Table 5-2 shows the results.

Table 5-2. Number of residential customers by building type

Building type	# of Customers	Percentage of Households
Single Family	1,110,428	48%
Single Family LI	787,740	34%
Multifamily	195,645	8%
Multifamily LI	182,454	8%
Manufactured Home	43,493	2%
Manufactured Home LI	13,121	1%
Total	2,332,881	100%

5.1.2.1 Residential end-use saturations

DNV calculated the equipment saturations (percentage of households having an end use) from the results of the residential energy use surveys. These results are shown in Table 5-3. For lighting, the equipment saturations interact with the number of lamps per home by usage and type.

Table 5-3. Residential end-use saturations by base measure

End-use Saturations	SF	MF	MH	SF LI	MF LI	MH LI
Base Central AC, SEER2 14.3 (non-electric heat)	37.9%	23.6%	7.2%	38%	24%	7%
Base Room AC, CEER 10.9 (non-electric heat)	1.5%	1.9%	5.5%	2%	2%	6%
Base Dehumidifier (40 pints/day, 1.5 liters/kWh)	18.8%	3.9%	9.5%	19%	4%	10%
Base Air Cleaner, PM 2.5 CADR = 200, CADR/Watt 1.9	22.5%	22.5%	22.5%	23%	23%	23%
Base Furnace Fan – Furnace & CAC	39.4%	25.5%	12.8%	39%	25%	13%
Base Air-Source Heat Pump, SEER2 14.3/HSPF2 7.5 w/Aux Strip Heat	40.4%	45.8%	37.6%	40%	46%	38%
Base Geothermal Heat Pump, EER 15.0 / COP 3.1	1.0%	0.0%	0.0%	1%	0%	0%
Base Electric Furnace + Central AC (SEER 13.0)	9.2%	17.0%	22.6%	9%	17%	23%
Base Electric Furnace + Room AC (EER 9.7)	0.1%	0.0%	8.1%	0%	0%	8%
Base Electric Baseboard Heating + Central AC (SEER 13.0)	0.7%	1.9%	1.0%	1%	2%	1%
Base Electric Baseboard Heating + Room AC (EER 9.7)	2.0%	3.2%	9.2%	2%	3%	9%
Base Electric Central Furnace, no cooling	0.1%	0.3%	1.4%	0%	0%	1%
Base Interior Fluorescent Fixture 1.8 hrs/day	23.1%	14.0%	9.0%	23%	14%	9%
Base Interior Lighting 9 Watt LED, 0.5 hrs/day	100%	100%	100%	100%	100%	100%

End-use Saturations	SF	MF	MH	SF LI	MF LI	MH LI
Base Interior Lighting 9 Watt LED, 2.5 hrs/day	100%	100%	100%	100%	100%	100%
Base Interior Lighting 9 Watt LED, 6 hrs/day	100%	100%	100%	100%	100%	100%
Base Exterior Lighting 9 Watt LED, 6 hrs/day	62.1%	25.4%	55.4%	62%	25%	55%
Base Refrigerator, Standard 2014	99.9%	100.0%	100.0%	100%	100%	100%
Base Refrigerator, Standard 2029						
Base Second Refrigerator, Standard 2014	43.2%	4.9%	16.4%	43%	5%	16%
Base Freezer, Standard 2014	36.4%	11.0%	35.6%	36%	11%	36%
Base Freezer, Standard 2029						
Base Second Freezer, Standard 2014	2.9%	0.7%	6.6%	3%	1%	7%
Base Clothes Washer, 2018 Standard Front Load (IMEF 1.84 / IWF 4.7)	97.0%	77.8%	93.9%	97%	78%	94%
Base Clothes Dryer, CEF 3.73	88.5%	68.5%	83.0%	89%	69%	83%
Base Dishwasher, Standard 2013 (<= 307 kWh)	80.8%	88.2%	41.3%	81%	88%	41%
Base 2-speed Pool Pump (ROB)	7.8%	0.0%	2.5%	8%	0%	2%
Base Exhaust fan, 3.1 CFM/W, <2.0 sones (quiet),ASHRAE 62.2	91%	91%	91%	91%	91%	91%
Base LED TV	58.5%	48.1%	37.0%	58%	48%	37%
Base LCD TV	23.9%	17.0%	14.8%	24%	17%	15%
Base Other TV	13.8%	12.9%	14.5%	14%	13%	15%
Base Set-Top Box	85.8%	74.3%	76.0%	86%	74%	76%
Base Desktop PC	39.8%	25.2%	27.4%	40%	25%	27%
Base Laptop PC	77.4%	71.7%	53.6%	77%	72%	54%
Base Monitor/Display	27.0%	17.1%	13.8%	27%	17%	14%
Base Water Heater (40 gal), Federal Standard EF 0.95	63.7%	65.9%	88.7%	64%	66%	89%
Base Electric Vehicle Level 1 Charger	1.5%	0.0%	0.5%	1%	0%	1%
Base Electric Vehicle Level 2 Charger	2.7%	0.0%	0.0%	3%	0%	0%
Base House Use	100%	100%	100%	100%	100%	100%
Base Miscellaneous	100%	100%	100%	100%	100%	100%

5.1.2.2 Residential end-use energy intensities

Table 5-4 shows the end-use energy intensities for the residential sector by base measure. End-use energy intensities represent the energy use per household for households that have that end-use. Most of these energy intensity values were derived from the conditional demand analysis, with lighting estimates supplemented by engineering calculations to support the usage bin breakouts. The rest were derived or calculated from a variety of sources, including:

- DOE's Home Energy Saver model
- The US Environmental Protection Agency (EPA) ENERGY STAR calculators

Note that the results shown below are presented on a per-household basis.

Table 5-4. Residential end-use energy intensities (kWh/household with end-use)

kWh/household	SF	MF	MH	SF LI	MF LI	MH LI
Base Central AC, SEER2 14.3 (non-electric heat)	2,513	1,504	2,204	2,513	1,504	2,204
Base Room AC, CEER 10.9	1,145	875	1,382	1,145	875	1,382

kWh/household	SF	MF	MH	SF LI	MF LI	MH LI
(non-electric heat)						
Base Dehumidifier (40 pints/day, 1.5 liters/kWh)	2,404	1,180	1,404	2,404	1,180	1,404
Base Air Cleaner, PM 2.5 CADR = 200, CADR/Watt 1.9	407	300	407	407	300	407
Base Furnace Fan - Furnace & CAC	521	436	3,962	521	436	3,962
Base Air-Source Heat Pump, SEER2 14.3/HSPF2 7.5 w/Aux Strip Heat	5,574	3,366	6,624	5,574	3,366	6,624
Base Geothermal Heat Pump, EER 15.0 / COP 3.1	5,638	0	0	5,638	0	0
Base Electric Furnace + Central AC (SEER 13.0)	6,652	3,172	11,297	6,652	3,172	11,297
Base Electric Furnace + Room AC (EER 9.7)	5,284	2,543	10,475	5,284	2,543	10,475
Base Electric Baseboard Heating + Central AC (SEER 13.0)	3,503	4,471	6,578	3,503	4,471	6,578
Base Electric Baseboard Heating + Room AC (EER 9.7)	2,135	3,842	5,756	2,135	3,842	5,756
Base Electric Central Furnace, no cooling	4,139	1,667	9,093	4,139	1,667	9,093
Base Interior Fluorescent Fixture 1.8 hrs/day	273	325	570	273	325	570
Base Interior Lighting 9 Watt LED, 0.5 hrs/day	288	178	157	288	178	157
Base Interior Lighting 9 Watt LED, 2.5 hrs/day	476	260	253	476	260	253
Base Interior Lighting 9 Watt LED, 6 hrs/day	735	337	352	735	337	352
Base Exterior Lighting 9 Watt LED, 6 hrs/day	64	8	57	64	8	57
Base Refrigerator, Standard 2014	1,778	1,691	1,722	1,778	1,691	1,722
Base Refrigerator, Standard 2029						
Base Second Refrigerator, Standard 2014	1,179	890	967	1,179	890	967
Base Freezer, Standard 2014	1,156	1,156	1,156	1,156	1,156	1,156
Base Freezer, Standard 2029						
Base Second Freezer, Standard 2014	1,475	1,476	1,475	1,475	1,476	1,475
Base Clothes Washer, 2018 Standard Front Load (IMEF 1.84 / IWF 4.7)	436	436	436	436	436	436
Base Clothes Dryer, CEF 3.73	122	122	122	122	122	122
Base Dishwasher, Standard 2013 (<= 307 kWh)	260	260	260	260	260	260
Base 2-speed Pool Pump (ROB)	1,908	0	1,672	1,908	0	1,672
Base Exhaust fan, 3.1 CFM/W, <2.0 sones (quiet),ASHRAE 62.2	122	122	122	122	122	122
Base LED TV	372	248	362	372	248	362
Base LCD TV	206	143	194	206	143	194
Base Other TV	609	548	624	609	548	624
Base Set-Top Box	338	215	253	338	215	253
Base Desktop PC	267	234	223	267	234	223
Base Laptop PC	183	153	129	183	153	129
Base Monitor/Display	227	208	191	227	208	191
Base Water Heater (40 gal), Federal Standard EF 0.95	2,952	1,132	2,228	2,952	1,132	2,228

kWh/household	SF	MF	MH	SF LI	MF LI	MH LI
Base Electric Vehicle Level 1 Charger	851	0	1,514	851	0	1,514
Base Electric Vehicle Level 2 Charger	1,151	0	0	1,151	0	0
Base House Use	14,280	7,587	16,671	14,280	7,587	16,671
Base Miscellaneous	819	143	1,500	576	100	1,500

5.1.2.3 Residential energy use

Residential energy use was calculated as the product of the number of households, equipment saturation, and end-use energy intensity. Energy use by building type and end use is shown in Table 5-5.

Table 5-5. Residential energy use by building type and end use

MWh	SF	MF	MH	SF LI	MF LI	MH LI
Base Central AC, SEER2 14.3 (non-electric heat)	1,057,136	69,383	2,096	749,934	64,706	6,949
Base Room AC, CEER 10.9 (non-electric heat)	19,632	3,218	998	13,927	3,001	3,307
Base Dehumidifier (40 pints/day, 1.5 liters/kWh)	501,030	9,004	1,750	355,432	8,397	5,801
Base Air Cleaner, PM 2.5 CADR = 200, CADR/Watt 1.9	101,603	13,206	1,201	72,077	12,316	3,980
Base Furnace Fan - Furnace & CAC	228,150	21,688	6,629	161,850	20,226	21,973
Base Air-Source Heat Pump, SEER2 14.3/HSPF2 7.5 w/Aux Strip Heat	2,499,398	301,817	32,638	1,773,077	281,468	108,189
Base Geothermal Heat Pump, EER 15.0 / COP 3.1	63,161	0	0	44,807	0	0
Base Electric Furnace + Central AC (SEER 13.0)	681,092	105,543	33,489	483,168	98,427	111,009
Base Electric Furnace + Room AC (EER 9.7)	4,416	0	11,107	3,133	0	36,817
Base Electric Baseboard Heating + Central AC (SEER 13.0)	26,173	16,192	896	18,567	15,100	2,969
Base Electric Baseboard Heating + Room AC (EER 9.7)	46,413	24,162	6,937	32,925	22,533	22,995
Base Electric Central Furnace, no cooling	4,749	894	1,718	3,369	834	5,694
Base Interior Fluorescent Fixture 1.8 hrs/day	70,057	8,917	672	49,698	8,316	2,227
Base Interior Lighting 9 Watt LED, 0.5 hrs/day	319,451	34,890	2,066	226,619	32,538	6,847
Base Interior Lighting 9 Watt LED, 2.5 hrs/day	528,895	50,896	3,320	375,199	47,465	11,005
Base Interior Lighting 9 Watt LED, 6 hrs/day	815,691	65,885	4,616	578,653	61,443	15,300
Base Exterior Lighting 9 Watt LED, 6 hrs/day	44,097	409	414	31,282	381	1,372
Base Refrigerator, Standard 2014	1,972,107	330,804	22,599	1,399,016	308,501	74,912
Base Refrigerator, Standard 2029						
Base Second Refrigerator, Standard 2014	566,124	8,476	2,077	401,609	7,904	6,885
Base Freezer, Standard 2014	466,821	24,847	5,409	331,163	23,172	17,930
Base Freezer, Standard 2029						
Base Second Freezer, Standard 2014	47,887	1,968	1,270	33,971	1,835	4,209
Base Clothes Washer, 2018 Standard Front Load (IMEF 1.84 / IWF 4.7)	468,982	66,305	5,370	332,697	61,834	17,799
Base Clothes Dryer, CEF 3.73	120,059	16,376	1,331	85,170	15,272	4,411

MWh	SF	MF	MH	SF LI	MF LI	MH LI
Base Dishwasher, Standard 2013 (<= 307 kWh)	233,423	44,865	1,410	165,590	41,841	4,675
Base 2-speed Pool Pump (ROB)	165,427	0	548	117,354	0	1,816
Base Exhaust fan, 3.1 CFM/W, <2.0 sones (quiet),ASHRAE 62.2	123,092	21,687	1,454	87,322	20,225	4,821
Base LED TV	241,879	23,286	1,756	171,589	21,716	5,821
Base LCD TV	54,652	4,735	377	38,771	4,416	1,249
Base Other TV	93,609	13,793	1,190	66,407	12,863	3,944
Base Set-Top Box	321,714	31,199	2,522	228,224	29,096	8,360
Base Desktop PC	117,846	11,574	804	83,600	10,794	2,665
Base Laptop PC	157,038	21,510	909	111,403	20,060	3,012
Base Monitor/Display	67,983	6,950	345	48,227	6,482	1,145
Base Water Heater (40 gal), Federal Standard EF 0.95	2,087,470	145,982	25,921	1,480,855	136,140	85,924
Base Electric Vehicle Level 1 Charger	13,994	0	102	9,927	0	339
Base Electric Vehicle Level 2 Charger	35,026	0	0	24,848	0	0
Base House Use	15,856,590	1,484,409	218,745	11,248,692	1,384,329	725,094
Base Miscellaneous	909,384	27,905	19,681	453,625	18,299	65,240
Total	15,275,660	1,528,366	205,621	10,645,086	1,417,598	681,591

Figure 5-1 and Figure 5-2 show the breakout of residential energy use by building type and end use, respectively. Single family non-low income homes make up more than half of homes, and with low income single family homes make up 87% of the building stock. Refrigeration and cooling were the largest end uses in terms of total consumption.

Figure 5-1. Residential energy use by building type

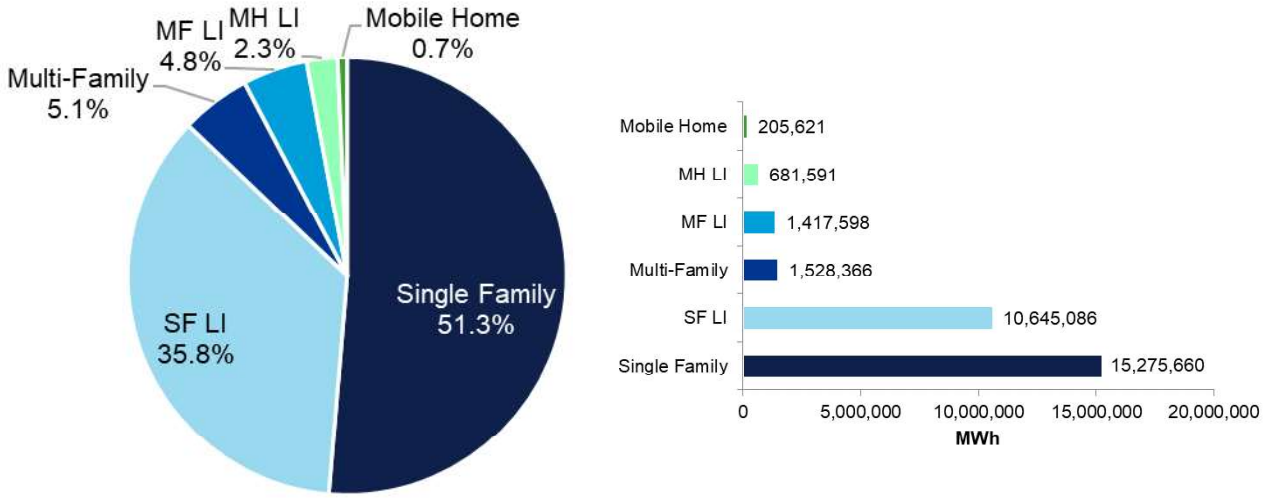
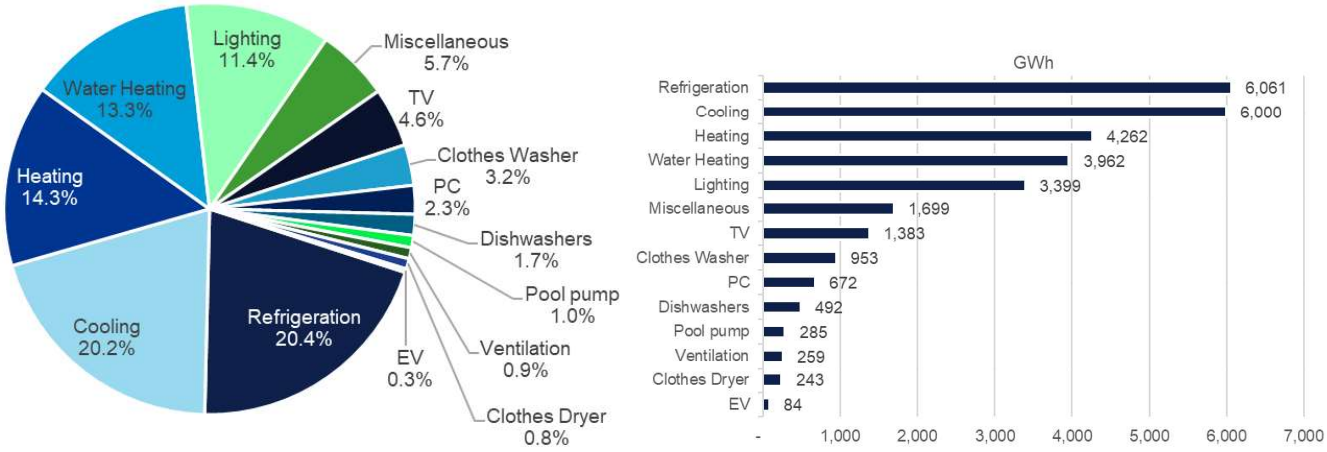


Figure 5-2. Residential energy use by end use



5.1.3 Non-Residential baseline

For this potential study, opt-out customers were split apart from the non-opt-out customers. These groups were broken down into building types, listed below, with non-jurisdictional customers additionally split out from the non-exempt customers:

- Office
- Restaurant
- Retail
- Grocery
- Warehouse
- Education
- Health
- Lodging
- Data center
- Non-jurisdictional
- Religious worship
- Other
- Industrial
- Agricultural

While DNV performed baseline analyses for both opt-out customers and non-opt-out customers, opt-out customers do not contribute to program potential.

5.1.3.1 Non-residential equipment saturations

The equipment saturations (percent of commercial square feet having an end use) were calculated primarily from the results of the commercial energy use surveys. For a few measures, such as motors, data from internal DNV databases (gleaned from previous potential studies and on-site data collection) were used. The resulting saturations are shown in Table 5-6.

Table 5-6. Non-Residential sector equipment saturations

End Use	Office	Restaurant	Retail	Grocery	Warehouse	Education	Health	Lodging	Data Center	Non-Jurisdictional	Religious Worship	Other	Industrial	Agriculture
Base Linear Lighting, Fluorescent Fixture, 2L4'T12	6%	4%	6%	2%	3%	6%	6%	2%	0%	4%	4%	2%	5%	3%
Base Linear Lighting, Fluorescent Fixture, 2L4'T12, integrated market	6%	4%	6%	2%	3%	6%	6%	2%	0%	4%	4%	2%	5%	3%
Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB	10%	4%	5%	2%	11%	7%	11%	4%	8%	5%	8%	3%	7%	0%
Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB, integrated market	10%	4%	5%	2%	11%	7%	11%	4%	8%	5%	8%	3%	7%	0%
Base Linear Lighting, LED Tube, 2 lamp fixture	12%	6%	16%	35%	15%	5%	12%	6%	8%	10%	20%	14%	24%	3%
Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market	12%	6%	16%	35%	15%	5%	12%	6%	8%	10%	20%	14%	24%	3%
Base General Service Screw-in, CFL	3%	4%	4%	1%	0%	1%	2%	6%	0%	6%	3%	11%	2%	1%
Base General Service Screw-in, Incandescent/halogen	2%	5%	7%	2%	2%	2%	2%	1%	0%	3%	5%	5%	2%	31%
Base General Service Screw-in, LED bulb	26%	52%	23%	17%	18%	58%	34%	62%	28%	45%	20%	41%	21%	52%
Base HID Lighting (low bay)	0%	0%	0%	0%	0%	0%	0%	0%	29%	0%	0%	0%	0%	0%
Base High Bay Lighting, Fluorescent T5	2%	1%	4%	1%	4%	1%	1%	0%	0%	1%	1%	1%	0%	1%
Base High Bay Lighting, Fluorescent T5, integrated market	2%	1%	4%	1%	4%	1%	1%	0%	0%	1%	1%	1%	0%	1%
Base High Bay Lighting, HID lighting	1%	1%	1%	1%	9%	0%	0%	2%	9%	1%	4%	1%	4%	1%
Base High Bay Lighting, LED lighting	2%	3%	0%	8%	0%	2%	0%	3%	0%	3%	10%	5%	12%	15%
Base CFL Exit Sign	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Base Area Lighting, Outdoor HID	16%	11%	9%	0%	14%	3%	8%	10%	4%	15%	24%	24%	29%	56%
Base General Service Screw-in, Outdoor CFL	5%	4%	4%	0%	0%	0%	1%	2%	0%	2%	7%	2%	1%	1%

End Use	Office	Restaurant	Retail	Grocery	Warehouse	Education	Health	Lodging	Data Center	Non-Jurisdictional	Religious Worship	Other	Industrial	Agriculture
Base General Service Screw-in, Outdoor Incandescent/Halogen	13%	15%	14%	0%	7%	14%	22%	6%	75%	15%	9%	17%	3%	3%
Base General Service Screw-in, Outdoor LED bulb	62%	48%	45%	0%	66%	82%	65%	62%	12%	58%	57%	39%	55%	41%
Base Linear Lighting, Outdoor Fluorescent Tube	2%	8%	22%	0%	1%	1%	1%	4%	0%	1%	0%	1%	0%	0%
Base Linear Lighting, Outdoor LED Tube	3%	7%	6%	0%	12%	0%	3%	9%	10%	7%	2%	13%	11%	0%
Base Water-Cooled Centrifugal Chiller, 0.58 kW/ton, 500 tons	23%	2%	1%	0%	1%	7%	9%	28%	0%	10%	11%	9%	3%	0%
Base DX Packaged System, EER=10.3, 10 tons	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%	35%	0%
Base Heat Pump cooling (14 SEER, 8.2 HSPF)	23%	17%	15%	5%	9%	4%	21%	6%	1%	10%	28%	11%	9%	4%
Base Split-System AC, SEER 14.5, <5.4 tons	8%	4%	9%	10%	7%	5%	16%	15%	5%	16%	15%	27%	7%	4%
Base PTAC cooling, EER=10.2, 1 ton	2%	1%	1%	0%	0%	2%	4%	17%	1%	4%	1%	5%	0%	0%
Base Room AC, CEER 10.9	0%	1%	2%	19%	1%	2%	12%	2%	0%	2%	3%	2%	1%	0%
Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	2%	4%	2%	8%	3%	5%	2%	3%	0%	3%	5%	2%	2%	1%
Base Open refrigerated/ freezer cases	4%	12%	4%	29%	0%	0%	7%	21%	0%	1%	5%	0%	0%	0%
Base Closed refrigerated/ freezer cases	7%	38%	10%	53%	0%	16%	14%	20%	0%	8%	31%	2%	4%	28%
Base Walk-in refrigeration/ freezer units	25%	85%	7%	68%	5%	13%	30%	53%	0%	11%	5%	6%	2%	3%
Base Large Cold Storage Area	0%	5%	2%	27%	8%	0%	4%	10%	0%	0%	4%	0%	4%	2%
Base Reach-in Refrigerator/Freezer, Federal Standard	3%	12%	2%	53%	0%	16%	8%	1%	0%	7%	31%	2%	4%	28%
Base Glass Door Reach-in Refrigerator/Freezer, Federal Standard	3%	25%	8%	0%	0%	0%	6%	19%	0%	1%	0%	1%	0%	0%
Base Ice Maker, Federal Standard	17%	70%	7%	41%	8%	26%	21%	81%	0%	13%	50%	3%	15%	5%

End Use	Office	Restaurant	Retail	Grocery	Warehouse	Education	Health	Lodging	Data Center	Non-Jurisdictional	Religious Worship	Other	Industrial	Agriculture
Base Residential-Type Refrigerator/Freezer, Federal Standard	75%	38%	60%	23%	62%	86%	59%	68%	98%	81%	70%	78%	83%	50%
Base Compact Refrigerator, Federal Standard	39%	15%	31%	8%	26%	14%	47%	56%	0%	15%	15%	10%	26%	6%
Base Computer Network Server	71%	55%	49%	51%	80%	31%	69%	81%	100%	37%	73%	32%	87%	7%
Base Desktop PC	91%	56%	78%	55%	90%	42%	98%	90%	21%	67%	90%	78%	93%	73%
Base Laptop PC	90%	49%	45%	21%	88%	37%	78%	83%	96%	44%	86%	35%	85%	41%
Base Monitor, LCD	90%	62%	76%	64%	79%	95%	85%	87%	96%	71%	88%	47%	88%	36%
Base Imaging	85%	43%	61%	53%	65%	39%	90%	81%	100%	52%	91%	51%	75%	16%
Base Water Heater, Resistance Heater, Standard Standby Wattage	81%	50%	82%	51%	82%	76%	75%	38%	91%	60%	58%	41%	76%	84%
Base Non-Refrigerated Vending Machines, Federal Standard	26%	8%	11%	24%	38%	18%	21%	33%	0%	16%	27%	13%	50%	6%
Base Refrigerated Vending Machines, Federal Standard	32%	16%	17%	27%	42%	21%	38%	47%	0%	22%	31%	19%	65%	7%
Base Combi Oven	20%	28%	4%	25%	2%	10%	20%	30%	0%	13%	28%	12%	20%	0%
Base Convection Oven	4%	54%	10%	59%	9%	87%	23%	57%	2%	51%	38%	39%	19%	26%
Base Fryer	7%	19%	2%	16%	1%	7%	11%	15%	0%	9%	4%	12%	6%	0%
Base Griddle	7%	10%	2%	7%	0%	13%	14%	23%	0%	11%	8%	11%	8%	0%
Base Hot Food Holding Cabinet	0%	42%	3%	58%	0%	25%	29%	40%	0%	12%	41%	7%	0%	0%
Base Steamer	9%	15%	2%	11%	0%	7%	15%	9%	0%	6%	2%	4%	2%	0%
Base Electric Boiler, Federal Standard	0.12 %	0.04 %	0.01 %	0.01 %	0.00 %	0.08 %	0.19 %	0.18 %	0.00 %	0.11 %	0.18 %	0.14 %	0.02 %	0.00 %
Base Electric Furnace, Federal Standard	1%	1%	0%	1%	1%	0%	1%	0%	0%	1%	0%	2%	0%	0%
Base Heating Air-Source Heat Pump, SEER 15.0/HSPF 8.8 w/Aux Strip Heat	23%	14%	16%	25%	9%	55%	29%	24%	3%	30%	17%	14%	12%	8%
Base Heating Packaged Heat Pump, IEER 13.9/COP 3.4 (w/ non-ER heating), 10 tons	19%	13%	3%	5%	3%	1%	17%	3%	73%	8%	4%	9%	4%	0%
Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	3%	3%	3%	5%	3%	1%	2%	5%	0%	2%	5%	2%	3%	4%
Base Ventilation	89%	83%	71%	52%	41%	86%	79%	71%	95%	81%	88%	75%	53%	8%

End Use	Office	Restaurant	Retail	Grocery	Warehouse	Education	Health	Lodging	Data Center	Non-Jurisdictional	Religious Worship	Other	Industrial	Agriculture
Base Compressed Air	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	7%
Base Process Heat	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	7%
Base Process Cooling	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	7%
Base Electrochemical process	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	7%
Base Process Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	7%
Base Industrial Motors or Pumps	23%	3%	3%	18%	6%	17%	21%	35%	0%	22%	22%	24%	53%	7%
Base Miscellaneous	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

5.1.3.2 Non-residential end-use energy intensities

Table 5-7 shows the end-use energy intensities (EUIs) for the Virginia non-residential sector by base measure. EUIs represent the energy use per square foot for businesses that have that end-use (for example, chiller annual kWh for commercial square feet with chillers). EUIs were developed from a variety of sources. At the base measure level, lighting and HVAC EUIs were developed from engineering calculations based on wattage or baseline efficiency and hours of use from the STEP Manual. For products covered by the ENERGY STAR program, the EPA's calculators were used.

At the end-use level, EUIs were obtained for the South Atlantic Census Division from the DOE's 2012 CBECS.[4] This provided concrete, survey-based, regionally appropriate values to use to calibrate the base measure-level EUIs. The resulting EUIs, when combined with the saturation data, produce intensities at the building type level.

[4] Consumption data for the 2018 CBECS were not yet available at the time of the analysis.

Table 5-7. Non-residential end-use energy intensities (kWh per end-use square foot)

End Use	Office	Restaurant	Retail	Grocery	Warehouse	Education	Health	Lodging	Data Center	Non-Jurisdictional	Religious Worship	Other	Industrial	Agriculture
Base Linear Lighting, Fluorescent Fixture, 2L4'T12	1.3	2.1	2.8	2.2	1.7	1.3	3.8	2.1	1.9	1.5	2.2	1.7	1.7	1.7
Base Linear Lighting, Fluorescent Fixture, 2L4'T12, integrated market	1.3	2.1	2.8	2.2	1.7	1.3	3.8	2.1	1.9	1.5	2.2	1.7	1.7	1.7
Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB	1.2	1.9	2.4	2.0	1.5	1.2	3.5	1.9	1.7	1.4	2.0	1.5	1.5	1.4
Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB, integrated market	1.2	1.9	2.4	2.0	1.5	1.2	3.5	1.9	1.7	1.4	2.0	1.5	1.5	1.4
Base Linear Lighting, LED Tube, 2 lamp fixture	0.6	1.0	1.3	1.0	0.8	0.6	1.8	1.0	0.9	0.7	1.0	0.8	0.8	0.8
Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market	0.6	1.0	1.3	1.0	0.8	0.6	1.8	1.0	0.9	0.7	1.0	0.8	0.8	0.8
Base General Service Screw-in, CFL	1.5	0.5	1.2	0.4	0.0	0.0	0.8	1.3	2.3	0.7	0.73	0.6	0.6	0.6
Base General Service Screw-in, Incandescent/halogen	4.5	1.4	3.5	1.2	0.0	0.1	2.5	3.8	6.7	2.1	2.16	1.7	1.7	1.7
Base General Service Screw-in, LED bulb	1.0	0.3	0.8	0.3	0.0	0.0	0.6	0.9	1.5	0.5	0.49	0.4	0.4	0.4
Base HID Lighting (low bay)	2.6	4.3	5.8	4.4	3.5	2.7	7.8	4.2	3.8	3.1	4.41	3.4	3.4	3.4
Base High Bay Lighting, Fluorescent T5	1.2	0.0	6.3	2.6	1.0	1.3	7.2	2.1	0.6	0.7	0.76	0.6	0.6	0.6
Base High Bay Lighting, Fluorescent T5, integrated market	1.2	0.0	6.3	2.6	1.0	1.3	7.2	2.1	0.6	0.7	0.76	0.6	0.6	0.6
Base High Bay Lighting, HID lighting	1.4	0.0	7.2	3.0	1.2	1.6	8.3	2.5	0.7	0.8	0.88	0.7	0.7	0.7
Base High Bay Lighting, LED lighting	0.5	0.0	2.5	1.0	0.4	0.5	2.8	0.8	0.2	0.3	0.30	0.2	0.2	0.2
Base CFL Exit Sign	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.02	0.0	0.0	0.0
Base Area Lighting, Outdoor HID	4.5	3.1	3.0	5.1	0.9	2.2	2.7	1.6	2.5	3.4	2.4	3.4	3.4	3.4

End Use	Office	Restaurant	Retail	Grocery	Warehouse	Education	Health	Lodging	Data Center	Non-Jurisdictional	Religious Worship	Other	Industrial	Agriculture
Base General Service Screw-in, Outdoor CFL	0.3	0.2	0.2	0.4	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2
Base General Service Screw-in, Outdoor Incandescent/Halogen	0.9	0.7	0.6	1.1	0.2	0.5	0.6	0.3	0.5	0.7	0.5	0.7	0.7	0.7
Base General Service Screw-in, Outdoor LED bulb	0.2	0.1	0.1	0.2	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2
Base Linear Lighting, Outdoor Fluorescent Tube	0.6	0.4	0.4	0.7	0.1	0.3	0.3	0.2	0.3	0.4	0.3	0.4	0.4	0.4
Base Linear Lighting, Outdoor LED Tube	0.4	0.2	0.2	0.4	0.1	0.2	0.2	0.1	0.2	0.3	0.2	0.3	0.3	0.3
Base Water-Cooled Centrifugal Chiller, 0.58 kW/ton, 500 tons	1.1	1.8	1.8	1.5	1.1	1.0	1.8	4.1	31.3	1.1	0.5	0.7	0.6	0.6
Base DX Packaged System, EER=10.3, 10 tons	2.6	2.9	3.5	2.7	5.4	1.5	3.0	8.3	62.4	2.5	0.6	1.5	1.1	1.1
Base Heat Pump cooling (14 SEER, 8.2 HSPF)	2.4	2.7	3.2	2.4	4.9	1.4	2.8	7.6	28.6	2.3	0.6	1.4	1.0	1.0
Base Split-System AC, SEER 14.5, <5.4 tons	1.911	2.094	2.514	1.926	3.879	1.096	2.183	5.975	22.526	1.780	0.457	1.099	0.799	0.799
Base PTAC cooling, EER=10.2, 1 ton	2.6	2.9	3.5	2.6	4.9	1.2	3.0	5.5	30.9	2.4	0.6	1.4	1.0	1.0
Base Room AC, CEER 10.9	1.049	1.150	1.380	1.292	3.195	0.712	1.438	2.812	12.367	0.977	0.376	0.905	0.658	0.658
Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	1.672	1.833	2.200	1.685	3.395	0.959	1.910	5.228	39.420	1.557	0.400	0.962	0.699	0.699
Base Open refrigerated/ freezer cases	0.0	1.1	0.0	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Base Closed refrigerated/ freezer cases	0.1	5.4	0.6	8.8	0.1	0.3	0.1	0.4	0.0	0.1	0.1	0.1	0.0	0.0
Base Walk-in refrigeration/ freezer units	0.0	30.5	0.3	40.9	1.1	0.0	0.0	0.2	0.0	0.1	0.0	0.2	0.0	0.6
Base Large Cold Storage Area	0.0	10.2	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.4
Base Reach-in Refrigerator /Freezer, Federal Standard	0.2	4.5	6.8	9.1	0.3	0.5	1.0	0.6	0.2	0.4	0.4	0.3	0.0	0.0
Base Glass Door Reach-in Refrigerator/Freezer, Federal Standard	0.2	5.9	2.1	10.7	0.2	0.4	0.4	0.5	0.4	0.3	0.4	0.3	0.0	0.0

End Use	Office	Restaurant	Retail	Grocery	Warehouse	Education	Health	Lodging	Data Center	Non-Jurisdictional	Religious Worship	Other	Industrial	Agriculture
Base Ice Maker, Federal Standard	0.0	1.8	0.0	0.3	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.0
Base Residential-Type Refrigerator/ Freezer, Federal Standard	0.3	0.5	0.1	0.6	0.1	0.1	0.1	0.4	0.0	0.7	0.1	1.1	0.7	0.1
Base Compact Refrigerator, Federal Standard	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.2	0.0
Base Computer Network Server	0.5	0.3	0.1	0.2	0.1	5.7	0.3	0.0	49.4	0.7	0.03	0.8	0.1	0.8
Base Desktop PC	0.3	0.1	0.1	0.1	0.1	0.3	0.2	0.0	0.0	0.0	0.06	0.1	0.1	0.1
Base Laptop PC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0
Base Monitor, LCD	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.0	0.0	0.0
Base Imaging	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0
Base Water Heater, Resistance Heater, Standard Standby Wattage	0.2	4.2	0.6	0.2	0.1	0.7	0.4	2.2	0.2	0.5	0.1	0.1	0.2	0.2
Base Non-Refrigerated Vending Machines, Federal Standard	0.002	0.001	0.000	0.003	0.002	0.001	0.001	0.001	0.002	0.001	0.00	0.001	0.001	0.001
Base Refrigerated Vending Machines, Federal Standard	0.024	0.015	0.015	0.081	0.015	0.015	0.021	0.030	0.005	0.030	0.009	0.014	0.014	0.014
Base Combi Oven	0.140	4.044	0.790	2.598	0.026	0.340	3.195	0.976	1.359	0.107	0.484	0.151	0.000	0.000
Base Convection Oven	0.708	2.133	0.573	0.680	0.128	0.452	2.155	0.115	0.573	0.414	0.203	0.203	0.203	0.203
Base Fryer	0.658	2.527	0.344	1.194	0.232	0.193	4.370	0.186	0.344	0.411	0.438	0.438	0.438	0.438
Base Griddle	0.101	2.906	0.568	1.867	0.019	0.244	2.296	0.701	0.487	0.077	0.348	0.109	0.000	0.000
Base Hot Food Holding Cabinet	0.182	2.049	0.650	1.440	0.014	0.053	0.882	0.548	0.251	0.091	0.203	0.063	0.000	0.000
Base Steamer	1.823	2.142	0.935	0.746	0.140	0.139	1.179	0.128	0.935	0.575	0.169	0.169	0.169	0.169
Base Electric Boiler, Federal Standard	3.2	11.4	6.4	5.9	3.9	5.5	4.6	25.4	92.4	4.1	0.9	3.3	3.3	3.3
Base Electric Furnace, Federal Standard	3.2	11.4	6.4	5.9	3.9	5.5	4.6	25.4	92.4	4.1	0.9	3.3	3.3	3.3
Base Heating Air-Source Heat Pump,	1.3	4.8	2.7	2.4	1.6	2.3	1.9	10.6	38.5	1.7	0.4	1.4	1.4	1.4

End Use	Office	Restaurant	Retail	Grocery	Warehouse	Education	Health	Lodging	Data Center	Non-Jurisdictional	Religious Worship	Other	Industrial	Agriculture
SEER 15.0/HSPF 8.8 w/Aux Strip Heat														
Base Heating Packaged Heat Pump, IEER 13.9/COP 3.4 (w/ non-ER heating), 10 tons	0.9	3.3	1.8	1.7	1.1	1.6	1.3	7.2	26.4	1.2	0.3	0.9	0.9	0.9
Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	1.3	4.8	2.7	2.4	1.6	2.3	1.9	10.6	38.5	1.7	0.4	1.4	1.4	1.4
Base Ventilation	6.3	9.9	5.2	2.9	0.9	0.7	10.3	3.8	2.0	1.7	0.7	0.5	10.3	0.5
Base Compressed Air	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	1.0
Base Process Heat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	3.1
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	5.2	0.0
Base Electrochemical 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	5.5	0.0
Base Process Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Base Motors	23.257	2.608	64.403	0.000	0.622	1.373	7.306	0.000	58.003	6.099	3.710	2.906	18.8	10.6
Base Miscellaneous	2.2	2.6	2.2	2.4	0.9	0.6	6.0	1.4	2.0	1.379	1.7	1.7	1.7	3.0

5.1.3.3 Non-residential building stock and energy use

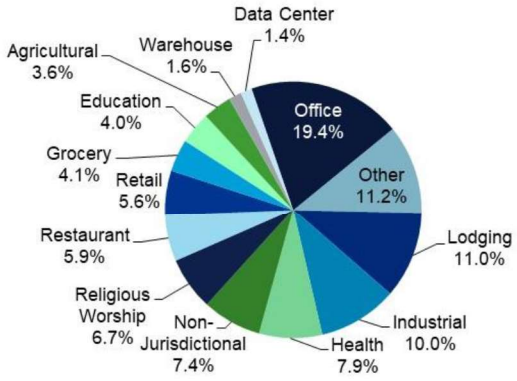
CBECS data from the South Atlantic Census Division was used to estimate the proportion of customers and the average floor space by building type. Energy use was then calculated as the product of the commercial floor space, equipment saturation, and the end-use energy intensity.

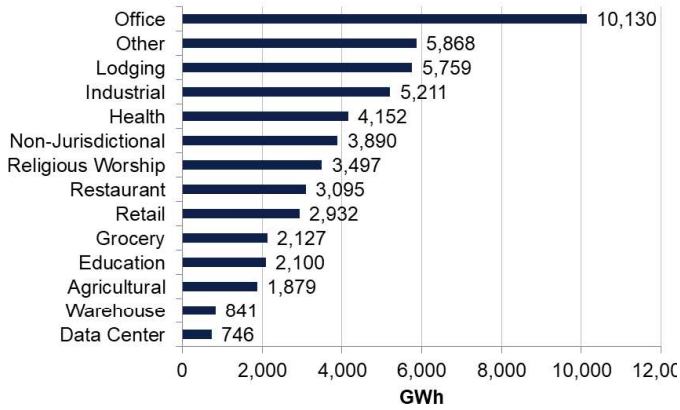
Figure 5-3 and Figure 5-4 show the breakout of energy use by building type and by end-use, respectively. Ventilation, miscellaneous, motors, and cooling end uses represent the largest shares of energy use. The results also include break-out summaries for opt-out customers, because that category captures most of Virginia's data center energy use, as well as some industrial and education (college/university) energy use. These data provide helpful context for understanding the distribution of the opt-out customers. For non-opt-out customers, office buildings represent the largest share of energy use followed by miscellaneous (other).[5] Data centers represent by far the largest share of energy use among opt-out customers.

[5] Miscellaneous buildings include churches, public safety, services, community centers, recreation, entertainment, etc.

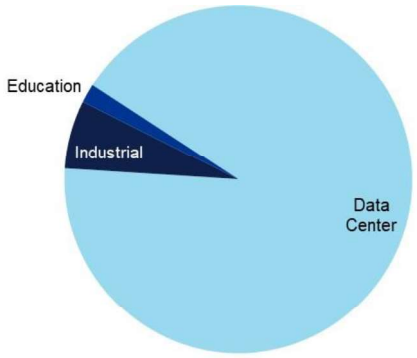
Figure 5-3. Non-residential energy use by building type

Non-Opt-Out





Opt-Out



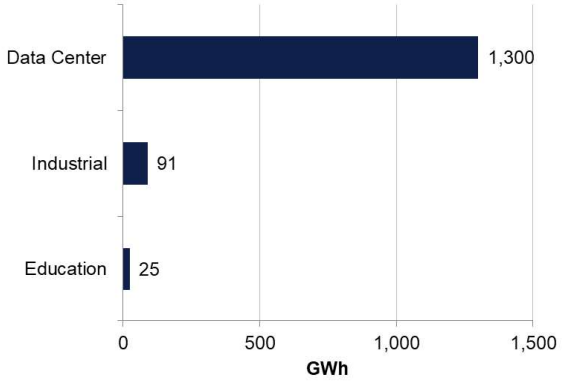


Figure 5-4. Non-residential energy use by end use

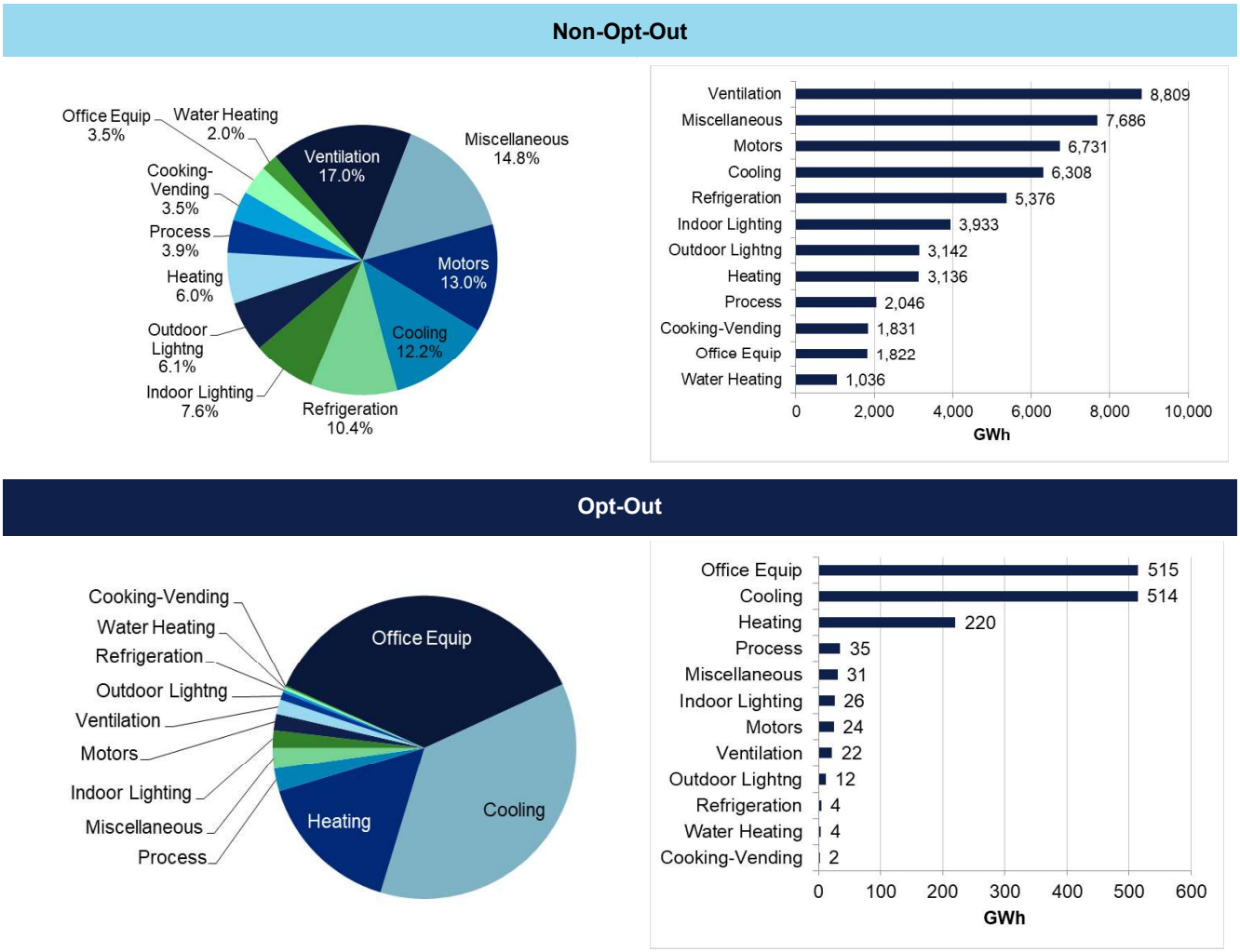


Table 5-8 on the next page shows commercial floor space by building type and resulting energy use by building type and equipment type.

Table 5-8. Non-residential sector floor space (1,000 sf) and energy use (MWh) by end use and building type

	Office	Restaurant	Retail	Grocery	Warehouse	Education	Health	Lodging	Data Center	Non-Jurisdictional	Religious	Other	Industrial	Agriculture	Total
Floor Space (1,000 sf)	536,027	56,901	204,917	42,981	178,575	268,941	168,658	360,070	5,891	409,557	553,905	809,005	136,901	247,431	3,979,761
MWh by End use															
Base Linear Lighting, Fluorescent Fixture, 2L4'T12	40,032	5,198	34,481	1,899	9,329	22,911	36,557	16,112	0	25,469	53,597	26,718	10,431	11,580	294,313
Base Linear Lighting, Fluorescent Fixture, 2L4'T12, integrated market	40,032	5,198	34,481	1,899	9,329	22,911	36,557	16,112	0	25,469	53,597	26,718	10,431	11,580	294,313
Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB	59,330	4,310	23,143	1,458	28,587	24,148	61,920	25,275	773	30,687	85,882	35,709	13,573	419	395,215
Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB, integrated market	59,330	4,310	23,143	1,458	28,587	24,148	61,920	25,275	773	30,687	85,882	35,709	13,573	419	395,215
Base Linear Lighting, LED Tube, 2 lamp fixture	38,150	3,452	42,979	15,060	21,318	8,361	34,928	20,249	391	29,668	110,210	86,423	25,496	6,016	442,701
Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market	38,150	3,452	42,979	15,060	21,318	8,361	34,928	20,249	391	29,668	110,210	86,423	25,496	6,016	442,701
Base General Service Screw-in, CFL	22,030	1,121	9,169	92	0	63	2,704	27,582	0	18,757	10,853	52,754	1,225	2,040	148,389
Base General Service Screw-in, Incandescent/halogen	45,064	3,735	47,154	862	0	248	9,084	8,258	0	27,428	56,411	65,403	4,485	128,587	396,719
Base General Service Screw-in, LED bulb	145,505	9,326	37,669	1,858	0	2,109	32,674	191,513	2,522	86,675	54,227	125,165	10,715	48,677	748,634
Base HID Lighting (low bay)	0	0	0	0	0	0	0	0	6,474	0	0	0	0	0	6,474
Base High Bay Lighting, Fluorescent T5	10,830	25	57,168	1,235	6,908	3,043	13,472	2,406	0	2,409	4,666	2,498	210	1,780	106,651
Base High Bay Lighting, Fluorescent T5, integrated market	10,830	25	57,168	1,235	6,908	3,043	13,472	2,406	0	2,409	4,666	2,498	210	1,780	106,651
Base High Bay Lighting, HID lighting	5,926	29	13,419	1,833	19,985	288	2,000	13,586	347	3,021	19,603	8,181	4,164	1,627	94,008
Base High Bay Lighting,	3,975	21	0	3,284	0	2,384	2,110	8,639	0	3,684	15,718	8,758	3,921	8,306	60,800

	Office	Restaurant	Retail	Grocery	Warehouse	Education	Health	Lodging	Data Center	Non-Jurisdictional	Religious	Other	Industrial	Agriculture	Total
LED lighting															
Base CFL Exit Sign	22,843	3,384	4,098	390	733	3,818	9,894	12,070	251	9,403	10,014	14,627	2,475	4,473	98,474
Base Area Lighting, Outdoor HID	375,497	18,888	53,709	0	21,092	16,730	36,901	60,061	525	212,231	317,850	677,467	137,137	475,654	2,403,741
Base General Service Screw-in, Outdoor CFL	7,812	456	1,537	0	31	98	196	923	0	1,794	7,149	4,263	180	310	24,750
Base General Service Screw-in, Outdoor Incandescent/Halogen	64,598	5,517	18,490	0	2,236	17,370	21,379	7,643	2,386	44,371	24,940	98,526	3,107	5,403	315,965
Base General Service Screw-in, Outdoor LED bulb	71,110	4,013	13,246	0	4,832	22,961	14,032	17,733	83	38,132	36,348	51,495	12,473	16,545	303,002
Base Linear Lighting, Outdoor Fluorescent Tube	5,695	1,706	16,733	0	132	627	329	3,097	0	1,646	673	2,569	155	0	33,363
Base Linear Lighting, Outdoor LED Tube	6,189	950	2,912	0	1,459	83	1,096	4,026	115	7,823	2,468	29,473	4,236	0	60,831
Base Water-Cooled Centrifugal Chiller, 0.58 kW/ton, 500 tons	138,257	1,896	4,452	254	2,378	19,518	26,771	409,182	0	43,991	27,954	45,949	2,095	0	722,698
Base DX Packaged System, EER=10.3, 10 tons	499,774	99,036	332,413	42,115	222,264	287,478	172,227	679,749	324,703	449,316	120,438	350,313	52,829	78	3,632,734
Base Heat Pump cooling (14 SEER, 8.2 HSPF)	296,300	26,210	96,459	4,818	76,728	13,772	96,516	166,202	2,212	92,945	91,164	122,485	12,076	9,841	1,107,729
Base Split-System AC, SEER 14.5, <5.4 tons	79,930	4,754	43,958	8,635	51,594	15,693	58,761	315,481	6,717	119,822	37,220	241,058	7,298	7,695	998,616
Base PTAC cooling, EER=10.2, 1 ton	34,206	1,434	4,370	0	0	5,942	20,579	347,978	2,388	37,071	2,832	61,144	155	0	518,098
Base Room AC, CEER 10.9	1,920	625	5,095	10,393	6,401	3,474	28,003	15,924	0	6,773	6,507	14,709	525	682	101,031
Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	16,276	3,738	9,046	5,508	20,985	12,449	5,533	60,976	0	20,264	10,397	18,563	1,824	1,969	187,529
Base Open refrigerated/ freezer cases	22	7,112	327	73,549	0	2	0	360	0	8	0	1	0	0	81,382
Base Closed refrigerated/ freezer cases	2,582	115,274	12,730	199,407	43	11,331	3,279	25,241	0	3,398	24,209	2,566	0	0	400,059

	Office	Restaurant	Retail	Grocery	Warehouse	Education	Health	Lodging	Data Center	Non-Jurisdictional	Religious	Other	Industrial	Agriculture	Total
Base Walk-in refrigeration/ freezer units	2,582	1,479,743	4,271	1,189,139	10,190	920	1,747	33,712	0	4,340	828	8,722	11	4,435	2,740,641
Base Large Cold Storage Area	10	29,205	129	21,174	386	0	13	47	0	25	292	134	137	2,388	53,940
Base Reach-in Refrigerator /Freezer, Federal Standard	4,099	31,606	21,238	207,280	129	20,954	13,863	1,852	0	11,992	67,328	4,376	0	0	384,717
Base Glass Door Reach-in Refrigerator/Freezer, Federal Standard	2,772	84,626	35,089	0	0	0	3,878	37,475	0	1,054	0	1,443	0	0	166,337
Base Ice Maker, Federal Standard	2,388	71,586	495	6,004	908	2,643	1,835	24,122	0	7,080	13,941	6,149	1,442	541	139,135
Base Residential-Type Refrigerator/Freezer, Federal Standard	134,632	11,466	6,428	6,335	5,886	25,891	12,068	101,415	287	240,788	31,537	709,553	78,014	7,273	1,371,572
Base Compact Refrigerator, Federal Standard	7,726	755	2,790	190	942	842	3,792	11,211	0	1,875	153	1,752	6,539	52	38,619
Base Computer Network Server	204,954	8,188	8,943	3,914	7,652	474,541	31,591	9,433	291,309	103,216	10,881	208,368	6,393	13,212	1,382,594
Base Desktop PC	144,777	2,064	11,002	2,065	8,314	29,351	38,246	14,878	29	8,952	29,434	45,923	6,570	13,082	354,688
Base Laptop PC	2,706	341	323	80	425	388	431	599	26	1,561	2,041	1,042	314	374	10,651
Base Monitor, LCD	24,717	529	1,753	436	1,248	10,216	5,094	2,237	44	9,116	4,997	4,570	1,074	783	66,814
Base Imaging	2,117	178	261	128	158	186	513	404	10	625	1,787	878	222	85	7,553
Base Water Heater, Resistance Heater, Standard Standby Wattage	66,495	119,343	93,500	3,703	7,635	146,770	57,113	302,584	820	125,709	17,351	21,434	22,813	45,504	1,030,773
Base Non-Refrigerated Vending Machines, Federal Standard	289	3	7	34	115	41	50	160	0	68	45	81	55	12	959
Base Refrigerated Vending Machines, Federal Standard	4,021	144	521	943	1,101	842	1,321	5,015	0	2,675	1,502	2,132	1,247	236	21,700
Base Combi Oven	15,365	64,811	5,962	27,428	98	8,749	110,022	105,101	0	5,513	75,643	15,024	0	0	433,716
Base Convection Oven	13,349	65,541	11,470	17,203	2,163	105,827	82,027	23,520	67	86,042	43,064	63,412	5,195	12,992	531,871
Base Fryer	26,058	27,890	1,104	7,993	281	3,639	80,883	10,327	0	15,666	10,239	40,889	3,530	0	228,499
Base Griddle	4,026	17,251	2,685	5,538	10	8,290	55,214	57,831	0	3,521	15,865	9,793	0	0	180,024

	Office	Restaurant	Retail	Grocery	Warehouse	Education	Health	Lodging	Data Center	Non-Jurisdictional	Religious	Other	Industrial	Agriculture	Total
Base Hot Food Holding Cabinet	412	48,490	3,497	35,634	0	3,603	43,151	79,755	0	4,631	45,732	3,470	0	0	268,376
Base Steamer	83,445	17,962	3,841	3,464	0	2,638	29,325	4,202	0	13,373	1,932	5,215	392	0	165,790
Base Electric Boiler, Federal Standard	2,052	253	105	18	32	1,170	1,516	15,983	0	1,875	948	3,582	84	0	27,619
Base Electric Furnace, Federal Standard	14,447	5,083	4,201	1,604	4,557	418	8,172	28,796	1,378	17,759	1,754	50,171	1,675	0	140,014
Base Heating Air-Source Heat Pump, SEER 15.0/HSPF 8.8 w/Aux Strip Heat	166,872	37,400	85,379	26,009	25,893	340,144	93,623	904,308	6,276	210,547	36,696	158,802	22,836	27,999	2,142,782
Base Heating Packaged Heat Pump, IEER 13.9/COP 3.4 (w/ non-ER heating),10 tons	91,432	23,378	12,853	3,745	6,246	6,195	36,995	69,996	114,285	37,282	5,885	70,081	5,097	0	483,471
Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	18,648	7,182	18,557	5,719	8,263	7,573	7,123	172,154	0	12,091	11,075	20,553	5,378	12,184	306,499
Base Ventilation	3,001,994	469,293	762,645	64,940	67,579	162,047	1,375,530	982,162	11,318	550,637	331,624	274,971	745,271	8,787	8,808,797
Base Compressed Air	0	0	0	0	0	0	0	0	0	0	0	0	356,270	15,554	371,824
Base Process Heat	0	0	0	0	0	0	0	0	0	0	0	0	383,207	50,668	433,875
Base Process Cooling	0	0	0	0	0	0	0	0	0	0	0	0	715,803	0	715,803
Base Electrochemical process	0	0	0	0	0	0	0	0	0	0	0	0	755,569	0	755,569
Base Process Other	0	0	0	0	0	0	0	0	0	0	0	0	140,991	0	140,991
Base Motors	2,903,155	4,279	403,685	0	6,863	63,788	259,247	0	0	540,336	445,813	571,301	1,361,717	171,097	6,731,282
Base Miscellaneous	1,179,260	147,944	450,818	103,154	160,717	161,364	1,011,947	504,099	11,783	564,908	941,638	1,375,309	232,732	742,292	7,587,966
Total	10,266,998	3,111,729	2,996,084	2,136,176	890,970	2,142,393	4,204,147	6,007,686	788,681	3,988,277	3,535,711	5,977,296	5,221,074	1,881,025	53,148,247

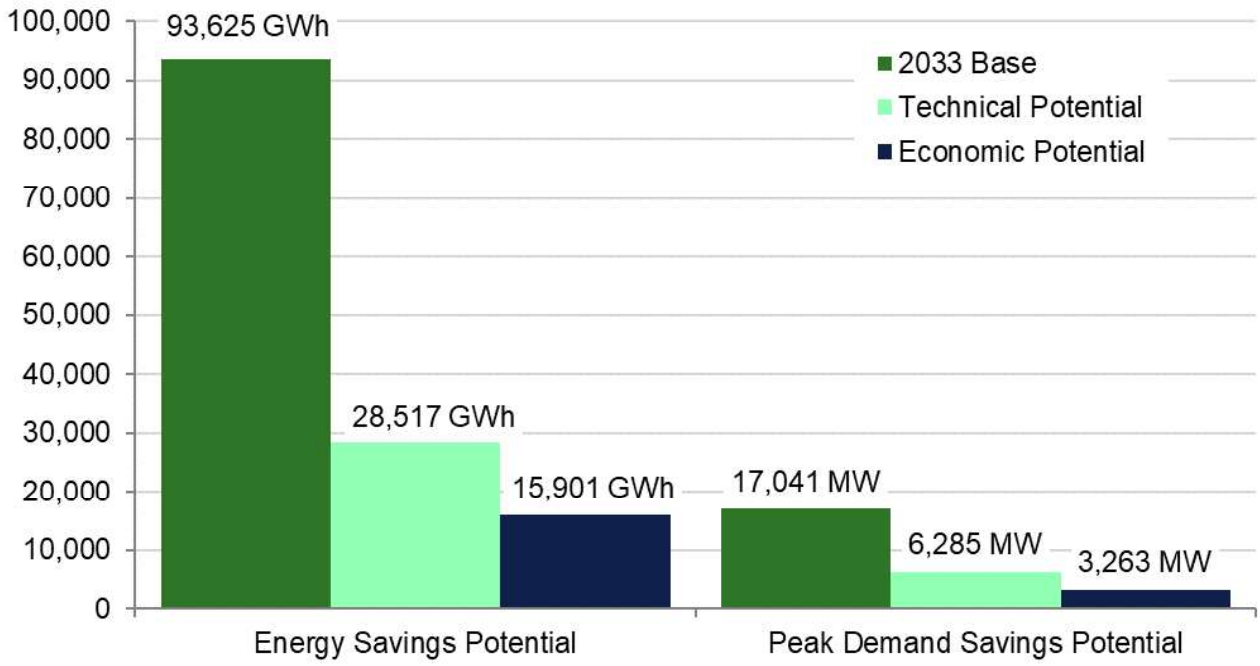
5.2 Technical and economic potential results

This section summarizes findings from the analysis of technical and economic savings potential of electric energy efficiency efforts in Dominion Energy's service territory. Technical potential is defined as the complete penetration of all measures analyzed in applications where they were deemed technically feasible from an engineering perspective. Economic potential is defined as the technical potential of those energy conservation measures that are cost-effective when compared to supply-side alternatives. All measures with a total resource cost (TRC) greater than 1 are considered to have economic potential.

5.2.1 Overall technical and economic potential

Figure 5-5 presents our overall estimates of total technical and economic potential for electrical energy and peak demand savings for Dominion Energy's service territory. These results exclude non-jurisdictional, federal, and opt-out customers.

Figure 5-5. Estimated electric technical and economic potential, 2033*



*Excludes Virginia non-jurisdictional, federal, and opt-out customers as well as voltage optimization and persistent savings from program activities prior to 2024

5.2.2 Base-case technical and economic potential

This section summarizes the identified technical and economic potential in more detail for the base avoided cost case, and further describes potentials by sector, state, building type, and by end use.

5.2.3 Potential by sector

Figure 5-6 and Figure 5-7 show the breakdown of technical and economic potential by sector, compared to the total base consumption and demand in 2033. The residential sector represents 43% of technical energy savings and 33% of economic energy savings. The residential sector has 61% of technical demand potential and 53% of the corresponding economic potential.

Figure 5-6. Technical and economic energy savings by sector, GWh

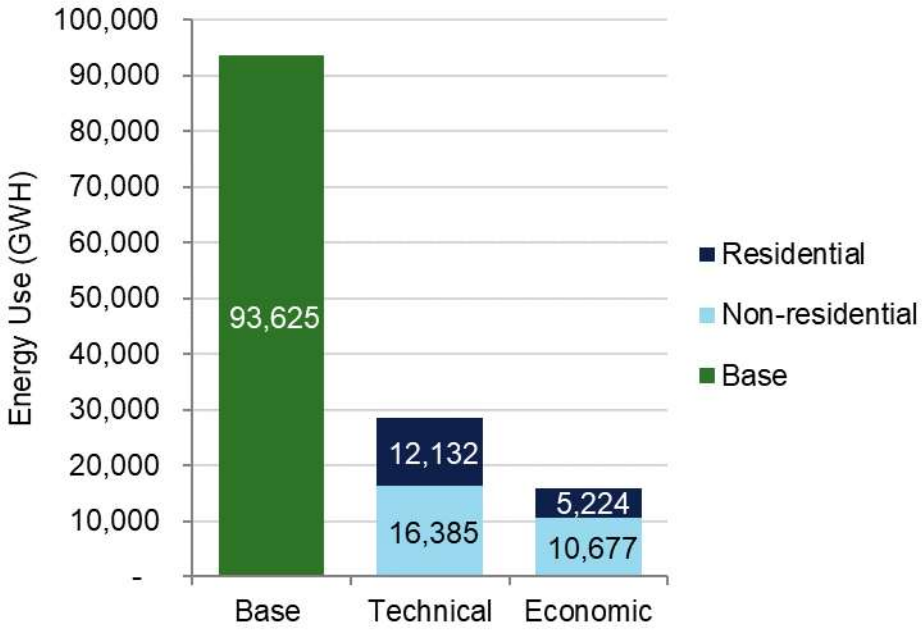
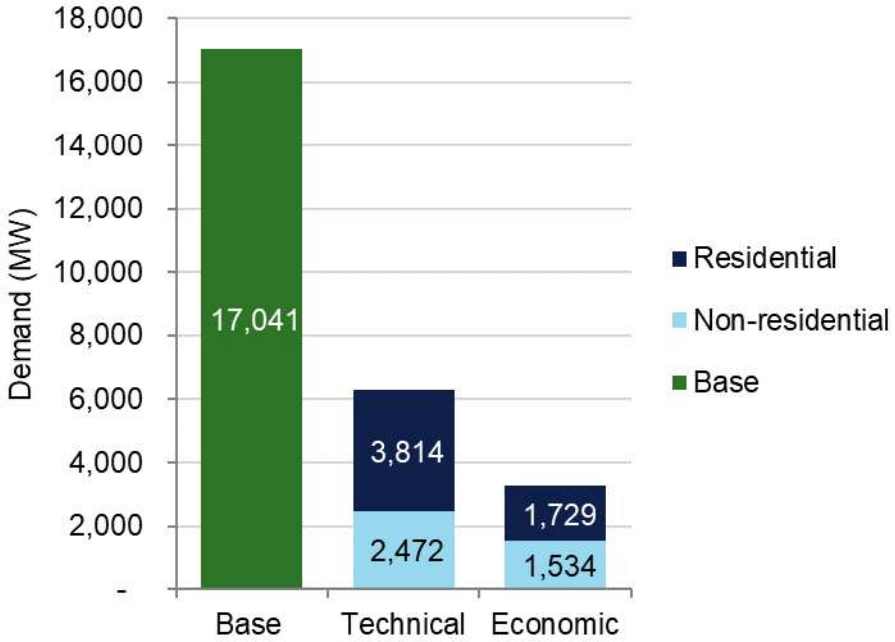


Figure 5-7. Technical and economic peak demand savings by sector, MW



5.2.4 Potential by building type

This section presents technical and economic potential by residential and non-residential building type to provide more detail about where potential savings exist in Dominion Energy's service territory.

5.2.4.1 Residential

Figure 5-8 shows potential in the residential sector by building type. We have included behavioral savings on the charts separately, without a breakout, because we analyzed behavioral programs by consumption rather than by building type. Single-family homes (including low- and moderate-income customers) account for 83% of the economic potential for energy and 80% for demand. Across all building types, low- and moderate-income customers account for 42% of economic energy potential (43% for demand).

Figure 5-8. Energy savings potential (GWh) by residential building type

Figure 5-9. Demand savings potential (MW) by residential building type

5.2.4.2 Non-residential

Figure 5-10 and Figure 5-11 show the building type breakdown for non-residential building energy and demand potential, respectively. Offices make up 21% of economic energy potential, followed by restaurants, retail, and grocery. The top four rankings are the same for demand potential.

Figure 5-10. Energy savings potential by non-residential building type

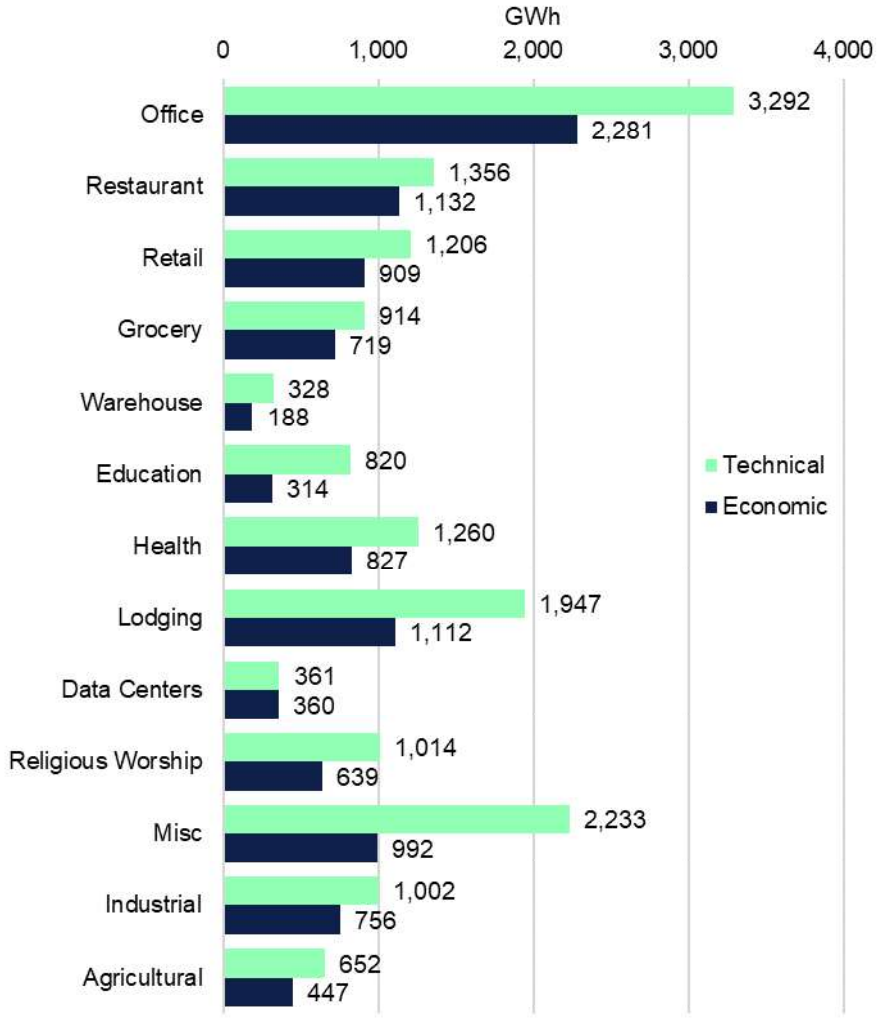
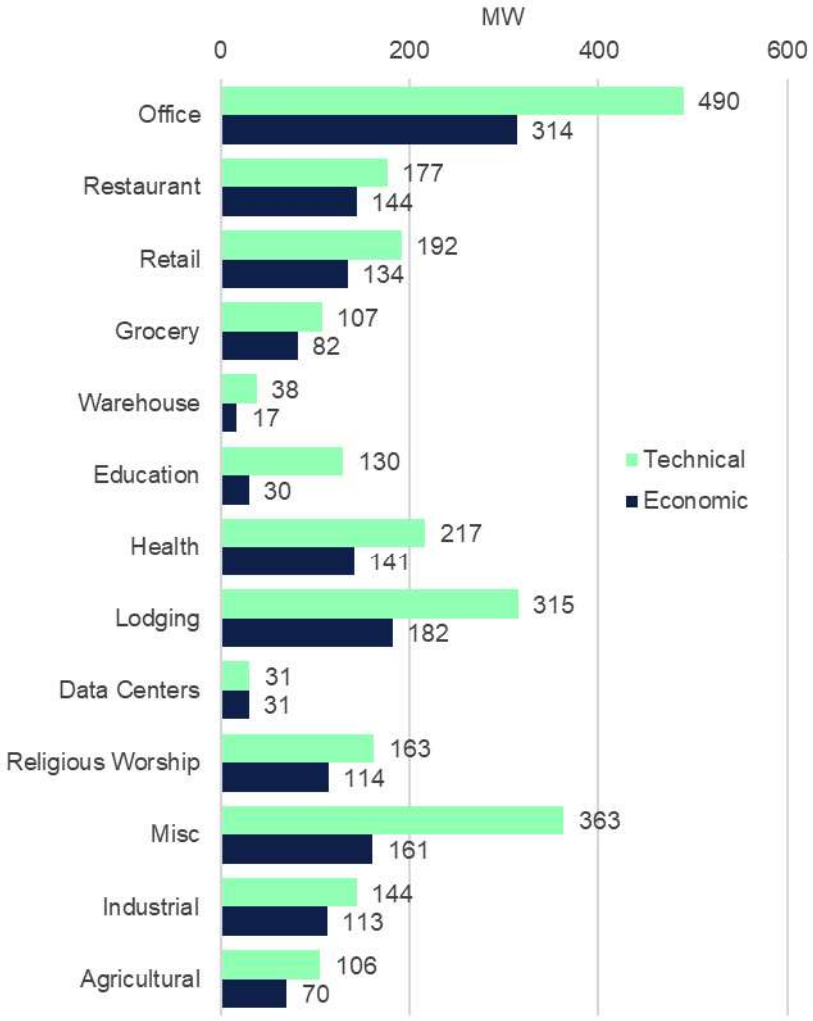


Figure 5-11. Demand savings potential by non-residential building type



The “miscellaneous” building type encompasses all the customer accounts that were left over after the other building types were broken out. Although we refer to it as a building type in the study, it includes not only buildings not explicitly categorized but also all non-residential energy use not associated with a building (for example, cell towers, area lighting in a park or surface parking lot, or irrigation pumping not associated with a building account). The category also captures a broad range of less common building types, including sports arenas, community centers, fitness centers, gas stations (without quick marts), parking garages, etc.

5.2.5 Potentials by Building Type

5.2.5.1 Residential

Figure 5-12 and Figure 5-13 show the end-use breakdown of residential energy and demand potential, respectively. Cooling and heating make up 31% of technical energy savings potential, followed by water heating at 27%. Cooling and heating make up the largest share of economic energy potential at 44%, followed by refrigeration and space cooling. On the demand side, cooling and heating (based on a winter peak) make up 59% of technical potential and 79% of economic potential.

Figure 5-12. Energy savings potential by residential end use

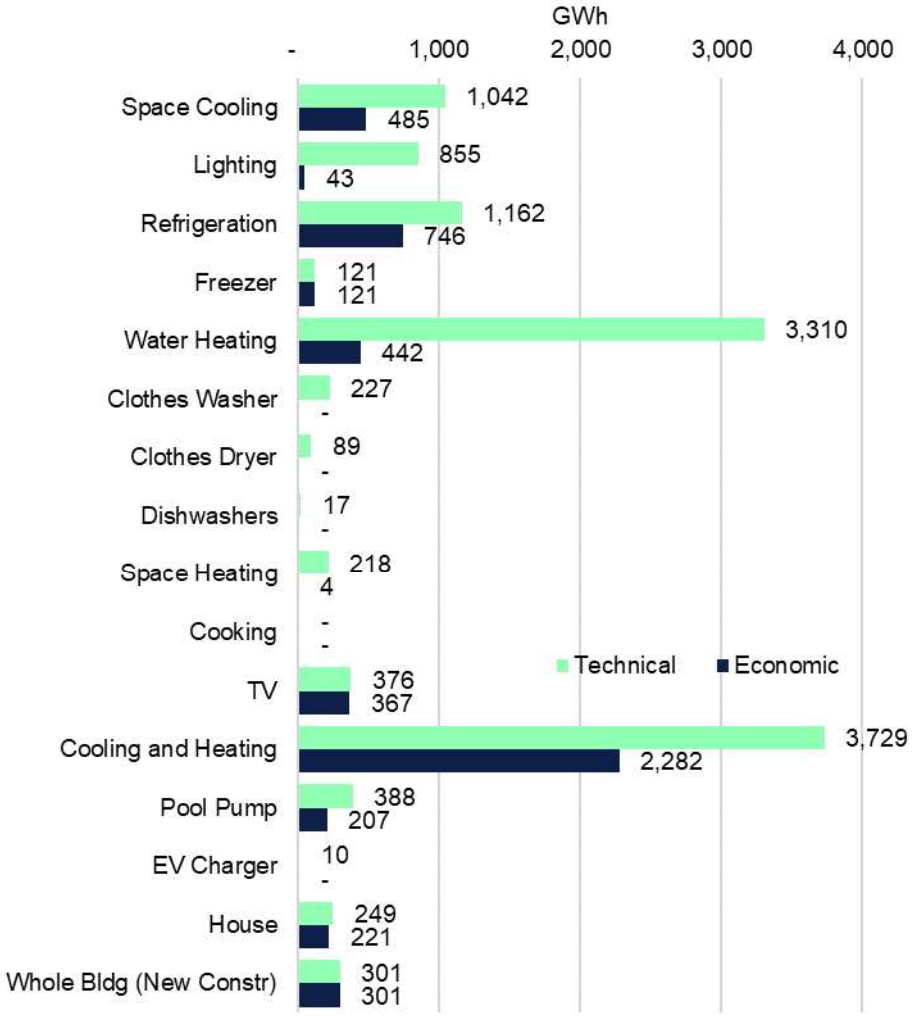
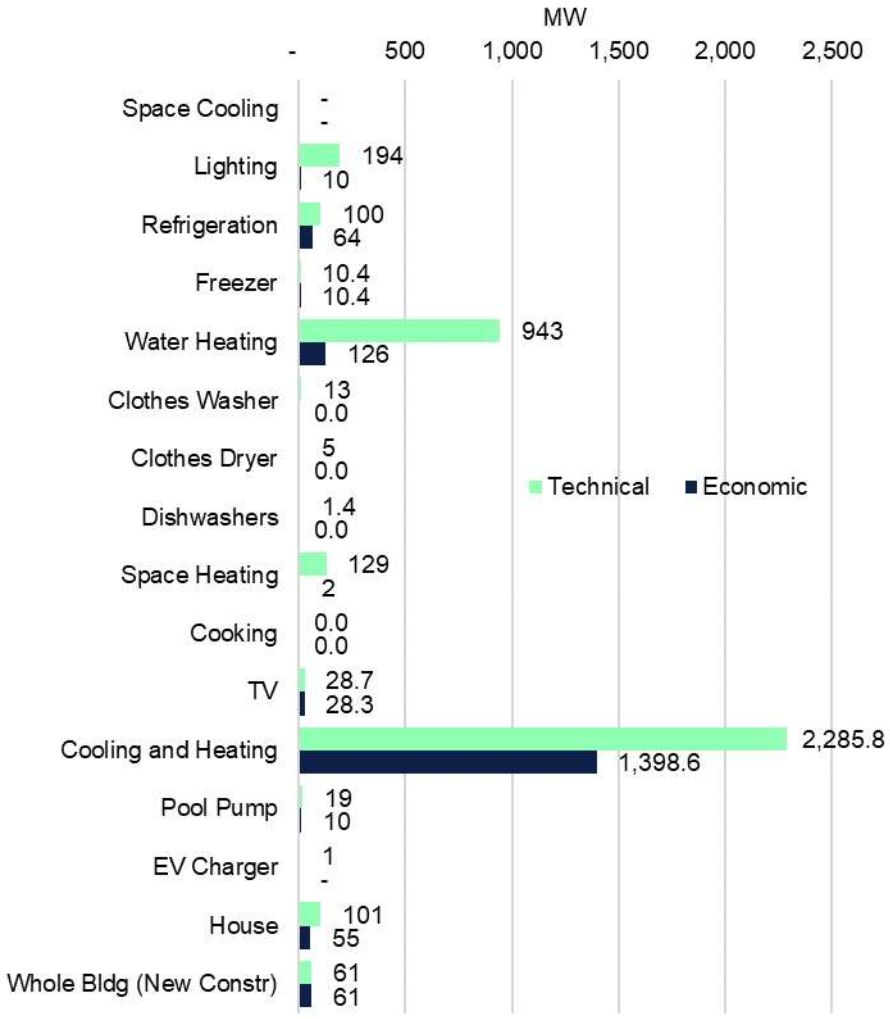


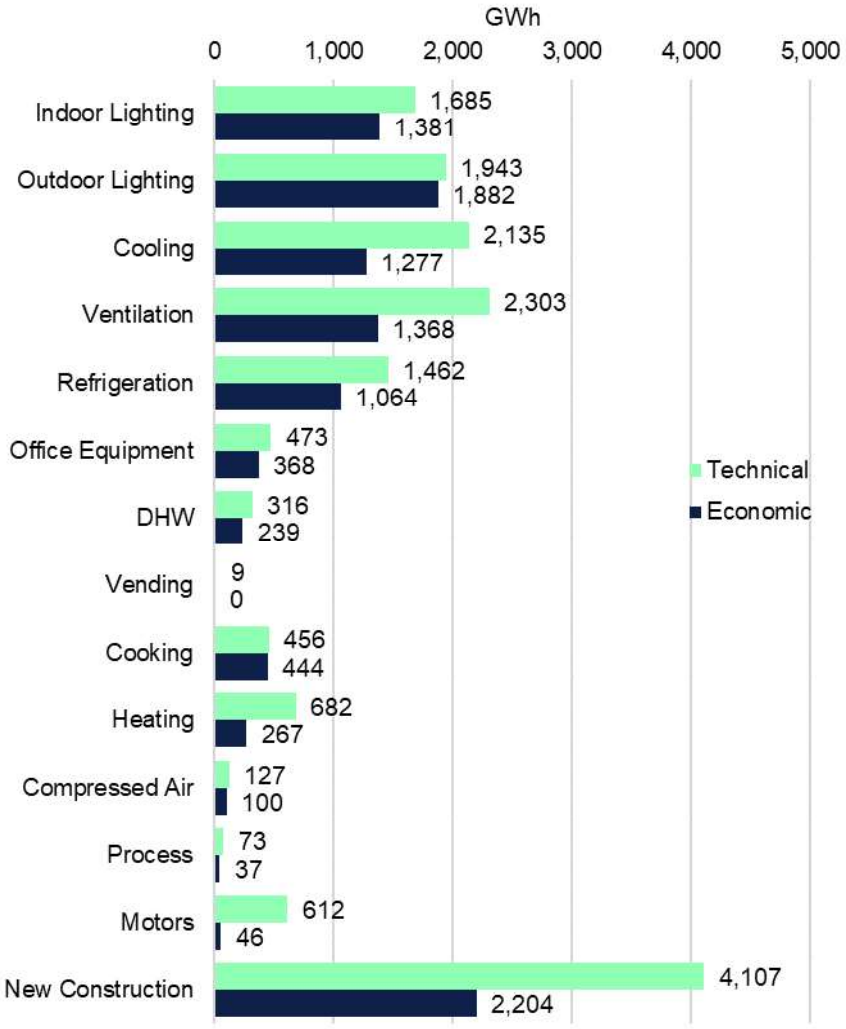
Figure 5-13. Demand savings potential by residential end use



5.2.5.2 Non-Residential

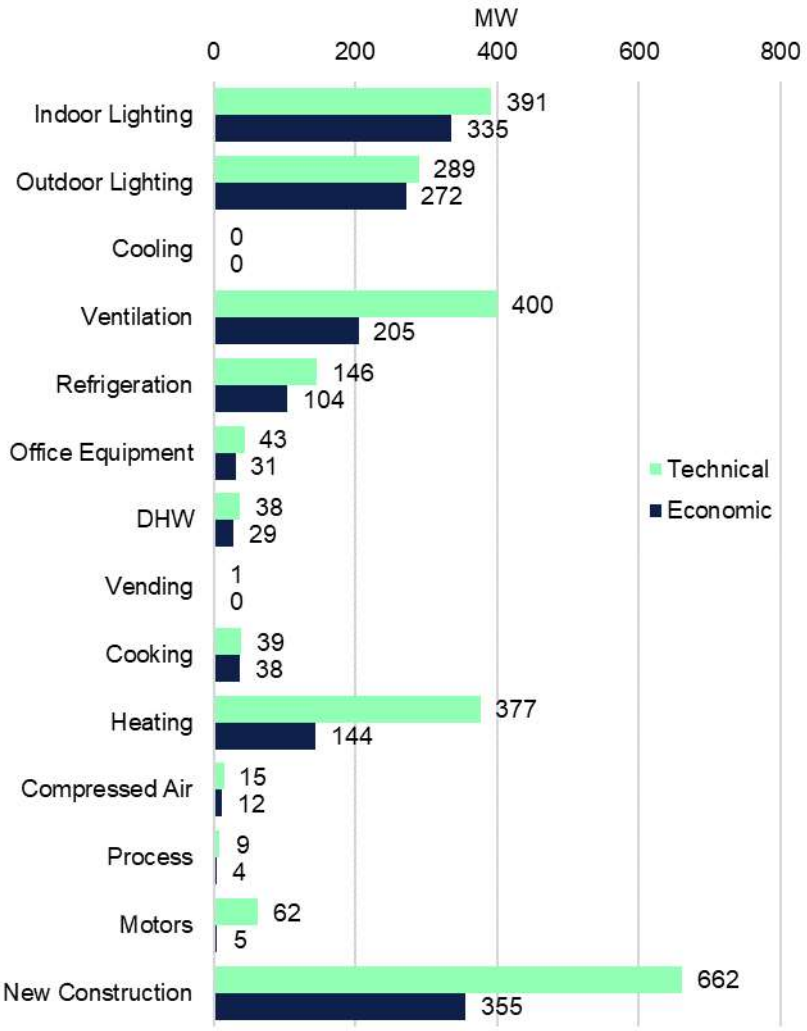
Figure 5-14 and Figure 5-15 show energy and demand savings by commercial end use. New construction makes up the largest share of economic potential at 21% for energy and 23% for demand. It is followed in energy use by outdoor lighting, indoor lighting, ventilation, and cooling; and in demand by indoor lighting, outdoor lighting, and ventilation.

Figure 5-14. Energy savings potential by non-residential end use



* Excludes Virginia non-jurisdictional, federal, and opt-out customers as well as voltage optimization and persistent savings from program activities prior to 2024.

Figure 5-15. Demand savings potential by non-residential end use



* Excludes Virginia non-jurisdictional, federal, and opt-out customers as well as voltage optimization and persistent savings from program activities prior to 2024.

5.2.6 Top 20 savings measures

Table 5-9 through Table 5-16 show the top 20 measures for energy and demand savings potential in the residential and non-residential sectors. For each section, the first table shows the top 20 measures as ranked by technical potential savings. The following table then shows the top 20 measures ranked by economic savings. All measures with a TRC less than one are not considered as part of the economic potential and thus were not carried over to the top 20 economic measures tables.

5.2.6.1 Residential

Table 5-9 through Table 5-12 show the top 20 measures by technical energy potential, economic energy potential, technical demand potential, and economic demand potential, respectively, for Dominion Energy's residential sector in Virginia.

Table 5-9. Top 20 measures contributing to residential technical energy savings potential

Base	Measure Number	Measure Name	Building Type	Technical GWh	Measure TRC	Economic GWh
7000	7002	Heat Pump Water Heater - Energy Star	Single Family	830.7	0.6	0.0
7000	7002	Heat Pump Water Heater - Energy Star	SF LI	589.3	0.6	0.0
4200	4201	2nd Refrigerator Recycling	Single Family	447.3	2.4	447.3
7000	7003	Solar Domestic Water Heating	Single Family	420.4	0.1	0.0
7000	7010	Drain Water Heat Recovery (GFX)	Single Family	415.1	0.3	0.0
1700	1701	Heat pump (16 SEER, 9.2 HSPF) (eFAF + CAC)	Single Family	327.7	5.2	327.7
4200	4201	2nd Refrigerator Recycling	SF LI	317.3	2.4	317.3
7000	7003	Solar Domestic Water Heating	SF LI	298.2	0.1	0.0
7000	7010	Drain Water Heat Recovery (GFX)	SF LI	294.5	0.3	0.0
1500	1502	Heat pump upgrade to (18 SEER, 10 HSPF) (HP heat/cool)	Single Family	282.4	1.5	282.4
4000	4002	Refrigerator (CEE Tier 2)	Single Family	256.8	1.4	256.8
1500	1521	Smart Thermostat (HP heat/cool)	Single Family	254.5	2.6	254.5
1700	1701	Heat pump (16 SEER, 9.2 HSPF) (eFAF + CAC)	SF LI	232.5	5.2	232.5
3030	3033	Dimmer Switch (base interior LED, 6 hrs/day)	Single Family	221.7	0.3	0.0
1500	1502	Heat pump upgrade to (18 SEER, 10 HSPF) (HP heat/cool)	SF LI	200.4	1.5	200.4
1700	1702	Heat pump (18 SEER, 10 HSPF) (eFAF + CAC)	Single Family	198.0	12.6	198.0
1500	1514	Crawlspace insulation (HP heat/cool)	Single Family	194.9	3.9	194.9
4000	4002	Refrigerator (CEE Tier 2)	SF LI	182.1	1.4	182.1
1500	1521	Smart Thermostat (HP heat/cool)	SF LI	180.6	2.6	180.6
1000	1003	18 SEER Split-System Air Conditioner (CAC)	Single Family	177.6	1.1	177.6
3030	3033	Dimmer Switch (base interior LED, 6 hrs/day)	SF LI	175.6	0.2	0.0

Table 5-10. Top 20 measures contributing to residential economic energy savings potential

Base	Measure Number	Measure Name	Building Type	Measure TRC	Economic GWh
4200	4201	2nd Refrigerator Recycling	Single Family	2.4	447.3
1700	1701	Heat pump (16 SEER, 9.2 HSPF) (eFAF + CAC)	Single Family	5.2	327.7
4200	4201	2nd Refrigerator Recycling	SF LI	2.4	317.3
1500	1502	Heat pump upgrade to (18 SEER, 10 HSPF) (HP heat/cool)	Single Family	1.5	282.4
4000	4002	Refrigerator (CEE Tier 2)	Single Family	1.4	256.8
1500	1521	Smart Thermostat (HP heat/cool)	Single Family	2.6	254.5
1700	1701	Heat pump (16 SEER, 9.2 HSPF) (eFAF + CAC)	SF LI	5.2	232.5

Base	Measure Number	Measure Name	Building Type	Measure TRC	Economic GWh
1500	1502	Heat pump upgrade to (18 SEER, 10 HSPF) (HP heat/cool)	SF LI	1.5	200.4
1700	1702	Heat pump (18 SEER, 10 HSPF) (eFAF + CAC)	Single Family	12.6	198.0
1500	1514	Crawlspace insulation (HP heat/cool)	Single Family	3.9	194.9
4000	4002	Refrigerator (CEE Tier 2)	SF LI	1.4	182.1
1500	1521	Smart Thermostat (HP heat/cool)	SF LI	2.6	180.6
1000	1003	18 SEER Split-System Air Conditioner (CAC)	Single Family	1.1	177.6
6000	6001	Energy Star LED TV	Single Family	5.4	148.4
1700	1702	Heat pump (18 SEER, 10 HSPF) (eFAF + CAC)	SF LI	12.6	140.4
1500	1514	Crawlspace insulation (HP heat/cool)	SF LI	3.9	138.2
1500	1501	Heat pump upgrade to (16 SEER, 9.2 HSPF) (HP heat/cool)	Single Family	2.3	136.1
7000	7013	Faucet Aerators	Single Family	2.9	127.1
1000	1003	18 SEER Split-System Air Conditioner (CAC)	SF LI	1.1	126.0
6000	6001	Energy Star LED TV	SF LI	5.4	105.3
1500	1501	Heat pump upgrade to (16 SEER, 9.2 HSPF) (HP heat/cool)	SF LI	2.3	96.5

Table 5-11. Top 20 measures contributing to residential technical demand savings potential

Base	Measure Number	Measure Name	Building Type	Technical MW	Measure TRC	Economic MW
7000	7002	Heat Pump Water Heater - Energy Star	Single Family	236.5	0.6	0.0
1700	1701	Heat pump (16 SEER, 9.2 HSPF) (eFAF + CAC)	Single Family	200.9	5.2	200.9
1500	1502	Heat pump upgrade to (18 SEER, 10 HSPF) (HP heat/cool)	Single Family	173.1	1.5	173.1
7000	7002	Heat Pump Water Heater - Energy Star	SF LI	167.8	0.6	0.0
1500	1521	Smart Thermostat (HP heat/cool)	Single Family	156.0	2.6	156.0
1700	1701	Heat pump (16 SEER, 9.2 HSPF) (eFAF + CAC)	SF LI	142.5	5.2	142.5
1500	1502	Heat pump upgrade to (18 SEER, 10 HSPF) (HP heat/cool)	SF LI	122.8	1.5	122.8
1700	1702	Heat pump (18 SEER, 10 HSPF) (eFAF + CAC)	Single Family	121.3	12.6	121.3
7000	7003	Solar Domestic Water Heating	Single Family	119.7	0.1	0.0
1500	1514	Crawlspace insulation (HP heat/cool)	Single Family	119.5	3.9	119.5
7000	7010	Drain Water Heat Recovery (GFX)	Single Family	118.2	0.3	0.0
1500	1521	Smart Thermostat (HP heat/cool)	SF LI	110.7	2.6	110.7
1700	1702	Heat pump (18 SEER, 10 HSPF) (eFAF + CAC)	SF LI	86.1	12.6	86.1
7000	7003	Solar Domestic Water Heating	SF LI	84.9	0.1	0.0
1500	1514	Crawlspace insulation (HP heat/cool)	SF LI	84.7	3.9	84.7
7000	7010	Drain Water Heat Recovery (GFX)	SF LI	83.8	0.3	0.0

Base	Measure Number	Measure Name	Building Type	Technical MW	Measure TRC	Economic MW
1500	1501	Heat pump upgrade to (16 SEER, 9.2 HSPF) (HP heat/cool)	Single Family	83.4	2.3	83.4
1400	1401	ECM Furnace Fan (variable speed motor)	Single Family	63.3	0.1	0.0
1500	1501	Heat pump upgrade to (16 SEER, 9.2 HSPF) (HP heat/cool)	SF LI	59.2	2.3	59.2
1500	1518	Cool Roof (HP heat/cool)	Single Family	57.4	0.4	0.0
3030	3033	Dimmer Switch (base interior LED, 6 hrs/day)	Single Family	50.3	0.3	0.0

In very cold weather, air-source heat pumps revert to electric resistance heating. In the past, that threshold was in the range of 25°F to 30°Fahrenheit. Heat pump technology has made strides in recent years in improving cold-weather performance, expanding the range of temperatures where air-source heat pumps can save energy. Under a winter peak, it will be important for Dominion Energy's program to focus on cold weather performance in addition to SEER and HSPF. The peak demand calculations for air source heat pumps and heat pump water heaters do not include any degradation in efficiency for winter peak, which may overstate the peak demand savings potential in severe winters, even assuming cold-climate heat pumps.

Table 5-12. Top 20 Measures contributing to residential economic demand savings potential

Base	Measure Number	Measure Name	Building Type	Measure TRC	Economic MW
1700	1701	Heat pump (16 SEER, 9.2 HSPF) (eFAF + CAC)	Single Family	5.2	200.9
1500	1502	Heat pump upgrade to (18 SEER, 10 HSPF) (HP heat/cool)	Single Family	1.5	173.1
1500	1521	Smart Thermostat (HP heat/cool)	Single Family	2.6	156.0
1700	1701	Heat pump (16 SEER, 9.2 HSPF) (eFAF + CAC)	SF LI	5.2	142.5
1500	1502	Heat pump upgrade to (18 SEER, 10 HSPF) (HP heat/cool)	SF LI	1.5	122.8
1700	1702	Heat pump (18 SEER, 10 HSPF) (eFAF + CAC)	Single Family	12.6	121.3
1500	1514	Crawlspace insulation (HP heat/cool)	Single Family	3.9	119.5
1500	1521	Smart Thermostat (HP heat/cool)	SF LI	2.6	110.7
1700	1702	Heat pump (18 SEER, 10 HSPF) (eFAF + CAC)	SF LI	12.6	86.1
1500	1514	Crawlspace insulation (HP heat/cool)	SF LI	3.9	84.7
1500	1501	Heat pump upgrade to (16 SEER, 9.2 HSPF) (HP heat/cool)	Single Family	2.3	83.4
1500	1501	Heat pump upgrade to (16 SEER, 9.2 HSPF) (HP heat/cool)	SF LI	2.3	59.2
4200	4201	2nd Refrigerator Recycling	Single Family	2.4	38.5
7000	7013	Faucet Aerators	Single Family	2.9	36.2
1700	1701	Heat pump (16 SEER, 9.2 HSPF) (eFAF + CAC)	MH LI	15.0	34.3
1700	1701	Heat pump (16 SEER, 9.2 HSPF) (eFAF + CAC)	Multi-Family	5.2	32.4
1700	1701	Heat pump (16 SEER, 9.2 HSPF) (eFAF + CAC)	MF LI	5.2	30.2
4200	4201	2nd Refrigerator Recycling	SF LI	2.4	27.3
7000	7013	Faucet Aerators	SF LI	2.9	25.7

Base	Measure Number	Measure Name	Building Type	Measure TRC	Economic MW
4000	4002	Refrigerator (CEE Tier 2)	Single Family	1.4	22.1
1500	1524	Door Weatherization (HP heat/cool)	Single Family	1.5	21.1

5.2.6.2 Non-Residential

Table 5-13 through Table 5-16 show the top 20 non-residential measures by technical energy potential, economic energy potential, technical demand potential, and economic demand potential, respectively, for non-opt-out customers.

Table 5-13. Top 20 measures contributing to non-residential technical energy savings potential

Base	Measure Number	Measure Name	Technical GWh	Measure TRC	Economic GWh
1650	1652	LED outdoor lighting with bi-level controls (Base Outdoor HID)	1847.2	3.5	1847.2
7800	7804	Demand Controlled Ventilation, 15 HP	1308.1	0.8	450.4
2100	2102	DX Packaged System, EER=13.4, 10 tons	602.5	3.8	577.8
9300	9302	Variable Speed Drive Control, base motors	592.8	0.5	16.1
7800	7803	Air Handler Optimization, 15 HP	554.8	4.9	512.5
7800	7805	Energy Recovery Ventilation (ERV)	402.9	1.2	327.1
4000	4001	Energy Star server	398.1	5.7	398.1
1350	1351	LED screw-in replacement (base incandescent/halogen)	390.5	-28.3	390.5
3300	3314	Refrigeration Coil Cleaning, walk-ins	310.2	1.4	310.2
1750	1752	LED screw-in replacement (base Outdoor Incandescent)	214.6	5.6	214.6
6200	6201	Electric Combination Oven	207.6	8.4	207.6
7200	7204	Smart Thermostat (Base Heat Pump Heating)	205.9	0.8	106.9
7800	7802	Variable Speed Drive Control, base motors	201.2	3.9	201.2
1050	1051	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	200.6	1.5	182.4
7200	7201	Air-Source Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons (base air-source heat pump heating)	184.9	1.4	92.0
1200	1201	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	184.4	1.2	101.4
3300	3303	Compressor VSD retrofit, walk-ins	182.6	2.7	182.6
6600	6601	Energy Star hot food holding cabinet	180.9	2.4	180.9
2300	2302	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Residential Split-System)	178.6	0.9	78.5
2100	2111	Economizer Repair - DX	173.0	2.3	166.7
2100	2114	Smart Thermostat - DX	168.9	0.3	0.0

Table 5-14. Top 20 measures contributing to non-residential economic energy savings potential

Base	Measure Number	Measure Name	Measure TRC	Economic GWh
1650	1652	LED outdoor lighting with bi-level controls (Base Outdoor HID)	3.5	1847.2
2100	2102	DX Packaged System, EER=13.4, 10 tons	3.8	577.8
7800	7803	Air Handler Optimization, 15 HP	4.9	512.5
7800	7804	Demand Controlled Ventilation, 15 HP	0.8	450.4
4000	4001	Energy Star server	5.7	398.1
1350	1351	LED screw-in replacement (base incandescent/halogen)	-28.3	390.5
7800	7805	Energy Recovery Ventilation (ERV)	1.2	327.1
3300	3314	Refrigeration Coil Cleaning, walk-ins	1.4	310.2
1750	1752	LED screw-in replacement (base Outdoor Incandescent)	5.6	214.6
6200	6201	Electric Combination Oven	8.4	207.6
7800	7802	Variable Speed Drive Control, base motors	3.9	201.2
3300	3303	Compressor VSD retrofit, walk-ins	2.7	182.6
1050	1051	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	1.5	182.4
6600	6601	Energy Star hot food holding cabinet	2.4	180.9
2100	2111	Economizer Repair - DX	2.3	166.7
1150	1151	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	1.3	163.7
3300	3306	Electronically commutated evaporator fan motor, walk-ins	2.8	151.0
5000	5006	Heat Recovery Unit	3.7	140.9
3300	3310	High-efficiency fan motors, walk-ins	2.7	132.4
1100	1101	High Performance Lighting R/R - Combined Strategies (Base T8)	3.7	124.0
7200	7204	Smart Thermostat (Base Heat Pump Heating)	0.8	106.9

Table 5-15. Top 20 measures contributing to non-residential technical demand savings potential

Base	Measure Number	Measure Name	Technical MW	Measure TRC	Economic MW
7800	7804	Demand Controlled Ventilation, 15 HP	296.8	0.8	102.2
1650	1652	LED outdoor lighting with bi-level controls (Base Outdoor HID)	267.1	3.5	267.1
7200	7201	Air-Source Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons (base air-source heat pump heating)	119.3	1.4	59.4
1350	1351	LED screw-in replacement (base incandescent/halogen)	117.8	-28.3	117.8
7300	7301	Packaged Heat Pump, heating, IEER 13.9/COP 3.4 (w/ non-ER heating), 10 tons	91.9	0.2	0.0
7200	7204	Smart Thermostat (Base Heat Pump Heating)	82.8	0.8	43.0
7800	7803	Air Handler Optimization, 15 HP	67.3	4.9	62.2
9300	9302	Variable Speed Drive Control, base motors	58.5	0.5	1.6
7800	7805	Energy Recovery Ventilation (ERV)	48.9	1.2	39.7
7100	7101	Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons, heating	46.0	11.0	46.0
1050	1051	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	37.2	1.5	33.8
1200	1201	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	37.0	1.2	20.3
3300	3314	Refrigeration Coil Cleaning, walk-ins	33.4	1.4	33.4
4000	4001	Energy Star server	33.1	5.7	33.1
1750	1752	LED screw-in replacement (base Outdoor Incandescent)	31.0	5.6	31.0
1150	1151	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	30.4	1.3	30.4
1100	1101	High Performance Lighting R/R - Combined Strategies (Base T8)	24.9	3.7	24.9
7200	7203	Duct/Pipe Insulation (base air-source heat pump heating)	20.8	0.2	0.0
7800	7802	Variable Speed Drive Control, base motors	19.9	3.9	19.9
5000	5006	Heat Recovery Unit	17.9	3.7	16.9
6200	6201	Electric Combination Oven	17.7	8.4	17.7

Table 5-16. Top 20 measures contributing to non-residential economic demand savings potential

Base	Measure Number	Measure Name	Measure TRC	Economic MW
1650	1652	LED outdoor lighting with bi-level controls (Base Outdoor HID)	3.5	267.1
1350	1351	LED screw-in replacement (base incandescent/halogen)	-28.3	117.8
7800	7804	Demand Controlled Ventilation, 15 HP	0.8	102.2
7800	7803	Air Handler Optimization, 15 HP	4.9	62.2
7200	7201	Air-Source Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons (base air-source heat pump heating)	1.4	59.4
7100	7101	Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons, heating	11.0	46.0
7200	7204	Smart Thermostat (Base Heat Pump Heating)	0.8	43.0
7800	7805	Energy Recovery Ventilation (ERV)	1.2	39.7
1050	1051	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	1.5	33.8
3300	3314	Refrigeration Coil Cleaning, walk-ins	1.4	33.4
4000	4001	Energy Star server	5.7	33.1
1750	1752	LED screw-in replacement (base Outdoor Incandescent)	5.6	31.0
1150	1151	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	1.3	30.4
1100	1101	High Performance Lighting R/R - Combined Strategies (Base T8)	3.7	24.9
1200	1201	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	1.2	20.3
7800	7802	Variable Speed Drive Control, base motors	3.9	19.9
6200	6201	Electric Combination Oven	8.4	17.7
5000	5006	Heat Recovery Unit	3.7	16.9
3300	3303	Compressor VSD retrofit, walk-ins	2.7	16.7
6600	6601	Energy Star hot food holding cabinet	2.4	15.4
1100	1102	ROB 2L4' LED Tube (Base T8)	3.7	14.9

5.2.7 Trends in technical and economic potential

In this section, we compare the results of the current study to the 2020, 2017, and 2014 Dominion Energy potential studies. The current study is based on residential and commercial saturation data collected in 2023. Data for the 2020 study was collected in 2019 and 2020, while the 2017 study used residential saturation data collected in 2016, and the 2017 non-residential analysis and both 2014 analyses used data from 2013 surveys. Dominion Energy's customer base has grown, and the mix of residential and commercial customers has shifted. Its avoided costs have changed, affecting which measures are cost-effective under the TRC test. The market penetration of many measures increased. Dramatic changes occurred in the lighting market. In 2014 LEDs were still relatively expensive and not cost-effective in many applications, and first phase of the lighting standards of the Energy Independence and Security Act (EISA) of 2007 had rolled out between 2012 and 2014. With phase 2 of the EISA standards, the market for general service screw-based lighting has shifted to LEDs, though some CFLs and incandescent lamps remain in the building stock and hoarded in customer's closets. LEDs have substantial market penetration with other lamp types as well, and additional new lighting standards for fluorescent tubes, scheduled for 2029, are expected to further limit opportunities for non-residential lighting programs.

Dominion Energy's system peak has also shifted: Where the 2014 and 2017 studies assigned all avoided capacity costs to summer peak demand reductions, the 2020 study and the current study assigned avoided generation capacity costs to summer peak demand reductions, avoided transmission costs to winter peak demand reductions, and split distribution

avoided costs evenly across summer and winter. These avoided costs are in line with how Dominion Energy currently incurs costs for these three types of capacity.

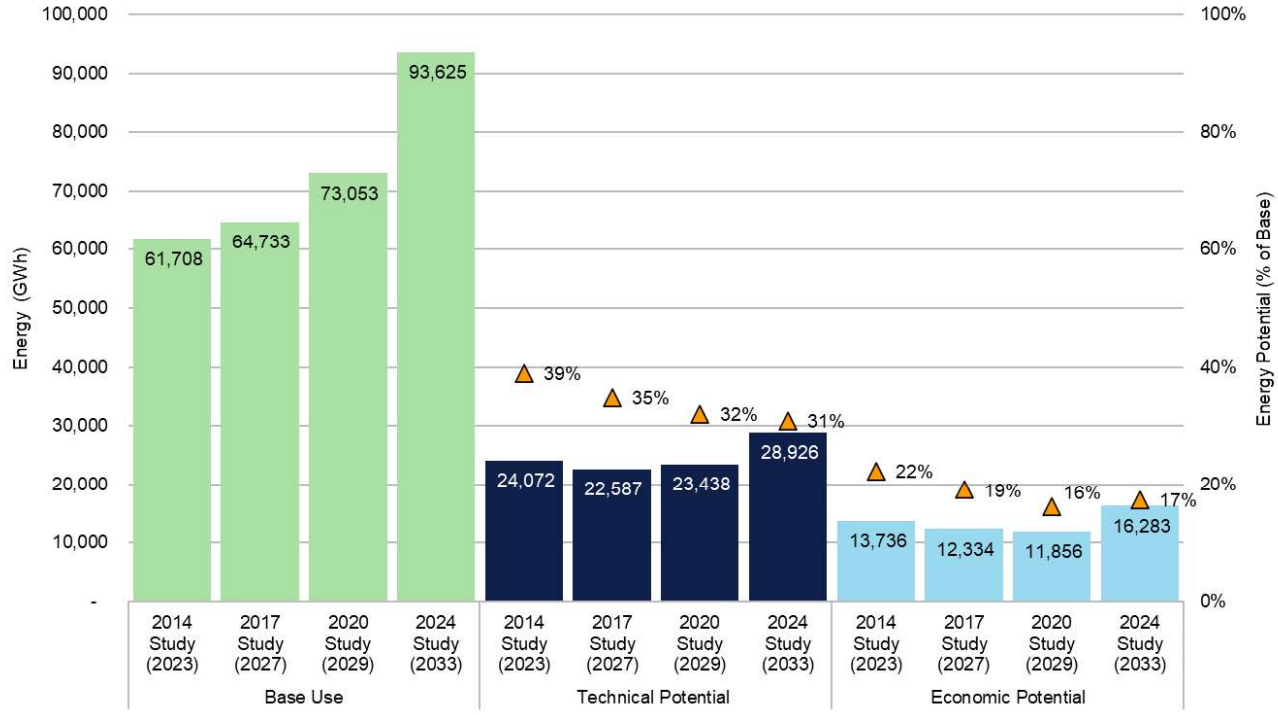
For each of the 10-year potential studies, we used base energy consumption at the end of the forecast period for savings comparisons: 2023 for the 2014 study, and 2027 for the 2017 study (the forecast started in 2018), 2029 for the 2020 study, and 2033 for the current study. We accounted for the accumulated effects of new construction over those 10 years in both potentials and base consumption. The difference in years accounts for a small portion of the change in the study results, as the number of customers, and corresponding base consumption, are expected to grow by 2033. The reader should keep this difference in mind during the discussion below.

Figure 5-16 compares the results of the 2014, 2017, and 2020 potential studies to the current study. All four studies exclude non-jurisdictional, federal, and actual opt-out customers, but the rules regarding opt-out eligibility have changed over time. In 2014 and 2017, all customers over 1 MW average demand were automatically exempt and customers over 500 kW demand were eligible to opt out. For the 2020 and 2024 studies, new rules eliminated the exempt classification and the threshold for opt-out eligibility has increased to 1 MW. Base energy consumption, technical potential, and economic potential are all shown (plotted on the left axis). The yellow triangles indicate the percentage of base energy consumption represented by the potential estimates (plotted on the right axis).

Base electricity consumption increased by 5% from the 2014 to the 2017 study, 13% from the 2017 to 2020 study, and then jumped 28% from 2020 to 2024. The large increase between the 2020 and 2024 studies is due to the inclusion of large industrial customers in the analysis for the first time. The exempt/opt-out rules in place in 2014 and 2017 put most large industrial customers out of reach of programs at that time, and the potential study focused only on the commercial sector. In 2020, we broke out small industrial and agricultural customer, but still excluded large industrial (based on Dominion Energy data reported to the EIA). With current opt-out rules and rates and aggressive savings targets, Dominion Energy is considering programs that could target large commercial customers (such as a non-residential custom program), so this study included all non-residential customers for the first time. This boosted base consumption, technical potential, and economic potential in absolute terms, but had modest impacts on savings as a percent of base use. Other factors influencing the changes from study to study include both changes to raw sector consumption, the size of opt-out consumption excluded, and changes to the growth forecast (since base consumption is projected 10 years to the end of the forecast horizon and accounts for growth/decay in the building stock). The 2024 study incorporated anticipated strong growth in data centers, for example.

Technical energy savings potential as a percentage of base consumption has declined across all three studies. Economic potential was slightly higher in the 2024 study than in the 2020 study, but still lower than in the 2014 and 2017 studies. We discuss the results in more detail below.

Figure 5-16. Comparison of technical and economic potential: 2024 study vs. 2020, 2017, and 2014 studies*



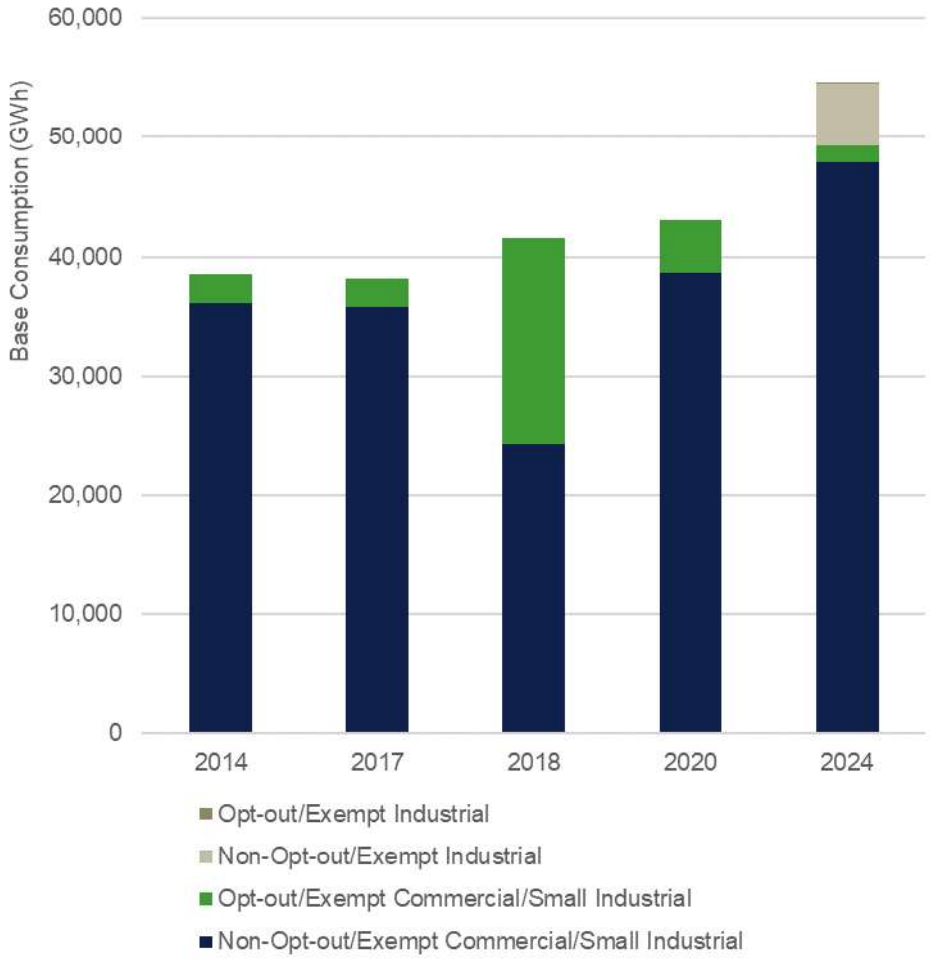
*All results exclude non-jurisdictional, federal, and opt-out customers, as well as voltage optimization and persistent savings from previous program years.

Comparisons of the non-residential sector between 2020 and the earlier studies are confounded by multiple factors.

- Inclusion of industrial customers. The 2024 non-residential base includes the entire non-residential sector including large industrial; the 2020 non-residential base included both commercial and small industrial and agricultural customers, while the 2017 and 2014 studies included only the commercial sector.
- Opt-out/exempt customers definition. The legal definition of exempt and opt-out customers has changed multiple times over the past decade. Prior to 2018, customers with demand 10 MW and above were automatically exempt, while customers between 500 kW and 10 MW had the opportunity to opt out. In 2018, the law was changed to eliminate the opt out process and all customers with demand 500 kW or higher became automatically exempt. In 2020, with the passage of the Virginia Clean Economy Act, the law once again changed, stating that all customers over 1 MW can opt out (there is no longer an auto-exempt category).

Figure 5-17 shows the non-residential base consumption used for each of the studies, broken out by opt-out/exempt status by large commercial.

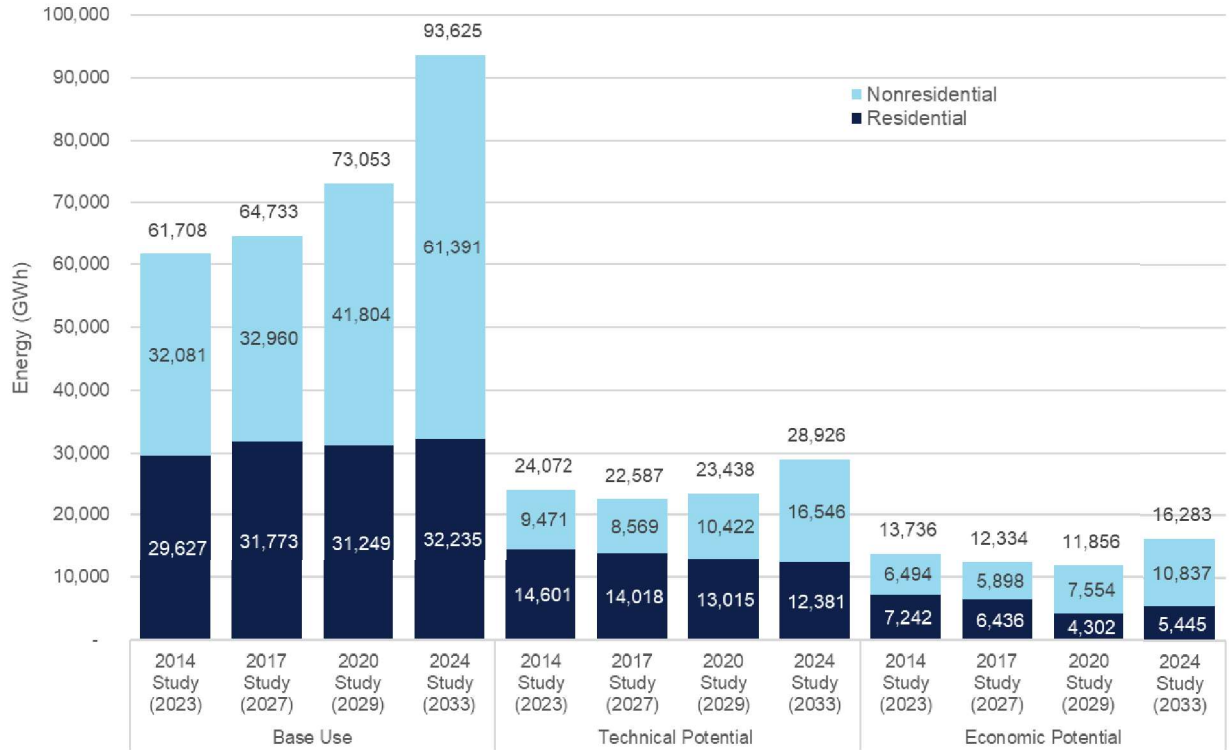
Figure 5-17. Non-residential base consumption by opt-out/exempt status and commercial/industrial: 2024 study vs 2020, 2017, and 2014 studies



*All results exclude non-jurisdictional, federal, and opt-out customers, as well as voltage optimization and persistent savings from previous program years.

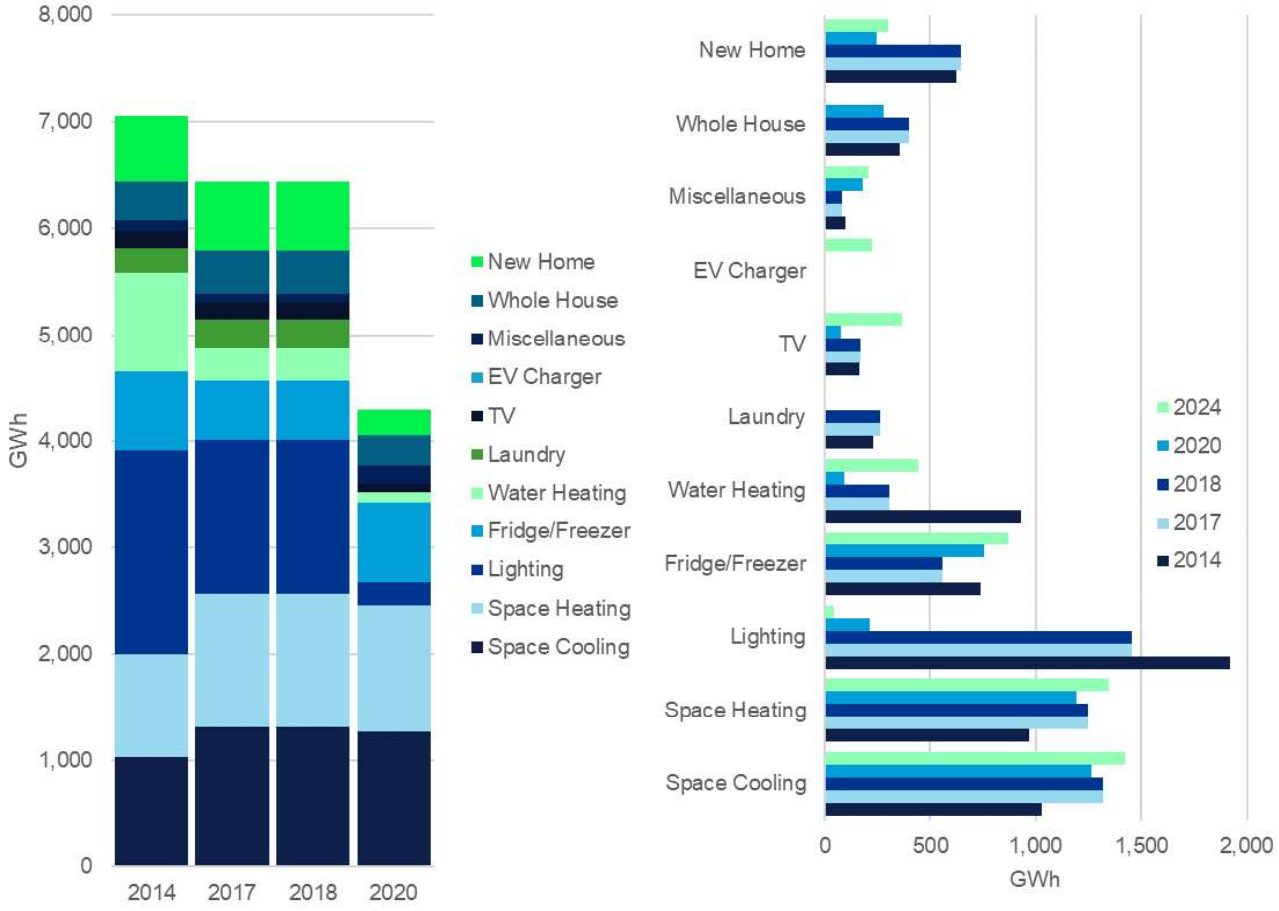
Figure 5-18 shows base consumption and technical and economic potential broken out by sector. Between the 2014 and 2017 studies, non-residential technical potential declined 10%, followed by an increase of 22% from the 2017 to the 2020 study. With the addition of large industrial and correspondingly higher base use, technical potential increased by 59% in the 2024 study. Residential technical potential declined 4% from 2014 to 2017, 7% between the 2017 and 2020 studies, and another 5% between the 2020 and 2024 studies. In the non-residential sector, economic potential declined 9% from 2014 to 2017, then jumped 28% from 2017 to 2020, and 43% from the 2020 study to the 2024 study. Residential sector economic potential declined from 2014 to 2020 (with declines of 11% and 33% between the studies), but increased between the 2020 and 2024 studies, though was still below what was found in the 2017 study.

Figure 5-18. Comparison of technical and economic potential by sector: 2024 study vs 2020, 2017, and 2014 studies



*All results exclude non-jurisdictional, federal, and opt-out customers, as well as voltage optimization and persistent savings from previous program years.Figure 5-19 shows the breakout of residential economic energy potential by end use across the 2014, 2017, 2020, and 2024 studies. Both lighting and whole-house (behavioral) measures declined (an 80% drop for lighting and 20% for whole-house measures) between the 2020 study and the 2024 study. Lighting potential declined due to the transformation of the lighting market, while reductions in behavioral programs reflect lower expectations for per-household savings Potential for other end uses increased or remained flat.

Figure 5-19. Comparison of residential economic potential by end use: 2024 study vs 2020, 2017, and 2014 studies

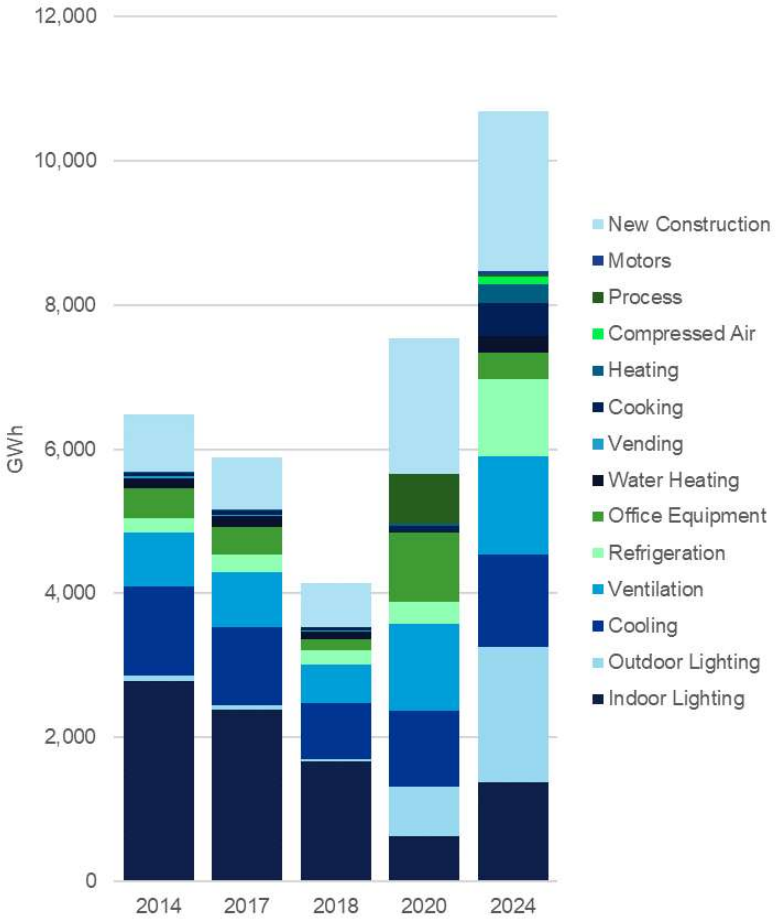


Note: The residential miscellaneous category includes air purifiers and home office equipment, and plug-load controls.

Figure 5-20 and Figure 5-21 show the end-use breakouts for the non-residential sector. There was a non-residential potential study update in 2018 corresponding with the change in legislation regarding opt-out and exempt customers (eliminating the opt-out provision and exempting all customers over 500 kW demand).

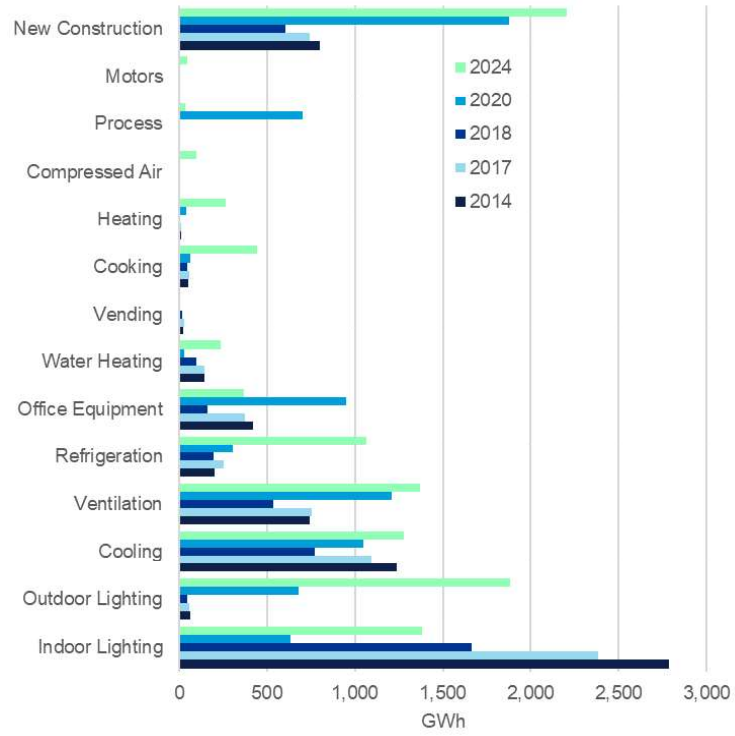
Our estimates of outdoor lighting potential both increased between the 2020 study and the 2024 study. This is due to higher saturations for HID lighting based on the saturation survey, which increased our overall estimate of base lighting energy use. This probably does not represent a trend toward HID (the trend has been toward LEDs for at least the last decade), but rather normal uncertainty in survey results. We also revised costs for LED bi-level outdoor lighting, resulting in the measure being cost-effective in more applications. In combination, those changes increased outdoor lighting savings significantly compared to the 2020 study. Other end uses with large savings were indoor lighting and refrigeration. Compared to 2020, the 2024 study found more lighting measures (primarily LED lamps or fixtures) cost-effective in more building types, roughly doubling the energy savings potential. Our estimate of baseline refrigeration energy use was higher for this study than for the 2024 study, and more measures were cost-effective, though only in grocery and restaurants (as was the case in 2020).

Figure 5-20. Non-residential economic potential broken down by end use: 2024 study vs 2020, 2018, 2017, and 2014 studies



*All results exclude non-jurisdictional, federal, and opt-out customers, as well as voltage optimization and persistent savings from previous program years.

Figure 5-21. Comparison of non-residential economic potential by end use: 2024 study vs 2020, 2018, 2017, and 2014 studies



*All results exclude non-jurisdictional, federal, and opt-out customers, as well as voltage optimization and persistent savings from previous program years.

We have cited Dominion Energy's low avoided costs in explaining its low energy-efficiency potential compared to other utilities. Avoided cost trends are also a key factor in explaining the trends in Dominion Energy's potential over time, since lower avoided costs reduce the benefits of energy efficiency and can tip the TRC of some measures from passing to failing. Figure 5-22 and Figure 5-23 show the energy avoided costs used for the 2014, 2017, 2020, and 2024 studies for peak time-of-use period and off-peak time-of-use, respectively. Energy avoided costs generally decreased across the four studies. While the drop from 2014 to 2017 is the most dramatic, especially in later years of the forecast, the change from 2017 to 2020 is large (20% for on-peak in 2020), as is the change from 2020 to 2024 for on-peak. Costs shown are in nominal USD; if the avoided costs used in the 2014, 2017, and 2020 studies were adjusted for inflation, the gaps would be even wider.

Figure 5-22. Energy avoided costs, peak period: 2024 study vs 2020, 2017, and 2014 studies (nominal USD)

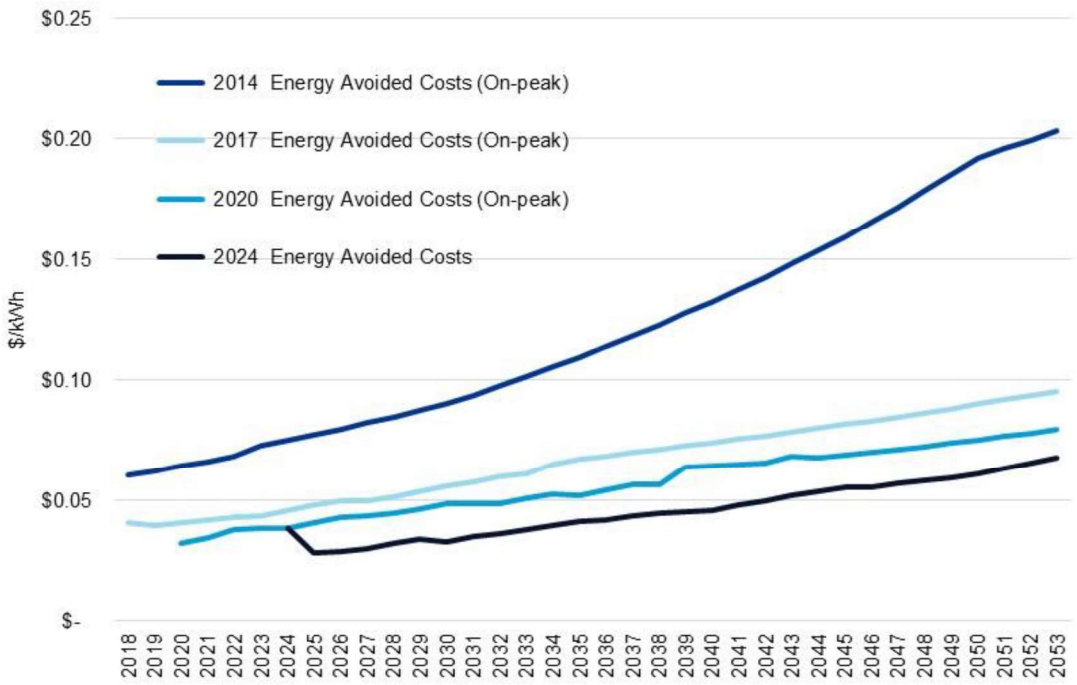


Figure 5-23. Energy avoided costs, off-peak period: 2024 study vs 2020, 2017, and 2014 studies (Nominal USD)

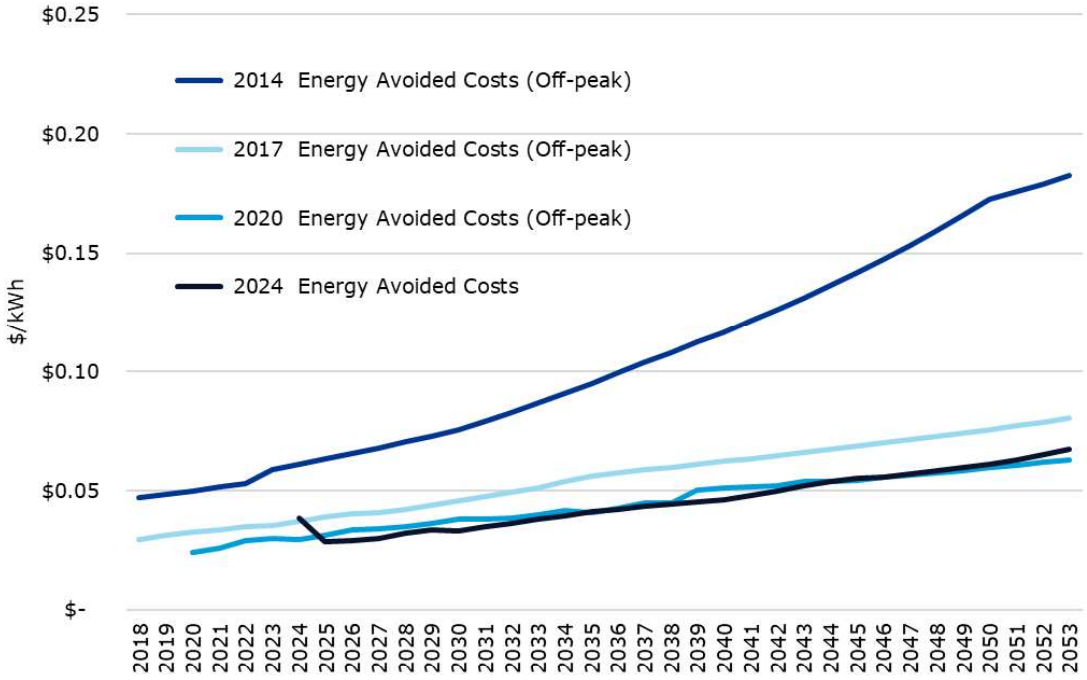
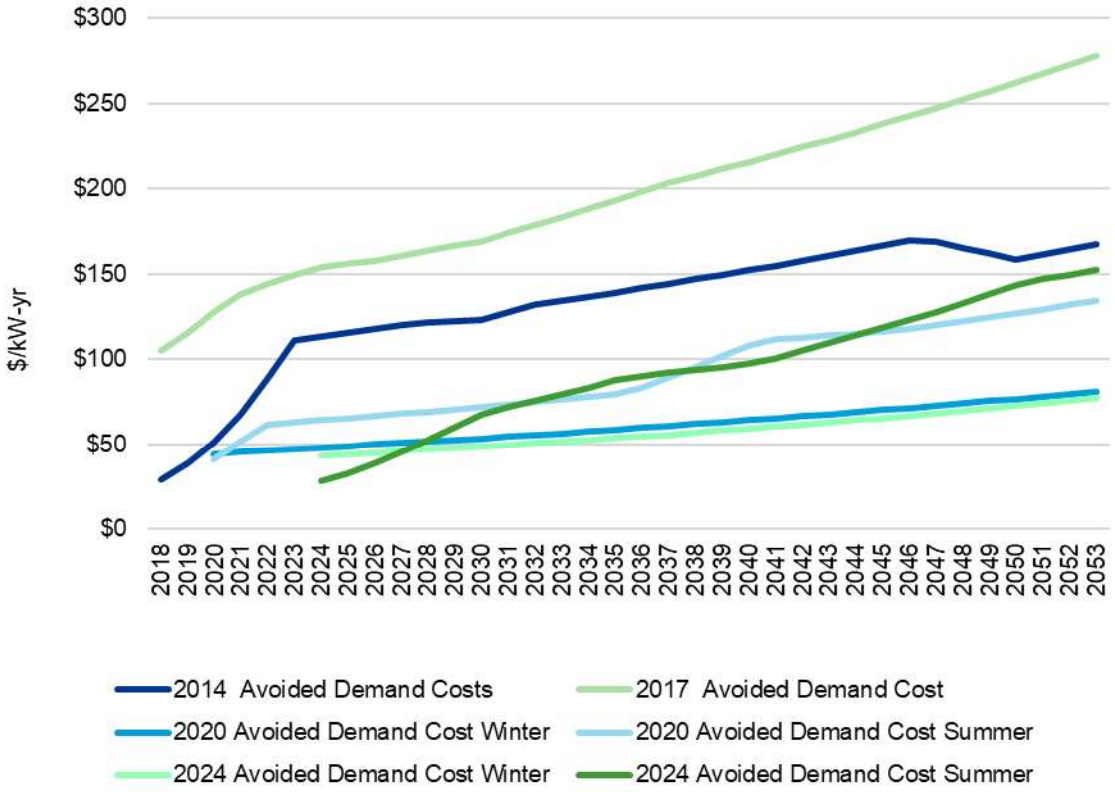


Figure 5-24 shows capacity avoided costs used for the four studies. The picture here is more complicated due to differing treatment of generation capacity avoided costs, transmission capacity avoided costs, and distribution capacity avoided costs. While Dominion Energy continues to pay for generation capacity based on its contribution to summer peak within the Pennsylvania, New Jersey, and Maryland (PJM) Interconnection power pool, it pays PJM for transmission costs based on the PJM Dominion Energy zone peak load, which is forecast to peak in the winter over the time frame of this potential study. Whereas in the 2014 and 2017 studies, all generation capacity and transmission and distribution (T&D) benefits accrued to summer demand reduction, this study and the 2020 study assigned generation capacity avoided cost benefits to summer, transmission avoided costs to winter, and split distribution avoided costs evenly across summer and winter. Comparisons are further complicated by the omission of T&D capacity avoided costs from the 2014 study (an omission that was not recognized until we compared the results of the 2017 study to those of the 2014 study for the 2017 report). The increase in capacity avoided costs from 2014 to 2017 reflects the addition of T&D avoided costs in addition to changes in capacity costs of generation. The omission of T&D in 2014, however, makes the 2014 avoided cost directly comparable to the 2020 and 2024 summer avoided costs, as all three reflect only the avoided cost of generation. And that cost dropped substantially from 2014 to 2020. The 2024 and 2020 winter avoided costs are very similar. Summer avoided costs start lower in the 2024 study but increase more rapidly through 2029; the forecasts are similar from 2030 through 2045.

Figure 5-24. Capacity avoided costs: 2024 study vs 2020, 2017, and 2014 studies (Nominal USD)



5.3 Achievable (program) potential results

This section provides a high-level summary of the achievable potential analysis, based on the results of the technical and economic potential analyses. This achievable analysis excludes savings for opt-out customers, non-jurisdictional customers, voltage optimization, and persistent savings from program activity before 2024.

In contrast to the technical and economic potential estimates that are based on measure-level costs and savings, the achievable analysis bundles measures into defined programs with specified marketing budgets, administrative budgets, and incentive levels. The program budgets are used in the TRC and other cost-effectiveness tests at the program and portfolio level (measure-level TRCs calculated when calculating technical and economic potential excluded program costs). Rates of adoption over time consider market and other factors that affect the adoption of efficiency measures. As further described in Section 4 and Appendix A of this report, our method of estimating measure adoption considers market barriers and program incentives and reflects actual consumer and business implicit discount rates. The discount rate assumptions can be found in Appendix C of the report, while annual budget assumptions can be found in Appendix I of the report.

In this analysis, achievable potential refers to the amount of savings that would occur in response to one or more specific program interventions. Gross or total market savings shown in this section include net savings and savings attributable to program free-riders—those customers who would have installed the measure in the absence of the program. Net or program savings associated with program potential are savings that are projected beyond those that would occur naturally in the absence of any market intervention.

The achievable analysis began by calibrating model parameters based on current program budgets and savings. This process anchors the model's parameters that represent customers' receptiveness to programs and response to specific incentives to concrete program data, and provides a solid foundation for projection changes to measure adoption in response to program changes. The model parameters adjusted in this process represent such things as the cost to reach a customer through program marketing, the maximum annual uptake for each measure, and how accepting or resistant the market is to a particular measure (market barriers). DNV set the input marketing and administrative budgets to match Dominion Energy's current programs, then calibrated these model parameters until the energy savings and incentive expenditures output by the model also aligned with current programs. The resulting calibrations closely represent recent Dominion Energy's program experience.

After the calibration was complete, all cost-effective measures from the technical and economic analysis were added to the model, using existing measures as a guideline for setting measure-specific parameters for the new measures. Administrative and marketing budgets were increased to account for the additional measures.

Because achievable potential depends on the type and degree of intervention applied, we developed potential estimates under alternative funding scenarios: 50%+ incentives and 75%+ incentives. We estimated program energy and peak demand savings under each scenario for the 2024-2033 period.

- 50%+ incentives: Assumes customer incentives are set at least 50% of incremental costs. If current incentives exceed 50%, for example in IAQ programs, incentives are maintained at the level currently offered.
- 75%+ incentives: Assumes customer incentives are offered at 75% of incremental costs. As with the 50%+ scenario, incentives that are already above 75% are retained at current levels.

Table 5-17 shows the results of the achievable analysis as compared to base consumption, technical potential, and economic potential, for Dominion Energy's Virginia service territory. By 2033, cumulative net energy savings are projected to be 1,882 GWh under the 50%+ scenario and 2,647 GWh under the 75% +incentive scenario.

As a percentage of base consumption, the Dominion Energy results are lower than results seen in other jurisdictions, largely due to Dominion Energy's low avoided costs and rates. Low avoided costs result in fewer measures passing the cost-effectiveness screening, while low rates reduce the customer's benefits from adopting a measure, resulting in lower measure penetrations.

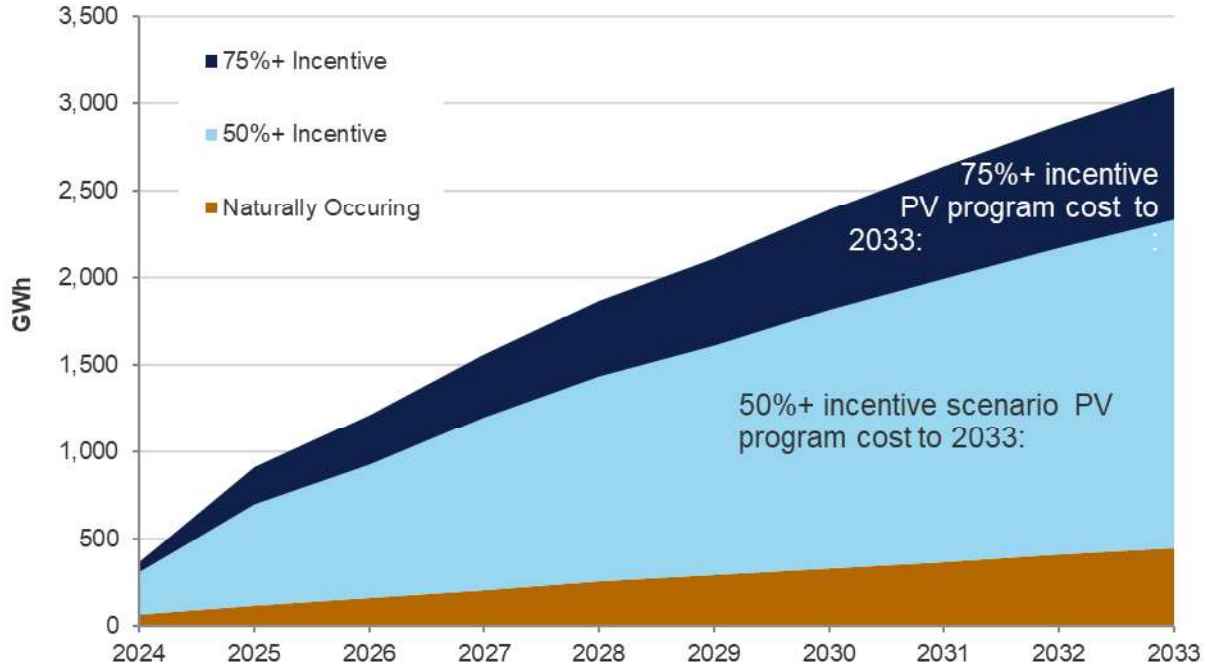
Table 5-17. Ten-year cumulative potential – GWh

Sector	2033 Base Energy Use (GWh)	10-Year Cumulative Potential - GWh			
		Technical Potential	Economic Potential	50% Achievable (Program)	75% Achievable (Program)
Residential	**32,235**	**12,381**	**5,445**	**441**	**595**
Savings % of Base		38%	17%	1.4%	1.8%
Non-Residential	**61,391**	**16,546**	**10,837**	**1,442**	**4,052**
Savings % of Base		27%	18%	2.3%	3.3%
Total	**93,625**	**28,926**	**16,283**	**1,882**	**2,647**
Savings % of Base		31%	17%	2.0%	2.8%

5.3.1 Achievable (program) potential – overall results

Figure 5-25 shows our estimates of achievable potential savings over time for Virginia. In each scenario, savings increase over time. The figure includes the present value of program cost over the 10-year forecast (including marketing, administrative, and incentive costs) associated with each scenario.

Figure 5-25. Achievable electric energy savings: all evaluated sectors*

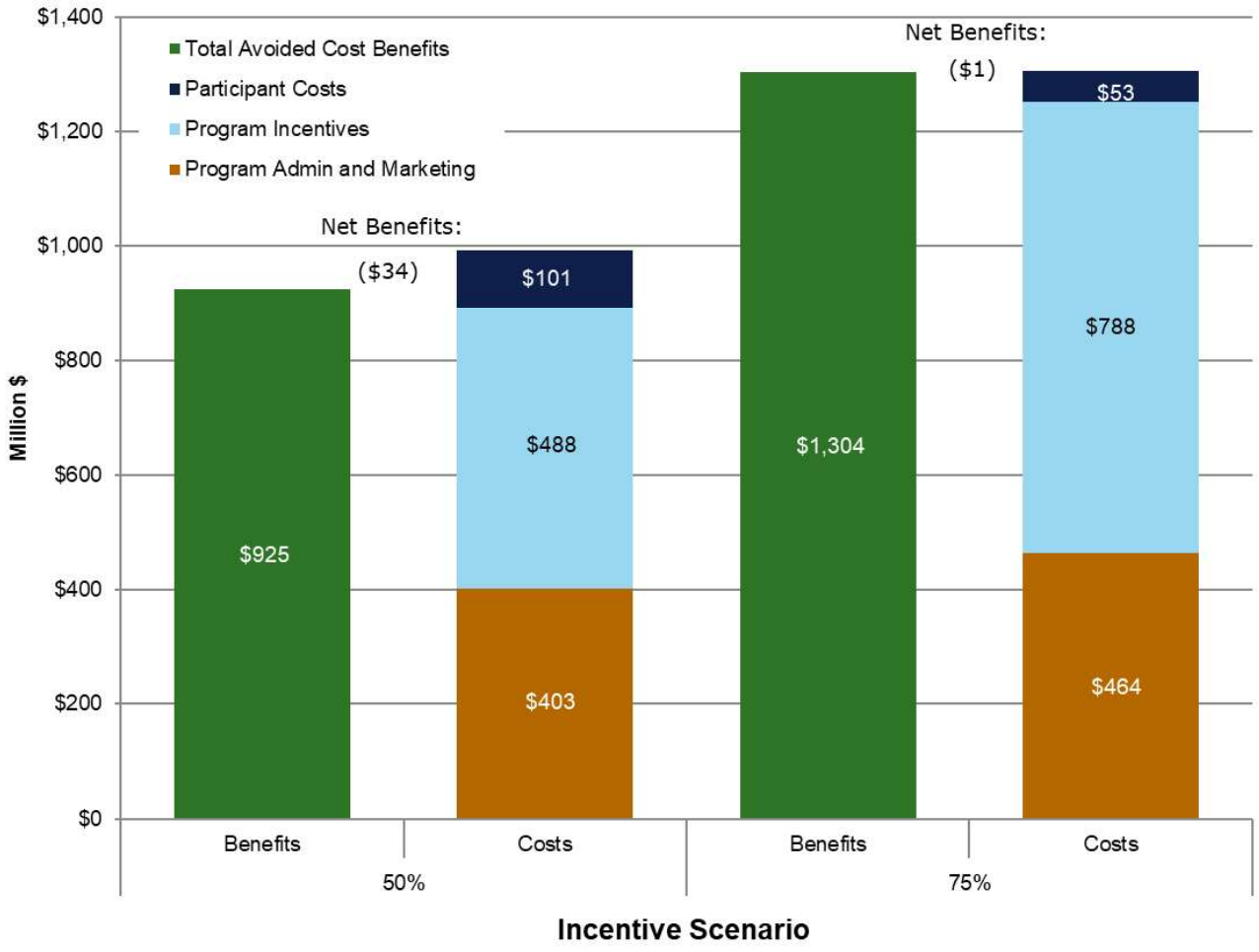


*Excludes Virginia non-jurisdictional, federal, and opt-out customers as well as voltage optimization and persistent savings from program activity prior to 2024.

As incentive levels increase between program scenarios, the costs to administer and market the program also increase from additional programmatic activity. Increased incentives also affect participant costs as the incremental cost participants must pay per measure has decreased as a result of the higher incentives. It is also important to note that although the level of naturally occurring savings does not change between scenarios, program free riders receive the same incentive payments as program participants.

Figure 5-26 depicts the estimated costs and benefits under each funding scenario from 2024 to 2033 for Virginia. In Virginia, the total costs (program incentives, program administrative and marketing costs, and net participant costs) exceed the net benefits for the 50%+ and 75%+ incentive scenarios. In the 50%+ scenario costs exceed benefits by $34 million. In the 75%+ incentive scenario, costs exceed benefits by only $1 million, which is less than 0.1% of total costs.

Figure 5-26. Benefits and costs of energy efficiency savings* 2024-2033† (Million $)



Additional key results of the efficiency scenario forecasts from 2024 to 2033 are summarized in Table 5-18.

Table 5-18. Summary of achievable potential results, 2024-2033

Result - Programs	Program Scenario: 50% Incentives	75% Incentives
Total Market Energy Savings - GWh (year 10 annual)	2,263	3,028
Total Market Peak Demand Savings - MW (year 10 annual)	491	643
Program Energy Savings - GWh (year 10 annual)	1,882	2,647
Program Peak Demand Savings - MW (year 10 annual)	396	547
Program Costs - Real, $ Million		
Administration (10-year total)	$270	$339
Marketing (10-year total)	$222	$220
Incentives (10-year total)	$589	$941
Total Program Costs (10-year total)	$1,081	$1,501
PV Avoided Costs (PV 10-year cost)	$925	$1,304
PV Annual Program Costs (Adm/Mkt) (PV 10-year cost)	$403	$464
PV Net Measure Costs (PV 10-year cost)	$589	$841
Net Benefits (PV 10-year cost)	-$67	-$1
TRC Ratio	0.93	1.00

The threshold for cost-effectiveness is a TRC of 1, meaning that the avoided cost benefits and participant benefits exceed the measure and program costs. Measures are included in the achievable analysis based on measure economics alone, without the added hurdle of program marketing and administrative costs. The two program scenarios modeled have negative net benefits when all costs are included in the analysis, but in the 75%+ scenario the shortfall is so small in the context of total costs and benefits that the TRC ratio rounds to 1.00.

The Dominion Energy zone within PJM is now winter peaking, but Dominion Energy has historically had a summer peak and continues to pay for generation capacity based on its contribution to PJM's summer peak. However, it now pays for transmission based on PJM's Dominion Energy zone winter peak. The avoided costs used in this analysis reflect this split and put a lower value on summer peak reductions and a greater value on winter peak reductions compared to the 2014 and 2017 DNV potential studies.

To calibrate the model, DNV grouped measures and assigned budgets to match Dominion Energy's current programs— programs that were developed and initiated when facing a summer peak. As a result, DNV included measures in the analysis that as of 2023 were offered in programs but are not cost-effective under the modeled avoided cost structure.

This had little impact on the non-residential analysis, but for residential, it meant that our business-as-usual analysis (in which we modeled continuing current programs) contained a large number of such measures. The net savings from the cost-effective measures were not enough to offset the net costs of these measures, and with the added layer of administrative and marketing expenditures, the portfolio was not cost-effective.

It is also important to understand what the TRCs reported in Figure 5-26 and Table 5-18 represent. They are averages over the 10-year forecast. Retrofit programs tend to become less cost-effective over time as measures saturate the market, so a program that is cost-effective in the early years of the forecast may still have an average 10-year TRC that is below one. In

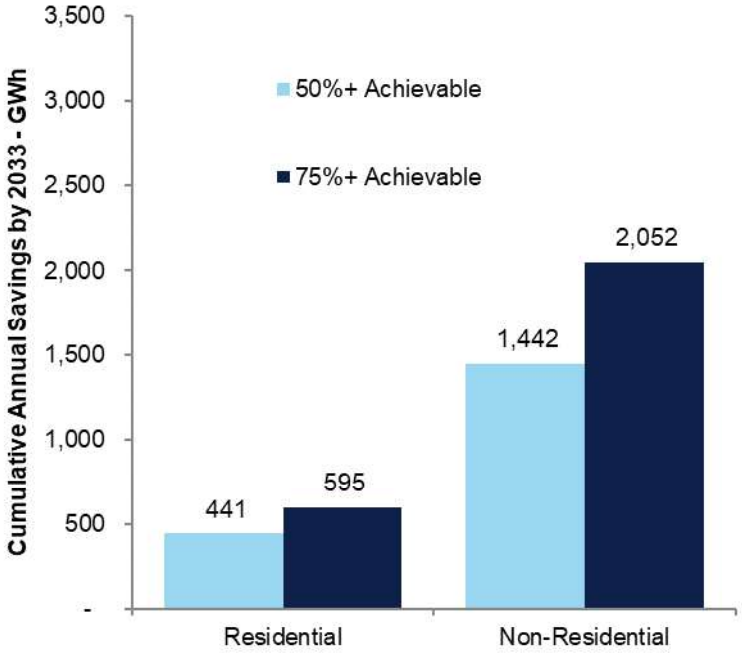
our model, we did not terminate programs or measures as their cost-effectiveness dropped but modeled them as running through the full 10-year forecast.

5.3.2 Breakdown of achievable potential by sector

Cumulative net achievable potential estimates by sector for the period of 2024-2033 are presented in Figure 5-27. These figures compare the residential and non-residential sector results for each funding scenario.

Under the program assumptions developed for this study, achievable energy under the 50%+ and 75%+ scenarios is highest for the non-residential sector.[6] Achievable peak demand savings is more balanced across the two sectors in Virginia.

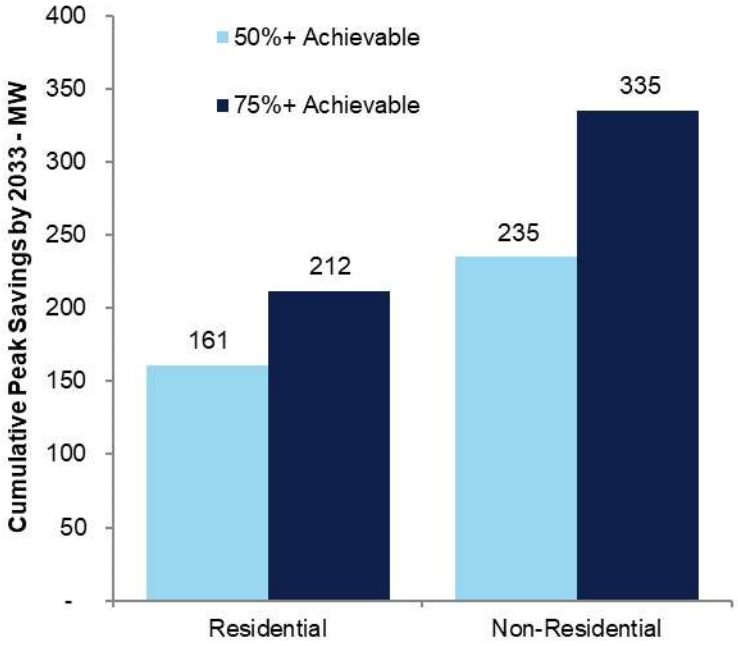
Figure 5-27. 2033 Net achievable energy savings by sector



*Excludes Virginia non-jurisdictional, federal, and opt-out customers as well as voltage optimization and persistent savings from program activities prior to 2024.

[6] The estimates of peak demand savings are from the installation of energy efficiency measures and do not include demand savings from demand response technologies such as direct load control or dynamic pricing.

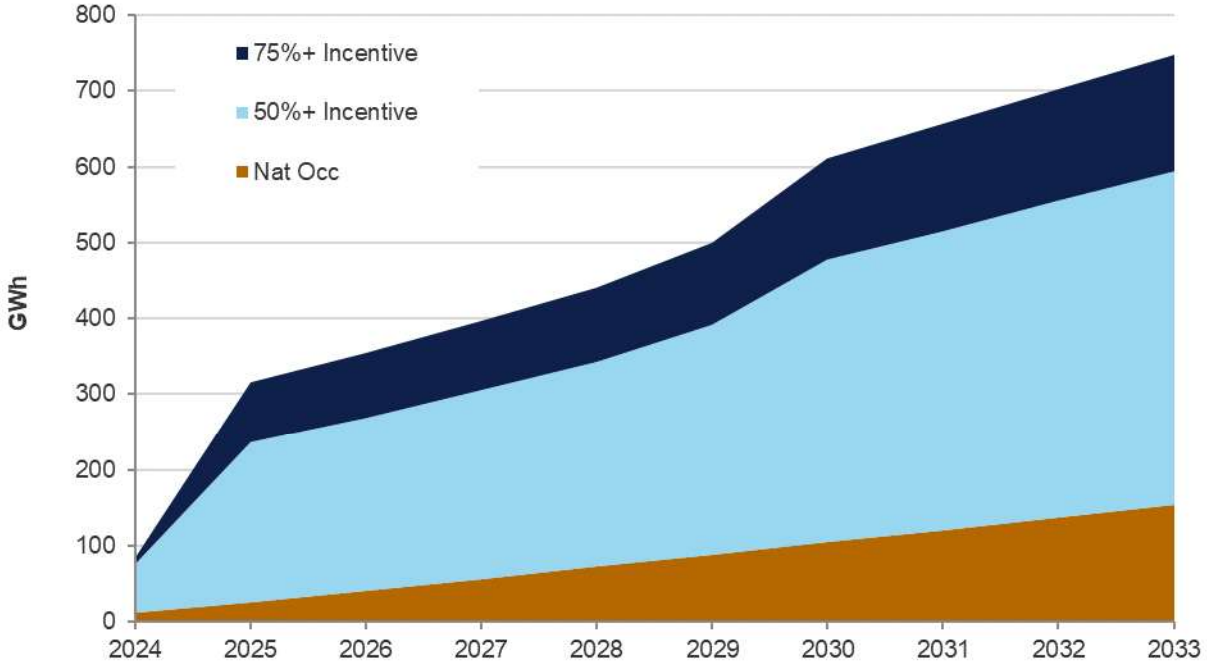
Figure 5-28. 2033 Net achievable peak-demand savings by sector



*Excludes Virginia non-jurisdictional, federal, and opt-out customers as well as voltage optimization and persistent savings from program activities prior to 2024.

Figure 5-29 shows cumulative net achievable program savings for the total residential sector by program scenario. By 2033, net energy savings are 441 GWh under the 50%+ scenario and 595 GWh in the 75%+ incentive scenario.

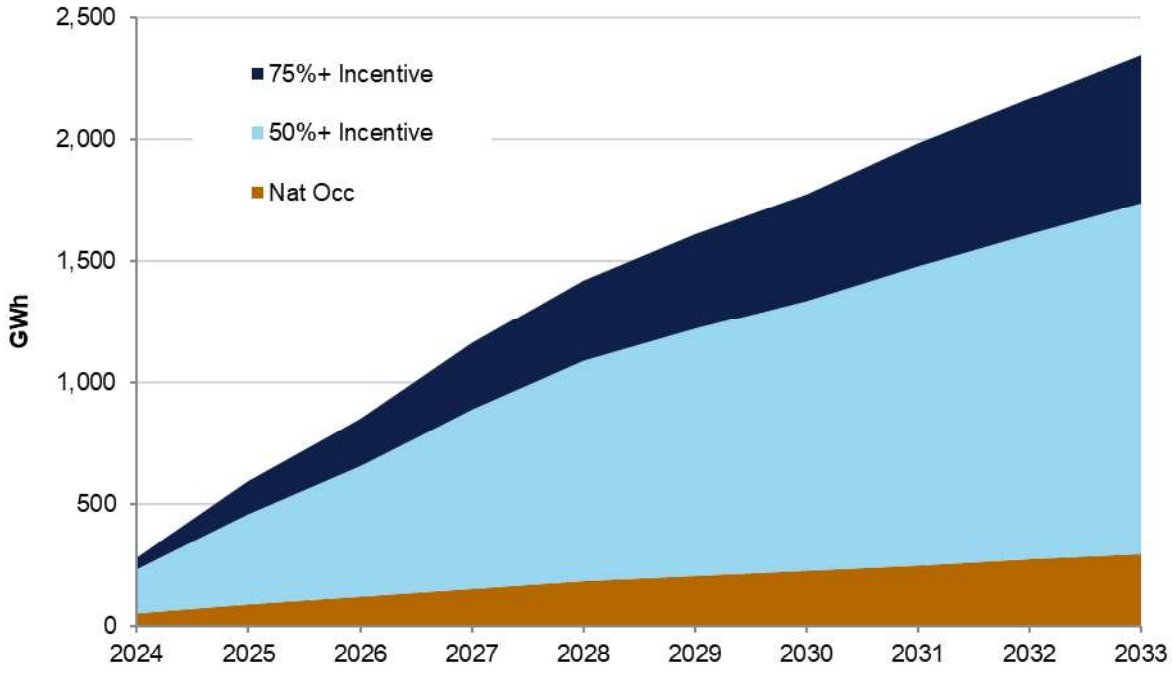
Figure 5-29. 2024 to 2033 achievable energy savings: residential sector



*Excludes Virginia non-jurisdictional, federal, and opt-out customers as well as voltage optimization and persistent savings from program activities prior to 2024.

Figure 5-30 shows cumulative net achievable program savings by non-residential program scenario. By 2033, net energy savings in Virginia are projected to reach 1,442 GWh under the 50%+ scenario, and 2,052 GWh under the 75%+ incentive scenario.

Figure 5-30. 2024 to 2033 achievable energy savings: non-residential sector



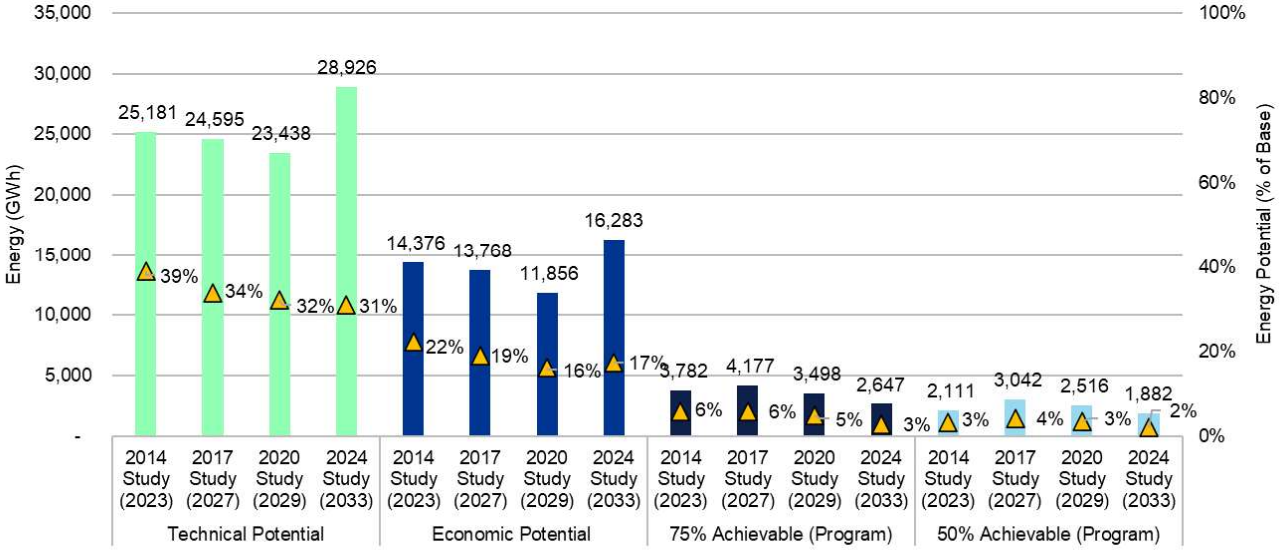
*Excludes Virginia non-jurisdictional, federal, and opt-out customers as well as voltage optimization and persistent savings from program activities prior to 2024.

5.3.3 Cross-study comparison of achievable results

In this section, we compare the results of the current study to prior Dominion Energy Potential study results, and other studies completed outside of Dominion Energy by DNV.

Figure 5-31 compares the results of the 2014, 2017, and 2020 potential studies to the current study, including technical potential, economic potential, and achievable potential for the 75% and 50% scenarios (plotted on left axis). The yellow triangles indicate the percentage of base energy consumption represented by the potential estimates (plotted on right axis). Achievable potentials for the two incentive scenarios declined in absolute terms and on a percentage basis from the 2020 study to the 2024 study. For example, achievable potential dropped from 3,498 GWh (4.8%) for the 75% scenario in the 2020 study to 2,647 GWh (2.8%) in the 2024 study. A similar drop was observed for the 50% achievable scenario, from 2,516 GWh (3.4%) in 2020 to 1,882 GWh (2.0%) in 2024.

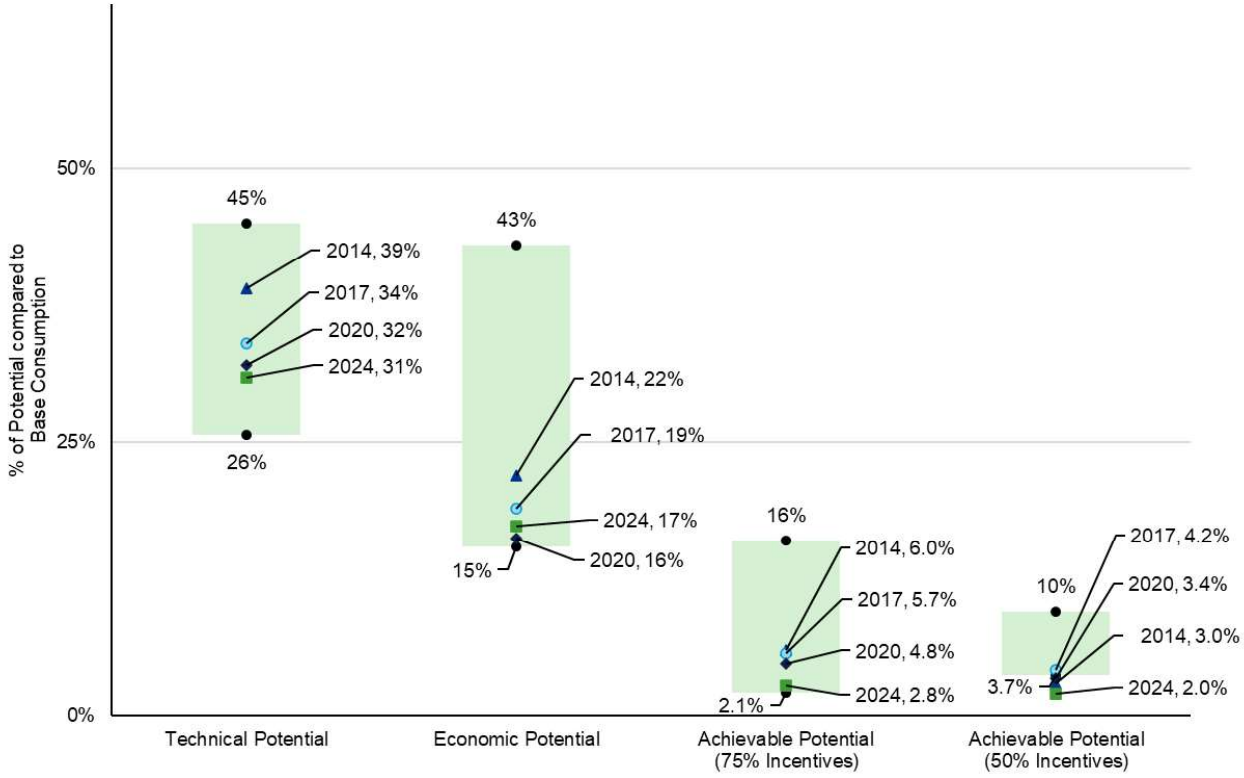
Figure 5-31. Comparison of technical, economic, and achievable potential: 2024, 2020, 2017, and 2014 studies



*2014 and 2017 studies exclude non-jurisdictional and actual opt-out/exempt customers. 2020 study excludes non-jurisdictional and 33% of opt-out-eligible customers. The 2024 study excludes Virginia non-jurisdictional, federal, and opt-out customers as well as voltage optimization and persistent savings from program activities prior to 2024.

Figure 5-32 compares the results of the Dominion Energy 2014, 2017, and 2020 potential studies and the current study to historical ranges of potential savings from other DNV studies. The blue bars indicate the range of potential from other DNV studies for technical, economic, 75% and 50% achievable scenarios. Dominion Energy's technical potential is in the mid-range when compared to other studies. However, the economic and achievable potential is on the lower end of the spectrum, largely due to Dominion Energy's low avoided costs and rates. As discussed above, low avoided costs result in fewer measures passing the cost-effectiveness screening, while low rates reduce the customer's benefits from adopting a measure, resulting in lower measure penetrations.

Figure 5-32. Current study compared to historical ranges of potential savings



About DNV

DNV is an independent assurance and risk management provider, operating in more than 100 countries, with the purpose of safeguarding life, property, and the environment. Whether assessing a new ship design, qualifying technology for a floating wind farm, analyzing sensor data from a gas pipeline or certifying a food company's supply chain, DNV enables its customers and their stakeholders to manage technological and regulatory complexity with confidence. As a trusted voice for many of the world's most successful organizations, we use our broad experience and deep expertise to advance safety and sustainable performance, set industry standards, and inspire and invent solutions.

APPENDICES

Virginia Energy Efficiency Potential Study 2024 to 2033

Virginia Electric and Power Company (Dominion Energy Virginia)

Prepared by DNV Energy Insights (DNV)

June 12, 2024

Appendices

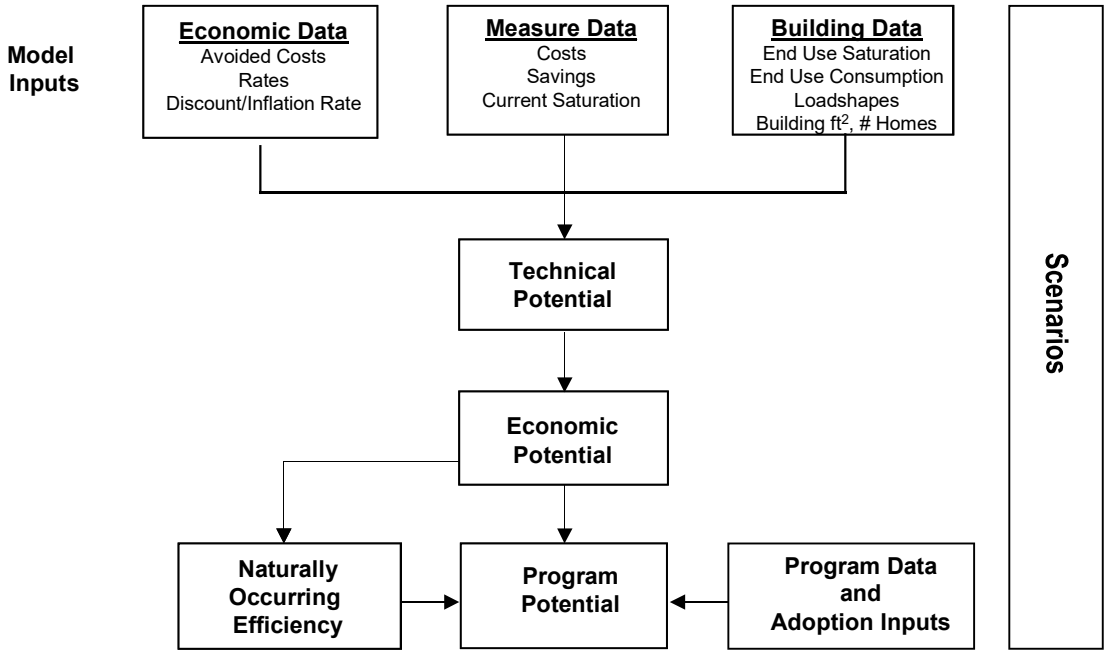
A DETAILED METHODOLOGY AND MODEL DESCRIPTION

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.

Figure A-1. Simplified Conceptual Overview of Modeling Process



Developing a DSM forecast is viewed by DNV 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 DNV'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]

Technical Potential of Efficient Measure	=	Total Square Feet	×	Base Case Equipment EUI	×	Applicability Factor	×	Not Complete Factor	×	Feasibility Factor	×	Savings Factor

[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.

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.

Savings factor is the percent 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 Equation 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.

Equation 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

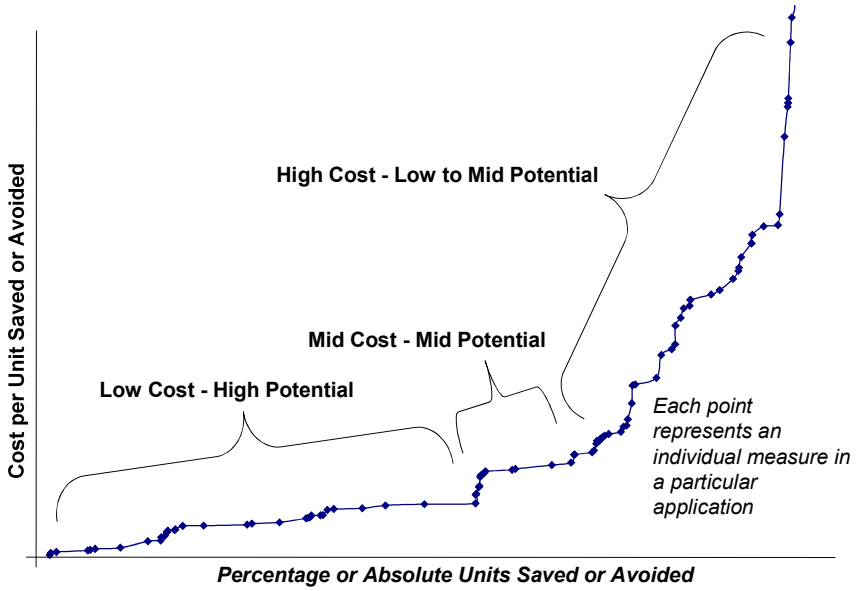
Technical EE potential is calculated in two steps. In the first step, all measures are treated independently; that is, the savings of each measure are not marginalized or otherwise adjusted for overlap between competing or synergistic measures. By treating measures independently, their relative economics 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 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):

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

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

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-1 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 A-1 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 A-1 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-1 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-1. 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

Measure	Total End Use Consumption of Population (GWh)	Applicable, Not Complete and Feasible (1000s of ft²)	Average kWh/ft² of population	Savings %	GWh Savings	Levelized Cost ($/kWh saved)
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 California Standard Practice Manual (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

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

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-2.

Table A-2. 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 Net 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. 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-2 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-2 and A-3 below.

Equation A-2

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

Equation A-3

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

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.

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-3. 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-3, 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-3. 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 ft (1,000s)	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 DNV'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 adoptions[5] 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.

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 costly it is to reach each customer.

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 this 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.

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[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, and remains out of the eligible stock until the end of the measure's useful life.

[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 $t + 15$.

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-4

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

Equation A-5

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

Where:

d = the discount rate
t = time (in years)
N = measure lifetime

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:

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

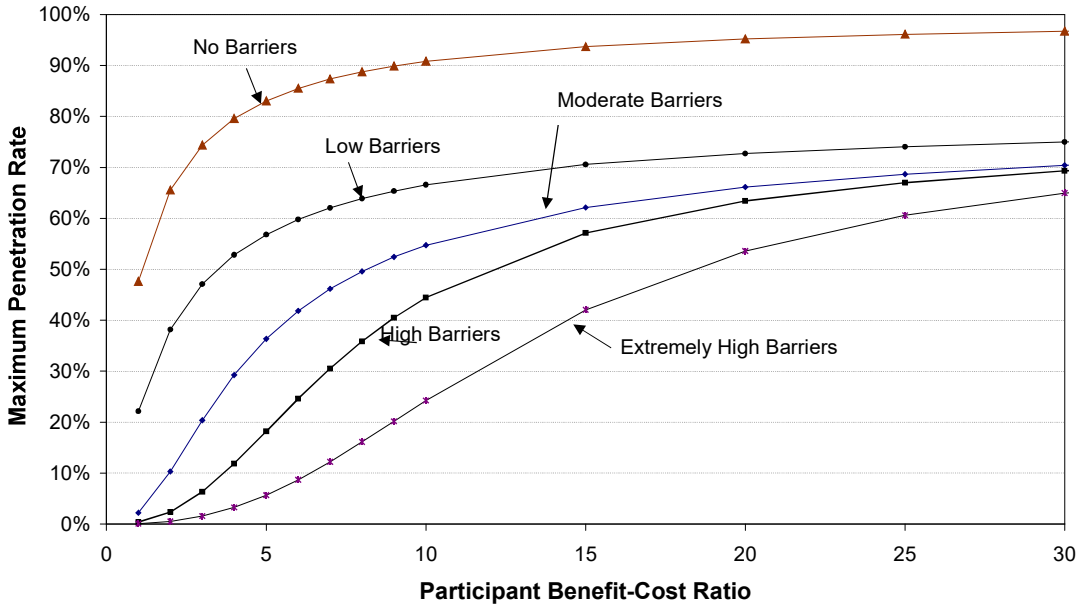
where:

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-4. 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]

Table A-4. Summary Description of Market Barriers from Eto, Prahl, Schlegel 1997

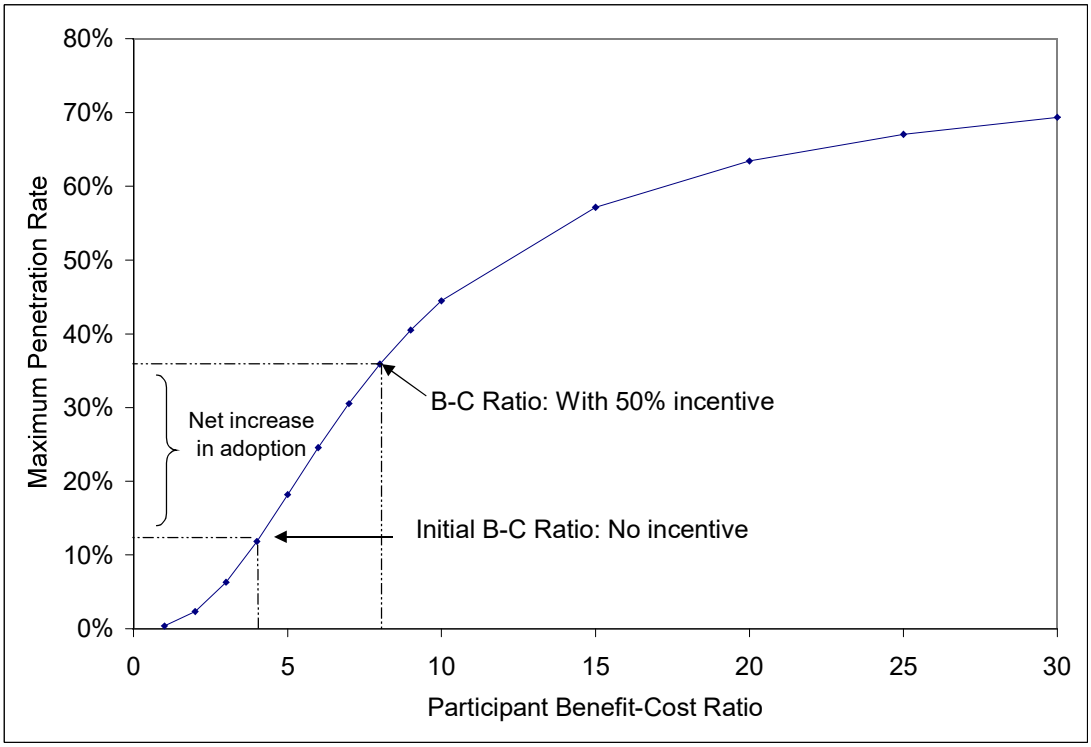
Barrier	Description
Information or Search Costs	The costs of identifying energy-efficient products or services or of learning about energy-efficient practices, including the value of time spent finding out about or locating a product or service or hiring someone else to do so.
Performance Uncertainties	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.

[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.

Barrier	Description
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

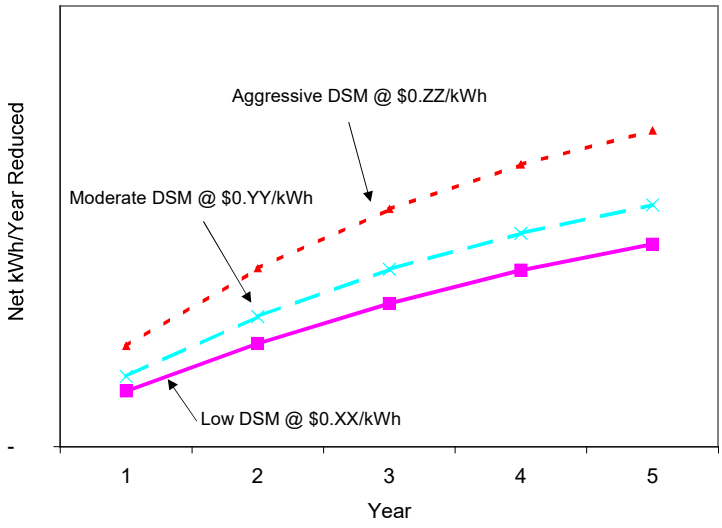
Achievable potential forecasts can be developed for multiple scenarios. For example, program savings can be modeled under low levels of program intervention, through moderate levels, up to an aggressive DSM acquisition scenario. Uncertainty in rates and avoided costs can be characterized in alternate 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-5 and Figure A-5.

Table A-5. 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)				

DSM ASSYST Program Output	2006	2007	2008	etc.
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. 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 those required by building codes. 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-6.

Once the levels of 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 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-6. Example of Industrial Efficiency Levels Developed for a Recent California Potential Study

DSM ASSYST ADDITIVE SUPPLY ANALYSIS		Year 2011					
		Vintage: Existing					
		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.

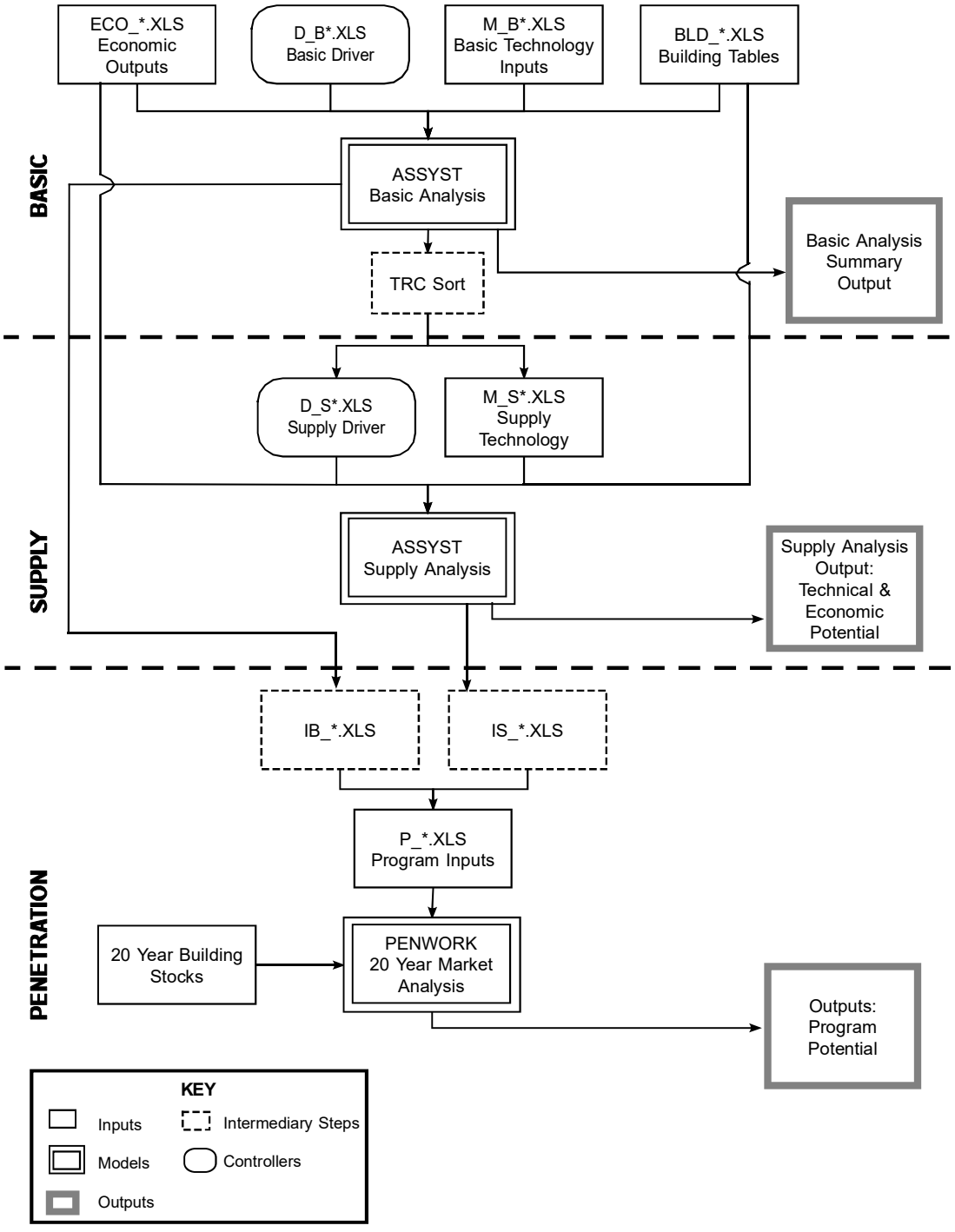
A.2.1 Basic Module

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
- Advertising Effective Ratio.

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 (14 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 (11.5 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.

Heat pump upgrade: Air-source heat pumps transfer heat from the outside air to the inside of a building or vice versa, providing both heating and cooling. We consider a 15 SEER/8.2 HSPF replacement and a 16 SEER/8.7 HSPF replacement of a base 14 SEER/8.2 HSPF unit. We consider both a replace-on-burnout measure and an early replacement measure.

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 (10.6 EER) to a higher efficiency unit (EER 10.8 or 11.3).

Room air conditioner early replacement: For this measure we assume replacement of an older room air conditioner (EER 9.7) 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.

Variable speed furnace/AC fans: Air handler models with the lowest electrical use ratings employ electronically commutated motors (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 fairly 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.

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.

Smart thermostat: Smart thermostats are wi-fi connected and can be used with home automation systems and can be remotely controlled by the user. They feature occupancy sensors that can save energy compared to the pre-set schedule of a conventional programmable thermostat.

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.

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

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. 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.

Smart LED bulbs: Smart bulbs are wi-fi connected LED lamps than can be controlled via a hub or smart phone app. While these bulbs offer built-in controls such as dimming capability and color-tuning, their connected nature means that they draw a small amount of power continuously. They will save energy as a replacement for an incandescent or CFL lamp due to the LED technology, but savings from the control technologies will be marginal.

Motion/Occupancy sensor: Motion sensors turn lamps on when movement is sensed and off again after a specified period of no movement. They are used frequently to control outdoor security lighting, but can be used indoors as well to ensure that

lights aren't left on in spaces used only intermittently. They can be convenient in spaces when light is needed for only brief periods.

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.

Drain water heat recovery (GFX): Gravity film exchange (GFX) drain-water heat recovery systems consist of a copper pipe for incoming cold water coiled tightly around a copper drain-water pipe. When water goes down the drain, it doesn't drop straight down as though poured from a spout, but rather falls against the side of the pipe. This phenomenon allows the GFX unit to easily re-capture some of this energy, as heat is transferred through the copper pipes to the incoming water supply going to the water heater.

Hot water temperatures turndown: Many residential water heaters are set well above the recommended 120 degrees Fahrenheit. Turning down the setpoint will save energy, and, depending on the original temperature, may also improve resident safety.

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: This measure removes and recycles an old, working refrigerator. When households replace a working refrigerator, the old unit is often retained as a secondary unit. Often relegated to a garage these older units can consume much more energy than even standard new units, and are often underutilized for storage.

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.

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 Combined Energy Factor (pounds of clothing per kilowatt hour) is 3.73 for standard units, 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: We model seven new construction measures, all framed as a percent reduction in energy use compared to code, ranging from 10% above code to 45% above code.

B.1.8 Other End Uses

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.

Electric vehicle chargers: ENERGY STAR® level 1 and level 2 chargers and smart (networked) electric vehicle level 1 and level 2 chargers are modelled in the analysis.

B.2 Commercial Measures

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

B.1.1 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.

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.

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.

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.

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 dimmable, 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, outdoor lighting, and streetlighting

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. LED products are rapidly becoming competitive in other applications.

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 outdoor lighting controls: 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

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 1 10.9 and an EER 13.4, compared to a base case unit with EER=10.3.

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.

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 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.

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.

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.

Smart thermostat: Smart thermostats are wi-fi connected and can be used with home automation systems and can be remotely controlled by the user. They feature occupancy sensors that can save energy compared to the pre-set schedule of a conventional programmable thermostat.

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. We specifically consider a dual-enthalpy economizer replacing a dry-bulb economizer.

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 waterproof 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.

Heat pump upgrade: Air-source heat pumps transfer heat from the outside air to the inside of a building or vice versa, providing both heating and cooling. We consider a 15 SEER, 8.2 HSPF heat pump.

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.

High-efficiency mini-split heat pump: Also know as a ductless heat pump, mini-split heat pumps consist of an indoor air handler unit and an outdoor compressor/condensing unit connected by refrigerant lines. An outdoor unit can connect to multiple indoor units allowing for zone heating and cooling, which can result in efficiency gain. The have not duct with their associated losses.

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.

Auto door closers for walk-ins and reach-ins: Auto door closers minimize air infiltrations in walk-in and reach-in refrigerators and freezers.

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.

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® servers, computers, monitors, and imaging equipment can reduce energy use both in all power modes.

B.2.6 Water Heating

High efficiency water heater: Higher efficiency water heater 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.

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.

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 refrigerated devices to ensure that the product stays cold.

B.2.7 Industrial

Efficient industrial process equipment: This study did not break out industrial energy use into specific industries. Across the industrial sector as a whole we analyzed four categories of efficient industrial process equipment: process heating, process cooling and refrigeration, electrochemical processes, and other process. With the industrial end use so broadly defined, our measures were correspondingly broad.

Industrial process improved operations: This measure broadly captures process improvements such as planning and scheduling and waste reduction. As with efficient industrial process equipment, we looked at improved operations across process heating, process cooling and refrigeration, electrochemical processes, and other processes.

High efficiency motors: Motors make up a large share of industrial energy use. Minimum efficiency standards have improved new motor efficiency in recent decades, but the industrial sectors had a large stock of older motors. Retrofitting these old motors with new, efficient motors would result in significant savings.

Variable speed drive control: A variable speed drive (VSD) or variable frequency drive (VFD) is used to control motor speed and torque by varying motor input frequency and voltage. Adjusting the motor speed as the load on the motor changes yields large energy savings, especially in fan and pump applications.

B.2.8 Compressed Air

Cold Air Intake: Common compressors take in air at ambient air pressures raise the pressure by reducing a volume of air by a fixed amount. The amount of air compressed depends the density of the air entering the compressor, and cold air is denser than warm air. Because air compressors can only intake a fixed volume of air, higher density (colder intake air) means more air in the system. The output of the air compressor is proportional to the density of the incoming air. Compressor motors produce heat, so pulling air from nearby results in worse performance than directing the intake inlet to a source of cooler ambient air. This can often be done very cost-effectively with a longer intake tube for the air filter.

End Use Optimization: The design of a compressed air system design should take into account the devices on the system and variability in demand. Different patterns of air usage may require different choices in the number and type of compressor or may benefit from the addition of compressed air storage. The design of the distribution system (e.g. narrow lines and sharp bends) can limit pressure at the point of use. Incorporating heat recovery can improve system energy efficiency as well. A wide variety of controls are available for compressed air systems, including pressure controls, flow controls, automation products, and controllers for specific compressor types.

Equipment Upgrade: Efficient air compressors may incorporate features such as built-in variable speed drives, high efficiency motors, adjustable air delivery, or automatic shut-off.

Maintenance and Leak Reduction: In a compressed air system, air is energy, and a leaky system results in the compressor cycling more frequently to maintain pressure. Leaks can be detected using an ultrasonic acoustic detector or through less high-tech means. Repairing leaks may involve nothing more than tightening connections or may involve replacing various system components.

Low Pressure Drop Filters: Filters in the air distribution center reduce air pressure to end device, and the pressure at the compressor end of the system must increase to compensate. Low pressure drop filters minimize the pressure drop and increase system efficiency.

Zero-Loss Condensate Drain: Condensate accumulates in a compressed air system and must be removed. Zero-Loss Drains are designed to drain condensate without any loss of compressed air.

C. ECONOMIC INPUTS

APPENDIX C - ECONOMIC INPUTS

Residential Electricity

UTILITY NAME	Dominion
SECTOR	Res
BATCH #	1
UTILITY DISCOUNT RATE	7.03%
CUSTOMER DISCOUNT RATE	6.25%
GENERAL INFLATION RATE (M	1.98%
BASE YEAR	2024
START YEAR	2024
UTILITY LINE LOSS RATE	5.09%

ENERGY COSTS AND RATES

RATE TYPE	Residential
ENERGY UNITS	$/kWh
DEMAND UNITS	$/kW

Rate/Time F	1	2	3	4	
Name	Winter On-Peak	Summer On-Peak	Summer Off-Peak	Winter Off-Peak	
Abbreviatior	WON	SON	SOFF	WOFF	TOTAL
Hours	876	318	3354	4212	8760

	AVOIDED ENERGY COSTS BY TIME PERIOD				AVOIDED DEMAND COSTS BY TIME PERIOD			
Year	WON $/kWh	SON $/kWh	SOFF $/kWh	WOFF $/kWh	WON $/kW	SON $/kW	SOFF $/kW	WOFF $/kW
2024	0.038	0.038	0.038	0.038	43.402	28.143	0.000	0.000
2025	0.028	0.028	0.028	0.028	44.234	32.403	0.000	0.000
2026	0.029	0.029	0.029	0.029	45.063	38.894	0.000	0.000
2027	0.030	0.030	0.030	0.030	45.937	45.609	0.000	0.000
2028	0.032	0.032	0.032	0.032	46.847	52.536	0.000	0.000
2029	0.034	0.034	0.034	0.034	47.793	59.698	0.000	0.000
2030	0.033	0.033	0.033	0.033	48.719	67.004	0.000	0.000
2031	0.035	0.035	0.035	0.035	49.649	72.196	0.000	0.000
2032	0.036	0.036	0.036	0.036	50.575	75.861	0.000	0.000
2033	0.038	0.038	0.038	0.038	51.521	79.627	0.000	0.000
2034	0.040	0.040	0.040	0.040	52.502	83.504	0.000	0.000
2035	0.041	0.041	0.041	0.041	53.529	87.520	0.000	0.000
2036	0.042	0.042	0.042	0.042	54.594	90.230	0.000	0.000
2037	0.044	0.044	0.044	0.044	55.690	91.960	0.000	0.000
2038	0.044	0.044	0.044	0.044	56.822	93.741	0.000	0.000
2039	0.045	0.045	0.045	0.045	57.993	95.572	0.000	0.000
2040	0.046	0.046	0.046	0.046	59.196	97.445	0.000	0.000
2041	0.048	0.048	0.048	0.048	60.403	100.640	0.000	0.000
2042	0.050	0.050	0.050	0.050	61.631	104.855	0.000	0.000
2043	0.052	0.052	0.052	0.052	62.884	109.195	0.000	0.000
2044	0.054	0.054	0.054	0.054	64.167	113.668	0.000	0.000
2045	0.055	0.055	0.055	0.055	65.477	118.262	0.000	0.000
2046	0.055	0.055	0.055	0.055	66.797	122.974	0.000	0.000
2047	0.057	0.057	0.057	0.057	68.146	127.815	0.000	0.000
2048	0.058	0.058	0.058	0.058	69.540	132.795	0.000	0.000
2049	0.060	0.060	0.060	0.060	70.969	137.918	0.000	0.000
2050	0.061	0.061	0.061	0.061	72.426	143.179	0.000	0.000
2051	0.063	0.063	0.063	0.063	73.907	146.999	0.000	0.000
2052	0.065	0.065	0.065	0.065	75.415	149.757	0.000	0.000
2053	0.067	0.067	0.067	0.067	76.953	152.567	0.000	0.000
2054	0.070	0.070	0.070	0.070	78.522	155.430	0.000	0.000
2055	0.072	0.072	0.072	0.072	80.123	158.347	0.000	0.000
2056	0.075	0.075	0.075	0.075	81.758	161.318	0.000	0.000
2057	0.077	0.077	0.077	0.077	83.425	164.345	0.000	0.000
2058	0.080	0.080	0.080	0.080	85.126	167.429	0.000	0.000
2059	0.082	0.082	0.082	0.082	86.862	170.571	0.000	0.000
2060	0.085	0.085	0.085	0.085	88.634	173.771	0.000	0.000
2061	0.085	0.085	0.085	0.085	90.441	174.171	0.000	0.000
2062	0.085	0.085	0.085	0.085	92.286	174.579	0.000	0.000
2063	0.085	0.085	0.085	0.085	94.168	174.995	0.000	0.000

Residential Electricity

Year	VIRGINIA RESIDENTIAL ENERGY RATES WON $/kWh	SON $/kWh	SOFF $/kWh	WOFF $/kWh
2024	0.132	0.132	0.132	0.132
2025	0.135	0.135	0.135	0.135
2026	0.138	0.138	0.138	0.138
2027	0.140	0.140	0.140	0.140
2028	0.143	0.143	0.143	0.143
2029	0.145	0.145	0.145	0.145
2030	0.148	0.148	0.148	0.148
2031	0.151	0.151	0.151	0.151
2032	0.154	0.154	0.154	0.154
2033	0.156	0.156	0.156	0.156
2034	0.159	0.159	0.159	0.159
2035	0.162	0.162	0.162	0.162
2036	0.165	0.165	0.165	0.165
2037	0.169	0.169	0.169	0.169
2038	0.172	0.172	0.172	0.172
2039	0.175	0.175	0.175	0.175
2040	0.179	0.179	0.179	0.179
2041	0.182	0.182	0.182	0.182
2042	0.186	0.186	0.186	0.186
2043	0.189	0.189	0.189	0.189
2044	0.193	0.193	0.193	0.193
2045	0.196	0.196	0.196	0.196
2046	0.200	0.200	0.200	0.200
2047	0.204	0.204	0.204	0.204
2048	0.208	0.208	0.208	0.208
2049	0.212	0.212	0.212	0.212
2050	0.217	0.217	0.217	0.217
2051	0.221	0.221	0.221	0.221
2052	0.226	0.226	0.226	0.226
2053	0.230	0.230	0.230	0.230
2054	0.235	0.235	0.235	0.235
2055	0.240	0.240	0.240	0.240
2056	0.245	0.245	0.245	0.245
2057	0.250	0.250	0.250	0.250
2058	0.255	0.255	0.255	0.255
2059	0.260	0.260	0.260	0.260
2060	0.265	0.265	0.265	0.265
2061	0.271	0.271	0.271	0.271
2062	0.276	0.276	0.276	0.276
2063	0.282	0.282	0.282	0.282

APPENDIX C - ECONOMIC INPUTS

Commercial Electricity

UTILITY NAME	Dominion
SECTOR	Com
BATCH #	1
UTILITY DISCOUNT RATE	7.03%
CUSTOMER DISCOUNT RATE	6.25%
GENERAL INFLATION RATE (M	1.98%
BASE YEAR	2024
START YEAR	2024
UTILITY LINE LOSS RATE	5.09%

ENERGY COSTS AND RATES

RATE TYPE	Commercial
ENERGY UNITS	$/kWh
DEMAND UNITS	$/kW

Rate/Time Per	1	2	3	4	
Name	Winter On-Peak	Summer On-Peak	Summer Off-Peak	Winter Off-Peak	
Abbreviation	WON	SON	SOFF	WOFF	TOTAL
Hours	876	318	3354	4212	8760

	AVOIDED ENERGY COSTS BY TIME PERIOD				AVOIDED DEMAND COSTS BY TIME PERIOD			
Year	WON $/kWh	SON $/kWh	SOFF $/kWh	WOFF $/kWh	WON $/kW	SON $/kW	SOFF $/kW	WOFF $/kW
2024	0.038	0.038	0.038	0.038	43.402	28.143	0.000	0.000
2025	0.028	0.028	0.028	0.028	44.234	32.403	0.000	0.000
2026	0.029	0.029	0.029	0.029	45.063	38.894	0.000	0.000
2027	0.030	0.030	0.030	0.030	45.937	45.609	0.000	0.000
2028	0.032	0.032	0.032	0.032	46.847	52.536	0.000	0.000
2029	0.034	0.034	0.034	0.034	47.793	59.698	0.000	0.000
2030	0.033	0.033	0.033	0.033	48.719	67.004	0.000	0.000
2031	0.035	0.035	0.035	0.035	49.649	72.196	0.000	0.000
2032	0.036	0.036	0.036	0.036	50.575	75.861	0.000	0.000
2033	0.038	0.038	0.038	0.038	51.521	79.627	0.000	0.000
2034	0.040	0.040	0.040	0.040	52.502	83.504	0.000	0.000
2035	0.041	0.041	0.041	0.041	53.529	87.520	0.000	0.000
2036	0.042	0.042	0.042	0.042	54.594	90.230	0.000	0.000
2037	0.044	0.044	0.044	0.044	55.690	91.960	0.000	0.000
2038	0.044	0.044	0.044	0.044	56.822	93.741	0.000	0.000
2039	0.045	0.045	0.045	0.045	57.993	95.572	0.000	0.000
2040	0.046	0.046	0.046	0.046	59.196	97.445	0.000	0.000
2041	0.048	0.048	0.048	0.048	60.403	100.640	0.000	0.000
2042	0.050	0.050	0.050	0.050	61.631	104.855	0.000	0.000
2043	0.052	0.052	0.052	0.052	62.884	109.195	0.000	0.000
2044	0.054	0.054	0.054	0.054	64.167	113.668	0.000	0.000
2045	0.055	0.055	0.055	0.055	65.477	118.262	0.000	0.000
2046	0.055	0.055	0.055	0.055	66.797	122.974	0.000	0.000
2047	0.057	0.057	0.057	0.057	68.146	127.815	0.000	0.000
2048	0.058	0.058	0.058	0.058	69.540	132.795	0.000	0.000
2049	0.060	0.060	0.060	0.060	70.969	137.918	0.000	0.000
2050	0.061	0.061	0.061	0.061	72.426	143.179	0.000	0.000
2051	0.063	0.063	0.063	0.063	73.907	146.999	0.000	0.000
2052	0.065	0.065	0.065	0.065	75.415	149.757	0.000	0.000
2053	0.067	0.067	0.067	0.067	76.953	152.567	0.000	0.000
2054	0.070	0.070	0.070	0.070	78.522	155.430	0.000	0.000
2055	0.072	0.072	0.072	0.072	80.123	158.347	0.000	0.000
2056	0.075	0.075	0.075	0.075	81.758	161.318	0.000	0.000
2057	0.077	0.077	0.077	0.077	83.425	164.345	0.000	0.000
2058	0.080	0.080	0.080	0.080	85.126	167.429	0.000	0.000
2059	0.082	0.082	0.082	0.082	86.862	170.571	0.000	0.000
2060	0.085	0.085	0.085	0.085	88.634	173.771	0.000	0.000
2061	0.085	0.085	0.085	0.085	90.441	174.171	0.000	0.000
2062	0.085	0.085	0.085	0.085	92.286	174.579	0.000	0.000
2063	0.085	0.085	0.085	0.085	94.168	174.995	0.000	0.000

Commercial Electricity

Year	VIRGINIA COMMERCIAL ENERGY RATES WON $/kWh	SON $/kWh	SOFF $/kWh	WOFF $/kWh
2024	0.085	0.085	0.085	0.085
2025	0.086	0.086	0.086	0.086
2026	0.088	0.088	0.088	0.088
2027	0.090	0.090	0.090	0.090
2028	0.091	0.091	0.091	0.091
2029	0.093	0.093	0.093	0.093
2030	0.095	0.095	0.095	0.095
2031	0.096	0.096	0.096	0.096
2032	0.098	0.098	0.098	0.098
2033	0.100	0.100	0.100	0.100
2034	0.102	0.102	0.102	0.102
2035	0.104	0.104	0.104	0.104
2036	0.106	0.106	0.106	0.106
2037	0.108	0.108	0.108	0.108
2038	0.110	0.110	0.110	0.110
2039	0.112	0.112	0.112	0.112
2040	0.114	0.114	0.114	0.114
2041	0.116	0.116	0.116	0.116
2042	0.119	0.119	0.119	0.119
2043	0.121	0.121	0.121	0.121
2044	0.123	0.123	0.123	0.123
2045	0.126	0.126	0.126	0.126
2046	0.128	0.128	0.128	0.128
2047	0.130	0.130	0.130	0.130
2048	0.133	0.133	0.133	0.133
2049	0.136	0.136	0.136	0.136
2050	0.138	0.138	0.138	0.138
2051	0.141	0.141	0.141	0.141
2052	0.144	0.144	0.144	0.144
2053	0.147	0.147	0.147	0.147
2054	0.150	0.150	0.150	0.150
2055	0.153	0.153	0.153	0.153
2056	0.156	0.156	0.156	0.156
2057	0.160	0.160	0.160	0.160
2058	0.163	0.163	0.163	0.163
2059	0.166	0.166	0.166	0.166
2060	0.169	0.169	0.169	0.169
2061	0.173	0.173	0.173	0.173
2062	0.176	0.176	0.176	0.176
2063	0.180	0.180	0.180	0.180

D. BUILDING AND TIME-OF-USE FACTOR INPUTS

Residential Electric Building Stock Table Number of Homes			
	Single Family Building Type	Multi-Family Building Type	Mobile Home Building Type
Segment	1	2	3
VA Existing	1,110,428	195,645	13,121
Opt-Outs	0	0	0
VA New	10,717	1,888	127

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

	End Use 1 - Space Cooling				End Use 2 - Lighting				End Use 3 - Refrigeration				End Use 4 - Freezer				End Use 5 - Water Heating			
Building Type	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF
1	0.0102	0.1644	0.7782	0.0473	0.1335	0.0321	0.3401	0.4943	0.0999	0.0413	0.4071	0.4517	0.0999	0.0413	0.4071	0.4517	0.1633	0.0277	0.3547	0.4544
2	0.0102	0.1644	0.7782	0.0473	0.1335	0.0321	0.3401	0.4943	0.0999	0.0413	0.4071	0.4517	0.0999	0.0413	0.4071	0.4517	0.1633	0.0277	0.3547	0.4544
3	0.0102	0.1644	0.7782	0.0473	0.1335	0.0321	0.3401	0.4943	0.0999	0.0413	0.4071	0.4517	0.0999	0.0413	0.4071	0.4517	0.1633	0.0277	0.3547	0.4544
4	0.0102	0.1644	0.7782	0.0473	0.1335	0.0321	0.3401	0.4943	0.0999	0.0413	0.4071	0.4517	0.0999	0.0413	0.4071	0.4517	0.1633	0.0277	0.3547	0.4544
5	0.0102	0.1644	0.7782	0.0473	0.1335	0.0321	0.3401	0.4943	0.0999	0.0413	0.4071	0.4517	0.0999	0.0413	0.4071	0.4517	0.1633	0.0277	0.3547	0.4544
6	0.0102	0.1644	0.7782	0.0473	0.1335	0.0321	0.3401	0.4943	0.0999	0.0413	0.4071	0.4517	0.0999	0.0413	0.4071	0.4517	0.1633	0.0277	0.3547	0.4544

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

	End Use 6 - Clothes Washer				End Use 7 - Clothes Dryer				End Use 8 - Dishwasher				End Use 9 - Space Heating				End Use 10 - Cooking			
Building Type	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF
1	0.1248	0.0389	0.3379	0.4984	0.1248	0.0389	0.3379	0.4984	0.1200	0.0413	0.3649	0.4738	0.1833	0.0017	0.0223	0.7927	0.1857	0.0945	0.2593	0.4604
2	0.1248	0.0389	0.3379	0.4984	0.1248	0.0389	0.3379	0.4984	0.1200	0.0413	0.3649	0.4738	0.1833	0.0017	0.0223	0.7927	0.1857	0.0945	0.2593	0.4604
3	0.1248	0.0389	0.3379	0.4984	0.1248	0.0389	0.3379	0.4984	0.1200	0.0413	0.3649	0.4738	0.1833	0.0017	0.0223	0.7927	0.1857	0.0945	0.2593	0.4604
4	0.1248	0.0389	0.3379	0.4984	0.1248	0.0389	0.3379	0.4984	0.1200	0.0413	0.3649	0.4738	0.1833	0.0017	0.0223	0.7927	0.1857	0.0945	0.2593	0.4604
5	0.1248	0.0389	0.3379	0.4984	0.1248	0.0389	0.3379	0.4984	0.1200	0.0413	0.3649	0.4738	0.1833	0.0017	0.0223	0.7927	0.1857	0.0945	0.2593	0.4604
6	0.1248	0.0389	0.3379	0.4984	0.1248	0.0389	0.3379	0.4984	0.1200	0.0413	0.3649	0.4738	0.1833	0.0017	0.0223	0.7927	0.1857	0.0945	0.2593	0.4604

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

	End Use 11 - TV				End Use 12- Cooling and Heating				End Use 13 - Pool Pump				End Use 14 - EV Charger				End Use 15 - Miscellaneous			
Building Type	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF
1	0.1189	0.0472	0.3447	0.4892	0.1571	0.0275	0.1858	0.6297	0.0775	0.0555	0.4873	0.3797	0.0941	0.0403	0.3386	0.5270	0.1200	0.0413	0.3649	0.4738
2	0.1189	0.0472	0.3447	0.4892	0.1571	0.0275	0.1858	0.6297	0.0775	0.0555	0.4873	0.3797	0.0941	0.0403	0.3386	0.5270	0.1200	0.0413	0.3649	0.4738
3	0.1189	0.0472	0.3447	0.4892	0.1571	0.0275	0.1858	0.6297	0.0775	0.0555	0.4873	0.3797	0.0941	0.0403	0.3386	0.5270	0.1200	0.0413	0.3649	0.4738
4	0.1189	0.0472	0.3447	0.4892	0.1571	0.0275	0.1858	0.6297	0.0775	0.0555	0.4873	0.3797	0.0941	0.0403	0.3386	0.5270	0.1200	0.0413	0.3649	0.4738
5	0.1189	0.0472	0.3447	0.4892	0.1571	0.0275	0.1858	0.6297	0.0775	0.0555	0.4873	0.3797	0.0941	0.0403	0.3386	0.5270	0.1200	0.0413	0.3649	0.4738
6	0.1189	0.0472	0.3447	0.4892	0.1571	0.0275	0.1858	0.6297	0.0775	0.0555	0.4873	0.3797	0.0941	0.0403	0.3386	0.5270	0.1200	0.0413	0.3649	0.4738

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

	End Use 16 - House				End Use 17 - New Home			
Building Type	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF
1	0.1068	0.0519	0.3934	0.4478	0.1068	0.0519	0.3934	0.4478
2	0.1068	0.0519	0.3934	0.4478	0.1068	0.0519	0.3934	0.4478
3	0.1068	0.0519	0.3934	0.4478	0.1068	0.0519	0.3934	0.4478
4	0.1068	0.0519	0.3934	0.4478	0.1068	0.0519	0.3934	0.4478
5	0.1068	0.0519	0.3934	0.4478	0.1068	0.0519	0.3934	0.4478
6	0.1068	0.0519	0.3934	0.4478	0.1068	0.0519	0.3934	0.4478

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

	End Use 1 - Space Cooling				End Use 2 - Lighting				End Use 3 - Refrigeration				End Use 4 - Freezer				End Use 5 - Water Heating			
Building Type	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF
1	0.0000	2.2706	4.7860	0.0000	1.4880	1.1368	1.6834	1.8988	0.7542	1.0853	1.2661	0.7777	0.7542	1.0853	1.2661	0.7777	1.5279	1.0804	1.0518	2.4931
2	0.0000	2.2706	4.7860	0.0000	1.4880	1.1368	1.6834	1.8988	0.7542	1.0853	1.2661	0.7777	0.7542	1.0853	1.2661	0.7777	1.5279	1.0804	1.0518	2.4931
3	0.0000	2.2706	4.7860	0.0000	1.4880	1.1368	1.6834	1.8988	0.7542	1.0853	1.2661	0.7777	0.7542	1.0853	1.2661	0.7777	1.5279	1.0804	1.0518	2.4931
4	0.0000	2.2706	4.7860	0.0000	1.4880	1.1368	1.6834	1.8988	0.7542	1.0853	1.2661	0.7777	0.7542	1.0853	1.2661	0.7777	1.5279	1.0804	1.0518	2.4931
5	0.0000	2.2706	4.7860	0.0000	1.4880	1.1368	1.6834	1.8988	0.7542	1.0853	1.2661	0.7777	0.7542	1.0853	1.2661	0.7777	1.5279	1.0804	1.0518	2.4931
6	0.0000	2.2706	4.7860	0.0000	1.4880	1.1368	1.6834	1.8988	0.7542	1.0853	1.2661	0.7777	0.7542	1.0853	1.2661	0.7777	1.5279	1.0804	1.0518	2.4931

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

	End Use 6 - Clothes Washer				End Use 7 - Clothes Dryer				End Use 8 - Dishwasher				End Use 9 - Space Heating				End Use 10 - Cooking			
Building Type	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF
1	0.4146	1.1049	0.9458	0.2909	0.4146	1.1049	0.9458	0.2909	0.6068	0.9546	1.4503	0.6954	2.8296	0.0000	0.0000	3.0404	0.9270	0.9365	3.5622	4.2695
2	0.4146	1.1049	0.9458	0.2909	0.4146	1.1049	0.9458	0.2909	0.6068	0.9546	1.4503	0.6954	2.8296	0.0000	0.0000	3.0404	0.9270	0.9365	3.5622	4.2695
3	0.4146	1.1049	0.9458	0.2909	0.4146	1.1049	0.9458	0.2909	0.6068	0.9546	1.4503	0.6954	2.8296	0.0000	0.0000	3.0404	0.9270	0.9365	3.5622	4.2695
4	0.4146	1.1049	0.9458	0.2909	0.4146	1.1049	0.9458	0.2909	0.6068	0.9546	1.4503	0.6954	2.8296	0.0000	0.0000	3.0404	0.9270	0.9365	3.5622	4.2695
5	0.4146	1.1049	0.9458	0.2909	0.4146	1.1049	0.9458	0.2909	0.6068	0.9546	1.4503	0.6954	2.8296	0.0000	0.0000	3.0404	0.9270	0.9365	3.5622	4.2695
6	0.4146	1.1049	0.9458	0.2909	0.4146	1.1049	0.9458	0.2909	0.6068	0.9546	1.4503	0.6954	2.8296	0.0000	0.0000	3.0404	0.9270	0.9365	3.5622	4.2695

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

	End Use 11 - TV				End Use 12 - Cooling and Heating				End Use 13 - Pool Pump				End Use 14 - EV Charger				End Use 15 - Miscellaneous			
Building Type	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF
1	0.5673	0.8817	1.4350	0.5736	3.4180	1.9516	2.3816	3.9706	0.5673	1.1665	0.9130	0.3401	0.6571	0.1432	1.1202	0.5422	0.6068	0.9546	1.4503	0.6954
2	0.5673	0.8817	1.4350	0.5736	3.4180	1.9516	2.3816	3.9706	0.5673	1.1665	0.9130	0.3401	0.6571	0.1432	1.1202	0.5422	0.6068	0.9546	1.4503	0.6954
3	0.5673	0.8817	1.4350	0.5736	3.4180	1.9516	2.3816	3.9706	0.5673	1.1665	0.9130	0.3401	0.6571	0.1432	1.1202	0.5422	0.6068	0.9546	1.4503	0.6954
4	0.5673	0.8817	1.4350	0.5736	3.4180	1.9516	2.3816	3.9706	0.5673	1.1665	0.9130	0.3401	0.6571	0.1432	1.1202	0.5422	0.6068	0.9546	1.4503	0.6954
5	0.5673	0.8817	1.4350	0.5736	3.4180	1.9516	2.3816	3.9706	0.5673	1.1665	0.9130	0.3401	0.6571	0.1432	1.1202	0.5422	0.6068	0.9546	1.4503	0.6954
6	0.5673	0.8817	1.4350	0.5736	3.4180	1.9516	2.3816	3.9706	0.5673	1.1665	0.9130	0.3401	0.6571	0.1432	1.1202	0.5422	0.6068	0.9546	1.4503	0.6954

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

	End Use 16 - House				End Use 17 - New Home			
Building Type	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF
1	1.6626	1.5904	2.1955	1.8433	1.6626	1.5904	2.1955	1.8433

2	1.6626	1.5904	2.1955	1.8433	1.6626	1.5904	2.1955	1.8433
3	1.6626	1.5904	2.1955	1.8433	1.6626	1.5904	2.1955	1.8433
4	1.6626	1.5904	2.1955	1.8433	1.6626	1.5904	2.1955	1.8433
5	1.6626	1.5904	2.1955	1.8433	1.6626	1.5904	2.1955	1.8433
6	1.6626	1.5904	2.1955	1.8433	1.6626	1.5904	2.1955	1.8433

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	Education Building Type 6	Health Building Type 7	Lodging Building Type 8	Data Centers Building Type 9	Non-Jurisdictional Building Type 10	Religious Worship Building Type 11	Misc Building Type 12	Industrial Building Type 13	Agricultural Building Type 14
VA Existing	536,027,192	56,901,365	204,917,278	42,980,968	178,574,784	268,940,637	168,657,870	360,070,390	5,891,485	409,556,726	553,904,824	809,005,414	136,901,213	247,430,755
Opt-Outs	0	0	0	0	0	3,201,098	0	0	10,268,532	0	0	0	4715879.136	0
VA New	16,328,574	1,733,341	6,242,234	1,309,295	5,439,783	8,192,527	5,137,692	10,968,541	179,468	12,476,004	16,873,166	24,644,095	4,170,314	7,537,288
Opt-Out New	0	0	0	0	0	97,513	0	0	312,802	0	0	0	143,656	0

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

	End Use 1 - Indoor Lighting				End Use 2 - Outdoor Lighting				End Use 3 - Cooling				End Use 4 - Ventilation			
Building Type	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF
Office	0.135	0.056	0.365	0.444	0.105	0.016	0.372	0.507	0.012	0.182	0.742	0.063	0.115	0.068	0.386	0.431
Restaurant	0.135	0.056	0.365	0.444	0.105	0.016	0.372	0.507	0.012	0.182	0.742	0.063	0.115	0.068	0.386	0.431
Retail	0.135	0.056	0.365	0.444	0.105	0.016	0.372	0.507	0.012	0.182	0.742	0.063	0.115	0.068	0.386	0.431
Grocery	0.135	0.056	0.365	0.444	0.105	0.016	0.372	0.507	0.012	0.182	0.742	0.063	0.115	0.068	0.386	0.431
Warehouse	0.135	0.056	0.365	0.444	0.105	0.016	0.372	0.507	0.012	0.182	0.742	0.063	0.115	0.068	0.386	0.431
Education	0.135	0.056	0.365	0.444	0.105	0.016	0.372	0.507	0.012	0.182	0.742	0.063	0.115	0.068	0.386	0.431
Health	0.135	0.056	0.365	0.444	0.105	0.016	0.372	0.507	0.012	0.182	0.742	0.063	0.115	0.068	0.386	0.431
Lodging	0.135	0.056	0.365	0.444	0.105	0.016	0.372	0.507	0.012	0.182	0.742	0.063	0.115	0.068	0.386	0.431
Data Centers	0.135	0.056	0.365	0.444	0.105	0.016	0.372	0.507	0.012	0.182	0.742	0.063	0.115	0.068	0.386	0.431
Non-Jurisdictiona	0.135	0.056	0.365	0.444	0.105	0.016	0.372	0.507	0.012	0.182	0.742	0.063	0.115	0.068	0.386	0.431
Religious Worshi	0.135	0.056	0.365	0.444	0.105	0.016	0.372	0.507	0.012	0.182	0.742	0.063	0.115	0.068	0.386	0.431
Misc	0.135	0.056	0.365	0.444	0.105	0.016	0.372	0.507	0.012	0.182	0.742	0.063	0.115	0.068	0.386	0.431
Industrial	0.135	0.056	0.365	0.444	0.105	0.016	0.372	0.507	0.012	0.182	0.742	0.063	0.115	0.068	0.386	0.431
Agricultural	0.135	0.056	0.365	0.444	0.105	0.016	0.372	0.507	0.012	0.182	0.742	0.063	0.115	0.068	0.386	0.431

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

	End Use 5 - Refrigeration				End Use 6 - Office Equipment				End Use 7 - Water Heating				End Use 8 - Vending			
Building Type	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF
Office	0.100	0.040	0.392	0.468	0.110	0.040	0.380	0.470	0.122	0.044	0.350	0.484	0.120	0.046	0.373	0.462
Restaurant	0.100	0.040	0.392	0.468	0.110	0.040	0.380	0.470	0.122	0.044	0.350	0.484	0.120	0.046	0.373	0.462
Retail	0.100	0.040	0.392	0.468	0.110	0.040	0.380	0.470	0.122	0.044	0.350	0.484	0.120	0.046	0.373	0.462
Grocery	0.100	0.040	0.392	0.468	0.110	0.040	0.380	0.470	0.122	0.044	0.350	0.484	0.120	0.046	0.373	0.462
Warehouse	0.100	0.040	0.392	0.468	0.110	0.040	0.380	0.470	0.122	0.044	0.350	0.484	0.120	0.046	0.373	0.462
Education	0.100	0.040	0.392	0.468	0.110	0.040	0.380	0.470	0.122	0.044	0.350	0.484	0.120	0.046	0.373	0.462
Health	0.100	0.040	0.392	0.468	0.110	0.040	0.380	0.470	0.122	0.044	0.350	0.484	0.120	0.046	0.373	0.462
Lodging	0.100	0.040	0.392	0.468	0.110	0.040	0.380	0.470	0.122	0.044	0.350	0.484	0.120	0.046	0.373	0.462
Data Centers	0.100	0.040	0.392	0.468	0.110	0.040	0.380	0.470	0.122	0.044	0.350	0.484	0.120	0.046	0.373	0.462
Non-Jurisdictiona	0.100	0.040	0.392	0.468	0.110	0.040	0.380	0.470	0.122	0.044	0.350	0.484	0.120	0.046	0.373	0.462
Religious Worshi	0.100	0.040	0.392	0.468	0.110	0.040	0.380	0.470	0.122	0.044	0.350	0.484	0.120	0.046	0.373	0.462
Misc	0.100	0.040	0.392	0.468	0.110	0.040	0.380	0.470	0.122	0.044	0.350	0.484	0.120	0.046	0.373	0.462
Industrial	0.100	0.040	0.392	0.468	0.110	0.040	0.380	0.470	0.122	0.044	0.350	0.484	0.120	0.046	0.373	0.462
Agricultural	0.100	0.040	0.392	0.468	0.110	0.040	0.380	0.470	0.122	0.044	0.350	0.484	0.120	0.046	0.373	0.462

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

	End Use 9 - Cooking				End Use 10 - Heating				End Use 11 - Compressed Air				End Use 12 - Process			
Building Type	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF
Office	0.123	0.057	0.363	0.457	0.234	0.002	0.022	0.742	0.117	0.044	0.374	0.465	0.117	0.044	0.374	0.465
Restaurant	0.123	0.057	0.363	0.457	0.234	0.002	0.022	0.742	0.117	0.044	0.374	0.465	0.117	0.044	0.374	0.465
Retail	0.123	0.057	0.363	0.457	0.234	0.002	0.022	0.742	0.117	0.044	0.374	0.465	0.117	0.044	0.374	0.465
Grocery	0.123	0.057	0.363	0.457	0.234	0.002	0.022	0.742	0.117	0.044	0.374	0.465	0.117	0.044	0.374	0.465
Warehouse	0.123	0.057	0.363	0.457	0.234	0.002	0.022	0.742	0.117	0.044	0.374	0.465	0.117	0.044	0.374	0.465
Education	0.123	0.057	0.363	0.457	0.234	0.002	0.022	0.742	0.117	0.044	0.374	0.465	0.117	0.044	0.374	0.465
Health	0.123	0.057	0.363	0.457	0.234	0.002	0.022	0.742	0.117	0.044	0.374	0.465	0.117	0.044	0.374	0.465
Lodging	0.123	0.057	0.363	0.457	0.234	0.002	0.022	0.742	0.117	0.044	0.374	0.465	0.117	0.044	0.374	0.465
Data Centers	0.123	0.057	0.363	0.457	0.234	0.002	0.022	0.742	0.117	0.044	0.374	0.465	0.117	0.044	0.374	0.465
Non-Jurisdictiona	0.123	0.057	0.363	0.457	0.234	0.002	0.022	0.742	0.117	0.044	0.374	0.465	0.117	0.044	0.374	0.465
Religious Worshi	0.123	0.057	0.363	0.457	0.234	0.002	0.022	0.742	0.117	0.044	0.374	0.465	0.117	0.044	0.374	0.465
Misc	0.123	0.057	0.363	0.457	0.234	0.002	0.022	0.742	0.117	0.044	0.374	0.465	0.117	0.044	0.374	0.465
Industrial	0.123	0.057	0.363	0.457	0.234	0.002	0.022	0.742	0.117	0.044	0.374	0.465	0.117	0.044	0.374	0.465
Agricultural	0.123	0.057	0.363	0.457	0.234	0.002	0.022	0.742	0.117	0.044	0.374	0.465	0.117	0.044	0.374	0.465

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

	End Use 13 - Motors				End Use 14 - Miscellaneous				End Use 15 -Whole Building				End Use 16 -New Construction			
Building Type	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF
Office	0.122	0.046	0.380	0.452	0.120	0.046	0.373	0.462	0.104	0.051	0.385	0.460	0.104	0.051	0.385	0.460
Restaurant	0.122	0.046	0.380	0.452	0.120	0.046	0.373	0.462	0.104	0.051	0.385	0.460	0.104	0.051	0.385	0.460
Retail	0.122	0.046	0.380	0.452	0.120	0.046	0.373	0.462	0.104	0.051	0.385	0.460	0.104	0.051	0.385	0.460
Grocery	0.122	0.046	0.380	0.452	0.120	0.046	0.373	0.462	0.104	0.051	0.385	0.460	0.104	0.051	0.385	0.460
Warehouse	0.122	0.046	0.380	0.452	0.120	0.046	0.373	0.462	0.104	0.051	0.385	0.460	0.104	0.051	0.385	0.460
Education	0.122	0.046	0.380	0.452	0.120	0.046	0.373	0.462	0.104	0.051	0.385	0.460	0.104	0.051	0.385	0.460
Health	0.122	0.046	0.380	0.452	0.120	0.046	0.373	0.462	0.104	0.051	0.385	0.460	0.104	0.051	0.385	0.460
Lodging	0.122	0.046	0.380	0.452	0.120	0.046	0.373	0.462	0.104	0.051	0.385	0.460	0.104	0.051	0.385	0.460
Data Centers	0.122	0.046	0.380	0.452	0.120	0.046	0.373	0.462	0.104	0.051	0.385	0.460	0.104	0.051	0.385	0.460
Non-Jurisdictiona	0.122	0.046	0.380	0.452	0.120	0.046	0.373	0.462	0.104	0.051	0.385	0.460	0.104	0.051	0.385	0.460
Religious Worshi	0.122	0.046	0.380	0.452	0.120	0.046	0.373	0.462	0.104	0.051	0.385	0.460	0.104	0.051	0.385	0.460
Misc	0.122	0.046	0.380	0.452	0.120	0.046	0.373	0.462	0.104	0.051	0.385	0.460	0.104	0.051	0.385	0.460
Industrial	0.122	0.046	0.380	0.452	0.120	0.046	0.373	0.462	0.104	0.051	0.385	0.460	0.104	0.051	0.385	0.460
Agricultural	0.122	0.046	0.380	0.452	0.120	0.046	0.373	0.462	0.104	0.051	0.385	0.460	0.104	0.051	0.385	0.460

Commercial Electric Peak To Energy Relationship Table (Utility Coincidence)

(Ratio of peak kW to average kW)

	End Use 1 - Indoor Lighting				End Use 2 - Outdoor Lighting				End Use 3 - Cooling				End Use 4 - Ventilation			
Building Type	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF
Office	1.724	1.263	2.566	2.662	1.211	1.000	1.117	1.559	0.000	2.227	1.517	0.000	0.926	1.294	1.135	1.043
Restaurant	1.724	1.263	2.566	2.662	1.211	1.000	1.117	1.559	0.000	2.227	1.517	0.000	0.926	1.294	1.135	1.043
Retail	1.724	1.263	2.566	2.662	1.211	1.000	1.117	1.559	0.000	2.227	1.517	0.000	0.926	1.294	1.135	1.043
Grocery	1.724	1.263	2.566	2.662	1.211	1.000	1.117	1.559	0.000	2.227	1.517	0.000	0.926	1.294	1.135	1.043
Warehouse	1.724	1.263	2.566	2.662	1.211	1.000	1.117	1.559	0.000	2.227	1.517	0.000	0.926	1.294	1.135	1.043
Education	1.724	1.263	2.566	2.662	1.211	1.000	1.117	1.559	0.000	2.227	1.517	0.000	0.926	1.294	1.135	1.043
Health	1.724	1.263	2.566	2.662	1.211	1.000	1.117	1.559	0.000	2.227	1.517	0.000	0.926	1.294	1.135	1.043
Lodging	1.724	1.263	2.566	2.662	1.211	1.000	1.117	1.559	0.000	2.227	1.517	0.000	0.926	1.294	1.135	1.043
Data Centers	1.724	1.263	2.566	2.662	1.211	1.000	1.117	1.559	0.000	2.227	1.517	0.000	0.926	1.294	1.135	1.043
Non-Jurisdictiona	1.724	1.263	2.566	2.662	1.211	1.000	1.117	1.559	0.000	2.227	1.517	0.000	0.926	1.294	1.135	1.043
Religious Worshi	1.724	1.263	2.566	2.662	1.211	1.000	1.117	1.559	0.000	2.227	1.517	0.000	0.926	1.294	1.135	1.043
Misc	1.724	1.263	2.566	2.662	1.211	1.000	1.117	1.559	0.000	2.227	1.517	0.000	0.926	1.294	1.135	1.043
Industrial	1.724	1.263	2.566	2.662	1.211	1.000	1.117	1.559	0.000	2.227	1.517	0.000	0.926	1.294	1.135	1.043
Agricultural	1.724	1.263	2.566	2.662	1.211	1.000	1.117	1.559	0.000	2.227	1.517	0.000	0.926	1.294	1.135	1.043

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

	End Use 5 - Refrigeration				End Use 6 - Office Equipment				End Use 7 - Water Heating				End Use 8 - Vending			
Building Type	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF
Office	0.947	1.026	1.043	0.950	0.970	1.145	0.848	0.908	0.858	1.076	0.996	0.807	0.845	1.113	1.023	0.810
Restaurant	0.947	1.026	1.043	0.950	0.970	1.145	0.848	0.908	0.858	1.076	0.996	0.807	0.845	1.113	1.023	0.810
Retail	0.947	1.026	1.043	0.950	0.970	1.145	0.848	0.908	0.858	1.076	0.996	0.807	0.845	1.113	1.023	0.810
Grocery	0.947	1.026	1.043	0.950	0.970	1.145	0.848	0.908	0.858	1.076	0.996	0.807	0.845	1.113	1.023	0.810
Warehouse	0.947	1.026	1.043	0.950	0.970	1.145	0.848	0.908	0.858	1.076	0.996	0.807	0.845	1.113	1.023	0.810
Education	0.947	1.026	1.043	0.950	0.970	1.145	0.848	0.908	0.858	1.076	0.996	0.807	0.845	1.113	1.023	0.810
Health	0.947	1.026	1.043	0.950	0.970	1.145	0.848	0.908	0.858	1.076	0.996	0.807	0.845	1.113	1.023	0.810
Lodging	0.947	1.026	1.043	0.950	0.970	1.145	0.848	0.908	0.858	1.076	0.996	0.807	0.845	1.113	1.023	0.810
Data Centers	0.947	1.026	1.043	0.950	0.970	1.145	0.848	0.908	0.858	1.076	0.996	0.807	0.845	1.113	1.023	0.810
Non-Jurisdictiona	0.947	1.026	1.043	0.950	0.970	1.145	0.848	0.908	0.858	1.076	0.996	0.807	0.845	1.113	1.023	0.810
Religious Worshi	0.947	1.026	1.043	0.950	0.970	1.145	0.848	0.908	0.858	1.076	0.996	0.807	0.845	1.113	1.023	0.810
Misc	0.947	1.026	1.043	0.950	0.970	1.145	0.848	0.908	0.858	1.076	0.996	0.807	0.845	1.113	1.023	0.810
Industrial	0.947	1.026	1.043	0.950	0.970	1.145	0.848	0.908	0.858	1.076	0.996	0.807	0.845	1.113	1.023	0.810
Agricultural	0.947	1.026	1.043	0.950	0.970	1.145	0.848	0.908	0.858	1.076	0.996	0.807	0.845	1.113	1.023	0.810

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

	End Use 9 - Cooking				End Use 10 - Heating				End Use 11 - Compressed Air				End Use 12 - Process			
Building Type	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF
Office	0.606	0.975	1.571	0.559	2.411	0.000	0.000	2.868	0.882	1.084	1.075	0.932	0.882	1.084	1.075	0.932
Restaurant	0.606	0.975	1.571	0.559	2.411	0.000	0.000	2.868	0.882	1.084	1.075	0.932	0.882	1.084	1.075	0.932

Retail	0.606	0.975	1.571	0.559	2.411	0.000	0.000	2.868	0.882	1.084	1.075	0.932	0.882	1.084	1.075	0.932
Grocery	0.606	0.975	1.571	0.559	2.411	0.000	0.000	2.868	0.882	1.084	1.075	0.932	0.882	1.084	1.075	0.932
Warehouse	0.606	0.975	1.571	0.559	2.411	0.000	0.000	2.868	0.882	1.084	1.075	0.932	0.882	1.084	1.075	0.932
School	0.606	0.975	1.571	0.559	2.411	0.000	0.000	2.868	0.882	1.084	1.075	0.932	0.882	1.084	1.075	0.932
Health	0.606	0.975	1.571	0.559	2.411	0.000	0.000	2.868	0.882	1.084	1.075	0.932	0.882	1.084	1.075	0.932
Lodging	0.606	0.975	1.571	0.559	2.411	0.000	0.000	2.868	0.882	1.084	1.075	0.932	0.882	1.084	1.075	0.932
Data Centers	0.606	0.975	1.571	0.559	2.411	0.000	0.000	2.868	0.882	1.084	1.075	0.932	0.882	1.084	1.075	0.932
Non-Jurisdictiona	0.606	0.975	1.571	0.559	2.411	0.000	0.000	2.868	0.882	1.084	1.075	0.932	0.882	1.084	1.075	0.932
Religious Worshi	0.606	0.975	1.571	0.559	2.411	0.000	0.000	2.868	0.882	1.084	1.075	0.932	0.882	1.084	1.075	0.932
Misc	0.606	0.975	1.571	0.559	2.411	0.000	0.000	2.868	0.882	1.084	1.075	0.932	0.882	1.084	1.075	0.932
Industrial	0.606	0.975	1.571	0.559	2.411	0.000	0.000	2.868	0.882	1.084	1.075	0.932	0.882	1.084	1.075	0.932
Agricultural	0.606	0.975	1.571	0.559	2.411	0.000	0.000	2.868	0.882	1.084	1.075	0.932	0.882	1.084	1.075	0.932

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

	End Use 13 - Motors				End Use 14 - Miscellaneous				End Use 15 - Whole Building				End Use 15 - New Construction			
Building Type	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF	WON	SON	SOFF	WOFF
Office	0.881	1.149	0.953	0.835	0.845	1.113	1.023	0.810	1.363	1.342	1.533	1.441	1.363	1.342	1.533	1.441
Restaurant	0.881	1.149	0.953	0.835	0.845	1.113	1.023	0.810	1.363	1.342	1.533	1.441	1.363	1.342	1.533	1.441
Retail	0.881	1.149	0.953	0.835	0.845	1.113	1.023	0.810	1.363	1.342	1.533	1.441	1.363	1.342	1.533	1.441
Grocery	0.881	1.149	0.953	0.835	0.845	1.113	1.023	0.810	1.363	1.342	1.533	1.441	1.363	1.342	1.533	1.441
Warehouse	0.881	1.149	0.953	0.835	0.845	1.113	1.023	0.810	1.363	1.342	1.533	1.441	1.363	1.342	1.533	1.441
School	0.881	1.149	0.953	0.835	0.845	1.113	1.023	0.810	1.363	1.342	1.533	1.441	1.363	1.342	1.533	1.441
Health	0.881	1.149	0.953	0.835	0.845	1.113	1.023	0.810	1.363	1.342	1.533	1.441	1.363	1.342	1.533	1.441
Lodging	0.881	1.149	0.953	0.835	0.845	1.113	1.023	0.810	1.363	1.342	1.533	1.441	1.363	1.342	1.533	1.441
Data Centers	0.881	1.149	0.953	0.835	0.845	1.113	1.023	0.810	1.363	1.342	1.533	1.441	1.363	1.342	1.533	1.441
Non-Jurisdictiona	0.881	1.149	0.953	0.835	0.845	1.113	1.023	0.810	1.363	1.342	1.533	1.441	1.363	1.342	1.533	1.441
Religious Worshi	0.881	1.149	0.953	0.835	0.845	1.113	1.023	0.810	1.363	1.342	1.533	1.441	1.363	1.342	1.533	1.441
Misc	0.881	1.149	0.953	0.835	0.845	1.113	1.023	0.810	1.363	1.342	1.533	1.441	1.363	1.342	1.533	1.441
Industrial	0.881	1.149	0.953	0.835	0.845	1.113	1.023	0.810	1.363	1.342	1.533	1.441	1.363	1.342	1.533	1.441
Agricultural	0.881	1.149	0.953	0.835	0.845	1.113	1.023	0.810	1.363	1.342	1.533	1.441	1.363	1.342	1.533	1.441

E. MEASURE INPUTS

Commercial Electric Measure Inputs			BASE TECHNOLOGY EUIs (kWh/square foot)											
Segment	Measure #	Measure Description	Office Building Type	Restaurant Building Type	Retail Building Type	Grocery Building Type	Warehouse Building Type	Education Building Type	Health Building Type	Lodging Building Type	Data Centers Building Type	Non-Jurisdictional Building Type 10	Religious Worship Building Type 11	Misc Building Type 1
VA Existing	1000	Base Linear Lighting, Fluorescent Fixture, 2L4'T12	1.3	2.1	2.8	2.2	1.7	1.3	3.8	2.1	1.9	1.5	2.2	1.7
VA Existing	1050	Base Linear Lighting, Fluorescent Fixture, 2L4'T12, integrated market	1.3	2.1	2.8	2.2	1.7	1.3	3.8	2.1	1.9	1.5	2.2	1.7
VA Existing	1100	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB	1.2	1.9	2.4	2.0	1.5	1.2	3.5	1.9	1.7	1.4	2.0	1.5
VA Existing	1150	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB, integrated market	1.2	1.9	2.4	2.0	1.5	1.2	3.5	1.9	1.7	1.4	2.0	1.5
VA Existing	1200	Base Linear Lighting, LED Tube, 2 lamp fixture	0.6	1.0	1.3	1.0	0.8	0.6	1.8	1.0	0.9	0.7	1.0	0.8
VA Existing	1225	Base Linear Lighting, LED Tube, 2 lamp fixture, 2028 Standard	0.6	1.0	1.3	1.0	0.8	0.6	1.8	1.0	0.9	0.7	1.0	0.8
VA Existing	1250	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market	0.6	1.0	1.3	1.0	0.8	0.6	1.8	1.0	0.9	0.7	1.0	0.8
VA Existing	1275	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market, 2028 Standarc	0.6	1.0	1.3	1.0	0.8	0.6	1.8	1.0	0.9	0.7	1.0	0.8
VA Existing	1300	Base General Service Screw-in, CFL	1.5	0.5	1.2	0.4	0.0	0.0	0.8	1.3	2.3	0.7	0.7	0.6
VA Existing	1350	Base General Service Screw-in, Incandescent/halogen	4.5	1.4	3.5	1.2	0.0	0.1	2.5	3.8	6.7	2.1	2.2	1.7
VA Existing	1400	Base General Service Screw-in, LED bulb	1.0	0.3	0.8	0.3	0.0	0.0	0.6	0.9	1.5	0.5	0.5	0.4
VA Existing	1425	Base General Service Screw-in, LED bulb, 2028 Standard	1.0	0.3	0.8	0.3	0.0	0.0	0.6	0.9	1.5	0.5	0.5	0.4
VA Existing	1450	Base HID Lighting (low bay)	2.6	4.3	5.8	4.4	3.5	2.7	7.8	4.2	3.8	3.1	4.4	3.4
VA Existing	1500	Base High Bay Lighting, Fluorescent T5	1.2	0.0	6.3	2.6	1.0	1.3	7.2	2.1	0.6	0.7	0.8	0.6
VA Existing	1525	Base High Bay Lighting, Fluorescent T5, integrated market	1.2	0.0	6.3	2.6	1.0	1.3	7.2	2.1	0.6	0.7	0.8	0.6
VA Existing	1550	Base High Bay Lighting, HID lighting	1.4	0.0	7.2	3.0	1.2	1.6	8.3	2.5	0.7	0.8	0.9	0.7
VA Existing	1575	Base High Bay Lighting, LED lighting	0.5	0.0	2.5	1.0	0.4	0.5	2.8	0.8	0.2	0.3	0.3	0.2
VA Existing	1600	Base CFL Exit Sign	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
VA Existing	1650	Base Area Lighting, Outdoor HID	4.5	3.1	3.0	5.1	0.9	2.2	2.7	1.6	2.5	3.4	2.4	3.4
VA Existing	1700	Base General Service Screw-in, Outdoor CFL	0.3	0.2	0.2	0.4	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2
VA Existing	1750	Base General Service Screw-in, Outdoor Incandescent/Halogen	0.9	0.7	0.6	1.1	0.2	0.5	0.6	0.3	0.5	0.7	0.5	0.7
VA Existing	1800	Base General Service Screw-in, Outdoor LED bulb	0.2	0.1	0.1	0.2	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.2
VA Existing	1850	Base Linear Lighting, Outdoor Fluorescent Tube	0.6	0.4	0.4	0.7	0.1	0.3	0.3	0.2	0.3	0.4	0.3	0.4
VA Existing	1900	Base Linear Lighting, Outdoor LED Tube	0.4	0.2	0.2	0.4	0.1	0.2	0.2	0.1	0.2	0.3	0.2	0.3
VA Existing	2000	Base Water-Cooled Centrifugal Chiller, 0.58 kW/ton, 500 tons	1.1	1.8	1.8	1.5	1.1	1.0	1.8	4.1	31.3	1.1	0.5	0.7
VA Existing	2100	Base DX Packaged System, EER=10.3, 10 tons	2.6	2.9	3.5	2.7	5.4	1.5	3.0	8.3	62.4	2.5	0.6	1.5
VA Existing	2150	Base DX Packaged System, 2029 Standard	2.6	2.9	3.5	2.7	5.4	1.5	3.0	8.3	62.4	2.5	0.6	1.5
VA Existing	2200	Base Heat Pump cooling (14.3 SEER, 8.2 HSPF)	2.4	2.7	3.2	2.4	4.9	1.4	2.8	7.6	28.6	2.3	0.6	1.4
VA Existing	2300	Base Split-System AC, SEER 14.5, <5.4 tons	1.9	2.1	2.5	1.9	3.9	1.1	2.2	6.0	22.5	1.8	0.5	1.1
VA Existing	2400	Base PTAC cooling, EER=10.2, 1 ton	2.6	2.9	3.5	2.6	4.9	1.2	3.0	5.5	30.9	2.4	0.6	1.4
VA Existing	2500	Base Room AC, CEER 10.9	1.0	1.1	1.4	1.3	3.2	0.7	1.4	2.8	12.4	1.0	0.4	0.9
VA Existing	2600	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	1.7	1.8	2.2	1.7	3.4	1.0	1.9	5.2	39.4	1.6	0.4	1.0
VA Existing	3100	Base Open refrigerated/freezer cases	0.0	1.1	0.0	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VA Existing	3200	Base Closed refrigerated/freezer cases	0.1	5.4	0.6	8.8	0.1	0.3	0.1	0.4	0.0	0.1	0.1	0.1
VA Existing	3300	Base Walk-in refrigeration/freezer units	0.0	30.5	0.3	40.9	1.1	0.0	0.0	0.2	0.0	0.1	0.0	0.2
VA Existing	3400	Base Large Cold Storage Area	0.0	10.2	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
VA Existing	3500	Base Reach-in Refrigerator/Freezer, Federal Standard	0.2	4.5	6.8	9.1	0.3	0.5	1.0	0.6	0.2	0.4	0.4	0.3
VA Existing	3600	Base Glass Door Reach-in Refrigerator/Freezer, Federal Standard	0.2	5.9	2.1	10.7	0.2	0.4	0.4	0.5	0.4	0.3	0.4	0.3
VA Existing	3700	Base Ice Maker, Federal Standard	0.0	1.8	0.0	0.3	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.2
VA Existing	3800	Base Residential-Type Refrigerator/Freezer, Federal Standard	0.3	0.5	0.1	0.6	0.1	0.1	0.1	0.4	0.0	0.7	0.1	1.1
VA Existing	3900	Base Compact Refrigerator, Federal Standard	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0
VA Existing	4000	Base Computer Network Server	0.5	0.3	0.1	0.2	0.1	5.7	0.3	0.0	49.4	0.7	0.0	0.8
VA Existing	4100	Base Desktop PC	0.3	0.1	0.1	0.1	0.1	0.3	0.2	0.0	0.0	0.0	0.1	0.1
VA Existing	4200	Base Laptop PC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VA Existing	4300	Base Monitor, LCD	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VA Existing	4400	Base Imaging	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VA Existing	5000	Base Water Heater, Resistance Heater, Standard Standby Wattage	0.2	4.2	0.6	0.2	0.1	0.7	0.4	2.2	0.2	0.5	0.1	0.1
VA Existing	6000	Base Non-Refrigerated Vending Machines, Federal Standard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VA Existing	6100	Base Refrigerated Vending Machines, Federal Standard	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VA Existing	6200	Base Combi Oven	0.1	4.0	0.8	2.6	0.0	0.3	3.2	1.0	1.4	0.1	0.5	0.2
VA Existing	6300	Base Convection Oven	0.7	2.1	0.6	0.7	0.1	0.5	2.2	0.1	0.6	0.4	0.2	0.2
VA Existing	6400	Base Fryer	0.7	2.5	0.3	1.2	0.2	0.2	4.4	0.2	0.3	0.4	0.4	0.4
VA Existing	6500	Base Griddle	0.1	2.9	0.6	1.9	0.0	0.2	2.3	0.7	0.5	0.1	0.3	0.1
VA Existing	6600	Base Hot Food Holding Cabinet	0.2	2.0	0.7	1.4	0.0	0.1	0.9	0.5	0.3	0.1	0.2	0.1
VA Existing	6700	Base Steamer	1.8	2.1	0.9	0.7	0.1	0.1	1.2	0.1	0.9	0.6	0.2	0.2
VA Existing	7000	Base Electric Boiler, Federal Standard	3.2	11.4	6.4	5.9	3.9	5.5	4.6	25.4	92.4	4.1	0.9	3.3
VA Existing	7100	Base Electric Furnace, Federal Standard	3.2	11.4	6.4	5.9	3.9	5.5	4.6	25.4	92.4	4.1	0.9	3.3

MEASURE COSTS

Segment	End Use	Measure #	Measure Description	First Year	Last Year	Savings Units	Cost Units	Unit Equipment Cost	Unit Labor Cost	NPV of Lifetime O & M Cost	Implementation Cost Factor	Type RET or ROB	Full = 1 Incr. = 0 Initial Cost	Replace Cost	Service Life	Full Unit Cost	ergy Reduction Factors WON	SON	SOFF	WOFF
VA Existing	Indoor Lighting	1000	Base Linear Lighting, Fluorescent Fixture, 2L4'T12	2024	2028	sqft	fixture				0	ROB	1	1	18	0	1.1	1.1	0.939	0.939
VA Existing	Indoor Lighting	1001	High Performance Lighting R/R - Combined Strategies (Base T12)	2024	2028	sqft	sqft	0.2			0.2	ROB	1	1	15	0.2	0.8	0.8	1.123	1.123
VA Existing	Indoor Lighting	1002	ROB 2L4' LED Tube (Base T12)	2024	2028	sqft	fixture	20	0	-7.4269	20	ROB	1	1	50000	12.5731	1.1	1.1	0.939	0.939
VA Existing	Indoor Lighting	1003	LED Troffer (Base T12)	2024	2028	sqft	fixture	75	15	-7.4269	90	RET	1	1	50000	82.5731	1.1	1.1	0.939	0.939
VA Existing	Indoor Lighting	1004	LED Troffer with lamp removal (T12)	2024	2028	sqft	fixture	56.25	11.25	-7.4269	67.5	RET	1	1	18	60.0731	1.1	1.1	0.939	0.939
VA Existing	Indoor Lighting	1005	Lighting Control Tuneup (Base T12)	2024	2028	sqft	sqft		0.0144		0.0144	RET	1	1	6	0.0144	0.5	0.5	1.307	1.307
VA Existing	Indoor Lighting	1006	Network Lighting Controls (Base T12)	2024	2028	sqft	sqft	1.8225	0		1.8225	RET	1	1	9	1.8225	0.5	0.5	1.307	1.307
VA Existing	Indoor Lighting	1007	Occupancy Sensor (Base T12)	2024	2028	sqft	sqft	0.3227			0.3227	RET	1	1	10	0.3227	0.25	0.25	1.46	1.46
VA Existing	Indoor Lighting	1050	Base Linear Lighting, Fluorescent Fixture, 2L4'T12, integrated market	2024	2028	sqft	fixture				0	ROB	1	1	18	0	1	1	1	1
VA Existing	Indoor Lighting	1051	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	2024	2028	sqft	fixture	100			100	RET	1	1	18	100	0.75	0.75	1.153	1.153
VA Existing	Indoor Lighting	1100	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB	2024	2028	sqft	fixture				0	ROB	1	1	18	0	1	1	1	1
VA Existing	Indoor Lighting	1101	High Performance Lighting R/R - Combined Strategies (Base T8)	2024	2028	sqft	sqft	0.2			0.2	ROB	1	1	15	0.2	0.8	0.8	1.123	1.123
VA Existing	Indoor Lighting	1102	ROB 2L4' LED Tube (Base T8)	2024	2028	sqft	fixture	20	0	-7.4269	20	ROB	1	1	50000	12.5731	1.1	1.1	0.939	0.939
VA Existing	Indoor Lighting	1103	LED Troffer (Base T8)	2024	2028	sqft	fixture	75	15	-7.4269	90	RET	1	1	50000	82.5731	1.1	1.1	0.939	0.939
VA Existing	Indoor Lighting	1104	LED Troffer with lamp removal (T8)	2024	2028	sqft	fixture	56.25	11.25	-7.4269	67.5	RET	1	1	18	60.0731	1.1	1.1	0.939	0.939
VA Existing	Indoor Lighting	1105	Lighting Control Tuneup (Base T8)	2024	2028	sqft	sqft		0.0144		0.0144	RET	1	1	6	0.0144	0.5	0.5	1.307	1.307
VA Existing	Indoor Lighting	1106	Network Lighting Controls (Base T8)	2024	2028	sqft	sqft	1.8225	0		1.8225	RET	1	1	9	1.8225	0.5	0.5	1.307	1.307
VA Existing	Indoor Lighting	1107	Occupancy Sensor (Base T8)	2024	2028	sqft	sqft	0.3227			0.3227	RET	1	1	10	0.3227	0.25	0.25	1.46	1.46
VA Existing	Indoor Lighting	1150	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB, integrated market	2024	2028	sqft	fixture				0	ROB	1	1	18	0	1	1	1	1
VA Existing	Indoor Lighting	1151	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	2024	2028	sqft	fixture	100			100	RET	1	1	18	100	0.75	0.75	1.153	1.153
VA Existing	Indoor Lighting	1200	Base Linear Lighting, LED Tube, 2 lamp fixture	2024	2028	sqft	fixture				0	ROB	1	1	18	0	1	1	1	1
VA Existing	Indoor Lighting	1201	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	2024	2028	sqft	sqft	0.2			0.2	ROB	1	1	15	0.2	0.8	0.8	1.123	1.123
VA Existing	Indoor Lighting	1202	Lighting Control Tuneup (Base LED Tube)	2024	2028	sqft	sqft		0.0144		0.0144	RET	1	1	6	0.0144	0.5	0.5	1.307	1.307
VA Existing	Indoor Lighting	1203	Network Lighting Controls (Base LED Tube)	2024	2028	sqft	sqft	1.8225	0		1.8225	RET	1	1	9	1.8225	0.5	0.5	1.307	1.307
VA Existing	Indoor Lighting	1204	Occupancy Sensor (Base LED tube)	2024	2028	sqft	sqft	0.3227			0.3227	RET	1	1	10	0.3227	0.25	0.25	1.46	1.46
VA Existing	Indoor Lighting	1225	Base Linear Lighting, LED Tube, 2 lamp fixture, 2028 Standard	2029	2063	sqft	fixture				0	ROB	1	1	18	0	1	1	1	1
VA Existing	Indoor Lighting	1226	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	2029	2063	sqft	sqft	0.2			0.2	ROB	1	1	15	0.2	0.8	0.8	1.123	1.123
VA Existing	Indoor Lighting	1227	Lighting Control Tuneup (Base LED Tube)	2029	2063	sqft	sqft		0.0144		0.0144	RET	1	1	6	0.0144	0.5	0.5	1.307	1.307
VA Existing	Indoor Lighting	1228	Network Lighting Controls (Base LED Tube)	2029	2063	sqft	sqft	1.8225	0		1.8225	RET	1	1	9	1.8225	0.5	0.5	1.307	1.307
VA Existing	Indoor Lighting	1229	Occupancy Sensor (Base LED tube)	2029	2063	sqft	sqft	0.3227			0.3227	RET	1	1	10	0.3227	0.25	0.25	1.46	1.46
VA Existing	Indoor Lighting	1250	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market	2024	2028	sqft	fixture				0	ROB	1	1	18	0	1	1	1	1
VA Existing	Indoor Lighting	1251	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	2024	2028	sqft	fixture	100			100	RET	1	1	18	100	0.75	0.75	1.153	1.153
VA Existing	Indoor Lighting	1275	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market, 2028 Standard	2029	2063	sqft	fixture				0	ROB	1	1	18	0	1	1	1	1
VA Existing	Indoor Lighting	1276	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	2029	2063	sqft	fixture	100			100	RET	1	1	18	100	0.75	0.75	1.153	1.153
VA Existing	Indoor Lighting	1300	Base General Service Screw-in, CFL	2024	2028	sqft	lamp				0	ROB	1	1	8000	0	1	1	1	1
VA Existing	Indoor Lighting	1301	LED screw-in replacement (base CFL)	2024	2028	sqft	lamp	2	3.77	0	5.77	RET	1	1	25000	5.77	1.1	1.1	0.939	0.939
VA Existing	Indoor Lighting	1350	Base General Service Screw-in, Incandescent/halogen	2024	2028	sqft	lamp				0	ROB	1	1	3500	0	1	1	1	1
VA Existing	Indoor Lighting	1351	LED screw-in replacement (base incandescent/halogen)	2024	2028	sqft	lamp	2	3.77	0	5.77	RET	1	1	25000	5.77	1.1	1.1	0.939	0.939
VA Existing	Indoor Lighting	1400	Base General Service Screw-in, LED bulb	2024	2028	sqft	lamp				0	ROB	1	1	25000	0	1	1	1	1
VA Existing	Indoor Lighting	1401	LED screw-in replacement (base LED)	2024	2028	sqft	lamp	2	3.77	0	5.77	RET	1	1	25000	5.77	1.1	1.1	0.939	0.939
VA Existing	Indoor Lighting	1425	Base General Service Screw-in, LED bulb, 2028 Standard	2029	2063	sqft	lamp				0	ROB	1	1	25000	0	1	1	1	1
VA Existing	Indoor Lighting	1426	LED screw-in replacement (base LED)	2029	2063	sqft	lamp	2	3.77	0	5.77	RET	1	1	25000	5.77	1.1	1.1	0.939	0.939
VA Existing	Indoor Lighting	1450	Base HID Lighting (low bay)	2024	2063	sqft	lamp				0	ROB	1	1	18	0	1	1	1	1
VA Existing	Indoor Lighting	1451	LED fixture (base Low bay HID)	2024	2063	sqft	fixture	75	15		90	RET	1	1	50000	90	1.1	1.1	0.939	0.939
VA Existing	Indoor Lighting	1452	High Performance Lighting R/R - Combined Strategies (base low bay HID)	2024	2063	sqft	sqft	0.2			0.2	ROB	1	1	15	0.2	0.8	0.8	1.123	1.123
VA Existing	Indoor Lighting	1500	Base High Bay Lighting, Fluorescent T5	2024	2063	sqft	fixture				0	ROB	1	1	18	0	1	1	1	1
VA Existing	Indoor Lighting	1501	High Performance Lighting R/R - Combined Strategies (Base T5)	2024	2063	sqft	sqft	0.2			0.2	ROB	1	1	15	0.2	0.8	0.8	1.123	1.123
VA Existing	Indoor Lighting	1502	ROB 2L4' LED Tube (Base T5)	2024	2063	sqft	fixture	20	0	-7.4269	20	ROB	1	1	50000	12.5731	1.1	1.1	0.939	0.939
VA Existing	Indoor Lighting	1503	High Bay LED Troffer (Base T5)	2024	2063	sqft	fixture	75	15	-7.4269	90	RET	1	1	50000	82.5731	1.1	1.1	0.939	0.939
VA Existing	Indoor Lighting	1504	Lighting Control Tuneup (Base T5)	2024	2063	sqft	sqft		0.0144		0.0144	RET	1	1	6	0.0144	0.5	0.5	1.307	1.307
VA Existing	Indoor Lighting	1505	Network Lighting Controls (Base T5)	2024	2063	sqft	sqft	1.8225	0		1.8225	RET	1	1	9	1.8225	0.5	0.5	1.307	1.307
VA Existing	Indoor Lighting	1506	Occupancy Sensor (Base T5)	2024	2063	sqft	sqft	0.3227			0.3227	RET	1	1	10	0.3227	0.25	0.25	1.46	1.46
VA Existing	Indoor Lighting	1525	Base High Bay Lighting, Fluorescent T5, integrated market	2024	2063	sqft	fixture				0	ROB	1	1	18	0	1	1	1	1
VA Existing	Indoor Lighting	1526	High Bay Bi-Level Programmed LED Fixture	2024	2063	sqft	fixture	60	11.25		71.25	ROB	1	1	75000	71.25	0.8	0.8	1.123	1.123
VA Existing	Indoor Lighting	1550	Base High Bay Lighting, HID lighting	2024	2063	sqft	fixture				0	ROB	1	1	18	0	1	1	1	1
VA Existing	Indoor Lighting	1551	High Bay Bi-Level Programmed LED Fixture	2024	2063	sqft	fixture	60	11.25		71.25	ROB	1	1	75000	71.25	0.8	0.8	1.123	1.123
VA Existing	Indoor Lighting	1552	High Performance Lighting R/R - Combined Strategies (base high bay HID)	2024	2063	sqft	sqft	0.2			0.2	ROB	1	1	15	0.2	0.8	0.8	1.123	1.123
VA Existing	Indoor Lighting	1575	Base High Bay Lighting, LED lighting	2024	2063		fixture				0	ROB	1	1	18	0	1	1	1	1
VA Existing	Indoor Lighting	1576	Network Lighting Controls (Base high bay LED)	2024	2063	sqft	sqft	1.8225	0		1.8225	RET	1	1	9	1.8225	0.5	0.5	1.307	1.307
VA Existing	Indoor Lighting	1577	Occupancy Sensor (Base high bay LED)	2024	2063	sqft	sqft	0.3227			0.3227	RET	1	1	10	0.3227	0.25	0.25	1.46	1.46
VA Existing	Indoor Lighting	1600	Base CFL Exit Sign	2024	2063	sqft	unit				0	ROB	1	1	18	0	1	1	1	1
VA Existing	Indoor Lighting	1601	LED Exit Sign	2024	2063	sqft	unit	26.01			26.01	RET	1	1	15	26.01	1	1	1	1
VA Existing	Outdoor Lighting	1650	Base Area Lighting, Outdoor HID	2024	2063	sqft	fixture				0	ROB	1	1	15	0	1	1	1	1
VA Existing	Outdoor Lighting	1651	LED Outdoor Area Lighting (Base Outdoor HID)	2024	2063	sqft	fixture	90	57	-56.4644	147	RET	1	1	60000	90.5356	1	1	1	1
VA Existing	Outdoor Lighting	1652	LED outdoor lighting with bi-level controls (Base Outdoor HID)	2024	2063	sqft	fixture	100	57	-56.4644	157	RET	1	1	60000	100.5356	1	1	1	1
VA Existing	Outdoor Lighting	1653	Outdoor Lighting Controls (Base Outdoor HID)	2024	2063	sqft	fixture	51	57		108	RET	1	1	18	108	3.305	3.305	0.1	0.6
VA Existing	Outdoor Lighting	1700	Base General Service Screw-in, Outdoor CFL	2024	2063	sqft	fixture				0	ROB	1	1	15	0	1	1	1	1
VA Existing	Outdoor Lighting	1701	LED outdoor lighting with bi-level controls (Base Outdoor CFL)	2024	2063	sqft	fixture	100	57	-56.4644	157	RET	1	1	60000	100.5356	1	1	1	1
VA Existing	Outdoor Lighting	1702	LED screw-in replacement (base Outdoor CFL)	2024	2063	sqft	lamp	2	3.77	0	5.77	RET	1	1	25000	5.77	1	1	1	1
VA Existing	Outdoor Lighting	1703	Outdoor Lighting Controls (Base Outdoor CFL)	2024	2063	sqft	fixture	51	57		108	RET	1	1	18	108	3.305	3.305	0.1	0.6
VA Existing	Outdoor Lighting	1750	Base General Service Screw-in, Outdoor Incandescent/Halogen	2024	2063	sqft	fixture				0	ROB	1	1	15	0	1	1	1	1
VA Existing	Outdoor Lighting	1751	LED outdoor lighting with bi-level controls (Base Outdoor Incandescent)	2024	2063	sqft	fixture	100	57	-56.4644	157	RET	1	1	60000	100.5356	1	1	1	1
VA Existing	Outdoor Lighting	1752	LED screw-in replacement (base Outdoor Incandescent)	2024	2063	sqft	lamp	2	3.77	0	5.77	RET	1	1	25000	5.77	1	1	1	1
VA Existing	Outdoor Lighting	1753	Outdoor Lighting Controls (Base Outdoor Incandescent)	2024	2063	sqft	fixture	51	57		108	RET	1	1	18	108	3.305	3.305	0.1	0.6
VA Existing	Outdoor Lighting	1800	Base General Service Screw-in, Outdoor LED bulb	2024	2063	sqft	fixture				0	ROB	1	1	15	0	1	1	1	1
VA Existing	Outdoor Lighting	1801	Outdoor Lighting Controls (Base Outdoor LED)	2024	2063	sqft	fixture	51	57		108	RET	1	1	18	108	3.305	3.305	0.1	0.6
VA Existing	Outdoor Lighting	1850	Base Linear Lighting, Outdoor Fluorescent Tube	2024	2063	sqft	fixture				0	ROB	1	1	15	0	1	1	1	1
VA Existing	Outdoor Lighting	1851	ROB 2L4' LED Tube (base outdoor fluorescent)	2024	2063	sqft	fixture	20	0	-7.4269	20	ROB	1	1	50000	12.5731	1	1	1	1
VA Existing	Outdoor Lighting	1852	LED outdoor lighting with bi-level controls (Base Outdoor Fluorescent)	2024	2063	sqft	fixture	100	57	-56.4644	157	RET	1	1	60000	100.5356	1	1	1	1
VA Existing	Outdoor Lighting	1853	Outdoor Lighting Controls (Base Outdoor Fluorescent)	2024	2063	sqft	fixture	51	57		108	RET	1	1	18	108	3.305	3.305	0.1	0.6

MEASURE COSTS

Segment	End Use	Measure #	Measure Description	First Year	Last Year	Savings Units	Cost Units	Unit Equipment Cost	Unit Labor Cost	NPV of Lifetime O & M Cost	Implementation Cost Factor	Implementati Type RET or ROB	Full = 1 Incr. = 0 Initial Cost	Replace Cost	Service Life	Full Unit Cost	ergy Reduction Factors WON	SON	SOFF	WOFF
VA Existing	Outdoor Lighting	1900	Base Linear Lighting, Outdoor LED Tube	2024	2063	sqft	fixture				0	ROB	1	1	15	0	1	1	1	1
VA Existing	Outdoor Lighting	1901	Outdoor Lighting Controls (Base Outdoor LED Tube)	2024	2063	sqft	fixture	51	57		108	RET	1	1	18	108	3.305	3.305	0.1	0.6
VA Existing	Cooling	2000	Base Water-Cooled Centrifugal Chiller, 0.58 kW/ton, 500 tons	2024	2063	sqft	ton				0	ROB	1	1	23	0	1	1	1	1
VA Existing	Cooling	2001	Centrifugal Chiller, 0.54 kW/ton, 500 tons	2024	2063	sqft	ton	54			54	ROB	1	1	23	54	1	1	1	1
VA Existing	Cooling	2002	Chiller Tune Up/Diagnostics	2024	2063	sqft	ton	17			17	RET	1	1	5	17	0.9	0.5	1.282	1.282
VA Existing	Cooling	2003	High Efficiency Chilled Water & Condenser Water Pump Motors	2024	2028	sqft	ton	19.4914			19.4914	RET	1	1	20	19.4914	1	1	1	1
VA Existing	Cooling	2004	VSD for Chiller Pumps and Towers	2024	2063	sqft	ton	32	10		42	RET	1	1	15	42	0.9	0.5	1.282	1.282
VA Existing	Cooling	2005	Ceiling/roof Insulation - Chiller	2024	2063	sqft	sf-ceiling	1.5			1.5	RET	1	1	20	1.5	1	1	1	1
VA Existing	Cooling	2006	Cool Roof - Chiller	2024	2063	sqft	sf-roof	0.25			0.25	RET	1	1	15	0.25	1	1	1	1
VA Existing	Cooling	2007	Duct Testing/Sealing - Chiller	2024	2063	sqft	ton	106.9			106.9	RET	1	1	18	106.9	1.388	0.075	1.388	1.388
VA Existing	Cooling	2008	Duct/Pipe Insulation - Chiller	2024	2063	sqft	sqft-insulation	3.0756			3.0756	RET	1	1	10	3.0756	1	1	1	1
VA Existing	Cooling	2009	EMS Optimization - Chiller	2024	2063	sqft	sqft	0	0.02	0	0.02	RET	1	1	5	0.02	1.25	0	1.459	1.459
VA Existing	Cooling	2010	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - Chiller	2024	2063	sqft	ton	126.76	0		126.76	RET	1	1	10	126.76	1.25	0	1.459	1.459
VA Existing	Cooling	2011	New Economizer - Chiller	2024	2063	sqft	ton	126.76	43.34		170.1	RET	1	1	10	170.1	1.25	0	1.459	1.459
VA Existing	Cooling	2012	Window Film (Standard) - Chiller	2024	2063	sqft	sf-window	2.6			2.6	RET	1	1	10	2.6	1.8	0.5	1.073	1.073
VA Existing	Cooling	2013	High Efficiency Windows - Chiller	2024	2063	sqft	sf-window	1.7863	0	0	1.7863	ROB	1	1	20	1.7863	1.8	0.5	1.073	1.073
VA Existing	Cooling	2100	Base DX Packaged System, EER=10.3, 10 tons	2024	2028	sqft	ton				0	ROB	1	1	15	0	1	1	1	1
VA Existing	Cooling	2101	DX Packaged System, EER=10.9, 10 tons	2024	2028	sqft	ton	54.78	0		54.78	ROB	1	1	15	54.78	1	1	1	1
VA Existing	Cooling	2102	DX Packaged System, EER=13.4, 10 tons	2024	2028	sqft	ton	74.2968	0		74.2968	ROB	1	1	15	74.2968	1	1	1	1
VA Existing	Cooling	2103	Geothermal Heat Pump, EER=13, 10 tons - DX	2024	2028	sqft	ton	800			800	RET	1	1	15	800	1	1	1	1
VA Existing	Cooling	2104	DX Tune Up/ Advanced Diagnostics	2024	2028	sqft	ton		34		34	RET	1	1	10	34	0.9	0.5	1.282	1.282
VA Existing	Cooling	2105	Refrigerant Charge Adjustment - DX	2024	2028	sqft	ton	150			150	RET	1	1	10	150	1	1	1	1
VA Existing	Cooling	2106	Ceiling/roof Insulation - DX	2024	2028	sqft	sf-ceiling	1.5			1.5	RET	1	1	20	1.5	1	1	1	1
VA Existing	Cooling	2107	Cool Roof - DX	2024	2028	sqft	sf-roof	0.25			0.25	RET	1	1	10	0.25	1	1	1	1
VA Existing	Cooling	2108	Duct Testing/Sealing - DX	2024	2028	sqft	ton	106.9			106.9	RET	1	1	18	106.9	1.388	0.075	1.388	1.388
VA Existing	Cooling	2109	Duct/Pipe Insulation - DX	2024	2028	sqft	sqft-insulation	3.0756			3.0756	RET	1	1	10	3.0756	1	1	1	1
VA Existing	Cooling	2110	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	2024	2028	sqft	unit	400	0		400	RET	1	1	10	400	1.25	0	1.459	1.459
VA Existing	Cooling	2111	Economizer Repair - DX	2024	2028	sqft	unit	800			800	RET	1	1	5	800	0.595	1.5	1.2	0.595
VA Existing	Cooling	2112	New Economizer - DX	2024	2028	sqft	ton	126.76	43.34		170.1	RET	1	1	10	170.1	1.25	0	1.46	1.46
VA Existing	Cooling	2113	Optimize Controls - DX	2024	2028	sqft	sqft		0.02	0	0.02	RET	1	1	5	0.02	0.8	0.25	1.435	1.435
VA Existing	Cooling	2114	Smart Thermostat - DX	2024	2028	sqft	ton	28.88	67		95.88	RET	1	1	8	95.88	0.8	0.25	1.435	1.435
VA Existing	Cooling	2115	Window Film (Standard) - DX	2024	2028	sqft	sf-window	2.6			2.6	RET	1	1	10	2.6	1.8	0.5	1.073	1.073
VA Existing	Cooling	2116	High Efficiency Windows - DX	2024	2028	sqft	sf-window	1.78631187	0	0	1.786311872	ROB	1	1	20	1.7863119	1	1	1	1
VA Existing	Cooling	2150	Base DX Packaged System, 2029 Standard	2029	2063	sqft	ton				0	ROB	1	1	15	0	1	1	1	1
VA Existing	Cooling	2152	DX Packaged System, EER=13.4, 10 tons	2029	2063	sqft	ton	74.2968	0		74.2968	ROB	1	1	15	74.2968	1	1	1	1
VA Existing	Cooling	2153	Geothermal Heat Pump, EER=13, 10 tons - DX	2029	2063	sqft	ton	800			800	RET	1	1	15	800	1	1	1	1
VA Existing	Cooling	2154	DX Tune Up/ Advanced Diagnostics	2029	2063	sqft	ton		34		34	RET	1	1	10	34	0.9	0.5	1.282	1.282
VA Existing	Cooling	2155	Refrigerant Charge Adjustment - DX	2029	2063	sqft	ton	150			150	RET	1	1	10	150	1	1	1	1
VA Existing	Cooling	2156	Ceiling/roof Insulation - DX	2029	2063	sqft	sf-ceiling	1.5			1.5	RET	1	1	20	1.5	1	1	1	1
VA Existing	Cooling	2157	Cool Roof - DX	2029	2063	sqft	sf-roof	0.25			0.25	RET	1	1	10	0.25	1	1	1	1
VA Existing	Cooling	2158	Duct Testing/Sealing - DX	2029	2063	sqft	ton	106.9			106.9	RET	1	1	18	106.9	1.388	0.075	1.388	1.388
VA Existing	Cooling	2159	Duct/Pipe Insulation - DX	2029	2063	sqft	sqft-insulation	3.0756			3.0756	RET	1	1	10	3.0756	1	1	1	1
VA Existing	Cooling	2160	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	2029	2063	sqft	unit	400	0		400	RET	1	1	10	400	1.25	0	1.459	1.459
VA Existing	Cooling	2161	Economizer Repair - DX	2029	2063	sqft	unit	800			800	RET	1	1	5	800	0.595	1.5	1.2	0.595
VA Existing	Cooling	2162	New Economizer - DX	2029	2063	sqft	ton	126.76	43.34		170.1	RET	1	1	10	170.1	1.25	0	1.46	1.46
VA Existing	Cooling	2163	Optimize Controls - DX	2029	2063	sqft	sqft		0.02	0	0.02	RET	1	1	5	0.02	0.8	0.25	1.435	1.435
VA Existing	Cooling	2164	Smart Thermostat - DX	2029	2063	sqft	ton	28.88	67		95.88	RET	1	1	8	95.88	0.8	0.25	1.435	1.435
VA Existing	Cooling	2165	Window Film (Standard) - DX	2029	2063	sqft	sf-window	2.6			2.6	RET	1	1	10	2.6	1.8	0.5	1.073	1.073
VA Existing	Cooling	2166	High Efficiency Windows - DX	2029	2063	sqft	sf-window	1.78631187	0	0	1.786311872	ROB	1	1	20	1.7863119	1	1	1	1
VA Existing	Cooling	2200	Base Heat Pump cooling (14.3 SEER, 8.2 HSPF)	2024	2063	sqft	ton				0	ROB	1	1	15	0	1	1	1	1
VA Existing	Cooling	2201	Heat Pump Upgrade (18 SEER, 8.2 HSPF), cooling	2024	2063	sqft	ton	133.6632			133.6632	ROB	1	1	15	133.6632	1	1	1	1
VA Existing	Cooling	2202	Mini-Split Heat Pump (Base Heat Pump Cooling)	2024	2063	sqft	ton	267			267	ROB	1	1	15	267	1	1	1	1
VA Existing	Cooling	2203	Ceiling/roof Insulation (Base Heat Pump Cooling)	2024	2063	sqft	sf-ceiling	1.5			1.5	RET	1	1	20	1.5	1	1	1	1
VA Existing	Cooling	2204	Duct/Pipe Insulation (Base Heat Pump Cooling)	2024	2063	sqft	sqft-insulation	3.0756			3.0756	RET	1	1	10	3.0756	1	1	1	1
VA Existing	Cooling	2205	Smart Thermostat (Base Heat Pump Cooling)	2024	2063	sqft	ton	28.88	67		95.88	RET	1	1	8	95.88	0.8	0.25	1.435	1.435
VA Existing	Cooling	2206	Window Film (Standard) (Base Heat Pump Cooling)	2024	2063	sqft	sf-window	2.6			2.6	RET	1	1	10	2.6	1.8	0.5	1.073	1.073
VA Existing	Cooling	2207	High Efficiency Windows (Base Heat Pump Cooling)	2024	2063	sqft	sf-window	1.78631187	0	0	1.786311872	ROB	1	1	20	1.7863119	1	1	1	1
VA Existing	Cooling	2300	Base Split-System AC, SEER 14.5, <5.4 tons	2024	2063	sqft	ton				0	ROB	1	1	15	0	1	1	1	1
VA Existing	Cooling	2301	Split System Air Conditioner, SEER 16.0 ENERGY STAR, <5.4 tons	2024	2063	sqft	ton	232.5			232.5	ROB	1	1	15	232.5	1	1	1	1
VA Existing	Cooling	2302	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Residential Split-System)	2024	2063	sqft	ton	267			267	ROB	1	1	15	267	1	1	1	1
VA Existing	Cooling	2303	Ceiling/roof Insulation (Base Residential Split-System)	2024	2063	sqft	sf-ceiling	1.5			1.5	RET	1	1	20	1.5	1	1	1	1
VA Existing	Cooling	2304	Duct/Pipe Insulation (Base Residential Split-System)	2024	2063	sqft	sqft-insulation	3.0756			3.0756	RET	1	1	10	3.0756	1	1	1	1
VA Existing	Cooling	2305	Smart Thermostat (Base Residential Split-System)	2024	2063	sqft	ton	28.88	67		95.88	RET	1	1	8	95.88	0.8	0.25	1.435	1.435
VA Existing	Cooling	2306	Window Film (Standard) (Base Residential Split-System)	2024	2063	sqft	sf-window	2.6			2.6	RET	1	1	10	2.6	1.8	0.5	1.073	1.073
VA Existing	Cooling	2400	Base PTAC cooling, EER=10.2, 1 ton	2024	2063	sqft	ton				0	ROB	1	1	15	0	1	1	1	1
VA Existing	Cooling	2401	HE PTAC, EER=9.6, 1 ton, cooling	2024	2063	sqft	ton	117			117	ROB	1	1	15	117	1	1	1	1
VA Existing	Cooling	2402	Ceiling/roof Insulation (Base PTAC)	2024	2063	sqft	sf-ceiling	1.5			1.5	RET	1	1	20	1.5	1	1	1	1
VA Existing	Cooling	2404	Occupancy Sensor (hotels)	2024	2063	sqft	ton	280			280	RET	1	1	10	280	1	1	1	1
VA Existing	Cooling	2405	Window Film (Standard) (Base PTAC)	2024	2063	sqft	sf-window	2.6			2.6	RET	1	1	10	2.6	1.8	0.5	1.073	1.073
VA Existing	Cooling	2500	Base Room AC, CEER 10.9	2024	2063	sqft	ton				0	ROB	1	1	15	0	1	1	1	1
VA Existing	Cooling	2501	Room AC, CEER 12.0 ENERGY STAR	2024	2063	sqft	ton	232.5			232.5	ROB	1	1	15	232.5	1	1	1	1
VA Existing	Cooling	2502	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Room AC)	2024	2063	sqft	ton	267			267	ROB	1	1	15	267	1	1	1	1
VA Existing	Cooling	2503	Ceiling/roof Insulation (Base Room AC)	2024	2063	sqft	sf-ceiling	1.5			1.5	RET	1	1	20	1.5	1	1	1	1
VA Existing	Cooling	2505	Window Film (Standard) (Base Room AC)	2024	2063	sqft	sf-window	2.6			2.6	RET	1	1	10	2.6	1.8	0.5	1.073	1.073
VA Existing	Cooling	2506	High Efficiency Windows (Base Room AC)	2024	2063	sqft	sf-window	1.7863	0	0	1.7863	ROB	1	1	20	1.7863	1.8	0.5	1.073	1.073
VA Existing	Cooling	2600	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	2024	2063	sqft	ton				0	ROB	1	1	15	0	1	1	1	1
VA Existing	Cooling	2601	Ceiling/roof Insulation (Base Ductless Mini-split)	2024	2063	sqft	sf-ceiling	1.5			1.5	RET	1	1	20	1.5	1	1	1	1
VA Existing	Cooling	2603	Window Film (Standard) (Base Ductless Mini-split)	2024	2063	sqft	sf-window	2.6			2.6	RET	1	1	10	2.6	1.8	0.5	1.073	1.073
VA Existing	Cooling	2604	High Efficiency Windows (Base Ductless Mini-split)	2024	2063	sqft	sf-window	1.7863	0	0	1.7863	ROB	1	1	20	1.7863	1.8	0.5	1.073	1.073
VA Existing	Refrigeration	3100	Base Open refrigerated/freezer cases	2024	2063	sqft	unit				0	ROB	1	1	16	0	1	1	1	1

MEASURE COSTS

Segment	End Use	Measure #	Measure Description	First Year	Last Year	Savings Units	Cost Units	Unit Equipment Cost	Unit Labor Cost	NPV of Lifetime O & M Cost	Implementation Cost Factor	Implementati Type RET or ROB	Full = 1 Incr. = 0 Initial Cost	Replace Cost	Service Life	Full Unit Cost	ergy Reduction Factors WON	SON	SOFF	WOFF
VA Existing	Refrigeration	3101	Efficient compressor motor, open cases	2024	2063	sqft	HP	43			43	ROB	1	1	15	43	1	1	1	1
VA Existing	Refrigeration	3102	Bi-level LED Case Lighting (self-contained units), open cases	2024	2063	sqft	lin ft display case	45.5	0		45.5	RET	1	1	8	45.5	1	1	1	1
VA Existing	Refrigeration	3103	Compressor VSD retrofit, open cases	2024	2063	sqft	HP	214	171		385	RET	1	1	13	385	0.9	0.5	1.106	1.106
VA Existing	Refrigeration	3104	Demand Defrost Electric, open cases	2024	2063	sqft	unit	686.3426	0		686.3426	RET	1	1	10	686.3426	1	1	1	1
VA Existing	Refrigeration	3105	Demand Hot Gas Defrost, open cases	2024	2063	sqft	unit	517.2437	0		517.2437	RET	1	1	10	517.2437	1	1	1	1
VA Existing	Refrigeration	3106	Electronically commutated evaporator fan motor, open cases	2024	2063	sqft	motor	220.0773			220.0773	RET	1	1	15	220.0773	0.65	0.65	1.133	1.133
VA Existing	Refrigeration	3107	High-efficiency fan motors, open cases	2024	2063	sqft	motor	220.0773	0		220.0773	RET	1	1	15	220.0773	1	1	1	1
VA Existing	Refrigeration	3108	Insulated suction lines, open cases	2024	2063	sqft	ft. of suction line	6	0		6	RET	1	1	11	6	1	1	1	1
VA Existing	Refrigeration	3109	LED Display Lighting, open cases	2024	2063	sqft	lin ft display case	36	0		36	RET	1	1	8	36	1	1	1	1
VA Existing	Refrigeration	3110	Multiplex Compressor System, open cases	2024	2063	sqft	tons	1750	0		1750	RET	1	1	14	1750	1	1	1	1
VA Existing	Refrigeration	3111	Night covers for display cases, open cases	2024	2063	sqft	linear ft. display	9.25	0	43.2948	9.25	RET	1	1	5	52.5448	0	0	1.38	1.38
VA Existing	Refrigeration	3112	Oversized Air Cooled Condenser, open cases	2024	2063	sqft	tons	350	0		350	RET	1	1	16	350	1	1	1	1
VA Existing	Refrigeration	3113	Refrigeration Coil Cleaning, open cases	2024	2063	sqft	Unit	0	346.358	0	346.3581	RET	1	1	5	346.3581	1	1	1	1
VA Existing	Refrigeration	3114	Refrigeration Commissioning, open cases	2024	2063	sqft	Ton of Load	113	0		113	RET	1	1	3	113	1	1	1	1
VA Existing	Refrigeration	3200	Base Closed refrigerated/freezer cases	2024	2063	sqft	unit				0	ROB	1	1	16	0	1	1	1	1
VA Existing	Refrigeration	3201	Efficient compressor motor, base closed cases	2024	2063	sqft	HP	43			43	ROB	1	1	15	43	1	1	1	1
VA Existing	Refrigeration	3202	Energy-Star Refrigerator/Freezer, base closed cases	2024	2063	sqft	unit	328	0		328	ROB	1	1	12	328	1	1	1	1
VA Existing	Refrigeration	3203	Anti-sweat (humidistat) controls, base closed cases	2024	2063	sqft	40,000 sqft store	6500	0		6500	RET	1	1	12	6500	1	1	1	1
VA Existing	Refrigeration	3204	Bi-level LED Case Lighting (self-contained units), base closed cases	2024	2063	sqft	lin ft glass doors	45.5	0		45.5	RET	1	1	8	45.5	1	1	1	1
VA Existing	Refrigeration	3205	Compressor VSD retrofit, base closed cases	2024	2063	sqft	HP	214	171		385	RET	1	1	13	385	0.9	0.5	1.106	1.106
VA Existing	Refrigeration	3206	Demand Defrost Electric, base closed cases	2024	2063	sqft	unit	686.3426	0		686.3426	RET	1	1	10	686.3426	1	1	1	1
VA Existing	Refrigeration	3207	Demand Hot Gas Defrost, base closed cases	2024	2063	sqft	unit	517.2437	0		517.2437	RET	1	1	10	517.2437	1	1	1	1
VA Existing	Refrigeration	3208	Electronically commutated evaporator fan motor, base closed cases	2024	2063	sqft	motor	220.0773			220.0773	RET	1	1	15	220.0773	0.65	0.65	1.133	1.133
VA Existing	Refrigeration	3209	Freezer-Cooler Replacement Gaskets, base closed cases	2024	2063	sqft	lin ft doors	8	0		8	RET	1	1	4	8	1	1	1	1
VA Existing	Refrigeration	3210	High R-Value Glass Doors, base closed cases	2024	2063	sqft	lin ft glass doors	100.28	0		100.28	RET	1	1	10	100.28	1	1	1	1
VA Existing	Refrigeration	3211	High-efficiency fan motors, base closed cases	2024	2063	sqft	motor	220.0773	0		220.0773	RET	1	1	15	220.0773	1	1	1	1
VA Existing	Refrigeration	3212	Insulated suction lines, base closed cases	2024	2063	sqft	ft. of suction line	6	0		6	RET	1	1	11	6	1	1	1	1
VA Existing	Refrigeration	3213	LED Display Lighting, base closed cases	2024	2063	sqft	lin ft glass doors	36	0		36	RET	1	1	8	36	1	1	1	1
VA Existing	Refrigeration	3214	Low or Anti-Sweat Door Film, base closed cases	2024	2063	sqft	sqft film	2.6683	0		2.6683	RET	1	1	10	2.6683	1	1	1	1
VA Existing	Refrigeration	3215	Multiplex Compressor System, base closed cases	2024	2063	sqft	tons	1750	0		1750	RET	1	1	14	1750	1	1	1	1
VA Existing	Refrigeration	3216	Oversized Air Cooled Condenser, base closed cases	2024	2063	sqft	tons	350	0		350	RET	1	1	16	350	1	1	1	1
VA Existing	Refrigeration	3217	Refrigeration Coil Cleaning, base closed cases	2024	2063	sqft	Unit	0	346.358	0	346.3581	RET	1	1	5	346.3581	1	1	1	1
VA Existing	Refrigeration	3218	Refrigeration Commissioning, base closed cases	2024	2063	sqft	Ton of Load	113	0		113	RET	1	1	3	113	1	1	1	1
VA Existing	Refrigeration	3300	Base Walk-in refrigeration/freezer units	2024	2063	sqft	unit				0	ROB	1	1	16	0	1	1	1	1
VA Existing	Refrigeration	3301	Efficient compressor motor, walk-ins	2024	2063	sqft	HP	43			43	ROB	1	1	15	43	1	1	1	1
VA Existing	Refrigeration	3302	Auto-closer on main door to walk-in freezer	2024	2063	sqft	unit	163.1555			163.1555	RET	1	1	8	163.1555	1	1	1	1
VA Existing	Refrigeration	3303	Compressor VSD retrofit, walk-ins	2024	2063	sqft	HP	214	171		385	RET	1	1	13	385	0.9	0.5	1.106	1.106
VA Existing	Refrigeration	3304	Demand Defrost Electric, walk-ins	2024	2063	sqft	unit	686.3426	0		686.3426	RET	1	1	10	686.3426	1	1	1	1
VA Existing	Refrigeration	3305	Demand Hot Gas Defrost, walk-ins	2024	2063	sqft	unit	517.2437	0		517.2437	RET	1	1	10	517.2437	1	1	1	1
VA Existing	Refrigeration	3306	Electronically commutated evaporator fan motor, walk-ins	2024	2063	sqft	motor	220.0773			220.0773	RET	1	1	15	220.0773	0.65	0.65	1.133	1.133
VA Existing	Refrigeration	3307	Evaporator fan controller for MT walk-ins	2024	2063	sqft	controller	1050	0		1050	RET	1	1	16	1050	1	1	1	1
VA Existing	Refrigeration	3308	Floating head pressure controls, walk-ins	2024	2063	sqft	circuit	432.6943	0		432.6943	RET	1	1	14	432.6943	1	1	1	1
VA Existing	Refrigeration	3309	Freezer-Cooler Replacement Gaskets, walk-ins	2024	2063	sqft	lin ft doors	8	0		8	RET	1	1	4	8	1	1	1	1
VA Existing	Refrigeration	3310	High-efficiency fan motors, walk-ins	2024	2063	sqft	motor	220.0773	0		220.0773	RET	1	1	15	220.0773	1	1	1	1
VA Existing	Refrigeration	3311	Insulated suction lines, walk-ins	2024	2063	sqft	ft. of suction line	6	0		6	RET	1	1	11	6	1	1	1	1
VA Existing	Refrigeration	3312	Multiplex Compressor System, walk-ins	2024	2063	sqft	tons	1750	0		1750	RET	1	1	14	1750	1	1	1	1
VA Existing	Refrigeration	3313	Oversized Air Cooled Condenser, walk-ins	2024	2063	sqft	tons	700	0		700	RET	1	1	16	700	1	1	1	1
VA Existing	Refrigeration	3314	Refrigeration Coil Cleaning, walk-ins	2024	2063	sqft	tons	0	1212.25	0	1212.2535	RET	1	1	5	1212.2535	1	1	1	1
VA Existing	Refrigeration	3315	Refrigeration Commissioning, walk-ins	2024	2063	sqft	Ton of Load	113	0		113	RET	1	1	3	113	1	1	1	1
VA Existing	Refrigeration	3316	Strip curtains for walk-ins	2024	2063	sqft	unit	100.2134	0		100.2134	RET	1	1	4	100.2134	1	1	1	1
VA Existing	Refrigeration	3400	Base Large Cold Storage Area	2024	2063	sqft	unit				0	ROB	1	1	16	0	1	1	1	1
VA Existing	Refrigeration	3401	Efficient compressor motor, base large cold storage	2024	2063	sqft	HP	43			43	ROB	1	1	15	43	1	1	1	1
VA Existing	Refrigeration	3402	Auto-closer on main door to walk-in freezer, base large cold storage	2024	2063	sqft	unit	163.1555			163.1555	RET	1	1	8	163.1555	1	1	1	1
VA Existing	Refrigeration	3403	Compressor VSD retrofit, base large cold storage	2024	2063	sqft	HP	214	171		385	RET	1	1	13	385	0.9	0.5	1.106	1.106
VA Existing	Refrigeration	3404	Electronically commutated evaporator fan motor, base large cold storage	2024	2063	sqft	motor	220.0773			220.0773	RET	1	1	15	220.0773	0.65	0.65	1.133	1.133
VA Existing	Refrigeration	3405	Evaporator fan controller for MT walk-ins, base large cold storage	2024	2063	sqft	controller	1050	0		1050	RET	1	1	16	1050	1	1	1	1
VA Existing	Refrigeration	3406	High-efficiency fan motors, base large cold storage	2024	2063	sqft	motor	220.0773	0		220.0773	RET	1	1	15	220.0773	1	1	1	1
VA Existing	Refrigeration	3407	Insulated suction lines, base large cold storage	2024	2063	sqft	ft. of suction line	6	0		6	RET	1	1	11	6	1	1	1	1
VA Existing	Refrigeration	3408	Multiplex Compressor System, base large cold storage	2024	2063	sqft	tons	1750	0		1750	RET	1	1	14	1750	1	1	1	1
VA Existing	Refrigeration	3409	Oversized Air Cooled Condenser, base large cold storage	2024	2063	sqft	tons	350	0		350	RET	1	1	16	350	1	1	1	1
VA Existing	Refrigeration	3410	Refrigeration Coil Cleaning, base large cold storage	2024	2063	sqft	tons	0	909.19	0	909.1901	RET	1	1	5	909.1901	1	1	1	1
VA Existing	Refrigeration	3411	Refrigeration Commissioning, base large cold storage	2024	2063	sqft	Ton of Load	113	0		113	RET	1	1	3	113	1	1	1	1
VA Existing	Refrigeration	3412	Strip curtains for walk-ins, base large cold storage	2024	2063	sqft	unit	100.2134	0		100.2134	RET	1	1	4	100.2134	1	1	1	1
VA Existing	Refrigeration	3500	Base Reach-in Refrigerator/Freezer, Federal Standard	2024	2063	sqft	unit				0	ROB	1	1	15	0	1	1	1	1
VA Existing	Refrigeration	3501	Energy Star solid door reach-in refrigerator/freezer	2024	2063	sqft	unit	50			50	ROB	1	1	15	50	1	1	1	1
VA Existing	Refrigeration	3502	Freezer-Cooler Replacement Gaskets, base reach-in	2024	2063	sqft	lin ft doors	8	0		8	RET	1	1	4	8	1	1	1	1
VA Existing	Refrigeration	3503	Refrigeration Coil Cleaning, base base reach-in	2024	2063	sqft	unit	0	43.2948	0	43.2948	RET	1	1	5	43.2948	1	1	1	1
VA Existing	Refrigeration	3600	Base Glass Door Reach-in Refrigerator/Freezer, Federal Standard	2024	2063	sqft	unit				0	ROB	1	1	15	0	1	1	1	1
VA Existing	Refrigeration	3601	Energy Star glass door reach-in refrigerator/freezer	2024	2063	sqft	unit	100	0		100	RET	1	1	15	100	1	1	1	1
VA Existing	Refrigeration	3602	Bi-level LED Case Lighting, base glass-door reach-in	2024	2063	sqft	lin ft glass doors	45.5	0		45.5	RET	1	1	8	45.5	1	1	1	1
VA Existing	Refrigeration	3603	Freezer-Cooler Replacement Gaskets, base glass-door reach-in	2024	2063	sqft	lin ft doors	8	0		8	RET	1	1	4	8	1	1	1	1
VA Existing	Refrigeration	3604	Refrigeration Coil Cleaning, base glass-door reach-in	2024	2063	sqft	unit	0	43.2948	0	43.2948	RET	1	1	5	43.2948	1	1	1	1
VA Existing	Refrigeration	3700	Base Ice Maker, Federal Standard	2024	2063	sqft	unit				0	ROB	1	1	10	0	1	1	1	1
VA Existing	Refrigeration	3701	Energy Star Ice Machines	2024	2063	sqft	unit	200	0		200	RET	1	1	10	200	1	1	1	1
VA Existing	Refrigeration	3702	Refrigeration Coil Cleaning, base ice maker	2024	2063	sqft	unit	0	43.2948	0	43.2948	RET	1	1	5	43.2948	1	1	1	1
VA Existing	Refrigeration	3800	Base Residential-Type Refrigerator/Freezer, Federal Standard	2024	2063	sqft	unit				0	ROB	1	1	18	0	1	1	1	1
VA Existing	Refrigeration	3801	Energy Star refrigerator/freezer	2024	2063	sqft	unit	79			79	ROB	1	1	18	79	1	1	1	1
VA Existing	Refrigeration	3802	Refrigeration Coil Cleaning, residential-type refrigerator	2024	2063	sqft	unit	0	43.2948	0	43.2948	RET	1	1	5	43.2948	1	1	1	1
VA Existing	Refrigeration	3900	Base Compact Refrigerator, Federal Standard	2024	2063	sqft	unit				0	ROB	1	1	14	0	1	1	1	1
VA Existing	Refrigeration	3901	Energy Star Compact Refrigerator	2024	2063	sqft	unit	18			18	ROB	1	1	14	18	1	1	1	1

MEASURE COSTS

Segment	End Use	Measure #	Measure Description	First Year	Last Year	Savings Units	Cost Units	Unit Equipment Cost	Unit Labor Cost	NPV of Lifetime O & M Cost	Implementation Cost Factor	Implementati Type RET or ROB	Full = 1 Incr. = 0 Initial Cost	Replace Cost	Service Life	Full Unit Cost	ergy Reduction Factors WON	SON	SOFF	WOFF
VA Existing	Refrigeration	3902	Refrigeration Coil Cleaning, compact refrigerator	2024	2063	sqft	unit	0	43.2948	0	43.2948	RET	1	1	5	43.2948	1	1	1	1
VA Existing	Office Equipment	4000	Base Computer Network Server	2024	2063	sqft	PC				0	ROB	1	1	4	0	1	1	1	1
VA Existing	Office Equipment	4001	Energy Star server	2024	2063	sqft	PC	20	0		20	ROB	1	1	4	20	0.75	0.5	1.19	1.15
VA Existing	Office Equipment	4002	Server Power Management Enabling	2024	2063	sqft	PC	0	20		20	RET	1	1	4	20	1	1	1	1
VA Existing	Office Equipment	4100	Base Desktop PC	2024	2063	sqft	PC				0	ROB	1	1	4	0	1	1	1	1
VA Existing	Office Equipment	4101	Energy Star or Better PC	2024	2063	sqft	PC	10	0		10	ROB	1	1	4	10	1	1	1	1
VA Existing	Office Equipment	4102	PC Network Power Management Enabling	2024	2063	sqft	PC	0	20		20	RET	1	1	4	20	0.75	0.5	1.19	1.15
VA Existing	Office Equipment	4200	Base Laptop PC	2024	2063	sqft	PC				0	ROB	1	1	4	0	1	1	1	1
VA Existing	Office Equipment	4201	Energy Star or Better Laptop	2024	2063	sqft	PC	2	0		2	ROB	1	1	4	2	1	1	1	1
VA Existing	Office Equipment	4202	Laptop Network Power Management Enabling	2024	2063	sqft	PC	0	20		20	RET	1	1	4	20	0.75	0.5	1.19	1.15
VA Existing	Office Equipment	4300	Base Monitor, LCD	2024	2063	sqft	Monitor				0	ROB	1	1	4	0	1	1	1	1
VA Existing	Office Equipment	4301	Energy Star or Better Monitor - LCD	2024	2063	sqft	Monitor	1	0		1	ROB	1	1	4	1	1	1	1	1
VA Existing	Office Equipment	4302	Monitor Power Management Enabling - LCD	2024	2063	sqft	Monitor	0	8		8	RET	1	1	4	8	0.75	0.5	1.19	1.15
VA Existing	Office Equipment	4303	Plug-load controls - Commercial Smart Strip (base monitor LCD)	2024	2063	sqft	unit	15			15	RET	1	1	10	15	0.5	0.25	1.276	1.276
VA Existing	Office Equipment	4400	Base Imaging	2024	2063	sqft	unit				0	ROB	1	1	6	0	1	1	1	1

Commercial Elec Measure Inputs			APPLICABILITY FACTOR (percent)												
Segment	Measure #	Measure Description	Office Building Type	Restaurant Building Type 2	Retail Building Type 3	Grocery Building Type 4	Warehouse Building Type 5	Education Building Type 6	Health Building Type	Lodging Building Type	Data Centers Building Type 9	Non-Jurisdictional Building Type 10	Religious Worship Building Type 11	Misc Building Type 1
VA Existing	1000	Base Linear Lighting, Fluorescent Fixture, 2L4'T12	6%	4%	6%	2%	3%	6%	6%	4%	0%	4%	4%	2%
VA Existing	1001	High Performance Lighting R/R - Combined Strategies (Base T12)	2%	2%	2%	1%	1%	2%	2%	2%	0%	1%	2%	1%
VA Existing	1002	ROB 2L4' LED Tube (Base T12)	2%	2%	2%	1%	1%	2%	2%	2%	0%	1%	2%	1%
VA Existing	1003	LED Troffer (Base T12)	1%	1%	1%	0%	0%	1%	1%	1%	0%	1%	1%	0%
VA Existing	1004	LED Troffer with lamp removal (T12)	1%	1%	1%	0%	0%	1%	1%	1%	0%	1%	1%	0%
VA Existing	1005	Lighting Control Tuneup (Base T12)	3%	0%	2%	2%	1%	1%	2%	2%	0%	4%	2%	1%
VA Existing	1006	Network Lighting Controls (Base T12)	6%	4%	6%	2%	3%	6%	6%	4%	0%	4%	4%	2%
VA Existing	1007	Occupancy Sensor (Base T12)	6%	4%	6%	2%	3%	6%	6%	4%	0%	4%	4%	2%
VA Existing	1050	Base Linear Lighting, Fluorescent Fixture, 2L4'T12, integrated market	6%	4%	6%	2%	3%	6%	6%	0%	0%	4%	4%	2%
VA Existing	1051	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	6%	4%	6%	2%	3%	6%	6%	0%	0%	4%	4%	2%
VA Existing	1100	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB	10%	4%	5%	2%	11%	15%	11%	7%	8%	5%	16%	3%
VA Existing	1101	High Performance Lighting R/R - Combined Strategies (Base T8)	3%	1%	2%	1%	4%	5%	4%	3%	3%	2%	6%	1%
VA Existing	1102	ROB 2L4' LED Tube (Base T8)	3%	1%	2%	1%	4%	5%	4%	3%	3%	2%	6%	1%
VA Existing	1103	LED Troffer (Base T8)	1%	1%	1%	0%	2%	2%	2%	1%	1%	1%	2%	0%
VA Existing	1104	LED Troffer with lamp removal (T8)	1%	1%	1%	0%	2%	2%	2%	1%	1%	1%	2%	0%
VA Existing	1105	Lighting Control Tuneup (Base T8)	6%	0%	2%	2%	4%	3%	3%	4%	8%	5%	6%	1%
VA Existing	1106	Network Lighting Controls (Base T8)	10%	4%	5%	2%	11%	15%	11%	7%	8%	5%	16%	3%
VA Existing	1107	Occupancy Sensor (Base T8)	10%	4%	5%	2%	11%	15%	11%	7%	8%	5%	16%	3%
VA Existing	1150	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB, integrated market	10%	4%	5%	2%	11%	0%	11%	0%	8%	5%	0%	3%
VA Existing	1151	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	10%	4%	5%	2%	11%	0%	11%	0%	8%	5%	0%	3%
VA Existing	1200	Base Linear Lighting, LED Tube, 2 lamp fixture	12%	6%	16%	35%	15%	5%	12%	6%	8%	10%	20%	14%
VA Existing	1201	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	12%	6%	16%	35%	15%	5%	12%	6%	8%	10%	20%	14%
VA Existing	1202	Lighting Control Tuneup (Base LED Tube)	7%	1%	5%	35%	6%	1%	4%	3%	8%	10%	7%	4%
VA Existing	1203	Network Lighting Controls (Base LED Tube)	12%	6%	16%	35%	15%	5%	12%	6%	8%	10%	20%	14%
VA Existing	1204	Occupancy Sensor (Base LED tube)	12%	6%	16%	35%	15%	5%	12%	6%	8%	10%	20%	14%
VA Existing	1225	Base Linear Lighting, LED Tube, 2 lamp fixture, 2028 Standard	28%	14%	26%	38%	29%	26%	28%	18%	15%	20%	40%	19%
VA Existing	1226	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	28%	14%	26%	38%	29%	26%	28%	18%	15%	20%	40%	19%
VA Existing	1227	Lighting Control Tuneup (Base LED Tube)	16%	1%	9%	38%	11%	6%	9%	9%	15%	20%	15%	5%
VA Existing	1228	Network Lighting Controls (Base LED Tube)	28%	14%	26%	38%	29%	26%	28%	18%	15%	20%	40%	19%
VA Existing	1229	Occupancy Sensor (Base LED tube)	28%	14%	26%	38%	29%	26%	28%	18%	15%	20%	40%	19%
VA Existing	1250	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market	12%	6%	16%	35%	15%	5%	12%	6%	8%	10%	20%	14%
VA Existing	1251	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	12%	6%	16%	35%	15%	5%	12%	6%	8%	10%	20%	14%
VA Existing	1275	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market, 2028 Standard	28%	14%	26%	38%	29%	11%	28%	6%	15%	20%	24%	19%
VA Existing	1276	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	28%	14%	26%	38%	29%	11%	28%	6%	15%	20%	24%	19%
VA Existing	1300	Base General Service Screw-in, CFL	3%	4%	4%	1%	0%	1%	2%	6%	0%	6%	3%	11%
VA Existing	1301	LED screw-in replacement (base CFL)	3%	4%	4%	1%	0%	1%	2%	6%	0%	6%	3%	11%
VA Existing	1350	Base General Service Screw-in, Incandescent/halogen	2%	5%	7%	2%	2%	2%	2%	1%	0%	3%	5%	5%
VA Existing	1351	LED screw-in replacement (base incandescent/halogen)	2%	11%	9%	2%	3%	2%	8%	5%	0%	8%	9%	9%
VA Existing	1400	Base General Service Screw-in, LED bulb	26%	52%	23%	17%	18%	58%	34%	62%	28%	45%	20%	41%
VA Existing	1401	LED screw-in replacement (base LED)	26%	52%	23%	17%	18%	58%	34%	62%	28%	45%	20%	41%
VA Existing	1425	Base General Service Screw-in, LED bulb, 2028 Standard	31%	61%	33%	19%	21%	61%	39%	69%	28%	55%	27%	57%
VA Existing	1426	LED screw-in replacement (base LED)	31%	61%	33%	19%	21%	61%	39%	69%	28%	55%	27%	57%
VA Existing	1450	Base HID Lighting (low bay)	0%	0%	0%	0%	0%	0%	0%	0%	29%	0%	0%	0%
VA Existing	1451	LED fixture (base Low bay HID)	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%
VA Existing	1452	High Performance Lighting R/R - Combined Strategies (base low bay HID)	0%	0%	0%	0%	0%	0%	0%	0%	22%	0%	0%	0%
VA Existing	1500	Base High Bay Lighting, Fluorescent T5	2%	1%	4%	1%	4%	1%	1%	0%	0%	1%	1%	1%
VA Existing	1501	High Performance Lighting R/R - Combined Strategies (Base T5)	0%	1%	4%	1%	4%	1%	1%	0%	0%	1%	1%	1%
VA Existing	1502	ROB 2L4' LED Tube (Base T5)	1%	1%	4%	1%	4%	1%	1%	0%	0%	1%	1%	1%
VA Existing	1503	High Bay LED Troffer (Base T5)	1%	1%	4%	1%	4%	1%	1%	0%	0%	1%	1%	1%
VA Existing	1504	Lighting Control Tuneup (Base T5)	1%	0%	1%	1%	1%	0%	0%	0%	0%	1%	0%	0%
VA Existing	1505	Network Lighting Controls (Base T5)	2%	1%	4%	1%	4%	1%	1%	0%	0%	1%	1%	1%
VA Existing	1506	Occupancy Sensor (Base T5)	2%	1%	4%	1%	4%	1%	1%	0%	0%	1%	1%	1%
VA Existing	1525	Base High Bay Lighting, Fluorescent T5, integrated market	2%	1%	4%	1%	4%	1%	1%	0%	0%	1%	1%	1%
VA Existing	1526	High Bay Bi-Level Programmed LED Fixture	2%	1%	4%	1%	4%	1%	1%	0%	0%	1%	1%	1%
VA Existing	1550	Base High Bay Lighting, HID lighting	1%	1%	1%	1%	9%	0%	0%	2%	9%	1%	4%	1%
VA Existing	1551	High Bay Bi-Level Programmed LED Fixture	0%	1%	0%	1%	5%	0%	0%	1%	4%	0%	2%	1%
VA Existing	1552	High Performance Lighting R/R - Combined Strategies (base high bay HID)	0%	1%	0%	1%	5%	0%	0%	1%	4%	0%	2%	1%
VA Existing	1575	Base High Bay Lighting, LED lighting	2%	3%	0%	8%	0%	2%	0%	3%	0%	3%	10%	5%
VA Existing	1576	Network Lighting Controls (Base high bay LED)	2%	3%	0%	8%	0%	2%	0%	3%	0%	3%	10%	5%
VA Existing	1577	Occupancy Sensor (Base high bay LED)	2%	3%	0%	8%	0%	2%	0%	3%	0%	3%	10%	5%
VA Existing	1600	Base CFL Exit Sign	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1601	LED Exit Sign	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1650	Base Area Lighting, Outdoor HID	16%	11%	9%	0%	14%	3%	8%	10%	4%	15%	24%	24%
VA Existing	1651	LED Outdoor Area Lighting (Base Outdoor HID)	16%	11%	9%	0%	14%	3%	8%	10%	4%	15%	24%	24%
VA Existing	1652	LED outdoor lighting with bi-level controls (Base Outdoor HID)	16%	11%	9%	0%	14%	3%	8%	10%	4%	15%	24%	24%
VA Existing	1653	Outdoor Lighting Controls (Base Outdoor HID)	16%	11%	9%	0%	14%	3%	8%	10%	4%	15%	24%	24%
VA Existing	1700	Base General Service Screw-in, Outdoor CFL	5%	4%	4%	0%	0%	0%	1%	2%	0%	2%	7%	2%
VA Existing	1701	LED outdoor lighting with bi-level controls (Base Outdoor CFL)	5%	4%	4%	0%	0%	0%	1%	2%	0%	2%	7%	2%
VA Existing	1702	LED screw-in replacement (base Outdoor CFL)	5%	4%	4%	0%	0%	0%	1%	2%	0%	2%	7%	2%
VA Existing	1703	Outdoor Lighting Controls (Base Outdoor CFL)	5%	4%	4%	0%	0%	0%	1%	2%	0%	2%	7%	2%
VA Existing	1750	Base General Service Screw-in, Outdoor Incandescent/Halogen	13%	15%	14%	0%	7%	14%	22%	6%	75%	15%	9%	17%

Commercial Elec Measure Inputs			APPLICABILITY FACTOR (percent)												
Segment	Measure #	Measure Description	Office Building Type	Restaurant Building Type 2	Retail Building Type 3	Grocery Building Type 4	Warehouse Building Type 5	Education Building Type 6	Health Building Type	Lodging Building Type 8	Data Centers Building Type 9	Non-Jurisdictional Building Type 10	Religious Worship Building Type 11	Misc Building Type 1
VA Existing	1751	LED outdoor lighting with bi-level controls (Base Outdoor Incandescent)	13%	15%	14%	0%	7%	14%	22%	6%	75%	15%	9%	17%
VA Existing	1752	LED screw-in replacement (base Outdoor Incandescent)	13%	15%	14%	0%	7%	14%	22%	6%	75%	15%	9%	17%
VA Existing	1753	Outdoor Lighting Controls (Base Outdoor Incandescent)	13%	15%	14%	0%	7%	14%	22%	6%	75%	15%	9%	17%
VA Existing	1800	Base General Service Screw-in, Outdoor LED bulb	62%	48%	45%	0%	66%	82%	65%	62%	12%	58%	57%	39%
VA Existing	1801	Outdoor Lighting Controls (Base Outdoor LED)	62%	48%	45%	0%	66%	82%	65%	62%	12%	58%	57%	39%
VA Existing	1850	Base Linear Lighting, Outdoor Fluorescent Tube	2%	8%	22%	0%	1%	1%	1%	4%	0%	1%	0%	1%
VA Existing	1851	ROB 2L4' LED Tube (base outdoor fluorescent)	2%	8%	22%	0%	1%	1%	1%	4%	0%	1%	0%	1%
VA Existing	1852	LED outdoor lighting with bi-level controls (Base Outdoor Fluorescent)	2%	8%	22%	0%	1%	1%	1%	4%	0%	1%	0%	1%
VA Existing	1853	Outdoor Lighting Controls (Base Outdoor Fluorescent)	2%	8%	22%	0%	1%	1%	1%	4%	0%	1%	0%	1%
VA Existing	1900	Base Linear Lighting, Outdoor LED Tube	3%	7%	6%	0%	12%	0%	3%	9%	10%	7%	2%	13%
VA Existing	1901	Outdoor Lighting Controls (Base Outdoor LED Tube)	3%	7%	6%	0%	12%	0%	3%	9%	10%	7%	2%	13%
VA Existing	2000	Base Water-Cooled Centrifugal Chiller, 0.58 kW/ton, 500 tons	23%	2%	1%	0%	1%	7%	9%	28%	0%	10%	11%	9%
VA Existing	2001	Centrifugal Chiller, 0.54 kW/ton, 500 tons	23%	2%	1%	0%	1%	7%	9%	28%	0%	10%	11%	9%
VA Existing	2002	Chiller Tune Up/Diagnostics	23%	2%	1%	0%	1%	7%	9%	28%	0%	10%	11%	9%
VA Existing	2003	High Efficiency Chilled Water & Condenser Water Pump Motors	23%	2%	1%	0%	1%	7%	9%	28%	0%	10%	11%	9%
VA Existing	2004	VSD for Chiller Pumps and Towers	23%	2%	1%	0%	1%	7%	9%	28%	0%	10%	11%	9%
VA Existing	2005	Ceiling/roof Insulation - Chiller	23%	2%	1%	0%	1%	7%	9%	28%	0%	10%	11%	9%
VA Existing	2006	Cool Roof - Chiller	23%	2%	1%	0%	1%	7%	9%	28%	0%	10%	11%	9%
VA Existing	2007	Duct Testing/Sealing - Chiller	23%	2%	1%	0%	1%	7%	9%	28%	0%	10%	11%	9%
VA Existing	2008	Duct/Pipe Insulation - Chiller	23%	2%	1%	0%	1%	7%	9%	28%	0%	10%	11%	9%
VA Existing	2009	EMS Optimization - Chiller	23%	2%	1%	0%	1%	7%	9%	28%	0%	10%	11%	9%
VA Existing	2010	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - Chiller	19%	2%	1%	0%	1%	2%	4%	9%	0%	4%	1%	0%
VA Existing	2011	New Economizer - Chiller	4%	0%	0%	0%	0%	5%	5%	19%	0%	6%	10%	8%
VA Existing	2012	Window Film (Standard) - Chiller	23%	2%	1%	0%	1%	7%	9%	28%	0%	10%	11%	9%
VA Existing	2013	High Efficiency Windows - Chiller	23%	2%	1%	0%	1%	7%	9%	28%	0%	10%	11%	9%
VA Existing	2100	Base DX Packaged System, EER=10.3, 10 tons	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2101	DX Packaged System, EER=10.9, 10 tons	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2102	DX Packaged System, EER=13.4, 10 tons	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2103	Geothermal Heat Pump, EER=13, 10 tons - DX	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2104	DX Tune Up/ Advanced Diagnostics	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2105	Refrigerant Charge Adjustment - DX	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2106	Ceiling/roof Insulation - DX	35%	60%	47%	37%	23%	70%	34%	23%	0%	45%	34%	28%
VA Existing	2107	Cool Roof - DX	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2108	Duct Testing/Sealing - DX	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2109	Duct/Pipe Insulation - DX	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2110	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	29%	41%	46%	36%	15%	19%	16%	5%	72%	19%	2%	1%
VA Existing	2111	Economizer Repair - DX	29%	41%	46%	36%	15%	19%	16%	5%	72%	19%	2%	1%
VA Existing	2112	New Economizer - DX	7%	19%	0%	1%	8%	52%	18%	17%	16%	25%	33%	27%
VA Existing	2113	Optimize Controls - DX	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2114	Smart Thermostat - DX	35%	60%	47%	37%	23%	70%	34%	23%	0%	45%	34%	28%
VA Existing	2115	Window Film (Standard) - DX	35%	60%	47%	37%	23%	70%	34%	23%	0%	45%	34%	28%
VA Existing	2116	High Efficiency Windows - DX	35%	60%	47%	37%	23%	70%	34%	23%	0%	45%	34%	28%
VA Existing	2150	Base DX Packaged System, 2029 Standard	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2152	DX Packaged System, EER=13.4, 10 tons	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2153	Geothermal Heat Pump, EER=13, 10 tons - DX	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2154	DX Tune Up/ Advanced Diagnostics	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2155	Refrigerant Charge Adjustment - DX	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2156	Ceiling/roof Insulation - DX	35%	60%	47%	37%	23%	70%	34%	23%	0%	45%	34%	28%
VA Existing	2157	Cool Roof - DX	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2158	Duct Testing/Sealing - DX	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2159	Duct/Pipe Insulation - DX	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2160	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	29%	41%	46%	36%	15%	19%	16%	5%	72%	19%	2%	1%
VA Existing	2161	Economizer Repair - DX	29%	41%	46%	36%	15%	19%	16%	5%	72%	19%	2%	1%
VA Existing	2162	New Economizer - DX	7%	19%	0%	1%	8%	52%	18%	17%	16%	25%	33%	27%
VA Existing	2163	Optimize Controls - DX	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2164	Smart Thermostat - DX	35%	60%	47%	37%	23%	70%	34%	23%	0%	45%	34%	28%
VA Existing	2165	Window Film (Standard) - DX	35%	60%	47%	37%	23%	70%	34%	23%	0%	45%	34%	28%
VA Existing	2166	High Efficiency Windows - DX	35%	60%	47%	37%	23%	70%	34%	23%	0%	45%	34%	28%
VA Existing	2200	Base Heat Pump cooling (14.3 SEER, 8.2 HSPF)	23%	17%	15%	5%	9%	4%	21%	6%	1%	10%	28%	11%
VA Existing	2201	Heat Pump Upgrade (18 SEER, 8.2 HSPF), cooling	23%	17%	15%	5%	9%	4%	21%	6%	1%	10%	28%	11%
VA Existing	2202	Mini-Split Heat Pump (Base Heat Pump Cooling)	23%	17%	15%	5%	9%	4%	21%	6%	1%	10%	28%	11%
VA Existing	2203	Ceiling/roof Insulation (Base Heat Pump Cooling)	23%	17%	15%	5%	9%	4%	21%	6%	0%	10%	28%	11%
VA Existing	2204	Duct/Pipe Insulation (Base Heat Pump Cooling)	23%	17%	15%	5%	9%	4%	21%	6%	1%	10%	28%	11%
VA Existing	2205	Smart Thermostat (Base Heat Pump Cooling)	23%	17%	15%	5%	9%	4%	21%	6%	0%	10%	28%	11%
VA Existing	2206	Window Film (Standard) (Base Heat Pump Cooling)	23%	17%	15%	5%	9%	4%	21%	6%	0%	10%	28%	11%
VA Existing	2207	High Efficiency Windows (Base Heat Pump Cooling)	23%	17%	15%	5%	9%	4%	21%	6%	0%	10%	28%	11%
VA Existing	2300	Base Split-System AC, SEER 14.5, <5.4 tons	8%	4%	9%	10%	7%	5%	16%	15%	5%	16%	15%	27%
VA Existing	2301	Split System Air Conditioner, SEER 16.0 ENERGY STAR, <5.4 tons	8%	4%	9%	10%	7%	5%	16%	15%	5%	16%	15%	27%
VA Existing	2302	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Residential Split-System)	8%	4%	9%	10%	7%	5%	16%	15%	5%	16%	15%	27%
VA Existing	2303	Ceiling/roof Insulation (Base Residential Split-System)	8%	4%	9%	10%	7%	5%	16%	15%	0%	16%	15%	27%
VA Existing	2304	Duct/Pipe Insulation (Base Residential Split-System)	8%	4%	9%	10%	7%	5%	16%	15%	5%	16%	15%	27%

Commercial Elec Measure Inputs			APPLICABILITY FACTOR (percent)												
Segment	Measure #	Measure Description	Office Building Type	Restaurant Building Type 2	Retail Building Type 3	Grocery Building Type 4	Warehouse Building Type 5	Education Building Type 6	Health Building Type	Lodging Building Type	Data Centers Building Type 9	Non-Jurisdictional Building Type 10	Religious Worship Building Type 11	Misc Building Type 1
VA Existing	2305	Smart Thermostat (Base Residential Split-System)	8%	4%	9%	10%	7%	5%	16%	15%	0%	16%	15%	27%
VA Existing	2306	Window Film (Standard) (Base Residential Split-System)	8%	4%	9%	10%	7%	5%	16%	15%	0%	16%	15%	27%
VA Existing	2400	Base PTAC cooling, EER=10.2, 1 ton	2%	1%	1%	0%	0%	2%	4%	17%	1%	4%	1%	5%
VA Existing	2401	HE PTAC, EER=9.6, 1 ton, cooling	2%	1%	1%	0%	0%	2%	4%	17%	1%	4%	1%	5%
VA Existing	2402	Ceiling/roof Insulation (Base PTAC)	2%	1%	1%	0%	0%	2%	4%	17%	0%	4%	1%	5%
VA Existing	2404	Occupancy Sensor (hotels)	2%	1%	1%	0%	0%	2%	4%	17%	1%	4%	1%	5%
VA Existing	2405	Window Film (Standard) (Base PTAC)	2%	1%	1%	0%	0%	2%	4%	17%	0%	4%	1%	5%
VA Existing	2500	Base Room AC, CEER 10.9	0%	1%	2%	19%	1%	2%	12%	2%	0%	2%	3%	2%
VA Existing	2501	Room AC, CEER 12.0 ENERGY STAR	0%	1%	2%	19%	1%	2%	12%	2%	0%	2%	3%	2%
VA Existing	2502	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Room AC)	0%	1%	2%	19%	1%	2%	12%	2%	0%	2%	3%	2%
VA Existing	2503	Ceiling/roof Insulation (Base Room AC)	0%	1%	2%	19%	1%	2%	12%	2%	0%	2%	3%	2%
VA Existing	2505	Window Film (Standard) (Base Room AC)	0%	1%	2%	19%	1%	2%	12%	2%	0%	2%	3%	2%
VA Existing	2506	High Efficiency Windows (Base Room AC)	0%	1%	2%	19%	1%	2%	12%	2%	0%	2%	3%	2%
VA Existing	2600	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	2%	4%	2%	8%	3%	5%	2%	3%	0%	3%	5%	2%
VA Existing	2601	Ceiling/roof Insulation (Base Ductless Mini-split)	2%	4%	2%	8%	3%	5%	2%	3%	0%	3%	5%	2%
VA Existing	2603	Window Film (Standard) (Base Ductless Mini-split)	2%	4%	2%	8%	3%	5%	2%	3%	0%	3%	5%	2%
VA Existing	2604	High Efficiency Windows (Base Ductless Mini-split)	2%	4%	2%	8%	3%	5%	2%	3%	0%	3%	5%	2%
VA Existing	3100	Base Open refrigerated/freezer cases	4%	12%	4%	29%	0%	0%	7%	21%	0%	1%	5%	0%
VA Existing	3101	Efficient compressor motor, open cases	4%	12%	4%	29%	0%	0%	7%	21%	0%	1%	5%	0%
VA Existing	3102	Bi-level LED Case Lighting (self-contained units), open cases	4%	12%	4%	29%	0%	0%	7%	21%	0%	1%	5%	0%
VA Existing	3103	Compressor VSD retrofit, open cases	4%	12%	4%	29%	0%	0%	7%	21%	0%	1%	5%	0%
VA Existing	3104	Demand Defrost Electric, open cases	4%	12%	4%	29%	0%	0%	7%	21%	0%	1%	5%	0%
VA Existing	3105	Demand Hot Gas Defrost, open cases	4%	12%	4%	29%	0%	0%	7%	21%	0%	1%	5%	0%
VA Existing	3106	Electronically commutated evaporator fan motor, open cases	4%	12%	4%	29%	0%	0%	7%	21%	0%	1%	5%	0%
VA Existing	3107	High-efficiency fan motors, open cases	4%	12%	4%	29%	0%	0%	7%	21%	0%	1%	5%	0%
VA Existing	3108	Insulated suction lines, open cases	4%	12%	4%	29%	0%	0%	7%	21%	0%	1%	5%	0%
VA Existing	3109	LED Display Lighting, open cases	4%	12%	4%	29%	0%	0%	7%	21%	0%	1%	5%	0%
VA Existing	3110	Multiplex Compressor System, open cases	4%	12%	4%	29%	0%	0%	7%	21%	0%	1%	5%	0%
VA Existing	3111	Night covers for display cases, open cases	4%	12%	4%	29%	0%	0%	7%	21%	0%	1%	5%	0%
VA Existing	3112	Oversized Air Cooled Condenser, open cases	4%	12%	4%	29%	0%	0%	7%	21%	0%	1%	5%	0%
VA Existing	3113	Refrigeration Coil Cleaning, open cases	4%	12%	4%	29%	0%	0%	7%	21%	0%	1%	5%	0%
VA Existing	3114	Refrigeration Commissioning, open cases	4%	12%	4%	29%	0%	0%	7%	21%	0%	1%	5%	0%
VA Existing	3200	Base Closed refrigerated/freezer cases	7%	38%	10%	53%	0%	16%	14%	20%	0%	8%	31%	2%
VA Existing	3201	Efficient compressor motor, base closed cases	7%	38%	10%	53%	0%	16%	14%	20%	0%	8%	31%	2%
VA Existing	3202	Energy-Star Refrigerator/Freezer, base closed cases	7%	38%	10%	53%	0%	16%	14%	20%	0%	8%	31%	2%
VA Existing	3203	Anti-sweat (humidistat) controls, base closed cases	7%	38%	10%	53%	0%	16%	14%	20%	0%	8%	31%	2%
VA Existing	3204	Bi-level LED Case Lighting (self-contained units), base closed cases	7%	38%	10%	53%	0%	16%	14%	20%	0%	8%	31%	2%
VA Existing	3205	Compressor VSD retrofit, base closed cases	7%	38%	10%	53%	0%	16%	14%	20%	0%	8%	31%	2%
VA Existing	3206	Demand Defrost Electric, base closed cases	7%	38%	10%	53%	0%	16%	14%	20%	0%	8%	31%	2%
VA Existing	3207	Demand Hot Gas Defrost, base closed cases	7%	38%	10%	53%	0%	16%	14%	20%	0%	8%	31%	2%
VA Existing	3208	Electronically commutated evaporator fan motor, base closed cases	7%	38%	10%	53%	0%	16%	14%	20%	0%	8%	31%	2%
VA Existing	3209	Freezer-Cooler Replacement Gaskets, base closed cases	7%	38%	10%	53%	0%	16%	14%	20%	0%	8%	31%	2%
VA Existing	3210	High R-Value Glass Doors, base closed cases	7%	38%	10%	53%	0%	16%	14%	20%	0%	8%	31%	2%
VA Existing	3211	High-efficiency fan motors, base closed cases	7%	38%	10%	53%	0%	16%	14%	20%	0%	8%	31%	2%
VA Existing	3212	Insulated suction lines, base closed cases	7%	38%	10%	53%	0%	16%	14%	20%	0%	8%	31%	2%
VA Existing	3213	LED Display Lighting, base closed cases	7%	38%	10%	53%	0%	16%	14%	20%	0%	8%	31%	2%
VA Existing	3214	Low or Anti-Sweat Door Film, base closed cases	7%	38%	10%	53%	0%	16%	14%	20%	0%	8%	31%	2%
VA Existing	3215	Multiplex Compressor System, base closed cases	7%	38%	10%	53%	0%	16%	14%	20%	0%	8%	31%	2%
VA Existing	3216	Oversized Air Cooled Condenser, base closed cases	7%	38%	10%	53%	0%	16%	14%	20%	0%	8%	31%	2%
VA Existing	3217	Refrigeration Coil Cleaning, base closed cases	7%	38%	10%	53%	0%	16%	14%	20%	0%	8%	31%	2%
VA Existing	3218	Refrigeration Commissioning, base closed cases	7%	38%	10%	53%	0%	16%	14%	20%	0%	8%	31%	2%
VA Existing	3300	Base Walk-in refrigeration/freezer units	25%	85%	7%	68%	5%	13%	30%	53%	0%	11%	5%	6%
VA Existing	3301	Efficient compressor motor, walk-ins	25%	85%	7%	68%	5%	13%	30%	53%	0%	11%	5%	6%
VA Existing	3302	Auto-closer on main door to walk-in freezer	25%	85%	7%	68%	5%	13%	30%	53%	0%	11%	5%	6%
VA Existing	3303	Compressor VSD retrofit, walk-ins	25%	85%	7%	68%	5%	13%	30%	53%	0%	11%	5%	6%
VA Existing	3304	Demand Defrost Electric, walk-ins	25%	85%	7%	68%	5%	13%	30%	53%	0%	11%	5%	6%
VA Existing	3305	Demand Hot Gas Defrost, walk-ins	25%	85%	7%	68%	5%	13%	30%	53%	0%	11%	5%	6%
VA Existing	3306	Electronically commutated evaporator fan motor, walk-ins	25%	85%	7%	68%	5%	13%	30%	53%	0%	11%	5%	6%
VA Existing	3307	Evaporator fan controller for MT walk-ins	25%	85%	7%	68%	5%	13%	30%	53%	0%	11%	5%	6%
VA Existing	3308	Floating head pressure controls, walk-ins	25%	85%	7%	68%	5%	13%	30%	53%	0%	11%	5%	6%
VA Existing	3309	Freezer-Cooler Replacement Gaskets, walk-ins	25%	85%	7%	68%	5%	13%	30%	53%	0%	11%	5%	6%
VA Existing	3310	High-efficiency fan motors, walk-ins	25%	85%	7%	68%	5%	13%	30%	53%	0%	11%	5%	6%
VA Existing	3311	Insulated suction lines, walk-ins	25%	85%	7%	68%	5%	13%	30%	53%	0%	11%	5%	6%
VA Existing	3312	Multiplex Compressor System, walk-ins	25%	85%	7%	68%	5%	13%	30%	53%	0%	11%	5%	6%
VA Existing	3313	Oversized Air Cooled Condenser, walk-ins	25%	85%	7%	68%	5%	13%	30%	53%	0%	11%	5%	6%
VA Existing	3314	Refrigeration Coil Cleaning, walk-ins	25%	85%	7%	68%	5%	13%	30%	53%	0%	11%	5%	6%
VA Existing	3315	Refrigeration Commissioning, walk-ins	25%	85%	7%	68%	5%	13%	30%	53%	0%	11%	5%	6%
VA Existing	3316	Strip curtains for walk-ins	25%	85%	7%	68%	5%	13%	30%	53%	0%	11%	5%	6%
VA Existing	3400	Base Large Cold Storage Area	0%	5%	2%	27%	8%	0%	4%	10%	0%	0%	4%	0%
VA Existing	3401	Efficient compressor motor, base large cold storage	0%	5%	2%	27%	8%	0%	4%	10%	0%	0%	4%	0%
VA Existing	3402	Auto-closer on main door to walk-in freezer, base large cold storage	0%	5%	2%	27%	8%	0%	4%	10%	0%	0%	4%	0%

Commercial Elec Measure Inputs			APPLICABILITY FACTOR (percent)											
Segment	Measure #	Measure Description	Office Building Type 1	Restaurant Building Type 2	Retail Building Type 3	Grocery Building Type 4	Warehouse Building Type 5	Education Building Type 6	Health Building Type 7	Lodging Building Type 8	Data Centers Building Type 9	Non-Jurisdictional Building Type 10	Religious Worship Building Type 11	Misc Building Type 12
VA Existing	3403	Compressor VSD retrofit, base large cold storage	0%	5%	2%	27%	8%	0%	4%	10%	0%	0%	4%	0%
VA Existing	3404	Electronically commutated evaporator fan motor, base large cold storage	0%	5%	2%	27%	8%	0%	4%	10%	0%	0%	4%	0%
VA Existing	3405	Evaporator fan controller for MT walk-ins, base large cold storage	0%	5%	2%	27%	8%	0%	4%	10%	0%	0%	4%	0%
VA Existing	3406	High-efficiency fan motors, base large cold storage	0%	5%	2%	27%	8%	0%	4%	10%	0%	0%	4%	0%
VA Existing	3407	Insulated suction lines, base large cold storage	0%	5%	2%	27%	8%	0%	4%	10%	0%	0%	4%	0%
VA Existing	3408	Multiplex Compressor System, base large cold storage	0%	5%	2%	27%	8%	0%	4%	10%	0%	0%	4%	0%
VA Existing	3409	Oversized Air Cooled Condenser, base large cold storage	0%	5%	2%	27%	8%	0%	4%	10%	0%	0%	4%	0%
VA Existing	3410	Refrigeration Coil Cleaning, base large cold storage	0%	5%	2%	27%	8%	0%	4%	10%	0%	0%	4%	0%
VA Existing	3411	Refrigeration Commissioning, base large cold storage	0%	5%	2%	27%	8%	0%	4%	10%	0%	0%	4%	0%
VA Existing	3412	Strip curtains for walk-ins, base large cold storage	0%	5%	2%	27%	8%	0%	4%	10%	0%	0%	4%	0%
VA Existing	3500	Base Reach-in Refrigerator/Freezer, Federal Standard	3%	12%	2%	53%	0%	16%	8%	1%	0%	7%	31%	2%
VA Existing	3501	Energy Star solid door reach-in refrigerator/freezer	3%	12%	2%	53%	0%	16%	8%	1%	0%	7%	31%	2%
VA Existing	3502	Freezer-Cooler Replacement Gaskets, base reach-in	3%	12%	2%	53%	0%	16%	8%	1%	0%	7%	31%	2%
VA Existing	3503	Refrigeration Coil Cleaning, base base reach-in	3%	12%	2%	53%	0%	16%	8%	1%	0%	7%	31%	2%
VA Existing	3600	Base Glass Door Reach-in Refrigerator/Freezer, Federal Standard	3%	25%	8%	0%	0%	0%	6%	19%	0%	1%	0%	1%
VA Existing	3601	Energy Star glass door reach-in refrigerator/freezer	3%	25%	8%	0%	0%	0%	6%	19%	0%	1%	0%	1%
VA Existing	3602	Bi-level LED Case Lighting, base glass-door reach-in	3%	25%	8%	0%	0%	0%	6%	19%	0%	1%	0%	1%
VA Existing	3603	Freezer-Cooler Replacement Gaskets, base glass-door reach-in	3%	25%	8%	0%	0%	0%	6%	19%	0%	1%	0%	1%
VA Existing	3604	Refrigeration Coil Cleaning, base glass-door reach-in	3%	25%	8%	0%	0%	0%	6%	19%	0%	1%	0%	1%
VA Existing	3700	Base Ice Maker, Federal Standard	17%	70%	7%	41%	8%	26%	21%	81%	0%	13%	50%	3%
VA Existing	3701	Energy Star Ice Machines	17%	70%	7%	41%	8%	26%	21%	81%	0%	13%	50%	3%
VA Existing	3702	Refrigeration Coil Cleaning, base ice maker	17%	70%	7%	41%	8%	26%	21%	81%	0%	13%	50%	3%
VA Existing	3800	Base Residential-Type Refrigerator/Freezer, Federal Standard	75%	38%	60%	23%	62%	86%	59%	68%	98%	81%	70%	78%
VA Existing	3801	Energy Star refrigerator/freezer	75%	38%	60%	23%	62%	86%	59%	68%	98%	81%	70%	78%
VA Existing	3802	Refrigeration Coil Cleaning, residential-type refrigerator	75%	38%	60%	23%	62%	86%	59%	68%	98%	81%	70%	78%
VA Existing	3900	Base Compact Refrigerator, Federal Standard	39%	15%	31%	8%	26%	14%	47%	56%	0%	15%	15%	10%
VA Existing	3901	Energy Star Compact Refrigerator	39%	15%	31%	8%	26%	14%	47%	56%	0%	15%	15%	10%
VA Existing	3902	Refrigeration Coil Cleaning, compact refrigerator	39%	15%	31%	8%	26%	14%	47%	56%	0%	15%	15%	10%
VA Existing	4000	Base Computer Network Server	71%	55%	49%	51%	80%	31%	69%	81%	100%	37%	73%	32%
VA Existing	4001	Energy Star server	71%	55%	49%	51%	80%	31%	69%	81%	100%	37%	73%	32%
VA Existing	4002	Server Power Management Enabling	71%	55%	49%	51%	80%	31%	69%	81%	100%	37%	73%	32%
VA Existing	4100	Base Desktop PC	91%	56%	78%	55%	90%	42%	98%	90%	21%	67%	90%	78%
VA Existing	4101	Energy Star or Better PC	91%	56%	78%	55%	90%	42%	98%	90%	21%	67%	90%	78%
VA Existing	4102	PC Network Power Management Enabling	91%	56%	78%	55%	90%	42%	98%	90%	21%	67%	90%	78%
VA Existing	4200	Base Laptop PC	90%	49%	45%	21%	88%	37%	78%	83%	96%	44%	86%	35%
VA Existing	4201	Energy Star or Better Laptop	90%	49%	45%	21%	88%	37%	78%	83%	96%	44%	86%	35%
VA Existing	4202	Laptop Network Power Management Enabling	90%	49%	45%	21%	88%	37%	78%	83%	96%	44%	86%	35%
VA Existing	4300	Base Monitor, LCD	90%	62%	76%	64%	79%	95%	85%	87%	96%	71%	88%	47%
VA Existing	4301	Energy Star or Better Monitor - LCD	90%	62%	76%	64%	79%	95%	85%	87%	96%	71%	88%	47%
VA Existing	4302	Monitor Power Management Enabling - LCD	90%	62%	76%	64%	79%	95%	85%	87%	96%	71%	88%	47%
VA Existing	4303	Plug-load controls - Commercial Smart Strip (base monitor LCD)	90%	62%	76%	64%	79%	95%	85%	87%	96%	71%	88%	47%
VA Existing	4400	Base Imaging	85%	43%	61%	53%	65%	39%	90%	81%	100%	52%	91%	51%

Commercial Elec Measure Inputs			ENERGY SAVINGS (percent)												
Segment	Measure #	Measure Description	Office Building Type	Restaurant Building Type 2	Retail Building Type	Grocery Building Type 4	Warehouse Building Type 5	Education Building Type 6	Health Building Type	Lodging ilding Type	Data Centers Building Type 9	Non-Jurisdictional Building Type 10	Religious Worship Building Type 11	Misc uilding Type 1
VA Existing	1000	Base Linear Lighting, Fluorescent Fixture, 2L4'T12	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1001	High Performance Lighting R/R - Combined Strategies (Base T12)	77%	77%	77%	77%	77%	77%	77%	77%	77%	77%	77%	77%
VA Existing	1002	ROB 2L4' LED Tube (Base T12)	51%	51%	51%	51%	51%	51%	51%	51%	51%	51%	51%	51%
VA Existing	1003	LED Troffer (Base T12)	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%
VA Existing	1004	LED Troffer with lamp removal (T12)	81%	81%	81%	81%	81%	81%	81%	81%	81%	81%	81%	81%
VA Existing	1005	Lighting Control Tuneup (Base T12)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
VA Existing	1006	Network Lighting Controls (Base T12)	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%
VA Existing	1007	Occupancy Sensor (Base T12)	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
VA Existing	1050	Base Linear Lighting, Fluorescent Fixture, 2L4'T12, integrated market	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1051	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
VA Existing	1100	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1101	High Performance Lighting R/R - Combined Strategies (Base T8)	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%
VA Existing	1102	ROB 2L4' LED Tube (Base T8)	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%
VA Existing	1103	LED Troffer (Base T8)	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%
VA Existing	1104	LED Troffer with lamp removal (T8)	77%	77%	77%	77%	77%	77%	77%	77%	77%	77%	77%	77%
VA Existing	1105	Lighting Control Tuneup (Base T8)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
VA Existing	1106	Network Lighting Controls (Base T8)	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%
VA Existing	1107	Occupancy Sensor (Base T8)	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
VA Existing	1150	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB, integrated market	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1151	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%
VA Existing	1200	Base Linear Lighting, LED Tube, 2 lamp fixture	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1201	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%
VA Existing	1202	Lighting Control Tuneup (Base LED Tube)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
VA Existing	1203	Network Lighting Controls (Base LED Tube)	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%
VA Existing	1204	Occupancy Sensor (Base LED tube)	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
VA Existing	1225	Base Linear Lighting, LED Tube, 2 lamp fixture, 2028 Standard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1226	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%
VA Existing	1227	Lighting Control Tuneup (Base LED Tube)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
VA Existing	1228	Network Lighting Controls (Base LED Tube)	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%
VA Existing	1229	Occupancy Sensor (Base LED tube)	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
VA Existing	1250	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1251	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
VA Existing	1275	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market, 2028 Standard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1276	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
VA Existing	1300	Base General Service Screw-in, CFL	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1301	LED screw-in replacement (base CFL)	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
VA Existing	1350	Base General Service Screw-in, Incandescent/halogen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1351	LED screw-in replacement (base incandescent/halogen)	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	1400	Base General Service Screw-in, LED bulb	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1401	LED screw-in replacement (base LED)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
VA Existing	1425	Base General Service Screw-in, LED bulb, 2028 Standard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1426	LED screw-in replacement (base LED)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
VA Existing	1450	Base HID Lighting (low bay)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1451	LED fixture (base Low bay HID)	49%	49%	49%	49%	49%	49%	49%	49%	49%	49%	49%	49%
VA Existing	1452	High Performance Lighting R/R - Combined Strategies (base low bay HID)	68%	68%	68%	68%	68%	68%	68%	68%	68%	68%	68%	68%
VA Existing	1500	Base High Bay Lighting, Fluorescent T5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1501	High Performance Lighting R/R - Combined Strategies (Base T5)	68%	68%	68%	68%	68%	68%	68%	68%	68%	68%	68%	68%
VA Existing	1502	ROB 2L4' LED Tube (Base T5)	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%
VA Existing	1503	High Bay LED Troffer (Base T5)	49%	49%	49%	49%	49%	49%	49%	49%	49%	49%	49%	49%
VA Existing	1504	Lighting Control Tuneup (Base T5)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
VA Existing	1505	Network Lighting Controls (Base T5)	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%
VA Existing	1506	Occupancy Sensor (Base T5)	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
VA Existing	1525	Base High Bay Lighting, Fluorescent T5, integrated market	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1526	High Bay Bi-Level Programmed LED Fixture	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%
VA Existing	1550	Base High Bay Lighting, HID lighting	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1551	High Bay Bi-Level Programmed LED Fixture	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%	59%
VA Existing	1552	High Performance Lighting R/R - Combined Strategies (base high bay HID)	68%	68%	68%	68%	68%	68%	68%	68%	68%	68%	68%	68%
VA Existing	1575	Base High Bay Lighting, LED lighting	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1576	Network Lighting Controls (Base high bay LED)	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%	38%
VA Existing	1577	Occupancy Sensor (Base high bay LED)	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
VA Existing	1600	Base CFL Exit Sign	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1601	LED Exit Sign	55%	55%	55%	55%	55%	55%	55%	55%	55%	55%	55%	55%
VA Existing	1650	Base Area Lighting, Outdoor HID	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1651	LED Outdoor Area Lighting (Base Outdoor HID)	68%	68%	68%	68%	68%	68%	68%	68%	68%	68%	68%	68%
VA Existing	1652	LED outdoor lighting with bi-level controls (Base Outdoor HID)	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
VA Existing	1653	Outdoor Lighting Controls (Base Outdoor HID)	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%
VA Existing	1700	Base General Service Screw-in, Outdoor CFL	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1701	LED outdoor lighting with bi-level controls (Base Outdoor CFL)	57%	57%	57%	57%	57%	57%	57%	57%	57%	57%	57%	57%
VA Existing	1702	LED screw-in replacement (base Outdoor CFL)	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
VA Existing	1703	Outdoor Lighting Controls (Base Outdoor CFL)	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%

Commercial Elec Measure Inputs			ENERGY SAVINGS (percent)												
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VA Existing	1750	Base General Service Screw-in, Outdoor Incandescent/Halogen	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1751	LED outdoor lighting with bi-level controls (Base Outdoor Incandescent)	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%
VA Existing	1752	LED screw-in replacement (base Outdoor Incandescent)	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	1753	Outdoor Lighting Controls (Base Outdoor Incandescent)	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%
VA Existing	1800	Base General Service Screw-in, Outdoor LED bulb	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1801	Outdoor Lighting Controls (Base Outdoor LED)	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%
VA Existing	1850	Base Linear Lighting, Outdoor Fluorescent Tube	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1851	ROB 2L4' LED Tube (base outdoor fluorescent)	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%
VA Existing	1852	LED outdoor lighting with bi-level controls (Base Outdoor Fluorescent)	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%
VA Existing	1853	Outdoor Lighting Controls (Base Outdoor Fluorescent)	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%
VA Existing	1900	Base Linear Lighting, Outdoor LED Tube	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1901	Outdoor Lighting Controls (Base Outdoor LED Tube)	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%
VA Existing	2000	Base Water-Cooled Centrifugal Chiller, 0.58 kW/ton, 500 tons	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	2001	Centrifugal Chiller, 0.54 kW/ton, 500 tons	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%
VA Existing	2002	Chiller Tune Up/Diagnostics	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
VA Existing	2003	High Efficiency Chilled Water & Condenser Water Pump Motors	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
VA Existing	2004	VSD for Chiller Pumps and Towers	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
VA Existing	2005	Ceiling/roof Insulation - Chiller	12%	12%	12%	12%	12%	12%	1%	12%	12%	12%	12%	12%
VA Existing	2006	Cool Roof - Chiller	1%	2%	4%	8%	2%	2%	1%	2%	0%	2%	2%	2%
VA Existing	2007	Duct Testing/Sealing - Chiller	26%	17%	18%	8%	8%	8%	13%	2%	26%	20%	13%	13%
VA Existing	2008	Duct/Pipe Insulation - Chiller	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
VA Existing	2009	EMS Optimization - Chiller	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
VA Existing	2010	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - Chiller	8%	6%	5%	9%	7%	7%	11%	3%	8%	6%	4%	4%
VA Existing	2011	New Economizer - Chiller	4%	5%	5%	6%	5%	6%	6%	3%	4%	4%	3%	3%
VA Existing	2012	Window Film (Standard) - Chiller	16%	10%	13%	1%	1%	9%	9%	4%	0%	13%	9%	9%
VA Existing	2013	High Efficiency Windows - Chiller	26%	14%	14%	1%	1%	11%	14%	13%	0%	19%	11%	11%
VA Existing	2100	Base DX Packaged System, EER=10.3, 10 tons	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	2101	DX Packaged System, EER=10.9, 10 tons	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
VA Existing	2102	DX Packaged System, EER=13.4, 10 tons	23%	23%	23%	23%	23%	23%	23%	23%	23%	23%	23%	23%
VA Existing	2103	Geothermal Heat Pump, EER=13, 10 tons - DX	21%	21%	21%	21%	21%	21%	21%	21%	21%	21%	21%	21%
VA Existing	2104	DX Tune Up/ Advanced Diagnostics	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
VA Existing	2105	Refrigerant Charge Adjustment - DX	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
VA Existing	2106	Ceiling/roof Insulation - DX	12%	12%	12%	12%	12%	12%	12%	12%	1%	12%	12%	12%
VA Existing	2107	Cool Roof - DX	2%	7%	13%	15%	18%	4%	1%	0%	2%	1%	0%	0%
VA Existing	2108	Duct Testing/Sealing - DX	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%
VA Existing	2109	Duct/Pipe Insulation - DX	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
VA Existing	2110	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	3%	3%	4%	1%	3%	8%	0%	1%	3%	2%	0%	0%
VA Existing	2111	Economizer Repair - DX	28%	12%	27%	2%	0%	5%	0%	4%	28%	14%	0%	0%
VA Existing	2112	New Economizer - DX	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	2113	Optimize Controls - DX	5%	5%	5%	5%	5%	5%	5%	5%	2%	5%	5%	5%
VA Existing	2114	Smart Thermostat - DX	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
VA Existing	2115	Window Film (Standard) - DX	9%	10%	2%	9%	12%	4%	1%	7%	9%	5%	1%	1%
VA Existing	2116	High Efficiency Windows - DX	26%	14%	14%	1%	1%	11%	14%	13%	0%	19%	11%	11%
VA Existing	2150	Base DX Packaged System, 2029 Standard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	2152	DX Packaged System, EER=13.4, 10 tons	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%
VA Existing	2153	Geothermal Heat Pump, EER=13, 10 tons - DX	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%
VA Existing	2154	DX Tune Up/ Advanced Diagnostics	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
VA Existing	2155	Refrigerant Charge Adjustment - DX	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
VA Existing	2156	Ceiling/roof Insulation - DX	12%	12%	12%	12%	12%	12%	12%	12%	1%	12%	12%	12%
VA Existing	2157	Cool Roof - DX	2%	7%	13%	15%	18%	4%	1%	0%	2%	1%	0%	0%
VA Existing	2158	Duct Testing/Sealing - DX	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%
VA Existing	2159	Duct/Pipe Insulation - DX	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
VA Existing	2160	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	3%	3%	4%	1%	3%	8%	0%	1%	3%	2%	0%	0%
VA Existing	2161	Economizer Repair - DX	28%	12%	27%	2%	0%	5%	0%	4%	28%	14%	0%	0%
VA Existing	2162	New Economizer - DX	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	2163	Optimize Controls - DX	5%	5%	5%	5%	5%	5%	5%	5%	2%	5%	5%	5%
VA Existing	2164	Smart Thermostat - DX	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
VA Existing	2165	Window Film (Standard) - DX	9%	10%	2%	9%	12%	4%	1%	7%	9%	5%	1%	1%
VA Existing	2166	High Efficiency Windows - DX	26%	14%	14%	1%	1%	11%	14%	13%	0%	19%	11%	11%
VA Existing	2200	Base Heat Pump cooling (14.3 SEER, 8.2 HSPF)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	2201	Heat Pump Upgrade (18 SEER, 8.2 HSPF), cooling	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%
VA Existing	2202	Mini-Split Heat Pump (Base Heat Pump Cooling)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
VA Existing	2203	Ceiling/roof Insulation (Base Heat Pump Cooling)	12%	12%	12%	12%	12%	12%	12%	12%	1%	12%	12%	12%
VA Existing	2204	Duct/Pipe Insulation (Base Heat Pump Cooling)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
VA Existing	2205	Smart Thermostat (Base Heat Pump Cooling)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
VA Existing	2206	Window Film (Standard) (Base Heat Pump Cooling)	9%	10%	2%	9%	12%	4%	1%	7%	9%	5%	1%	1%
VA Existing	2207	High Efficiency Windows (Base Heat Pump Cooling)	26%	14%	14%	1%	1%	11%	14%	13%	0%	19%	11%	11%
VA Existing	2300	Base Split-System AC, SEER 14.5, <5.4 tons	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	2301	Split System Air Conditioner, SEER 16.0 ENERGY STAR, <5.4 tons	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
VA Existing	2302	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Residential Split-System)	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%

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VA Existing	2303	Ceiling/roof Insulation (Base Residential Split-System)	12%	12%	12%	12%	12%	12%	1%	12%	12%	12%	12%	12%
VA Existing	2304	Duct/Pipe Insulation (Base Residential Split-System)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
VA Existing	2305	Smart Thermostat (Base Residential Split-System)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
VA Existing	2306	Window Film (Standard) (Base Residential Split-System)	16%	10%	13%	1%	1%	9%	9%	4%	0%	13%	9%	9%
VA Existing	2400	Base PTAC cooling, EER=10.2, 1 ton	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	2401	HE PTAC, EER=9.6, 1 ton, cooling	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%
VA Existing	2402	Ceiling/roof Insulation (Base PTAC)	12%	12%	12%	12%	12%	12%	12%	12%	1%	12%	12%	12%
VA Existing	2404	Occupancy Sensor (hotels)	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%
VA Existing	2405	Window Film (Standard) (Base PTAC)	9%	10%	2%	9%	12%	4%	1%	7%	9%	5%	1%	1%
VA Existing	2500	Base Room AC, CEER 10.9	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	2501	Room AC, CEER 12.0 ENERGY STAR	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
VA Existing	2502	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Room AC)	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
VA Existing	2503	Ceiling/roof Insulation (Base Room AC)	12%	12%	12%	12%	12%	12%	1%	12%	12%	12%	12%	12%
VA Existing	2505	Window Film (Standard) (Base Room AC)	16%	10%	13%	1%	1%	9%	9%	4%	0%	13%	9%	9%
VA Existing	2506	High Efficiency Windows (Base Room AC)	11%	6%	5%	0%	0%	4%	6%	6%	0%	8%	4%	4%
VA Existing	2600	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	2601	Ceiling/roof Insulation (Base Ductless Mini-split)	12%	12%	12%	12%	12%	12%	1%	12%	12%	12%	12%	12%
VA Existing	2603	Window Film (Standard) (Base Ductless Mini-split)	16%	10%	13%	1%	1%	9%	9%	4%	0%	13%	9%	9%
VA Existing	2604	High Efficiency Windows (Base Ductless Mini-split)	26%	14%	14%	1%	1%	11%	14%	13%	0%	19%	11%	11%
VA Existing	3100	Base Open refrigerated/freezer cases	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3101	Efficient compressor motor, open cases	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%
VA Existing	3102	Bi-level LED Case Lighting (self-contained units), open cases	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
VA Existing	3103	Compressor VSD retrofit, open cases	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
VA Existing	3104	Demand Defrost Electric, open cases	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
VA Existing	3105	Demand Hot Gas Defrost, open cases	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
VA Existing	3106	Electronically commutated evaporator fan motor, open cases	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
VA Existing	3107	High-efficiency fan motors, open cases	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
VA Existing	3108	Insulated suction lines, open cases	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3109	LED Display Lighting, open cases	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
VA Existing	3110	Multiplex Compressor System, open cases	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%
VA Existing	3111	Night covers for display cases, open cases	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
VA Existing	3112	Oversized Air Cooled Condenser, open cases	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
VA Existing	3113	Refrigeration Coil Cleaning, open cases	23%	23%	23%	23%	23%	23%	23%	23%	23%	23%	23%	23%
VA Existing	3114	Refrigeration Commissioning, open cases	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
VA Existing	3200	Base Closed refrigerated/freezer cases	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3201	Efficient compressor motor, base closed cases	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
VA Existing	3202	Energy-Star Refrigerator/Freezer, base closed cases	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
VA Existing	3203	Anti-sweat (humidistat) controls, base closed cases	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
VA Existing	3204	Bi-level LED Case Lighting (self-contained units), base closed cases	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
VA Existing	3205	Compressor VSD retrofit, base closed cases	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
VA Existing	3206	Demand Defrost Electric, base closed cases	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
VA Existing	3207	Demand Hot Gas Defrost, base closed cases	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
VA Existing	3208	Electronically commutated evaporator fan motor, base closed cases	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%
VA Existing	3209	Freezer-Cooler Replacement Gaskets, base closed cases	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
VA Existing	3210	High R-Value Glass Doors, base closed cases	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
VA Existing	3211	High-efficiency fan motors, base closed cases	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
VA Existing	3212	Insulated suction lines, base closed cases	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3213	LED Display Lighting, base closed cases	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
VA Existing	3214	Low or Anti-Sweat Door Film, base closed cases	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
VA Existing	3215	Multiplex Compressor System, base closed cases	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%
VA Existing	3216	Oversized Air Cooled Condenser, base closed cases	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
VA Existing	3217	Refrigeration Coil Cleaning, base closed cases	23%	23%	23%	23%	23%	23%	23%	23%	23%	23%	23%	23%
VA Existing	3218	Refrigeration Commissioning, base closed cases	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
VA Existing	3300	Base Walk-in refrigeration/freezer units	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3301	Efficient compressor motor, walk-ins	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
VA Existing	3302	Auto-closer on main door to walk-in freezer	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
VA Existing	3303	Compressor VSD retrofit, walk-ins	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
VA Existing	3304	Demand Defrost Electric, walk-ins	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
VA Existing	3305	Demand Hot Gas Defrost, walk-ins	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
VA Existing	3306	Electronically commutated evaporator fan motor, walk-ins	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%
VA Existing	3307	Evaporator fan controller for MT walk-ins	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
VA Existing	3308	Floating head pressure controls, walk-ins	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
VA Existing	3309	Freezer-Cooler Replacement Gaskets, walk-ins	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
VA Existing	3310	High-efficiency fan motors, walk-ins	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
VA Existing	3311	Insulated suction lines, walk-ins	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3312	Multiplex Compressor System, walk-ins	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%
VA Existing	3313	Oversized Air Cooled Condenser, walk-ins	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
VA Existing	3314	Refrigeration Coil Cleaning, walk-ins	23%	23%	23%	23%	23%	23%	23%	23%	23%	23%	23%	23%

Commercial Elec Measure Inputs			ENERGY SAVINGS (percent)												
Segment	Measure #	Measure Description	Office Building Type	Restaurant Building Type 2	Retail Building Type	Grocery Building Type 4	Warehouse Building Type 5	Education Building Type 6	Health Building Type	Lodging ilding Type	Data Centers Building Type 9	Non-Jurisdictional Building Type 10	Religious Worship Building Type 11	Misc uilding Type 1
VA Existing	3315	Refrigeration Commissioning, walk-ins	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
VA Existing	3316	Strip curtains for walk-ins	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
VA Existing	3400	Base Large Cold Storage Area	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3401	Efficient compressor motor, base large cold storage	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
VA Existing	3402	Auto-closer on main door to walk-in freezer, base large cold storage	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
VA Existing	3403	Compressor VSD retrofit, base large cold storage	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
VA Existing	3404	Electronically commutated evaporator fan motor, base large cold storage	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%
VA Existing	3405	Evaporator fan controller for MT walk-ins, base large cold storage	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
VA Existing	3406	High-efficiency fan motors, base large cold storage	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
VA Existing	3407	Insulated suction lines, base large cold storage	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3408	Multiplex Compressor System, base large cold storage	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%
VA Existing	3409	Oversized Air Cooled Condenser, base large cold storage	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
VA Existing	3410	Refrigeration Coil Cleaning, base large cold storage	23%	23%	23%	23%	23%	23%	23%	23%	23%	23%	23%	23%
VA Existing	3411	Refrigeration Commissioning, base large cold storage	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
VA Existing	3412	Strip curtains for walk-ins, base large cold storage	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
VA Existing	3500	Base Reach-in Refrigerator/Freezer, Federal Standard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3501	Energy Star solid door reach-in refrigerator/freezer	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
VA Existing	3502	Freezer-Cooler Replacement Gaskets, base reach-in	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
VA Existing	3503	Refrigeration Coil Cleaning, base base reach-in	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
VA Existing	3600	Base Glass Door Reach-in Refrigerator/Freezer, Federal Standard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3601	Energy Star glass door reach-in refrigerator/freezer	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%
VA Existing	3602	Bi-level LED Case Lighting, base glass-door reach-in	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
VA Existing	3603	Freezer-Cooler Replacement Gaskets, base glass-door reach-in	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
VA Existing	3604	Refrigeration Coil Cleaning, base glass-door reach-in	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
VA Existing	3700	Base Ice Maker, Federal Standard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3701	Energy Star Ice Machines	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
VA Existing	3702	Refrigeration Coil Cleaning, base ice maker	10%	2%	10%	2%	2%	10%	10%	10%	10%	10%	10%	10%
VA Existing	3800	Base Residential-Type Refrigerator/Freezer, Federal Standard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3801	Energy Star refrigerator/freezer	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
VA Existing	3802	Refrigeration Coil Cleaning, residential-type refrigerator	10%	2%	10%	2%	2%	10%	10%	10%	10%	10%	10%	10%
VA Existing	3900	Base Compact Refrigerator, Federal Standard	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3901	Energy Star Compact Refrigerator	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
VA Existing	3902	Refrigeration Coil Cleaning, compact refrigerator	10%	2%	10%	2%	2%	10%	10%	10%	10%	10%	10%	10%
VA Existing	4000	Base Computer Network Server	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	4001	Energy Star server	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
VA Existing	4002	Server Power Management Enabling	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	4100	Base Desktop PC	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	4101	Energy Star or Better PC	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%
VA Existing	4102	PC Network Power Management Enabling	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	4200	Base Laptop PC	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	4201	Energy Star or Better Laptop	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
VA Existing	4202	Laptop Network Power Management Enabling	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	4300	Base Monitor, LCD	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	4301	Energy Star or Better Monitor - LCD	21%	21%	21%	21%	21%	21%	21%	21%	21%	21%	21%	21%
VA Existing	4302	Monitor Power Management Enabling - LCD	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	4303	Plug-load controls - Commercial Smart Strip (base monitor LCD)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
VA Existing	4400	Base Imaging	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Commercial Elec Measure Inputs			Standards Adjustment Factor (percent)												
Segment	Measure #	Measure Description	Office uilding Type	Restaurant uilding Type	Retail uilding Type	Grocery uilding Type	Warehouse uilding Type	Education uilding Type	Health uilding Type	Lodging ilding Typ	Data Centers uilding Type	Non-Jurisdictional ilding Type	Religious Worship ilding Type	Misc uilding Type 1
VA Existing	1000	Base Linear Lighting, Fluorescent Fixture, 2L4'T12	100%	100%	100%	97%	96%	100%	100%	96%	100%	100%	100%	100%
VA Existing	1001	High Performance Lighting R/R - Combined Strategies (Base T12)	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%
VA Existing	1002	ROB 2L4' LED Tube (Base T12)	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%
VA Existing	1003	LED Troffer (Base T12)	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%
VA Existing	1004	LED Troffer with lamp removal (T12)	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%
VA Existing	1005	Lighting Control Tuneup (Base T12)	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%
VA Existing	1006	Network Lighting Controls (Base T12)	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%
VA Existing	1007	Occupancy Sensor (Base T12)	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%
VA Existing	1050	Base Linear Lighting, Fluorescent Fixture, 2L4'T12, integrated market	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1051	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%
VA Existing	1100	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1101	High Performance Lighting R/R - Combined Strategies (Base T8)	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%
VA Existing	1102	ROB 2L4' LED Tube (Base T8)	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%
VA Existing	1103	LED Troffer (Base T8)	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%
VA Existing	1104	LED Troffer with lamp removal (T8)	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%
VA Existing	1105	Lighting Control Tuneup (Base T8)	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%
VA Existing	1106	Network Lighting Controls (Base T8)	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%
VA Existing	1107	Occupancy Sensor (Base T8)	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%
VA Existing	1150	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB, integrated market	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1151	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%
VA Existing	1200	Base Linear Lighting, LED Tube, 2 lamp fixture	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1201	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1202	Lighting Control Tuneup (Base LED Tube)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1203	Network Lighting Controls (Base LED Tube)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1204	Occupancy Sensor (Base LED tube)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1225	Base Linear Lighting, LED Tube, 2 lamp fixture, 2028 Standard	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	1226	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	1227	Lighting Control Tuneup (Base LED Tube)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	1228	Network Lighting Controls (Base LED Tube)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	1229	Occupancy Sensor (Base LED tube)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	1250	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1251	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1275	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market, 2028 Standard	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	1276	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	1300	Base General Service Screw-in, CFL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1301	LED screw-in replacement (base CFL)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1350	Base General Service Screw-in, Incandescent/halogen	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1351	LED screw-in replacement (base incandescent/halogen)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1400	Base General Service Screw-in, LED bulb	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1401	LED screw-in replacement (base LED)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1425	Base General Service Screw-in, LED bulb, 2028 Standard	82%	82%	82%	82%	82%	82%	82%	82%	82%	82%	82%	82%
VA Existing	1426	LED screw-in replacement (base LED)	82%	82%	82%	82%	82%	82%	82%	82%	82%	82%	82%	82%
VA Existing	1450	Base HID Lighting (low bay)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1451	LED fixture (base Low bay HID)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1452	High Performance Lighting R/R - Combined Strategies (base low bay HID)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1500	Base High Bay Lighting, Fluorescent T5	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1501	High Performance Lighting R/R - Combined Strategies (Base T5)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1502	ROB 2L4' LED Tube (Base T5)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1503	High Bay LED Troffer (Base T5)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1504	Lighting Control Tuneup (Base T5)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1505	Network Lighting Controls (Base T5)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1506	Occupancy Sensor (Base T5)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1525	Base High Bay Lighting, Fluorescent T5, integrated market	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1526	High Bay Bi-Level Programmed LED Fixture	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1550	Base High Bay Lighting, HID lighting	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1551	High Bay Bi-Level Programmed LED Fixture	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1552	High Performance Lighting R/R - Combined Strategies (base high bay HID)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1575	Base High Bay Lighting, LED lighting	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1576	Network Lighting Controls (Base high bay LED)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1577	Occupancy Sensor (Base high bay LED)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1600	Base CFL Exit Sign	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1601	LED Exit Sign	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1650	Base Area Lighting, Outdoor HID	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1651	LED Outdoor Area Lighting (Base Outdoor HID)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1652	LED outdoor lighting with bi-level controls (Base Outdoor HID)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Commercial Elec Measure Inputs			Standards Adjustment Factor (percent)												
Segment	Measure #	Measure Description	Office uilding Type	Restaurant uilding Type	Retail uilding Type	Grocery uilding Type	Warehouse uilding Type	Education uilding Type	Health uilding Type	Lodging ilding Typ	Data Centers uilding Type	Non-Jurisdictional ilding Type	Religious Worship ilding Type	Misc uilding Type 1
VA Existing	1653	Outdoor Lighting Controls (Base Outdoor HID)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1700	Base General Service Screw-in, Outdoor CFL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1701	LED outdoor lighting with bi-level controls (Base Outdoor CFL)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1702	LED screw-in replacement (base Outdoor CFL)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1703	Outdoor Lighting Controls (Base Outdoor CFL)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1750	Base General Service Screw-in, Outdoor Incandescent/Halogen	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1751	LED outdoor lighting with bi-level controls (Base Outdoor Incandescent)	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%
VA Existing	1752	LED screw-in replacement (base Outdoor Incandescent)	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%
VA Existing	1753	Outdoor Lighting Controls (Base Outdoor Incandescent)	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%
VA Existing	1800	Base General Service Screw-in, Outdoor LED bulb	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1801	Outdoor Lighting Controls (Base Outdoor LED)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1850	Base Linear Lighting, Outdoor Fluorescent Tube	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1851	ROB 2L4' LED Tube (base outdoor fluorescent)	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%
VA Existing	1852	LED outdoor lighting with bi-level controls (Base Outdoor Fluorescent)	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%
VA Existing	1853	Outdoor Lighting Controls (Base Outdoor Fluorescent)	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%
VA Existing	1900	Base Linear Lighting, Outdoor LED Tube	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1901	Outdoor Lighting Controls (Base Outdoor LED Tube)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2000	Base Water-Cooled Centrifugal Chiller, 0.58 kW/ton, 500 tons	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2001	Centrifugal Chiller, 0.54 kW/ton, 500 tons	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2002	Chiller Tune Up/Diagnostics	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2003	High Efficiency Chilled Water & Condenser Water Pump Motors	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2004	VSD for Chiller Pumps and Towers	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2005	Ceiling/roof Insulation - Chiller	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2006	Cool Roof - Chiller	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2007	Duct Testing/Sealing - Chiller	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2008	Duct/Pipe Insulation - Chiller	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2009	EMS Optimization - Chiller	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2010	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - Chiller	73%	100%	79%	100%	100%	85%	100%	100%	73%	86%	100%	100%
VA Existing	2011	New Economizer - Chiller	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2012	Window Film (Standard) - Chiller	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2013	High Efficiency Windows - Chiller	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2100	Base DX Packaged System, EER=10.3, 10 tons	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2101	DX Packaged System, EER=10.9, 10 tons	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2102	DX Packaged System, EER=13.4, 10 tons	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2103	Geothermal Heat Pump, EER=13, 10 tons - DX	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2104	DX Tune Up/ Advanced Diagnostics	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2105	Refrigerant Charge Adjustment - DX	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2106	Ceiling/roof Insulation - DX	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2107	Cool Roof - DX	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2108	Duct Testing/Sealing - DX	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2109	Duct/Pipe Insulation - DX	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2110	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2111	Economizer Repair - DX	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2112	New Economizer - DX	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2113	Optimize Controls - DX	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2114	Smart Thermostat - DX	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2115	Window Film (Standard) - DX	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2116	High Efficiency Windows - DX	100%	88%	100%	88%	88%	100%	100%	88%	100%	100%	100%	100%
VA Existing	2150	Base DX Packaged System, 2029 Standard	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2152	DX Packaged System, EER=13.4, 10 tons	79%	79%	79%	79%	79%	79%	79%	79%	79%	79%	79%	79%
VA Existing	2153	Geothermal Heat Pump, EER=13, 10 tons - DX	79%	79%	79%	79%	79%	79%	79%	79%	79%	79%	79%	79%
VA Existing	2154	DX Tune Up/ Advanced Diagnostics	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2155	Refrigerant Charge Adjustment - DX	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2156	Ceiling/roof Insulation - DX	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2157	Cool Roof - DX	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2158	Duct Testing/Sealing - DX	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2159	Duct/Pipe Insulation - DX	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2160	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2161	Economizer Repair - DX	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2162	New Economizer - DX	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2163	Optimize Controls - DX	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2164	Smart Thermostat - DX	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2165	Window Film (Standard) - DX	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
VA Existing	2166	High Efficiency Windows - DX	100%	88%	100%	88%	88%	100%	100%	88%	100%	100%	100%	100%
VA Existing	2200	Base Heat Pump cooling (14.3 SEER, 8.2 HSPF)	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%
VA Existing	2201	Heat Pump Upgrade (18 SEER, 8.2 HSPF), cooling	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%

Commercial Elec Measure Inputs			Standards Adjustment Factor (percent)												
Segment	Measure #	Measure Description	Office uilding Type	Restaurant uilding Type	Retail uilding Type	Grocery uilding Type	Warehouse uilding Type	Education uilding Type	Health uilding Type	Lodging ilding Typ	Data Centers uilding Type	Non-Jurisdictional lding Type	Religious Worship ilding Type	Misc uilding Type 1
VA Existing	2202	Mini-Split Heat Pump (Base Heat Pump Cooling)	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%
VA Existing	2203	Ceiling/roof Insulation (Base Heat Pump Cooling)	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%
VA Existing	2204	Duct/Pipe Insulation (Base Heat Pump Cooling)	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%
VA Existing	2205	Smart Thermostat (Base Heat Pump Cooling)	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%
VA Existing	2206	Window Film (Standard) (Base Heat Pump Cooling)	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%
VA Existing	2207	High Efficiency Windows (Base Heat Pump Cooling)	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%
VA Existing	2300	Base Split-System AC, SEER 14.5, <5.4 tons	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2301	Split System Air Conditioner, SEER 16.0 ENERGY STAR, <5.4 tons	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2302	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Residential Split-System)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2303	Ceiling/roof Insulation (Base Residential Split-System)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2304	Duct/Pipe Insulation (Base Residential Split-System)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2305	Smart Thermostat (Base Residential Split-System)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2306	Window Film (Standard) (Base Residential Split-System)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2400	Base PTAC cooling, EER=10.2, 1 ton	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
VA Existing	2401	HE PTAC, EER=9.6, 1 ton, cooling	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
VA Existing	2402	Ceiling/roof Insulation (Base PTAC)	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
VA Existing	2404	Occupancy Sensor (hotels)	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
VA Existing	2405	Window Film (Standard) (Base PTAC)	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
VA Existing	2500	Base Room AC, CEER 10.9	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2501	Room AC, CEER 12.0 ENERGY STAR	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2502	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Room AC)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2503	Ceiling/roof Insulation (Base Room AC)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2505	Window Film (Standard) (Base Room AC)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2506	High Efficiency Windows (Base Room AC)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2600	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2601	Ceiling/roof Insulation (Base Ductless Mini-split)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2603	Window Film (Standard) (Base Ductless Mini-split)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2604	High Efficiency Windows (Base Ductless Mini-split)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3100	Base Open refrigerated/freezer cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3101	Efficient compressor motor, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3102	Bi-level LED Case Lighting (self-contained units), open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3103	Compressor VSD retrofit, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3104	Demand Defrost Electric, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3105	Demand Hot Gas Defrost, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3106	Electronically commutated evaporator fan motor, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3107	High-efficiency fan motors, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3108	Insulated suction lines, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3109	LED Display Lighting, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3110	Multiplex Compressor System, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3111	Night covers for display cases, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3112	Oversized Air Cooled Condenser, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3113	Refrigeration Coil Cleaning, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3114	Refrigeration Commissioning, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3200	Base Closed refrigerated/freezer cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3201	Efficient compressor motor, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3202	Energy-Star Refrigerator/Freezer, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3203	Anti-sweat (humidistat) controls, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3204	Bi-level LED Case Lighting (self-contained units), base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3205	Compressor VSD retrofit, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3206	Demand Defrost Electric, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3207	Demand Hot Gas Defrost, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3208	Electronically commutated evaporator fan motor, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3209	Freezer-Cooler Replacement Gaskets, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3210	High R-Value Glass Doors, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3211	High-efficiency fan motors, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3212	Insulated suction lines, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3213	LED Display Lighting, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3214	Low or Anti-Sweat Door Film, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3215	Multiplex Compressor System, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3216	Oversized Air Cooled Condenser, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3217	Refrigeration Coil Cleaning, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3218	Refrigeration Commissioning, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3300	Base Walk-in refrigeration/freezer units	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3301	Efficient compressor motor, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3302	Auto-closer on main door to walk-in freezer	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3303	Compressor VSD retrofit, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Commercial Elec Measure Inputs			Standards Adjustment Factor (percent)												
Segment	Measure #	Measure Description	Office uilding Type	Restaurant uilding Type	Retail uilding Type	Grocery uilding Type	Warehouse uilding Type	Education uilding Type	Health uilding Type	Lodging ilding Typ	Data Centers uilding Type	Non-Jurisdictional ilding Type	Religious Worship eilding Type	Misc uilding Type 1
VA Existing	3304	Demand Defrost Electric, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3305	Demand Hot Gas Defrost, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3306	Electronically commutated evaporator fan motor, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3307	Evaporator fan controller for MT walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3308	Floating head pressure controls, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3309	Freezer-Cooler Replacement Gaskets, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3310	High-efficiency fan motors, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3311	Insulated suction lines, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3312	Multiplex Compressor System, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3313	Oversized Air Cooled Condenser, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3314	Refrigeration Coil Cleaning, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3315	Refrigeration Commissioning, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3316	Strip curtains for walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3400	Base Large Cold Storage Area	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3401	Efficient compressor motor, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3402	Auto-closer on main door to walk-in freezer, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3403	Compressor VSD retrofit, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3404	Electronically commutated evaporator fan motor, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3405	Evaporator fan controller for MT walk-ins, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3406	High-efficiency fan motors, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3407	Insulated suction lines, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3408	Multiplex Compressor System, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3409	Oversized Air Cooled Condenser, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3410	Refrigeration Coil Cleaning, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3411	Refrigeration Commissioning, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3412	Strip curtains for walk-ins, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3500	Base Reach-in Refrigerator/Freezer, Federal Standard	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3501	Energy Star solid door reach-in refrigerator/freezer	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3502	Freezer-Cooler Replacement Gaskets, base reach-in	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3503	Refrigeration Coil Cleaning, base base reach-in	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3600	Base Glass Door Reach-in Refrigerator/Freezer, Federal Standard	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3601	Energy Star glass door reach-in refrigerator/freezer	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3602	Bi-level LED Case Lighting, base glass-door reach-in	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3603	Freezer-Cooler Replacement Gaskets, base glass-door reach-in	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3604	Refrigeration Coil Cleaning, base glass-door reach-in	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3700	Base Ice Maker, Federal Standard	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3701	Energy Star Ice Machines	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3702	Refrigeration Coil Cleaning, base ice maker	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3800	Base Residential-Type Refrigerator/Freezer, Federal Standard	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3801	Energy Star refrigerator/freezer	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3802	Refrigeration Coil Cleaning, residential-type refrigerator	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3900	Base Compact Refrigerator, Federal Standard	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3901	Energy Star Compact Refrigerator	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3902	Refrigeration Coil Cleaning, compact refrigerator	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4000	Base Computer Network Server	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4001	Energy Star server	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4002	Server Power Management Enabling	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4100	Base Desktop PC	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4101	Energy Star or Better PC	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4102	PC Network Power Management Enabling	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4200	Base Laptop PC	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4201	Energy Star or Better Laptop	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4202	Laptop Network Power Management Enabling	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4300	Base Monitor, LCD	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4301	Energy Star or Better Monitor - LCD	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4302	Monitor Power Management Enabling - LCD	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4303	Plug-load controls - Commercial Smart Strip (base monitor LCD)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4400	Base Imaging	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Commercial Elec Measure Inputs			FEASIBILITY FACTOR (percent)											
Segment	Measure #	Measure Description	Office Building Type	Restaurant Building Type	Retail Building Type	Grocery Building Type	Warehouse Building Type	Education Building Type	Health Building Type	Lodging Building Type	Data Centers Building Type	Non-Jurisdictional Building Type	Religious Worship Building Type	Misc Building Type 1
VA Existing	1000	Base Linear Lighting, Fluorescent Fixture, 2L4'T12	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1001	High Performance Lighting R/R - Combined Strategies (Base T12)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1002	ROB 2L4' LED Tube (Base T12)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1003	LED Troffer (Base T12)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1004	LED Troffer with lamp removal (T12)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1005	Lighting Control Tuneup (Base T12)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1006	Network Lighting Controls (Base T12)	28%	7%	7%	7%	14%	35%	35%	14%	28%	21%	14%	14%
VA Existing	1007	Occupancy Sensor (Base T12)	28%	7%	7%	7%	14%	35%	35%	14%	28%	21%	14%	14%
VA Existing	1050	Base Linear Lighting, Fluorescent Fixture, 2L4'T12, integrated market	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1051	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1100	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1101	High Performance Lighting R/R - Combined Strategies (Base T8)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1102	ROB 2L4' LED Tube (Base T8)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1103	LED Troffer (Base T8)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1104	LED Troffer with lamp removal (T8)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1105	Lighting Control Tuneup (Base T8)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1106	Network Lighting Controls (Base T8)	28%	7%	7%	7%	14%	35%	35%	14%	28%	21%	14%	14%
VA Existing	1107	Occupancy Sensor (Base T8)	28%	7%	7%	7%	14%	35%	35%	14%	28%	21%	14%	14%
VA Existing	1150	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB, integrated market	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1151	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1200	Base Linear Lighting, LED Tube, 2 lamp fixture	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1201	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1202	Lighting Control Tuneup (Base LED Tube)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1203	Network Lighting Controls (Base LED Tube)	28%	7%	7%	7%	14%	35%	35%	14%	28%	21%	14%	14%
VA Existing	1204	Occupancy Sensor (Base LED tube)	28%	7%	7%	7%	14%	35%	35%	14%	28%	21%	14%	14%
VA Existing	1225	Base Linear Lighting, LED Tube, 2 lamp fixture, 2028 Standard	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1226	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1227	Lighting Control Tuneup (Base LED Tube)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1228	Network Lighting Controls (Base LED Tube)	28%	7%	7%	7%	14%	35%	35%	14%	28%	21%	14%	14%
VA Existing	1229	Occupancy Sensor (Base LED tube)	28%	7%	7%	7%	14%	35%	35%	14%	28%	21%	14%	14%
VA Existing	1250	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1251	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1275	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market, 2028 Standard	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1276	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1300	Base General Service Screw-in, CFL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1301	LED screw-in replacement (base CFL)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1350	Base General Service Screw-in, Incandescent/halogen	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1351	LED screw-in replacement (base incandescent/halogen)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1400	Base General Service Screw-in, LED bulb	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1401	LED screw-in replacement (base LED)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1425	Base General Service Screw-in, LED bulb, 2028 Standard	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1426	LED screw-in replacement (base LED)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1450	Base HID Lighting (low bay)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1451	LED fixture (base Low bay HID)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1452	High Performance Lighting R/R - Combined Strategies (base low bay HID)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1500	Base High Bay Lighting, Fluorescent T5	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1501	High Performance Lighting R/R - Combined Strategies (Base T5)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1502	ROB 2L4' LED Tube (Base T5)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1503	High Bay LED Troffer (Base T5)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1504	Lighting Control Tuneup (Base T5)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1505	Network Lighting Controls (Base T5)	28%	7%	7%	7%	14%	35%	35%	14%	28%	21%	14%	14%
VA Existing	1506	Occupancy Sensor (Base T5)	28%	7%	7%	7%	14%	35%	35%	14%	28%	28%	14%	14%
VA Existing	1525	Base High Bay Lighting, Fluorescent T5, integrated market	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1526	High Bay Bi-Level Programmed LED Fixture	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1550	Base High Bay Lighting, HID lighting	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1551	High Bay Bi-Level Programmed LED Fixture	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1552	High Performance Lighting R/R - Combined Strategies (base high bay HID)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1575	Base High Bay Lighting, LED lighting	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1576	Network Lighting Controls (Base high bay LED)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Commercial Elec Measure Inputs			FEASIBILITY FACTOR (percent)											
Segment	Measure #	Measure Description	Office Building Type	Restaurant Building Type	Retail Building Type	Grocery Building Type	Warehouse Building Type	Education Building Type	Health Building Type	Lodging Building Type	Data Centers Building Type	Non-Jurisdictional Building Type	Religious Worship Building Type	Misc Building Type 1
VA Existing	1577	Occupancy Sensor (Base high bay LED)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1600	Base CFL Exit Sign	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1601	LED Exit Sign	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1650	Base Area Lighting, Outdoor HID	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1651	LED Outdoor Area Lighting (Base Outdoor HID)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1652	LED outdoor lighting with bi-level controls (Base Outdoor HID)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1653	Outdoor Lighting Controls (Base Outdoor HID)	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
VA Existing	1700	Base General Service Screw-in, Outdoor CFL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1701	LED outdoor lighting with bi-level controls (Base Outdoor CFL)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1702	LED screw-in replacement (base Outdoor CFL)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1703	Outdoor Lighting Controls (Base Outdoor CFL)	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
VA Existing	1750	Base General Service Screw-in, Outdoor Incandescent/Halogen	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1751	LED outdoor lighting with bi-level controls (Base Outdoor Incandescent)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1752	LED screw-in replacement (base Outdoor Incandescent)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1753	Outdoor Lighting Controls (Base Outdoor Incandescent)	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
VA Existing	1800	Base General Service Screw-in, Outdoor LED bulb	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1801	Outdoor Lighting Controls (Base Outdoor LED)	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
VA Existing	1850	Base Linear Lighting, Outdoor Fluorescent Tube	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1851	ROB 2L4' LED Tube (base outdoor fluorescent)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1852	LED outdoor lighting with bi-level controls (Base Outdoor Fluorescent)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1853	Outdoor Lighting Controls (Base Outdoor Fluorescent)	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
VA Existing	1900	Base Linear Lighting, Outdoor LED Tube	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1901	Outdoor Lighting Controls (Base Outdoor LED Tube)	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
VA Existing	2000	Base Water-Cooled Centrifugal Chiller, 0.58 kW/ton, 500 tons	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2001	Centrifugal Chiller, 0.54 kW/ton, 500 tons	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2002	Chiller Tune Up/Diagnostics	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2003	High Efficiency Chilled Water & Condenser Water Pump Motors	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2004	VSD for Chiller Pumps and Towers	16%	0%	0%	100%	0%	17%	15%	4%	16%	39%	62%	62%
VA Existing	2005	Ceiling/roof Insulation - Chiller	22%	100%	43%	100%	3%	100%	100%	100%	22%	36%	49%	49%
VA Existing	2006	Cool Roof - Chiller	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	2007	Duct Testing/Sealing - Chiller	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2008	Duct/Pipe Insulation - Chiller	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	2009	EMS Optimization - Chiller	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2010	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - Chiller	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2011	New Economizer - Chiller	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2012	Window Film (Standard) - Chiller	75%	75%	50%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	2013	High Efficiency Windows - Chiller	75%	75%	50%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	2100	Base DX Packaged System, EER=10.3, 10 tons	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2101	DX Packaged System, EER=10.9, 10 tons	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2102	DX Packaged System, EER=13.4, 10 tons	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2103	Geothermal Heat Pump, EER=13, 10 tons - DX	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
VA Existing	2104	DX Tune Up/ Advanced Diagnostics	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2105	Refrigerant Charge Adjustment - DX	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2106	Ceiling/roof Insulation - DX	22%	43%	100%	100%	100%	52%	100%	100%	22%	61%	100%	100%
VA Existing	2107	Cool Roof - DX	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	2108	Duct Testing/Sealing - DX	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%
VA Existing	2109	Duct/Pipe Insulation - DX	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	2110	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
VA Existing	2111	Economizer Repair - DX	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
VA Existing	2112	New Economizer - DX	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2113	Optimize Controls - DX	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2114	Smart Thermostat - DX	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2115	Window Film (Standard) - DX	75%	75%	50%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	2116	High Efficiency Windows - DX	75%	75%	50%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	2150	Base DX Packaged System, 2029 Standard	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2152	DX Packaged System, EER=13.4, 10 tons	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2153	Geothermal Heat Pump, EER=13, 10 tons - DX	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
VA Existing	2154	DX Tune Up/ Advanced Diagnostics	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2155	Refrigerant Charge Adjustment - DX	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Commercial Elec Measure Inputs			FEASIBILITY FACTOR (percent)											
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VA Existing	2156	Ceiling/roof Insulation - DX	22%	43%	100%	100%	100%	52%	100%	100%	22%	61%	100%	100%
VA Existing	2157	Cool Roof - DX	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	2158	Duct Testing/Sealing - DX	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%
VA Existing	2159	Duct/Pipe Insulation - DX	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	2160	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
VA Existing	2161	Economizer Repair - DX	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
VA Existing	2162	New Economizer - DX	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2163	Optimize Controls - DX	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2164	Smart Thermostat - DX	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2165	Window Film (Standard) - DX	75%	75%	50%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	2166	High Efficiency Windows - DX	75%	75%	50%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	2200	Base Heat Pump cooling (14.3 SEER, 8.2 HSPF)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2201	Heat Pump Upgrade (18 SEER, 8.2 HSPF), cooling	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2202	Mini-Split Heat Pump (Base Heat Pump Cooling)	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%
VA Existing	2203	Ceiling/roof Insulation (Base Heat Pump Cooling)	22%	43%	100%	100%	100%	52%	100%	100%	22%	61%	100%	100%
VA Existing	2204	Duct/Pipe Insulation (Base Heat Pump Cooling)	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	2205	Smart Thermostat (Base Heat Pump Cooling)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2206	Window Film (Standard) (Base Heat Pump Cooling)	75%	75%	50%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	2207	High Efficiency Windows (Base Heat Pump Cooling)	75%	75%	50%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	2300	Base Split-System AC, SEER 14.5, <5.4 tons	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2301	Split System Air Conditioner, SEER 16.0 ENERGY STAR, <5.4 tons	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2302	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Residential Split-System)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2303	Ceiling/roof Insulation (Base Residential Split-System)	22%	43%	100%	100%	100%	52%	100%	100%	22%	61%	100%	100%
VA Existing	2304	Duct/Pipe Insulation (Base Residential Split-System)	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	2305	Smart Thermostat (Base Residential Split-System)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2306	Window Film (Standard) (Base Residential Split-System)	75%	75%	50%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	2400	Base PTAC cooling, EER=10.2, 1 ton	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2401	HE PTAC, EER=9.6, 1 ton, cooling	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2402	Ceiling/roof Insulation (Base PTAC)	22%	43%	100%	100%	100%	52%	100%	100%	22%	61%	100%	100%
VA Existing	2404	Occupancy Sensor (hotels)	0%	0%	0%	0%	0%	0%	0%	75%	0%	0%	0%	0%
VA Existing	2405	Window Film (Standard) (Base PTAC)	75%	75%	50%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	2500	Base Room AC, CEER 10.9	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2501	Room AC, CEER 12.0 ENERGY STAR	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2502	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Room AC)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2503	Ceiling/roof Insulation (Base Room AC)	22%	43%	100%	100%	100%	52%	100%	100%	22%	61%	100%	100%
VA Existing	2505	Window Film (Standard) (Base Room AC)	75%	75%	50%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	2506	High Efficiency Windows (Base Room AC)	75%	75%	50%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	2600	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2601	Ceiling/roof Insulation (Base Ductless Mini-split)	22%	43%	100%	100%	100%	52%	100%	100%	22%	61%	100%	100%
VA Existing	2603	Window Film (Standard) (Base Ductless Mini-split)	75%	75%	50%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	2604	High Efficiency Windows (Base Ductless Mini-split)	75%	75%	50%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	3100	Base Open refrigerated/freezer cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3101	Efficient compressor motor, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3102	Bi-level LED Case Lighting (self-contained units), open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3103	Compressor VSD retrofit, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3104	Demand Defrost Electric, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3105	Demand Hot Gas Defrost, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3106	Electronically commutated evaporator fan motor, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3107	High-efficiency fan motors, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3108	Insulated suction lines, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3109	LED Display Lighting, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3110	Multiplex Compressor System, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3111	Night covers for display cases, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3112	Oversized Air Cooled Condenser, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3113	Refrigeration Coil Cleaning, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3114	Refrigeration Commissioning, open cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3200	Base Closed refrigerated/freezer cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3201	Efficient compressor motor, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3202	Energy-Star Refrigerator/Freezer, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Commercial Elec Measure Inputs			FEASIBILITY FACTOR (percent)											
Segment	Measure #	Measure Description	Office	Restaurant	Retail	Grocery	Warehouse	Education	Health	Lodging	Data Centers	Non-Jurisdictional	Religious Worship	Misc
VA Existing	3203	Anti-sweat (humidistat) controls, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3204	Bi-level LED Case Lighting (self-contained units), base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3205	Compressor VSD retrofit, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3206	Demand Defrost Electric, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3207	Demand Hot Gas Defrost, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3208	Electronically commutated evaporator fan motor, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3209	Freezer-Cooler Replacement Gaskets, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3210	High R-Value Glass Doors, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3211	High-efficiency fan motors, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3212	Insulated suction lines, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3213	LED Display Lighting, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3214	Low or Anti-Sweat Door Film, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3215	Multiplex Compressor System, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3216	Oversized Air Cooled Condenser, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3217	Refrigeration Coil Cleaning, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3218	Refrigeration Commissioning, base closed cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3300	Base Walk-in refrigeration/freezer units	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3301	Efficient compressor motor, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3302	Auto-closer on main door to walk-in freezer	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3303	Compressor VSD retrofit, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3304	Demand Defrost Electric, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3305	Demand Hot Gas Defrost, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3306	Electronically commutated evaporator fan motor, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3307	Evaporator fan controller for MT walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3308	Floating head pressure controls, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3309	Freezer-Cooler Replacement Gaskets, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3310	High-efficiency fan motors, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3311	Insulated suction lines, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3312	Multiplex Compressor System, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3313	Oversized Air Cooled Condenser, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3314	Refrigeration Coil Cleaning, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3315	Refrigeration Commissioning, walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3316	Strip curtains for walk-ins	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3400	Base Large Cold Storage Area	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3401	Efficient compressor motor, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3402	Auto-closer on main door to walk-in freezer, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3403	Compressor VSD retrofit, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3404	Electronically commutated evaporator fan motor, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3405	Evaporator fan controller for MT walk-ins, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3406	High-efficiency fan motors, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3407	Insulated suction lines, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3408	Multiplex Compressor System, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3409	Oversized Air Cooled Condenser, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3410	Refrigeration Coil Cleaning, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3411	Refrigeration Commissioning, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3412	Strip curtains for walk-ins, base large cold storage	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3500	Base Reach-in Refrigerator/Freezer, Federal Standard	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3501	Energy Star solid door reach-in refrigerator/freezer	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3502	Freezer-Cooler Replacement Gaskets, base reach-in	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3503	Refrigeration Coil Cleaning, base base reach-in	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3600	Base Glass Door Reach-in Refrigerator/Freezer, Federal Standard	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3601	Energy Star glass door reach-in refrigerator/freezer	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3602	Bi-level LED Case Lighting, base glass-door reach-in	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3603	Freezer-Cooler Replacement Gaskets, base glass-door reach-in	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3604	Refrigeration Coil Cleaning, base glass-door reach-in	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3700	Base Ice Maker, Federal Standard	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3701	Energy Star Ice Machines	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3702	Refrigeration Coil Cleaning, base ice maker	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3800	Base Residential-Type Refrigerator/Freezer, Federal Standard	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Commercial Elec Measure Inputs			FEASIBILITY FACTOR (percent)											
Segment	Measure #	Measure Description	Office Building Type	Restaurant Building Type	Retail Building Type	Grocery Building Type	Warehouse Building Type	Education Building Type	Health Building Type	Lodging Building Type	Data Centers Building Type	Non-Jurisdictional Building Type	Religious Worship Building Type	Misc Building Type 1
VA Existing	3801	Energy Star refrigerator/freezer	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3802	Refrigeration Coil Cleaning, residential-type refrigerator	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3900	Base Compact Refrigerator, Federal Standard	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3901	Energy Star Compact Refrigerator	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3902	Refrigeration Coil Cleaning, compact refrigerator	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4000	Base Computer Network Server	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4001	Energy Star server	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4002	Server Power Management Enabling	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	4100	Base Desktop PC	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4101	Energy Star or Better PC	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4102	PC Network Power Management Enabling	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	4200	Base Laptop PC	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4201	Energy Star or Better Laptop	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4202	Laptop Network Power Management Enabling	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4300	Base Monitor, LCD	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4301	Energy Star or Better Monitor - LCD	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4302	Monitor Power Management Enabling - LCD	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	4303	Plug-load controls - Commercial Smart Strip (base monitor LCD)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4400	Base Imaging	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Commercial Elec Measure Inputs			INCOMPLETE FACTOR (percent)											
Segment	Measure #	Measure Description	Office uilding Type	Restaurant uilding Type	Retail uilding Type	Grocery uilding Type	Warehouse uilding Type	Education ilding Type	Health uilding Type	Lodging ldingTyp	Data Centers ilding Typ	Non-Jurisdictional ldingType	Religious Worship ldingTyp	Misc uilding Type
VA Existing	1000	Base Linear Lighting, Fluorescent Fixture, 2L4'T12	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1001	High Performance Lighting R/R - Combined Strategies (Base T12)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1002	ROB 2L4' LED Tube (Base T12)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1003	LED Troffer (Base T12)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1004	LED Troffer with lamp removal (T12)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1005	Lighting Control Tuneup (Base T12)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1006	Network Lighting Controls (Base T12)	64%	99%	92%	100%	100%	98%	99%	87%	92%	100%	98%	97%
VA Existing	1007	Occupancy Sensor (Base T12)	62%	98%	85%	100%	75%	96%	86%	86%	60%	100%	88%	91%
VA Existing	1050	Base Linear Lighting, Fluorescent Fixture, 2L4'T12, integrated market	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1051	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1100	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1101	High Performance Lighting R/R - Combined Strategies (Base T8)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1102	ROB 2L4' LED Tube (Base T8)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1103	LED Troffer (Base T8)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1104	LED Troffer with lamp removal (T8)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1105	Lighting Control Tuneup (Base T8)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1106	Network Lighting Controls (Base T8)	64%	99%	92%	100%	100%	98%	99%	87%	92%	100%	98%	97%
VA Existing	1107	Occupancy Sensor (Base T8)	62%	98%	85%	100%	75%	96%	86%	86%	60%	100%	88%	91%
VA Existing	1150	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB, integrated market	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1151	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1200	Base Linear Lighting, LED Tube, 2 lamp fixture	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1201	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1202	Lighting Control Tuneup (Base LED Tube)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1203	Network Lighting Controls (Base LED Tube)	64%	99%	92%	100%	100%	98%	99%	87%	92%	100%	98%	97%
VA Existing	1204	Occupancy Sensor (Base LED tube)	62%	98%	85%	100%	75%	96%	86%	86%	60%	100%	88%	91%
VA Existing	1225	Base Linear Lighting, LED Tube, 2 lamp fixture, 2028 Standard	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1226	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1227	Lighting Control Tuneup (Base LED Tube)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1228	Network Lighting Controls (Base LED Tube)	64%	99%	92%	100%	100%	98%	99%	87%	92%	100%	98%	97%
VA Existing	1229	Occupancy Sensor (Base LED tube)	62%	98%	85%	100%	75%	96%	86%	86%	60%	100%	88%	91%
VA Existing	1250	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1251	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1275	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market, 2028 Standard	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1276	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1300	Base General Service Screw-in, CFL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1301	LED screw-in replacement (base CFL)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1350	Base General Service Screw-in, Incandescent/halogen	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1351	LED screw-in replacement (base incandescent/halogen)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1400	Base General Service Screw-in, LED bulb	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1401	LED screw-in replacement (base LED)	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	1425	Base General Service Screw-in, LED bulb, 2028 Standard	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1426	LED screw-in replacement (base LED)	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	1450	Base HID Lighting (low bay)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1451	LED fixture (base Low bay HID)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1452	High Performance Lighting R/R - Combined Strategies (base low bay HID)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1500	Base High Bay Lighting, Fluorescent T5	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1501	High Performance Lighting R/R - Combined Strategies (Base T5)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1502	ROB 2L4' LED Tube (Base T5)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1503	High Bay LED Troffer (Base T5)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1504	Lighting Control Tuneup (Base T5)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1505	Network Lighting Controls (Base T5)	64%	99%	92%	100%	100%	98%	99%	87%	92%	100%	98%	97%
VA Existing	1506	Occupancy Sensor (Base T5)	62%	98%	85%	100%	75%	96%	86%	86%	60%	100%	88%	91%
VA Existing	1525	Base High Bay Lighting, Fluorescent T5, integrated market	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1526	High Bay Bi-Level Programmed LED Fixture	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1550	Base High Bay Lighting, HID lighting	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1551	High Bay Bi-Level Programmed LED Fixture	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%
VA Existing	1552	High Performance Lighting R/R - Combined Strategies (base high bay HID)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1575	Base High Bay Lighting, LED lighting	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Commercial Elec Measure Inputs			INCOMPLETE FACTOR (percent)											
Segment	Measure #	Measure Description	Office uilding Type	Restaurant uilding Type	Retail uilding Type	Grocery uilding Type	Warehouse uilding Type	Education ilding Type	Health uilding Type	Lodging ilding Type	Data Centers ilding Type	Non-Jurisdictional ilding Type	Religious Worship ilding Type	Misc uilding Type
VA Existing	1576	Network Lighting Controls (Base high bay LED)	64%	99%	92%	100%	100%	98%	99%	87%	92%	100%	98%	97%
VA Existing	1577	Occupancy Sensor (Base high bay LED)	62%	98%	85%	100%	75%	96%	86%	86%	60%	100%	88%	91%
VA Existing	1600	Base CFL Exit Sign	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1601	LED Exit Sign	35%	64%	58%	1%	100%	56%	6%	35%	35%	37%	39%	39%
VA Existing	1650	Base Area Lighting, Outdoor HID	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1651	LED Outdoor Area Lighting (Base Outdoor HID)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1652	LED outdoor lighting with bi-level controls (Base Outdoor HID)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1653	Outdoor Lighting Controls (Base Outdoor HID)	54%	68%	37%	49%	16%	42%	35%	36%	19%	27%	6%	32%
VA Existing	1700	Base General Service Screw-in, Outdoor CFL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1701	LED outdoor lighting with bi-level controls (Base Outdoor CFL)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1702	LED screw-in replacement (base Outdoor CFL)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1703	Outdoor Lighting Controls (Base Outdoor CFL)	54%	68%	37%	49%	16%	42%	35%	36%	19%	27%	6%	32%
VA Existing	1750	Base General Service Screw-in, Outdoor Incandescent/Halogen	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1751	LED outdoor lighting with bi-level controls (Base Outdoor Incandescent)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1752	LED screw-in replacement (base Outdoor Incandescent)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1753	Outdoor Lighting Controls (Base Outdoor Incandescent)	54%	68%	37%	49%	16%	42%	35%	36%	19%	27%	6%	32%
VA Existing	1800	Base General Service Screw-in, Outdoor LED bulb	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1801	Outdoor Lighting Controls (Base Outdoor LED)	54%	68%	37%	49%	16%	42%	35%	36%	19%	27%	6%	32%
VA Existing	1850	Base Linear Lighting, Outdoor Fluorescent Tube	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1851	ROB 2L4' LED Tube (base outdoor fluorescent)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1852	LED outdoor lighting with bi-level controls (Base Outdoor Fluorescent)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1853	Outdoor Lighting Controls (Base Outdoor Fluorescent)	54%	68%	37%	49%	16%	42%	35%	36%	19%	27%	6%	32%
VA Existing	1900	Base Linear Lighting, Outdoor LED Tube	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
VA Existing	1901	Outdoor Lighting Controls (Base Outdoor LED Tube)	54%	68%	37%	49%	16%	42%	35%	36%	19%	27%	6%	32%
VA Existing	2000	Base Water-Cooled Centrifugal Chiller, 0.58 kW/ton, 500 tons	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2001	Centrifugal Chiller, 0.54 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%	68.0%
VA Existing	2002	Chiller Tune Up/Diagnostics	15%	12%	10%	13%	4%	1%	7%	12%	2%	0%	20%	13%
VA Existing	2003	High Efficiency Chilled Water & Condenser Water Pump Motors	19%	0%	0%	100%	0%	49%	55%	4%	19%	45%	62%	62%
VA Existing	2004	VSD for Chiller Pumps and Towers	38.5%	0.0%	0.0%	100.0%	0.0%	10.5%	13.4%	100.0%	38.5%	50.2%	61.8%	61.8%
VA Existing	2005	Ceiling/roof Insulation - Chiller	10%	26%	37%	36%	26%	16%	9%	2%	100%	13%	9%	14%
VA Existing	2006	Cool Roof - Chiller	34%	0%	0%	100%	0%	61%	88%	100%	34%	67%	100%	100%
VA Existing	2007	Duct Testing/Sealing - Chiller	100.0%	91.6%	100.0%	100.0%	97.4%	84.7%	100.0%	100.0%	100.0%	98.0%	96.0%	96.0%
VA Existing	2008	Duct/Pipe Insulation - Chiller	20%	0%	0%	100%	0%	39%	75%	33%	20%	55%	89%	89%
VA Existing	2009	EMS Optimization - Chiller	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%
VA Existing	2010	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - Chiller	53.0%	53.0%	53.0%	53.0%	53.0%	53.0%	53.0%	53.0%	53.0%	53.0%	53.0%	53.0%
VA Existing	2011	New Economizer - Chiller	19%	0%	0%	3%	0%	74%	54%	68%	19%	57%	95%	95%
VA Existing	2012	Window Film (Standard) - Chiller	86%	92%	86%	91%	92%	82%	91%	64%	100%	100%	95%	97%
VA Existing	2013	High Efficiency Windows - Chiller	24.4%	45.5%	59.3%	56.7%	48.3%	23.4%	34.3%	18.8%	6.8%	29.1%	40.6%	39.5%
VA Existing	2100	Base DX Packaged System, EER=10.3, 10 tons	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2101	DX Packaged System, EER=10.9, 10 tons	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2102	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%	100.0%
VA Existing	2103	Geothermal Heat Pump, EER=13, 10 tons - DX	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%
VA Existing	2104	DX Tune Up/ Advanced Diagnostics	15%	12%	10%	13%	4%	1%	7%	12%	2%	0%	20%	13%
VA Existing	2105	Refrigerant Charge Adjustment - DX	80.0%	12.4%	10.2%	13.3%	4.3%	1.2%	7.0%	11.7%	2.0%	0.0%	19.6%	13.3%
VA Existing	2106	Ceiling/roof Insulation - DX	10%	26%	37%	36%	26%	16%	9%	2%	100%	13%	9%	14%
VA Existing	2107	Cool Roof - DX	94%	91%	66%	100%	78%	95%	100%	100%	94%	97%	100%	100%
VA Existing	2108	Duct Testing/Sealing - DX	100.0%	91.6%	100.0%	100.0%	97.4%	84.7%	100.0%	100.0%	100.0%	98.0%	96.0%	96.0%
VA Existing	2109	Duct/Pipe Insulation - DX	43%	81%	48%	100%	13%	79%	73%	72%	43%	42%	42%	42%
VA Existing	2110	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	53%	53%	53%	53%	53%	53%	53%	53%	53%	53%	53%	53%
VA Existing	2111	Economizer Repair - DX	66.0%	66.0%	66.0%	66.0%	66.0%	66.0%	66.0%	66.0%	66.0%	66.0%	66.0%	66.0%
VA Existing	2112	New Economizer - DX	19%	0%	0%	3%	0%	74%	54%	68%	19%	65%	95%	95%
VA Existing	2113	Optimize Controls - DX	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%
VA Existing	2114	Smart Thermostat - DX	90.5%	69.9%	91.3%	93.0%	81.9%	95.7%	80.9%	92.7%	98.7%	100.0%	88.3%	77.4%
VA Existing	2115	Window Film (Standard) - DX	86%	92%	86%	91%	92%	82%	91%	64%	100%	100%	95%	97%
VA Existing	2116	High Efficiency Windows - DX	24%	46%	59%	57%	48%	23%	34%	19%	7%	29%	41%	40%
VA Existing	2150	Base DX Packaged System, 2029 Standard	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
VA Existing	2152	DX Packaged System, EER=13.4, 10 tons	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2153	Geothermal Heat Pump, EER=13, 10 tons - DX	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%

Commercial Elec Measure Inputs			INCOMPLETE FACTOR (percent)											
Segment	Measure #	Measure Description	Office uilding Type	Restaurant uilding Type	Retail uilding Type	Grocery uilding Type	Warehouse uilding Type	Education ilding Type	Health uilding Type	Lodging ilding Type	Data Centers ilding Type	Non-Jurisdictional ilding Type	Religious Worship ilding Type	Misc uilding Type
VA Existing	2154	DX Tune Up/ Advanced Diagnostics	15%	12%	10%	13%	4%	1%	7%	12%	2%	0%	20%	13%
VA Existing	2155	Refrigerant Charge Adjustment - DX	80%	12%	10%	13%	4%	1%	7%	12%	2%	0%	20%	13%
VA Existing	2156	Ceiling/roof Insulation - DX	10%	26%	37%	36%	26%	16%	9%	2%	100%	13%	9%	14%
VA Existing	2157	Cool Roof - DX	94%	91%	66%	100%	78%	95%	100%	100%	94%	97%	100%	100%
VA Existing	2158	Duct Testing/Sealing - DX	100%	92%	100%	100%	97%	85%	100%	100%	100%	98%	96%	96%
VA Existing	2159	Duct/Pipe Insulation - DX	43%	81%	48%	100%	13%	79%	73%	72%	43%	42%	42%	42%
VA Existing	2160	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	53%	53%	53%	53%	53%	53%	53%	53%	53%	53%	53%	53%
VA Existing	2161	Economizer Repair - DX	66%	66%	66%	66%	66%	66%	66%	66%	66%	66%	66%	66%
VA Existing	2162	New Economizer - DX	19%	0%	0%	3%	0%	74%	54%	68%	19%	65%	95%	95%
VA Existing	2163	Optimize Controls - DX	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%
VA Existing	2164	Smart Thermostat - DX	90%	70%	91%	93%	82%	96%	81%	93%	99%	100%	88%	77%
VA Existing	2165	Window Film (Standard) - DX	86%	92%	86%	91%	92%	82%	91%	64%	100%	100%	95%	97%
VA Existing	2166	High Efficiency Windows - DX	24%	46%	59%	57%	48%	23%	34%	19%	7%	29%	41%	40%
VA Existing	2200	Base Heat Pump cooling (14.3 SEER, 8.2 HSPF)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2201	Heat Pump Upgrade (18 SEER, 8.2 HSPF), cooling	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%	92%
VA Existing	2202	Mini-Split Heat Pump (Base Heat Pump Cooling)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2203	Ceiling/roof Insulation (Base Heat Pump Cooling)	10%	26%	37%	36%	26%	16%	9%	2%	100%	13%	9%	14%
VA Existing	2204	Duct/Pipe Insulation (Base Heat Pump Cooling)	43%	81%	48%	100%	13%	79%	73%	72%	43%	42%	42%	42%
VA Existing	2205	Smart Thermostat (Base Heat Pump Cooling)	90%	70%	91%	93%	82%	96%	81%	93%	99%	100%	88%	77%
VA Existing	2206	Window Film (Standard) (Base Heat Pump Cooling)	86%	92%	86%	91%	92%	82%	91%	64%	100%	100%	95%	97%
VA Existing	2207	High Efficiency Windows (Base Heat Pump Cooling)	24%	46%	59%	57%	48%	23%	34%	19%	7%	29%	41%	40%
VA Existing	2300	Base Split-System AC, SEER 14.5, <5.4 tons	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2301	Split System Air Conditioner, SEER 16.0 ENERGY STAR, <5.4 tons	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%
VA Existing	2302	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Residential Split-System)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2303	Ceiling/roof Insulation (Base Residential Split-System)	10%	26%	37%	36%	26%	16%	9%	2%	100%	13%	9%	14%
VA Existing	2304	Duct/Pipe Insulation (Base Residential Split-System)	43%	81%	48%	100%	13%	79%	73%	72%	43%	42%	42%	42%
VA Existing	2305	Smart Thermostat (Base Residential Split-System)	90%	70%	91%	93%	82%	96%	81%	93%	99%	100%	88%	77%
VA Existing	2306	Window Film (Standard) (Base Residential Split-System)	86%	92%	86%	91%	92%	82%	91%	64%	100%	100%	95%	97%
VA Existing	2400	Base PTAC cooling, EER=10.2, 1 ton	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2401	HE PTAC, EER=9.6, 1 ton, cooling	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2402	Ceiling/roof Insulation (Base PTAC)	10%	26%	37%	36%	26%	16%	9%	2%	100%	13%	9%	14%
VA Existing	2404	Occupancy Sensor (hotels)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2405	Window Film (Standard) (Base PTAC)	86%	92%	86%	91%	92%	82%	91%	64%	100%	100%	95%	97%
VA Existing	2500	Base Room AC, CEER 10.9	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2501	Room AC, CEER 12.0 ENERGY STAR	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
VA Existing	2502	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Room AC)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2503	Ceiling/roof Insulation (Base Room AC)	10%	26%	37%	36%	26%	16%	9%	2%	100%	0.1297	0.0907	0.135515
VA Existing	2505	Window Film (Standard) (Base Room AC)	86%	92%	86%	91%	92%	82%	91%	64%	100%	100%	95%	97%
VA Existing	2506	High Efficiency Windows (Base Room AC)	24%	46%	59%	57%	48%	23%	34%	19%	7%	29%	41%	40%
VA Existing	2600	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	2601	Ceiling/roof Insulation (Base Ductless Mini-split)	10%	26%	37%	36%	26%	16%	9%	2%	100%	13%	9%	14%
VA Existing	2603	Window Film (Standard) (Base Ductless Mini-split)	86%	92%	86%	91%	92%	82%	91%	64%	100%	100%	95%	97%
VA Existing	2604	High Efficiency Windows (Base Ductless Mini-split)	24%	46%	59%	57%	48%	23%	34%	19%	7%	29%	41%	40%
VA Existing	3100	Base Open refrigerated/freezer cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3101	Efficient compressor motor, open cases	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3102	Bi-level LED Case Lighting (self-contained units), open cases	50%	21%	40%	100%	100%	100%	60%	41%	100%	100%	64%	76%
VA Existing	3103	Compressor VSD retrofit, open cases	58%	100%	100%	100%	0%	76%	100%	100%	58%	79%	100%	100%
VA Existing	3104	Demand Defrost Electric, open cases	0%	75%	19%	75%	75%	0%	75%	75%	0%	0%	0%	0%
VA Existing	3105	Demand Hot Gas Defrost, open cases	58%	75%	100%	75%	75%	76%	75%	75%	58%	79%	100%	100%
VA Existing	3106	Electronically commutated evaporator fan motor, open cases	61%	25%	36%	27%	0%	0%	54%	15%	100%	100%	55%	20%
VA Existing	3107	High-efficiency fan motors, open cases	64%	100%	48%	57%	48%	100%	100%	100%	64%	82%	100%	100%
VA Existing	3108	Insulated suction lines, open cases	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	3109	LED Display Lighting, open cases	67%	90%	61%	99%	100%	95%	46%	78%	100%	100%	100%	64%
VA Existing	3110	Multiplex Compressor System, open cases	0%	0%	0%	11%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3111	Night covers for display cases, open cases	100%	26%	20%	100%	100%	100%	86%	18%	100%	100%	100%	60%
VA Existing	3112	Oversized Air Cooled Condenser, open cases	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	3113	Refrigeration Coil Cleaning, open cases	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	3114	Refrigeration Commissioning, open cases	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%

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VA Existing	3200	Base Closed refrigerated/freezer cases	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3201	Efficient compressor motor, base closed cases	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3202	Energy-Star Refrigerator/Freezer, base closed cases	64%	64%	64%	64%	64%	64%	64%	64%	64%	64%	64%	64%
VA Existing	3203	Anti-sweat (humidistat) controls, base closed cases	0%	0%	0%	27%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3204	Bi-level LED Case Lighting (self-contained units), base closed cases	50%	21%	40%	100%	100%	100%	60%	41%	100%	100%	64%	76%
VA Existing	3205	Compressor VSD retrofit, base closed cases	58%	100%	100%	100%	0%	76%	100%	100%	58%	79%	100%	100%
VA Existing	3206	Demand Defrost Electric, base closed cases	0%	75%	19%	75%	75%	0%	75%	75%	0%	0%	0%	0%
VA Existing	3207	Demand Hot Gas Defrost, base closed cases	58%	75%	100%	75%	75%	76%	75%	75%	58%	79%	100%	100%
VA Existing	3208	Electronically commutated evaporator fan motor, base closed cases	61%	25%	36%	27%	0%	0%	54%	15%	100%	100%	55%	20%
VA Existing	3209	Freezer-Cooler Replacement Gaskets, base closed cases	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	3210	High R-Value Glass Doors, base closed cases	0%	0%	100%	95%	0%	0%	0%	0%	0%	50%	100%	100%
VA Existing	3211	High-efficiency fan motors, base closed cases	64%	100%	48%	57%	48%	100%	100%	100%	64%	82%	100%	100%
VA Existing	3212	Insulated suction lines, base closed cases	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	3213	LED Display Lighting, base closed cases	67%	90%	61%	99%	100%	95%	46%	78%	100%	100%	100%	64%
VA Existing	3214	Low or Anti-Sweat Door Film, base closed cases	80%	80.0%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
VA Existing	3215	Multiplex Compressor System, base closed cases	0%	0%	0%	11%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3216	Oversized Air Cooled Condenser, base closed cases	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	3217	Refrigeration Coil Cleaning, base closed cases	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	3218	Refrigeration Commissioning, base closed cases	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	3300	Base Walk-in refrigeration/freezer units	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3301	Efficient compressor motor, walk-ins	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3302	Auto-closer on main door to walk-in freezer	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	3303	Compressor VSD retrofit, walk-ins	58%	100%	100%	100%	0%	76%	100%	100%	58%	79%	100%	100%
VA Existing	3304	Demand Defrost Electric, walk-ins	0%	75%	19%	75%	75%	0%	75%	75%	0%	0%	0%	0%
VA Existing	3305	Demand Hot Gas Defrost, walk-ins	58%	75%	100%	75%	75%	76%	75%	75%	58%	0.7894	1	1
VA Existing	3306	Electronically commutated evaporator fan motor, walk-ins	61%	25%	36%	27%	0%	0%	54%	15%	100%	100%	55%	20%
VA Existing	3307	Evaporator fan controller for MT walk-ins	14%	37%	32%	22%	0%	18%	30%	7%	100%	100%	43%	14%
VA Existing	3308	Floating head pressure controls, walk-ins	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3309	Freezer-Cooler Replacement Gaskets, walk-ins	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	3310	High-efficiency fan motors, walk-ins	64%	100%	48%	57%	48%	100%	100%	100%	64%	82%	100%	100%
VA Existing	3311	Insulated suction lines, walk-ins	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	3312	Multiplex Compressor System, walk-ins	0%	0%	0%	11%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3313	Oversized Air Cooled Condenser, walk-ins	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	3314	Refrigeration Coil Cleaning, walk-ins	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	3315	Refrigeration Commissioning, walk-ins	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	3316	Strip curtains for walk-ins	11%	32%	47%	50%	3%	0%	37%	36%	100%	1	0.3862	0.5362671
VA Existing	3400	Base Large Cold Storage Area	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3401	Efficient compressor motor, base large cold storage	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3402	Auto-closer on main door to walk-in freezer, base large cold storage	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	3403	Compressor VSD retrofit, base large cold storage	58%	100%	100%	100%	0%	76%	100%	100%	58%	79%	100%	100%
VA Existing	3404	Electronically commutated evaporator fan motor, base large cold storage	61%	25%	36%	27%	0%	0%	54%	15%	100%	1	0.5464	0.2041129
VA Existing	3405	Evaporator fan controller for MT walk-ins, base large cold storage	14%	37%	32%	22%	0%	18%	30%	7%	100%	100%	43%	14%
VA Existing	3406	High-efficiency fan motors, base large cold storage	64%	100%	48%	57%	48%	100%	100%	100%	64%	82%	100%	100%
VA Existing	3407	Insulated suction lines, base large cold storage	50%	50%	50%	50%	50%	50%	50%	50%	50%	0.5	0.5	0.5
VA Existing	3408	Multiplex Compressor System, base large cold storage	0%	0%	0%	11%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3409	Oversized Air Cooled Condenser, base large cold storage	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	3410	Refrigeration Coil Cleaning, base large cold storage	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	3411	Refrigeration Commissioning, base large cold storage	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	3412	Strip curtains for walk-ins, base large cold storage	11%	32%	47%	50%	3%	0%	37%	36%	100%	100%	39%	54%
VA Existing	3500	Base Reach-in Refrigerator/Freezer, Federal Standard	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3501	Energy Star solid door reach-in refrigerator/freezer	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%
VA Existing	3502	Freezer-Cooler Replacement Gaskets, base reach-in	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	3503	Refrigeration Coil Cleaning, base base reach-in	50%	50%	50%	50%	50%	50%	50%	50%	50%	0.5	0.5	0.5
VA Existing	3600	Base Glass Door Reach-in Refrigerator/Freezer, Federal Standard	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3601	Energy Star glass door reach-in refrigerator/freezer	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%
VA Existing	3602	Bi-level LED Case Lighting, base glass-door reach-in	50%	21%	40%	100%	100%	100%	60%	41%	100%	100%	64%	76%
VA Existing	3603	Freezer-Cooler Replacement Gaskets, base glass-door reach-in	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	3604	Refrigeration Coil Cleaning, base glass-door reach-in	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%

Commercial Elec Measure Inputs			INCOMPLETE FACTOR (percent)											
Segment	Measure #	Measure Description	Office uilding Type	Restaurant uilding Type	Retail uilding Type	Grocery uilding Type	Warehouse uilding Type	Education ilding Type	Health uilding Type	Lodging ldg Type	Data Centers ilding Type	Non-Jurisdictional ldg Type	Religious Worship ldg Type	Misc uilding Type
VA Existing	3700	Base Ice Maker, Federal Standard	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3701	Energy Star Ice Machines	64%	64%	64%	64%	64%	64%	64%	64%	64%	64%	64%	64%
VA Existing	3702	Refrigeration Coil Cleaning, base ice maker	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	3800	Base Residential-Type Refrigerator/Freezer, Federal Standard	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3801	Energy Star refrigerator/freezer	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%
VA Existing	3802	Refrigeration Coil Cleaning, residential-type refrigerator	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	3900	Base Compact Refrigerator, Federal Standard	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	3901	Energy Star Compact Refrigerator	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
VA Existing	3902	Refrigeration Coil Cleaning, compact refrigerator	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
VA Existing	4000	Base Computer Network Server	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4001	Energy Star server	86%	99%	51%	98%	99%	83%	94%	54%	86%	89%	92%	92%
VA Existing	4002	Server Power Management Enabling	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
VA Existing	4100	Base Desktop PC	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4101	Energy Star or Better PC	86%	99%	51%	98%	99%	83%	94%	54%	86%	89%	92%	92%
VA Existing	4102	PC Network Power Management Enabling	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
VA Existing	4200	Base Laptop PC	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4201	Energy Star or Better Laptop	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%
VA Existing	4202	Laptop Network Power Management Enabling	29%	29%	29%	29%	29%	29%	29%	29%	29%	29%	29%	29%
VA Existing	4300	Base Monitor, LCD	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	4301	Energy Star or Better Monitor - LCD	58%	97%	62%	98%	99%	84%	94%	43%	58%	72%	85%	85%
VA Existing	4302	Monitor Power Management Enabling - LCD	46%	55%	23%	95%	7%	14%	30%	74%	46%	33%	20%	20%
VA Existing	4303	Plug-load controls - Commercial Smart Strip (base monitor LCD)	62%	79%	65%	45%	40%	79%	41%	67%	19%	100%	42%	55%
VA Existing	4400	Base Imaging	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Commercial Elec Measure Inputs			TECHNOLOGY SATURATION (units/square foot)											
Segment	Measure #	Measure Description	Office uilding Type	Restaurant uilding Type	Retail uilding Type	Grocery uilding Type	Warehouse uilding Type	Education uilding Type	Health uilding Type	Lodging ilding Typ	Data Centers ilding Typ	Non-Jurisdictional ding Type	Religious Worship ilding Type	Misc uilding Type 1
VA Existing	1000	Base Linear Lighting, Fluorescent Fixture, 2L4'T12	0.0040	0.0060	0.0080	0.0042	0.0049	0.0064	0.0112	0.0104	0.0059	0.0050	0.0095	0.0046
VA Existing	1001	High Performance Lighting R/R - Combined Strategies (Base T12)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	1002	ROB 2L4' LED Tube (Base T12)	0.0040	0.0060	0.0080	0.0042	0.0049	0.0064	0.0112	0.0104	0.0059	0.0050	0.0095	0.0046
VA Existing	1003	LED Troffer (Base T12)	0.0040	0.0060	0.0080	0.0042	0.0049	0.0064	0.0112	0.0104	0.0059	0.0050	0.0095	0.0046
VA Existing	1004	LED Troffer with lamp removal (T12)	0.0040	0.0060	0.0080	0.0042	0.0049	0.0064	0.0112	0.0104	0.0059	0.0050	0.0095	0.0046
VA Existing	1005	Lighting Control Tuneup (Base T12)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	1006	Network Lighting Controls (Base T12)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	1007	Occupancy Sensor (Base T12)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	1050	Base Linear Lighting, Fluorescent Fixture, 2L4'T12, integrated market	0.0040	0.0060	0.0080	0.0042	0.0049	0.0064	0.0112	0.0104	0.0059	0.0050	0.0095	0.0046
VA Existing	1051	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	0.0040	0.0060	0.0080	0.0042	0.0049	0.0064	0.0112	0.0104	0.0059	0.0050	0.0095	0.0046
VA Existing	1100	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB	0.0040	0.0060	0.0080	0.0042	0.0049	0.0064	0.0112	0.0104	0.0059	0.0050	0.0095	0.0046
VA Existing	1101	High Performance Lighting R/R - Combined Strategies (Base T8)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	1102	ROB 2L4' LED Tube (Base T8)	0.0040	0.0060	0.0080	0.0042	0.0049	0.0064	0.0112	0.0104	0.0059	0.0050	0.0095	0.0046
VA Existing	1103	LED Troffer (Base T8)	0.0040	0.0060	0.0080	0.0042	0.0049	0.0064	0.0112	0.0104	0.0059	0.0050	0.0095	0.0046
VA Existing	1104	LED Troffer with lamp removal (T8)	0.0040	0.0060	0.0080	0.0042	0.0049	0.0064	0.0112	0.0104	0.0059	0.0050	0.0095	0.0046
VA Existing	1105	Lighting Control Tuneup (Base T8)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	1106	Network Lighting Controls (Base T8)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	1107	Occupancy Sensor (Base T8)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	1150	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB, integrated market	0.0040	0.0060	0.0080	0.0042	0.0049	0.0064	0.0112	0.0104	0.0059	0.0050	0.0095	0.0046
VA Existing	1151	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	0.0040	0.0060	0.0080	0.0042	0.0049	0.0064	0.0112	0.0104	0.0059	0.0050	0.0095	0.0046
VA Existing	1200	Base Linear Lighting, LED Tube, 2 lamp fixture	0.0040	0.0060	0.0080	0.0042	0.0049	0.0064	0.0112	0.0104	0.0059	0.0050	0.0095	0.0046
VA Existing	1201	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	1202	Lighting Control Tuneup (Base LED Tube)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	1203	Network Lighting Controls (Base LED Tube)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	1204	Occupancy Sensor (Base LED tube)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	1225	Base Linear Lighting, LED Tube, 2 lamp fixture, 2028 Standard	0.0040	0.0060	0.0080	0.0042	0.0049	0.0064	0.0112	0.0104	0.0059	0.0050	0.0095	0.0046
VA Existing	1226	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	1227	Lighting Control Tuneup (Base LED Tube)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	1228	Network Lighting Controls (Base LED Tube)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	1229	Occupancy Sensor (Base LED tube)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	1250	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market	0.0040	0.0060	0.0080	0.0042	0.0049	0.0064	0.0112	0.0104	0.0059	0.0050	0.0095	0.0046
VA Existing	1251	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	0.0040	0.0060	0.0080	0.0042	0.0049	0.0064	0.0112	0.0104	0.0059	0.0050	0.0095	0.0046
VA Existing	1275	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market, 2028 Standard	0.0040	0.0060	0.0080	0.0042	0.0049	0.0064	0.0112	0.0104	0.0059	0.0050	0.0095	0.0046
VA Existing	1276	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	0.0040	0.0060	0.0080	0.0042	0.0049	0.0064	0.0112	0.0104	0.0059	0.0050	0.0095	0.0046
VA Existing	1300	Base General Service Screw-in, CFL	0.0235	0.0064	0.0163	0.0036	0.0000	0.0005	0.0117	0.0308	0.0345	0.0112	0.0154	0.0074
VA Existing	1301	LED screw-in replacement (base CFL)	0.0235	0.0064	0.0163	0.0036	0.0000	0.0005	0.0117	0.0308	0.0345	0.0112	0.0154	0.0074
VA Existing	1350	Base General Service Screw-in, Incandescent/halogen	0.0235	0.0064	0.0163	0.0036	0.0000	0.0005	0.0117	0.0308	0.0345	0.0112	0.0154	0.0074
VA Existing	1351	LED screw-in replacement (base incandescent/halogen)	0.0235	0.0064	0.0163	0.0036	0.0000	0.0005	0.0117	0.0308	0.0345	0.0112	0.0154	0.0074
VA Existing	1400	Base General Service Screw-in, LED bulb	0.0235	0.0064	0.0163	0.0036	0.0000	0.0005	0.0117	0.0308	0.0345	0.0112	0.0154	0.0074
VA Existing	1401	LED screw-in replacement (base LED)	0.0235	0.0064	0.0163	0.0036	0.0000	0.0005	0.0117	0.0308	0.0345	0.0112	0.0154	0.0074
VA Existing	1425	Base General Service Screw-in, LED bulb, 2028 Standard	0.0235	0.0064	0.0163	0.0036	0.0000	0.0005	0.0117	0.0308	0.0345	0.0112	0.0154	0.0074
VA Existing	1426	LED screw-in replacement (base LED)	0.0235	0.0064	0.0163	0.0036	0.0000	0.0005	0.0117	0.0308	0.0345	0.0112	0.0154	0.0074
VA Existing	1450	Base HID Lighting (low bay)	0.0040	0.0060	0.0080	0.0042	0.0049	0.0064	0.0112	0.0104	0.0059	0.0050	0.0095	0.0046
VA Existing	1451	LED fixture (base Low bay HID)	0.0040	0.0060	0.0080	0.0042	0.0049	0.0064	0.0112	0.0104	0.0059	0.0050	0.0095	0.0046
VA Existing	1452	High Performance Lighting R/R - Combined Strategies (base low bay HID)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	1500	Base High Bay Lighting, Fluorescent T5	0.0015	0.0000	0.0071	0.0020	0.0012	0.0025	0.0083	0.0043	0.0007	0.0010	0.0013	0.0006
VA Existing	1501	High Performance Lighting R/R - Combined Strategies (Base T5)	1.0000	1.0000	2.0000	1.0000	1.0000	1.0000	2.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	1502	ROB 2L4' LED Tube (Base T5)	0.0046	0.0001	0.0212	0.0059	0.0036	0.0076	0.0250	0.0128	0.0022	0.0029	0.0040	0.0019
VA Existing	1503	High Bay LED Troffer (Base T5)	0.0015	0.0000	0.0071	0.0020	0.0012	0.0025	0.0083	0.0043	0.0007	0.0010	0.0013	0.0006
VA Existing	1504	Lighting Control Tuneup (Base T5)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	1505	Network Lighting Controls (Base T5)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	1506	Occupancy Sensor (Base T5)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	1525	Base High Bay Lighting, Fluorescent T5, integrated market	0.0015	0.0000	0.0071	0.0020	0.0012	0.0025	0.0083	0.0043	0.0007	0.0010	0.0013	0.0006
VA Existing	1526	High Bay Bi-Level Programmed LED Fixture	0.0015	0.0000	0.0071	0.0020	0.0012	0.0025	0.0083	0.0043	0.0007	0.0010	0.0013	0.0006
VA Existing	1550	Base High Bay Lighting, HID lighting	0.0015	0.0000	0.0071	0.0020	0.0012	0.0025	0.0083	0.0043	0.0007	0.0010	0.0013	0.0006
VA Existing	1551	High Bay Bi-Level Programmed LED Fixture	0.0015	0.0000	0.0071	0.0020	0.0012	0.0025	0.0083	0.0043	0.0007	0.0010	0.0013	0.0006
VA Existing	1552	High Performance Lighting R/R - Combined Strategies (base high bay HID)	1.0000	1.0000	2.0000	1.0000	1.0000	1.0000	2.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	1575	Base High Bay Lighting, LED lighting	0.0015	0.0000	0.0071	0.0020	0.0012	0.0025	0.0083	0.0043	0.0007	0.0010	0.0013	0.0006
VA Existing	1576	Network Lighting Controls (Base high bay LED)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	1577	Occupancy Sensor (Base high bay LED)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Commercial Elec Measure Inputs			TECHNOLOGY SATURATION (units/square foot)											
Segment	Measure #	Measure Description	Office uilding Type	Restaurant uilding Type	Retail uilding Type	Grocery uilding Type	Warehouse uilding Type	Education uilding Type	Health uilding Type	Lodging ilding Typ	Data Centers ilding Typ	Non-Jurisdictional ding Type	Religious Worship ilding Type	Misc uilding Type 1
VA Existing	1600	Base CFL Exit Sign	0.0003	0.0005	0.0002	0.0001	0.0000	0.0001	0.0005	0.0003	0.0003	0.0002	0.0001	0.0001
VA Existing	1601	LED Exit Sign	0.0003	0.0005	0.0002	0.0001	0.0000	0.0001	0.0005	0.0003	0.0003	0.0002	0.0001	0.0001
VA Existing	1650	Base Area Lighting, Outdoor HID	0.0054	0.0037	0.0036	0.0061	0.0010	0.0026	0.0032	0.0020	0.0030	0.0040	0.0029	0.0041
VA Existing	1651	LED Outdoor Area Lighting (Base Outdoor HID)	0.0054	0.0037	0.0036	0.0061	0.0010	0.0026	0.0032	0.0020	0.0030	0.0040	0.0029	0.0041
VA Existing	1652	LED outdoor lighting with bi-level controls (Base Outdoor HID)	0.0054	0.0037	0.0036	0.0061	0.0010	0.0026	0.0032	0.0020	0.0030	0.0040	0.0029	0.0041
VA Existing	1653	Outdoor Lighting Controls (Base Outdoor HID)	0.0054	0.0037	0.0036	0.0061	0.0010	0.0026	0.0032	0.0020	0.0030	0.0040	0.0029	0.0041
VA Existing	1700	Base General Service Screw-in, Outdoor CFL	0.0054	0.0037	0.0036	0.0061	0.0010	0.0026	0.0032	0.0020	0.0030	0.0040	0.0029	0.0041
VA Existing	1701	LED outdoor lighting with bi-level controls (Base Outdoor CFL)	0.0054	0.0037	0.0036	0.0061	0.0010	0.0026	0.0032	0.0020	0.0030	0.0040	0.0029	0.0041
VA Existing	1702	LED screw-in replacement (base Outdoor CFL)	0.0054	0.0037	0.0036	0.0061	0.0010	0.0026	0.0032	0.0020	0.0030	0.0040	0.0029	0.0041
VA Existing	1703	Outdoor Lighting Controls (Base Outdoor CFL)	0.0054	0.0037	0.0036	0.0061	0.0010	0.0026	0.0032	0.0020	0.0030	0.0040	0.0029	0.0041
VA Existing	1750	Base General Service Screw-in, Outdoor Incandescent/Halogen	0.0054	0.0037	0.0036	0.0061	0.0010	0.0026	0.0032	0.0020	0.0030	0.0040	0.0029	0.0041
VA Existing	1751	LED outdoor lighting with bi-level controls (Base Outdoor Incandescent)	0.0054	0.0037	0.0036	0.0061	0.0010	0.0026	0.0032	0.0020	0.0030	0.0040	0.0029	0.0041
VA Existing	1752	LED screw-in replacement (base Outdoor Incandescent)	0.0054	0.0037	0.0036	0.0061	0.0010	0.0026	0.0032	0.0020	0.0030	0.0040	0.0029	0.0041
VA Existing	1753	Outdoor Lighting Controls (Base Outdoor Incandescent)	0.0054	0.0037	0.0036	0.0061	0.0010	0.0026	0.0032	0.0020	0.0030	0.0040	0.0029	0.0041
VA Existing	1800	Base General Service Screw-in, Outdoor LED bulb	0.0054	0.0037	0.0036	0.0061	0.0010	0.0026	0.0032	0.0020	0.0030	0.0040	0.0029	0.0041
VA Existing	1801	Outdoor Lighting Controls (Base Outdoor LED)	0.0054	0.0037	0.0036	0.0061	0.0010	0.0026	0.0032	0.0020	0.0030	0.0040	0.0029	0.0041
VA Existing	1850	Base Linear Lighting, Outdoor Fluorescent Tube	0.0054	0.0037	0.0036	0.0061	0.0010	0.0026	0.0032	0.0020	0.0030	0.0040	0.0029	0.0041
VA Existing	1851	ROB 2L4' LED Tube (base outdoor fluorescent)	0.0054	0.0037	0.0036	0.0061	0.0010	0.0026	0.0032	0.0020	0.0030	0.0040	0.0029	0.0041
VA Existing	1852	LED outdoor lighting with bi-level controls (Base Outdoor Fluorescent)	0.0054	0.0037	0.0036	0.0061	0.0010	0.0026	0.0032	0.0020	0.0030	0.0040	0.0029	0.0041
VA Existing	1853	Outdoor Lighting Controls (Base Outdoor Fluorescent)	0.0054	0.0037	0.0036	0.0061	0.0010	0.0026	0.0032	0.0020	0.0030	0.0040	0.0029	0.0041
VA Existing	1900	Base Linear Lighting, Outdoor LED Tube	0.0054	0.0037	0.0036	0.0061	0.0010	0.0026	0.0032	0.0020	0.0030	0.0040	0.0029	0.0041
VA Existing	1901	Outdoor Lighting Controls (Base Outdoor LED Tube)	0.0054	0.0037	0.0036	0.0061	0.0010	0.0026	0.0032	0.0020	0.0030	0.0040	0.0029	0.0041
VA Existing	2000	Base Water-Cooled Centrifugal Chiller, 0.58 kW/ton, 500 tons	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2001	Centrifugal Chiller, 0.54 kW/ton, 500 tons	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2002	Chiller Tune Up/Diagnostics	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2003	High Efficiency Chilled Water & Condenser Water Pump Motors	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2004	VSD for Chiller Pumps and Towers	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2005	Ceiling/roof Insulation - Chiller	0.3315	0.8926	0.8973	0.9691	0.9149	0.4838	0.4936	0.4692	0.3315	0.3315	0.5000	0.5000
VA Existing	2006	Cool Roof - Chiller	0.3315	0.8926	0.8973	0.9691	0.9149	0.4838	0.4936	0.4692	0.3315	0.3315	0.5000	0.5000
VA Existing	2007	Duct Testing/Sealing - Chiller	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2008	Duct/Pipe Insulation - Chiller	0.2500	0.1000	0.2500	0.1000	0.1000	0.2500	0.1000	0.1000	0.2500	0.2500	0.2500	0.2500
VA Existing	2009	EMS Optimization - Chiller	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	2010	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - Chiller	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2011	New Economizer - Chiller	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2012	Window Film (Standard) - Chiller	0.0877	0.1322	0.0409	0.0873	0.0152	0.0335	0.0601	0.0691	0.0877	0.0877	0.0284	0.0284
VA Existing	2013	High Efficiency Windows - Chiller	0.0877	0.1322	0.0409	0.0873	0.0152	0.0335	0.0601	0.0691	0.0877	0.0877	0.0284	0.0284
VA Existing	2100	Base DX Packaged System, EER=10.3, 10 tons	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2101	DX Packaged System, EER=10.9, 10 tons	0.0030	0.0030	0.0030	0.0025	0.0030	0.0025	0.0025	0.0053	0.0120	0.0030	0.0020	0.0020
VA Existing	2102	DX Packaged System, EER=13.4, 10 tons	0.0030	0.0030	0.0030	0.0025	0.0030	0.0025	0.0025	0.0053	0.0120	0.0030	0.0020	0.0020
VA Existing	2103	Geothermal Heat Pump, EER=13, 10 tons - DX	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2104	DX Tune Up/ Advanced Diagnostics	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2105	Refrigerant Charge Adjustment - DX	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2106	Ceiling/roof Insulation - DX	0.3315	0.8926	0.8973	0.9691	0.9149	0.4838	0.4936	0.4692	0.3315	0.3315	0.5000	0.5000
VA Existing	2107	Cool Roof - DX	0.3315	0.8926	0.8973	0.9691	0.9149	0.4838	0.4936	0.4692	0.3315	0.3315	0.5000	0.5000
VA Existing	2108	Duct Testing/Sealing - DX	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2109	Duct/Pipe Insulation - DX	0.2500	0.1000	0.2500	0.1000	0.1000	0.2500	0.1000	0.1000	0.2500	0.2500	0.2500	0.2500
VA Existing	2110	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	0.0003	0.0015	0.0003	0.0000	0.0002	0.0003	0.0045	0.0005	0.0003	0.0003	0.0002	0.0002
VA Existing	2111	Economizer Repair - DX	0.0003	0.0015	0.0003	0.0000	0.0002	0.0003	0.0045	0.0005	0.0012	0.0003	0.0002	0.0002
VA Existing	2112	New Economizer - DX	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2113	Optimize Controls - DX	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	2114	Smart Thermostat - DX	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2115	Window Film (Standard) - DX	0.0877	0.1322	0.0409	0.0873	0.0152	0.0335	0.0601	0.0691	0.0877	0.0877	0.0284	0.0284
VA Existing	2116	High Efficiency Windows - DX	0.0877	0.1322	0.0409	0.0873	0.0152	0.0335	0.0601	0.0691	0.0877	0.0877	0.0284	0.0284
VA Existing	2150	Base DX Packaged System, 2029 Standard	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2152	DX Packaged System, EER=13.4, 10 tons	0.0030	0.0030	0.0030	0.0025	0.0030	0.0025	0.0025	0.0053	0.0120	0.0030	0.0020	0.0020
VA Existing	2153	Geothermal Heat Pump, EER=13, 10 tons - DX	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2154	DX Tune Up/ Advanced Diagnostics	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2155	Refrigerant Charge Adjustment - DX	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2156	Ceiling/roof Insulation - DX	0.3315	0.8926	0.8973	0.9691	0.9149	0.4838	0.4936	0.4692	0.3315	0.3315	0.5000	0.5000
VA Existing	2157	Cool Roof - DX	0.3315	0.8926	0.8973	0.9691	0.9149	0.4838	0.4936	0.4692	0.3315	0.3315	0.5000	0.5000

Commercial Elec Measure Inputs			TECHNOLOGY SATURATION (units/square foot)											
Segment	Measure #	Measure Description	Office uilding Type	Restaurant uilding Type	Retail uilding Type	Grocery uilding Type	Warehouse uilding Type	Education uilding Type	Health uilding Type	Lodging ilding Typ	Data Centers ilding Typ	Non-Jurisdictional ding Type	Religious Worship ilding Type	Misc uilding Type 1
VA Existing	2158	Duct Testing/Sealing - DX	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2159	Duct/Pipe Insulation - DX	0.2500	0.1000	0.2500	0.1000	0.1000	0.2500	0.1000	0.1000	0.2500	0.2500	0.2500	0.2500
VA Existing	2160	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	0.0003	0.0015	0.0003	0.0000	0.0002	0.0003	0.0045	0.0005	0.0003	0.0003	0.0002	0.0002
VA Existing	2161	Economizer Repair - DX	0.0003	0.0015	0.0003	0.0000	0.0002	0.0003	0.0045	0.0005	0.0012	0.0003	0.0002	0.0002
VA Existing	2162	New Economizer - DX	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2163	Optimize Controls - DX	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
VA Existing	2164	Smart Thermostat - DX	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2165	Window Film (Standard) - DX	0.0877	0.1322	0.0409	0.0873	0.0152	0.0335	0.0601	0.0691	0.0877	0.0877	0.0284	0.0284
VA Existing	2166	High Efficiency Windows - DX	0.0877	0.1322	0.0409	0.0873	0.0152	0.0335	0.0601	0.0691	0.0877	0.0877	0.0284	0.0284
VA Existing	2200	Base Heat Pump cooling (14.3 SEER, 8.2 HSPF)	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2201	Heat Pump Upgrade (18 SEER, 8.2 HSPF), cooling	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019
VA Existing	2202	Mini-Split Heat Pump (Base Heat Pump Cooling)	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2203	Ceiling/roof Insulation (Base Heat Pump Cooling)	0.3315	0.8926	0.8973	0.9691	0.9149	0.4838	0.4936	0.4692	0.3315	0.3315	0.5000	0.5000
VA Existing	2204	Duct/Pipe Insulation (Base Heat Pump Cooling)	0.2500	0.1000	0.2500	0.1000	0.1000	0.2500	0.1000	0.1000	0.2500	0.2500	0.2500	0.2500
VA Existing	2205	Smart Thermostat (Base Heat Pump Cooling)	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2206	Window Film (Standard) (Base Heat Pump Cooling)	0.0877	0.1322	0.0409	0.0873	0.0152	0.0335	0.0601	0.0691	0.0877	0.0877	0.0284	0.0284
VA Existing	2207	High Efficiency Windows (Base Heat Pump Cooling)	0.0877	0.1322	0.0409	0.0873	0.0152	0.0335	0.0601	0.0691	0.0877	0.0877	0.0284	0.0284
VA Existing	2300	Base Split-System AC, SEER 14.5, <5.4 tons	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2301	Split System Air Conditioner, SEER 16.0 ENERGY STAR, <5.4 tons	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019
VA Existing	2302	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Residential Split-System)	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2303	Ceiling/roof Insulation (Base Residential Split-System)	0.3315	0.8926	0.8973	0.9691	0.9149	0.4838	0.4936	0.4692	0.3315	0.3315	0.5000	0.5000
VA Existing	2304	Duct/Pipe Insulation (Base Residential Split-System)	0.2500	0.1000	0.2500	0.1000	0.1000	0.2500	0.1000	0.1000	0.2500	0.2500	0.2500	0.2500
VA Existing	2305	Smart Thermostat (Base Residential Split-System)	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2306	Window Film (Standard) (Base Residential Split-System)	0.0877	0.1322	0.0409	0.0873	0.0152	0.0335	0.0601	0.0691	0.0877	0.0877	0.0284	0.0284
VA Existing	2400	Base PTAC cooling, EER=10.2, 1 ton	0.0030	0.0030	0.0030	0.0025	0.0018	0.0020	0.0025	0.0024	0.0030	0.0030	0.0018	0.0018
VA Existing	2401	HE PTAC, EER=9.6, 1 ton, cooling	0.0030	0.0030	0.0030	0.0025	0.0018	0.0020	0.0025	0.0024	0.0060	0.0030	0.0018	0.0018
VA Existing	2402	Ceiling/roof Insulation (Base PTAC)	0.3315	0.8926	0.8973	0.9691	0.9149	0.4838	0.4936	0.4692	0.3315	0.3315	0.5000	0.5000
VA Existing	2404	Occupancy Sensor (hotels)	0.0030	0.0030	0.0030	0.0025	0.0018	0.0020	0.0025	0.0024	0.0030	0.0030	0.0018	0.0018
VA Existing	2405	Window Film (Standard) (Base PTAC)	0.0877	0.1322	0.0409	0.0873	0.0152	0.0335	0.0601	0.0691	0.0877	0.0877	0.0284	0.0284
VA Existing	2500	Base Room AC, CEER 10.9	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
VA Existing	2501	Room AC, CEER 12.0 ENERGY STAR	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
VA Existing	2502	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Room AC)	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
VA Existing	2503	Ceiling/roof Insulation (Base Room AC)	0.33152	0.89262	0.89725	0.96907	0.91485	0.48378	0.49356	0.46920	0.33152	0.33152	0.50000	0.50000
VA Existing	2505	Window Film (Standard) (Base Room AC)	0.0877	0.1322	0.0409	0.0873	0.0152	0.0335	0.0601	0.0691	0.0877	0.0877	0.0284	0.0284
VA Existing	2506	High Efficiency Windows (Base Room AC)	0.0877	0.1322	0.0409	0.0873	0.0152	0.0335	0.0601	0.0691	0.0877	0.0877	0.0284	0.0284
VA Existing	2600	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	0.0030	0.0030	0.0030	0.0025	0.0020	0.0025	0.0025	0.0035	0.0060	0.0030	0.0020	0.0020
VA Existing	2601	Ceiling/roof Insulation (Base Ductless Mini-split)	0.3315	0.8926	0.8973	0.9691	0.9149	0.4838	0.4936	0.4692	0.3315	0.3315	0.5000	0.5000
VA Existing	2603	Window Film (Standard) (Base Ductless Mini-split)	0.0877	0.1322	0.0409	0.0873	0.0152	0.0335	0.0601	0.0691	0.0877	0.0877	0.0284	0.0284
VA Existing	2604	High Efficiency Windows (Base Ductless Mini-split)	0.0877	0.1322	0.0409	0.0873	0.0152	0.0335	0.0601	0.0691	0.0877	0.0877	0.0284	0.0284
VA Existing	3100	Base Open refrigerated/freezer cases	0.0000	0.0002	0.0000	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3101	Efficient compressor motor, open cases	0.0000	0.0004	0.0000	0.0025	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3102	Bi-level LED Case Lighting (self-contained units), open cases	0.0000	0.0007	0.0000	0.0039	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3103	Compressor VSD retrofit, open cases	0.0000	0.0001	0.0000	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3104	Demand Defrost Electric, open cases	0.0000	0.0002	0.0000	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3105	Demand Hot Gas Defrost, open cases	0.0000	0.0002	0.0000	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3106	Electronically commutated evaporator fan motor, open cases	0.0000	0.0005	0.0000	0.0029	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3107	High-efficiency fan motors, open cases	0.0000	0.0002	0.0000	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3108	Insulated suction lines, open cases	0.0000	0.0009	0.0000	0.0050	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3109	LED Display Lighting, open cases	0.0000	0.0007	0.0000	0.0039	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3110	Multiplex Compressor System, open cases	0.0000	0.0001	0.0000	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3111	Night covers for display cases, open cases	0.0000	0.0007	0.0000	0.0039	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3112	Oversized Air Cooled Condenser, open cases	0.0000	0.0001	0.0000	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3113	Refrigeration Coil Cleaning, open cases	0.0000	0.0002	0.0000	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3114	Refrigeration Commissioning, open cases	0.0000	0.0001	0.0000	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3200	Base Closed refrigerated/freezer cases	0.0000	0.0006	0.0001	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3201	Efficient compressor motor, base closed cases	0.0000	0.0015	0.0002	0.0025	0.0000	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000
VA Existing	3202	Energy-Star Refrigerator/Freezer, base closed cases	0.0000	0.0006	0.0001	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3203	Anti-sweat (humidistat) controls, base closed cases	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3204	Bi-level LED Case Lighting (self-contained units), base closed cases	0.0000	0.0025	0.0003	0.0040	0.0000	0.0001	0.0001	0.0002	0.0000	0.0000	0.0001	0.0001
VA Existing	3205	Compressor VSD retrofit, base closed cases	0.0000	0.0003	0.0000	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Commercial Elec Measure Inputs			TECHNOLOGY SATURATION (units/square foot)											
Segment	Measure #	Measure Description	Office uilding Type	Restaurant uilding Type	Retail uilding Type	Grocery uilding Type	Warehouse uilding Type	Education uilding Type	Health uilding Type	Lodging ilding Typ	Data Centers ilding Typ	Non-Jurisdictional ding Type	Religious Worship ilding Type	Misc uilding Type 1
VA Existing	3206	Demand Defrost Electric, base closed cases	0.0000	0.0006	0.0001	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3207	Demand Hot Gas Defrost, base closed cases	0.0000	0.0006	0.0001	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3208	Electronically commutated evaporator fan motor, base closed cases	0.0000	0.0019	0.0002	0.0030	0.0000	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000
VA Existing	3209	Freezer-Cooler Replacement Gaskets, base closed cases	0.0000	0.0025	0.0003	0.0040	0.0000	0.0001	0.0001	0.0002	0.0000	0.0000	0.0001	0.0001
VA Existing	3210	High R-Value Glass Doors, base closed cases	0.0000	0.0025	0.0003	0.0040	0.0000	0.0001	0.0001	0.0002	0.0000	0.0000	0.0001	0.0001
VA Existing	3211	High-efficiency fan motors, base closed cases	0.0000	0.0006	0.0001	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3212	Insulated suction lines, base closed cases	0.0000	0.0031	0.0004	0.0050	0.0000	0.0002	0.0001	0.0002	0.0000	0.0001	0.0001	0.0001
VA Existing	3213	LED Display Lighting, base closed cases	0.0000	0.0025	0.0003	0.0040	0.0000	0.0001	0.0001	0.0002	0.0000	0.0000	0.0001	0.0001
VA Existing	3214	Low or Anti-Sweat Door Film, base closed cases	0.0002	1.2%	0.0015	0.0202	0.0002	0.0006	0.0003	0.0008	0.0000	0.0002	0.0003	0.0003
VA Existing	3215	Multiplex Compressor System, base closed cases	0.0000	0.0003	0.0000	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3216	Oversized Air Cooled Condenser, base closed cases	0.0000	0.0003	0.0000	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3217	Refrigeration Coil Cleaning, base closed cases	0.0000	0.0006	0.0001	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3218	Refrigeration Commissioning, base closed cases	0.0000	0.0003	0.0000	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3300	Base Walk-in refrigeration/freezer units	0.0000	0.0015	0.0000	0.0020	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3301	Efficient compressor motor, walk-ins	0.0000	0.0037	0.0000	0.0049	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3302	Auto-closer on main door to walk-in freezer	0.00000	0.00147	0.00001	0.00197	0.00006	0.00000	0.00000	0.00001	0.00000	0.00000	0.00000	0.00001
VA Existing	3303	Compressor VSD retrofit, walk-ins	0.00000	0.00073	0.00001	0.00099	0.00003	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
VA Existing	3304	Demand Defrost Electric, walk-ins	0.00000	0.00147	0.00001	0.00197	0.00006	0.00000	0.00000	0.00001	0.00000	0.00000	0.00000	0.00001
VA Existing	3305	Demand Hot Gas Defrost, walk-ins	0.00000	0.00147	0.00001	0.00197	0.00006	0.00000	0.00000	0.00001	0.00000	0.00000	0.00000	0.00001
VA Existing	3306	Electronically commutated evaporator fan motor, walk-ins	0.00000	0.00441	0.00004	0.00591	0.00017	0.00000	0.00001	0.00003	0.00000	0.00001	0.00000	0.00002
VA Existing	3307	Evaporator fan controller for MT walk-ins	0.00000	0.00147	0.00001	0.00197	0.00006	0.00000	0.00000	0.00001	0.00000	0.00000	0.00000	0.00001
VA Existing	3308	Floating head pressure controls, walk-ins	0.00000	0.00147	0.00001	0.00197	0.00006	0.00000	0.00000	0.00001	0.00000	0.00000	0.00000	0.00001
VA Existing	3309	Freezer-Cooler Replacement Gaskets, walk-ins	0.00000	0.00367	0.00004	0.00493	0.00014	0.00000	0.00000	0.00002	0.00000	0.00001	0.00000	0.00002
VA Existing	3310	High-efficiency fan motors, walk-ins	0.00000	0.00147	0.00001	0.00197	0.00006	0.00000	0.00000	0.00001	0.00000	0.00000	0.00000	0.00001
VA Existing	3311	Insulated suction lines, walk-ins	0.00000	0.00372	0.00004	0.00500	0.00014	0.00000	0.00000	0.00002	0.00000	0.00001	0.00000	0.00002
VA Existing	3312	Multiplex Compressor System, walk-ins	0.00000	0.00073	0.00001	0.00099	0.00003	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
VA Existing	3313	Oversized Air Cooled Condenser, walk-ins	0.00000	0.00073	0.00001	0.00099	0.00003	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
VA Existing	3314	Refrigeration Coil Cleaning, walk-ins	0.00000	0.00073	0.00001	0.00099	0.00003	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
VA Existing	3315	Refrigeration Commissioning, walk-ins	0.00000	0.00073	0.00001	0.00099	0.00003	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
VA Existing	3316	Strip curtains for walk-ins	0.00000	0.00147	0.00001	0.00197	0.00006	0.00000	0.00000	0.00001	0.00000	0.00000	0.00000	0.00001
VA Existing	3400	Base Large Cold Storage Area	0.00000	0.00049	0.00000	0.00009	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
VA Existing	3401	Efficient compressor motor, base large cold storage	0.00000	0.00123	0.00000	0.00022	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001
VA Existing	3402	Auto-closer on main door to walk-in freezer, base large cold storage	0.00000	0.00049	0.00000	0.00009	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
VA Existing	3403	Compressor VSD retrofit, base large cold storage	0.00000	0.00025	0.00000	0.00004	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
VA Existing	3404	Electronically commutated evaporator fan motor, base large cold storage	0.00000	0.00148	0.00001	0.00027	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001
VA Existing	3405	Evaporator fan controller for MT walk-ins, base large cold storage	0.0000	0.0005	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
VA Existing	3406	High-efficiency fan motors, base large cold storage	0.00000	0.00049	0.00000	0.00009	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
VA Existing	3407	Insulated suction lines, base large cold storage	0.00002	0.02762	0.00010	0.00500	0.00008	0.00000	0.00001	0.00000	0.00000	0.00009	0.00004	0.00017
VA Existing	3408	Multiplex Compressor System, base large cold storage	0.00000	0.00025	0.00000	0.00004	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
VA Existing	3409	Oversized Air Cooled Condenser, base large cold storage	0.00000	0.00025	0.00000	0.00004	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
VA Existing	3410	Refrigeration Coil Cleaning, base large cold storage	0.00000	0.00025	0.00000	0.00004	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
VA Existing	3411	Refrigeration Commissioning, base large cold storage	0.00000	0.00025	0.00000	0.00004	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
VA Existing	3412	Strip curtains for walk-ins, base large cold storage	0.00000	0.00049	0.00000	0.00009	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
VA Existing	3500	Base Reach-in Refrigerator/Freezer, Federal Standard	0.00006	0.00117	0.00179	0.00239	0.00007	0.00013	0.00026	0.00015	0.00006	0.00011	0.00010	0.00009
VA Existing	3501	Energy Star solid door reach-in refrigerator/freezer	0.00006	0.00117	0.00179	0.00239	0.00007	0.00013	0.00026	0.00015	0.00006	0.00011	0.00010	0.00009
VA Existing	3502	Freezer-Cooler Replacement Gaskets, base reach-in	0.00024	0.00468	0.00715	0.00954	0.00026	0.00052	0.00103	0.00062	0.00024	0.00044	0.00042	0.00036
VA Existing	3503	Refrigeration Coil Cleaning, base base reach-in	0.00006	0.00117	0.00179	0.00239	0.00007	0.00013	0.00026	0.00015	0.00006	0.00011	0.00010	0.00009
VA Existing	3600	Base Glass Door Reach-in Refrigerator/Freezer, Federal Standard	0.00002	0.00085	0.00030	0.00155	0.00002	0.00005	0.00006	0.00008	0.00006	0.00004	0.00006	0.00004
VA Existing	3601	Energy Star glass door reach-in refrigerator/freezer	0.00002	0.00085	0.00030	0.00155	0.00002	0.00005	0.00006	0.00008	0.00006	0.00004	0.00006	0.00004
VA Existing	3602	Bi-level LED Case Lighting, base glass-door reach-in	0.00009	0.00340	0.00120	0.00621	0.00010	0.00021	0.00024	0.00032	0.00024	0.00018	0.00025	0.00015
VA Existing	3603	Freezer-Cooler Replacement Gaskets, base glass-door reach-in	0.00009	0.00340	0.00120	0.00621	0.00010	0.00021	0.00024	0.00032	0.00024	0.00018	0.00025	0.00015
VA Existing	3604	Refrigeration Coil Cleaning, base glass-door reach-in	0.00002	0.00085	0.00030	0.00155	0.00002	0.00005	0.00006	0.00008	0.00006	0.00004	0.00006	0.00004
VA Existing	3700	Base Ice Maker, Federal Standard	0.00000	0.00034	0.00001	0.00006	0.00001	0.00001	0.00001	0.00002	0.00000	0.00002	0.00001	0.00004
VA Existing	3701	Energy Star Ice Machines	0.00000	0.00034	0.00001	0.00006	0.00001	0.00001	0.00001	0.00002	0.00000	0.00002	0.00001	0.00004
VA Existing	3702	Refrigeration Coil Cleaning, base ice maker	0.00000	0.00034	0.00001	0.00006	0.00001	0.00001	0.00001	0.00002	0.00000	0.00002	0.00001	0.00004
VA Existing	3800	Base Residential-Type Refrigerator/Freezer, Federal Standard	0.00054	0.00086	0.00009	0.00105	0.00009	0.00018	0.00020	0.00068	0.00008	0.00118	0.00013	0.00183
VA Existing	3801	Energy Star refrigerator/freezer	0.00054	0.00086	0.00009	0.00105	0.00009	0.00018	0.00020	0.00068	0.00008	0.00118	0.00013	0.00183
VA Existing	3802	Refrigeration Coil Cleaning, residential-type refrigerator	0.00054	0.00086	0.00009	0.00105	0.00009	0.00018	0.00020	0.00068	0.00008	0.00118	0.00013	0.00183
VA Existing	3900	Base Compact Refrigerator, Federal Standard	0.00017	0.00040	0.00020	0.00025	0.00009	0.00010	0.00022	0.00025	0.00040	0.00014	0.00001	0.00010
VA Existing	3901	Energy Star Compact Refrigerator	0.00017	0.00040	0.00020	0.00025	0.00009	0.00010	0.00022	0.00025	0.00040	0.00014	0.00001	0.00010

Commercial Elec Measure Inputs			TECHNOLOGY SATURATION (units/square foot)											
Segment	Measure #	Measure Description	Office uilding Type	Restaurant uilding Type	Retail uilding Type	Grocery uilding Type	Warehouse uilding Type	Education uilding Type	Health uilding Type	Lodging ilding Typ	Data Centers ilding Typ	Non-Jurisdictional ding Type	Religious Worship ilding Type	Misc uilding Type 1
VA Existing	3902	Refrigeration Coil Cleaning, compact refrigerator	0.00017	0.00040	0.00020	0.00025	0.00009	0.00010	0.00022	0.00025	0.00040	0.00014	0.00001	0.00010
VA Existing	4000	Base Computer Network Server	0.00023	0.00011	0.00004	0.00008	0.00002	0.00247	0.00012	0.00001	0.02150	0.00029	0.00001	0.00035
VA Existing	4001	Energy Star server	0.00023	0.00011	0.00004	0.00008	0.00002	0.00247	0.00012	0.00001	0.02150	0.00029	0.00001	0.00035
VA Existing	4002	Server Power Management Enabling	0.00023	0.00011	0.00004	0.00008	0.00002	0.00247	0.00012	0.00001	0.02150	0.00029	0.00001	0.00035
VA Existing	4100	Base Desktop PC	0.00184	0.00040	0.00043	0.00054	0.00032	0.00162	0.00144	0.00029	0.00014	0.00020	0.00037	0.00045
VA Existing	4101	Energy Star or Better PC	0.00184	0.00040	0.00043	0.00054	0.00032	0.00162	0.00144	0.00029	0.00014	0.00020	0.00037	0.00045
VA Existing	4102	PC Network Power Management Enabling	0.00184	0.00040	0.00043	0.00054	0.00032	0.00162	0.00144	0.00029	0.00014	0.00020	0.00037	0.00045
VA Existing	4200	Base Laptop PC	0.00009	0.00020	0.00006	0.00014	0.00004	0.00006	0.00005	0.00003	0.00008	0.00014	0.00007	0.00006
VA Existing	4201	Energy Star or Better Laptop	0.00009	0.00020	0.00006	0.00014	0.00004	0.00006	0.00005	0.00003	0.00008	0.00014	0.00007	0.00006
VA Existing	4202	Laptop Network Power Management Enabling	0.00009	0.00020	0.00006	0.00014	0.00004	0.00006	0.00005	0.00003	0.00008	0.00014	0.00007	0.00006
VA Existing	4300	Base Monitor, LCD	0.00234	0.00069	0.00052	0.00072	0.00041	0.00183	0.00163	0.00033	0.00035	0.00145	0.00047	0.00055
VA Existing	4301	Energy Star or Better Monitor - LCD	0.00234	0.00069	0.00052	0.00072	0.00041	0.00183	0.00163	0.00033	0.00035	0.00145	0.00047	0.00055
VA Existing	4302	Monitor Power Management Enabling - LCD	0.00234	0.00069	0.00052	0.00072	0.00041	0.00183	0.00163	0.00033	0.00035	0.00145	0.00047	0.00055
VA Existing	4303	Plug-load controls - Commercial Smart Strip (base monitor LCD)	0.00234	0.00069	0.00052	0.00072	0.00041	0.00183	0.00163	0.00033	0.00035	0.00145	0.00047	0.00055
VA Existing	4400	Base Imaging	0.00010	0.00015	0.00004	0.00012	0.00003	0.00004	0.00007	0.00003	0.00004	0.00006	0.00007	0.00004

Commercial Elec Measure Inputs			APPLICABILITY*INCOMPLETE*FEASIBILITY (percent)												
Segment	Measure #	Measure Description	Office Building Type 3	Restaurant Building Type 3	Retail Building Type 3	Grocery Building Type 3	Warehouse Building Type 3	Education Building Type 3	Health Building Type 3	Lodging Building Type 3	Data Centers Building Type 3	Non-Jurisdictional uilding Type 1	Religious Worship uilding Type 1	Misc uilding Type 1
VA Existing	1000	Base Linear Lighting, Fluorescent Fixture, 2L4'T12	6%	4%	6%	2%	3%	6%	6%	4%	0%	4%	4%	2%
VA Existing	1001	High Performance Lighting R/R - Combined Strategies (Base T12)	2%	2%	2%	1%	1%	2%	2%	2%	0%	1%	2%	1%
VA Existing	1002	ROB 2L4' LED Tube (Base T12)	2%	2%	2%	1%	1%	2%	2%	2%	0%	1%	2%	1%
VA Existing	1003	LED Troffer (Base T12)	1%	1%	1%	0%	0%	1%	1%	1%	0%	1%	1%	0%
VA Existing	1004	LED Troffer with lamp removal (T12)	1%	1%	1%	0%	0%	1%	1%	1%	0%	1%	1%	0%
VA Existing	1005	Lighting Control Tuneup (Base T12)	3%	0%	2%	2%	1%	1%	2%	2%	0%	4%	2%	1%
VA Existing	1006	Network Lighting Controls (Base T12)	1%	0%	0%	0%	0%	2%	2%	1%	0%	1%	1%	0%
VA Existing	1007	Occupancy Sensor (Base T12)	1%	0%	0%	0%	0%	2%	2%	1%	0%	1%	1%	0%
VA Existing	1050	Base Linear Lighting, Fluorescent Fixture, 2L4'T12, integrated market	6%	4%	6%	2%	3%	6%	6%	0%	0%	4%	4%	2%
VA Existing	1051	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	6%	4%	6%	2%	3%	6%	6%	0%	0%	4%	4%	2%
VA Existing	1100	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB	10%	4%	5%	2%	11%	15%	11%	7%	8%	5%	16%	3%
VA Existing	1101	High Performance Lighting R/R - Combined Strategies (Base T8)	3%	1%	2%	1%	4%	5%	4%	3%	3%	2%	6%	1%
VA Existing	1102	ROB 2L4' LED Tube (Base T8)	3%	1%	2%	1%	4%	5%	4%	3%	3%	2%	6%	1%
VA Existing	1103	LED Troffer (Base T8)	1%	1%	1%	0%	2%	2%	2%	1%	1%	1%	2%	0%
VA Existing	1104	LED Troffer with lamp removal (T8)	1%	1%	1%	0%	2%	2%	2%	1%	1%	1%	2%	0%
VA Existing	1105	Lighting Control Tuneup (Base T8)	6%	0%	2%	2%	4%	3%	3%	4%	8%	5%	6%	1%
VA Existing	1106	Network Lighting Controls (Base T8)	2%	0%	0%	0%	2%	5%	4%	1%	2%	1%	2%	0%
VA Existing	1107	Occupancy Sensor (Base T8)	2%	0%	0%	0%	1%	5%	3%	1%	1%	1%	2%	0%
VA Existing	1150	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB, integrated market	10%	4%	5%	2%	11%	0%	11%	0%	8%	5%	0%	3%
VA Existing	1151	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	10%	4%	5%	2%	11%	0%	11%	0%	8%	5%	0%	3%
VA Existing	1200	Base Linear Lighting, LED Tube, 2 lamp fixture	12%	6%	16%	35%	15%	5%	12%	6%	8%	10%	20%	14%
VA Existing	1201	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	12%	6%	16%	35%	15%	5%	12%	6%	8%	10%	20%	14%
VA Existing	1202	Lighting Control Tuneup (Base LED Tube)	7%	1%	5%	35%	6%	1%	4%	3%	8%	10%	7%	4%
VA Existing	1203	Network Lighting Controls (Base LED Tube)	2%	0%	1%	2%	2%	2%	4%	1%	2%	2%	3%	2%
VA Existing	1204	Occupancy Sensor (Base LED tube)	2%	0%	1%	2%	2%	2%	3%	1%	1%	2%	2%	2%
VA Existing	1225	Base Linear Lighting, LED Tube, 2 lamp fixture, 2028 Standard	28%	14%	26%	38%	29%	26%	28%	18%	15%	20%	40%	19%
VA Existing	1226	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	28%	14%	26%	38%	29%	26%	28%	18%	15%	20%	40%	19%
VA Existing	1227	Lighting Control Tuneup (Base LED Tube)	16%	1%	9%	38%	11%	6%	9%	9%	15%	20%	15%	5%
VA Existing	1228	Network Lighting Controls (Base LED Tube)	5%	1%	2%	3%	4%	9%	10%	2%	4%	4%	5%	3%
VA Existing	1229	Occupancy Sensor (Base LED tube)	5%	1%	2%	3%	3%	9%	8%	2%	3%	4%	5%	2%
VA Existing	1250	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market	12%	6%	16%	35%	15%	5%	12%	6%	8%	10%	20%	14%
VA Existing	1251	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	12%	6%	16%	35%	15%	5%	12%	6%	8%	10%	20%	14%
VA Existing	1275	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market, 2028 Standard	28%	14%	26%	38%	29%	11%	28%	6%	15%	20%	24%	19%
VA Existing	1276	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	28%	14%	26%	38%	29%	11%	28%	6%	15%	20%	24%	19%
VA Existing	1300	Base General Service Screw-in, CFL	3%	4%	4%	1%	0%	1%	2%	6%	0%	6%	3%	11%
VA Existing	1301	LED screw-in replacement (base CFL)	3%	4%	4%	1%	0%	1%	2%	6%	0%	6%	3%	11%
VA Existing	1350	Base General Service Screw-in, Incandescent/halogen	2%	5%	7%	2%	2%	2%	2%	1%	0%	3%	5%	5%
VA Existing	1351	LED screw-in replacement (base incandescent/halogen)	2%	11%	9%	2%	3%	2%	8%	5%	0%	8%	9%	9%
VA Existing	1400	Base General Service Screw-in, LED bulb	26%	52%	23%	17%	18%	58%	34%	62%	28%	45%	20%	41%
VA Existing	1401	LED screw-in replacement (base LED)	13%	26%	11%	8%	9%	29%	17%	31%	14%	22%	10%	20%
VA Existing	1425	Base General Service Screw-in, LED bulb, 2028 Standard	31%	61%	33%	19%	21%	61%	39%	69%	28%	55%	27%	57%
VA Existing	1426	LED screw-in replacement (base LED)	16%	31%	17%	9%	10%	30%	19%	34%	14%	27%	14%	29%
VA Existing	1450	Base HID Lighting (low bay)	0%	0%	0%	0%	0%	0%	0%	0%	29%	0%	0%	0%
VA Existing	1451	LED fixture (base Low bay HID)	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%
VA Existing	1452	High Performance Lighting R/R - Combined Strategies (base low bay HID)	0%	0%	0%	0%	0%	0%	0%	0%	22%	0%	0%	0%
VA Existing	1500	Base High Bay Lighting, Fluorescent T5	2%	1%	4%	1%	4%	1%	1%	0%	0%	1%	1%	1%
VA Existing	1501	High Performance Lighting R/R - Combined Strategies (Base T5)	0%	1%	4%	1%	4%	1%	1%	0%	0%	1%	1%	1%
VA Existing	1502	ROB 2L4' LED Tube (Base T5)	1%	1%	4%	1%	4%	1%	1%	0%	0%	1%	1%	1%
VA Existing	1503	High Bay LED Troffer (Base T5)	1%	1%	4%	1%	4%	1%	1%	0%	0%	1%	1%	1%
VA Existing	1504	Lighting Control Tuneup (Base T5)	1%	0%	1%	1%	1%	0%	0%	0%	0%	1%	0%	0%
VA Existing	1505	Network Lighting Controls (Base T5)	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1506	Occupancy Sensor (Base T5)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	1525	Base High Bay Lighting, Fluorescent T5, integrated market	2%	1%	4%	1%	4%	1%	1%	0%	0%	1%	1%	1%
VA Existing	1526	High Bay Bi-Level Programmed LED Fixture	2%	1%	4%	1%	4%	1%	1%	0%	0%	1%	1%	1%
VA Existing	1550	Base High Bay Lighting, HID lighting	1%	1%	1%	1%	9%	0%	0%	2%	9%	1%	4%	1%
VA Existing	1551	High Bay Bi-Level Programmed LED Fixture	0%	1%	0%	1%	5%	0%	0%	1%	4%	0%	2%	1%
VA Existing	1552	High Performance Lighting R/R - Combined Strategies (base high bay HID)	0%	1%	0%	1%	5%	0%	0%	1%	4%	0%	2%	1%
VA Existing	1575	Base High Bay Lighting, LED lighting	2%	3%	0%	8%	0%	2%	0%	3%	0%	3%	10%	5%
VA Existing	1576	Network Lighting Controls (Base high bay LED)	1%	3%	0%	8%	0%	2%	0%	3%	0%	3%	9%	5%
VA Existing	1577	Occupancy Sensor (Base high bay LED)	1%	3%	0%	8%	0%	2%	0%	2%	0%	3%	8%	4%
VA Existing	1600	Base CFL Exit Sign	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
VA Existing	1601	LED Exit Sign	35%	64%	58%	1%	100%	56%	6%	35%	35%	37%	39%	39%
VA Existing	1650	Base Area Lighting, Outdoor HID	16%	11%	9%	0%	14%	3%	8%	10%	4%	15%	24%	24%
VA Existing	1651	LED Outdoor Area Lighting (Base Outdoor HID)	16%	11%	9%	0%	14%	3%	8%	10%	4%	15%	24%	24%
VA Existing	1652	LED outdoor lighting with bi-level controls (Base Outdoor HID)	16%	11%	9%	0%	14%	3%	8%	10%	4%	15%	24%	24%
VA Existing	1653	Outdoor Lighting Controls (Base Outdoor HID)	8%	7%	3%	0%	2%	1%	3%	3%	1%	4%	1%	7%
VA Existing	1700	Base General Service Screw-in, Outdoor CFL	5%	4%	4%	0%	0%	0%	1%	2%	0%	2%	7%	2%
VA Existing	1701	LED outdoor lighting with bi-level controls (Base Outdoor CFL)	5%	4%	4%	0%	0%	0%	1%	2%	0%	2%	7%	2%

Commercial Elec Measure Inputs			APPLICABILITY*INCOMPLETE*FEASIBILITY (percent)												
Segment	Measure #	Measure Description	Office Building Type 3	Restaurant Building Type 3	Retail Building Type 3	Grocery Building Type 3	Warehouse Building Type 3	Education Building Type 3	Health Building Type 3	Lodging Building Type 3	Data Centers Building Type	Non-Jurisdictional uilding Type 1	Religious Worship uilding Type 1	Misc uilding Type 1
VA Existing	1702	LED screw-in replacement (base Outdoor CFL)	5%	4%	4%	0%	0%	0%	1%	2%	0%	2%	7%	2%
VA Existing	1703	Outdoor Lighting Controls (Base Outdoor CFL)	2%	2%	1%	0%	0%	0%	0%	1%	0%	0%	0%	1%
VA Existing	1750	Base General Service Screw-in, Outdoor Incandescent/Halogen	13%	15%	14%	0%	7%	14%	22%	6%	75%	15%	9%	17%
VA Existing	1751	LED outdoor lighting with bi-level controls (Base Outdoor Incandescent)	13%	15%	14%	0%	7%	14%	22%	6%	75%	15%	9%	17%
VA Existing	1752	LED screw-in replacement (base Outdoor Incandescent)	13%	15%	14%	0%	7%	14%	22%	6%	75%	15%	9%	17%
VA Existing	1753	Outdoor Lighting Controls (Base Outdoor Incandescent)	6%	9%	5%	0%	1%	5%	7%	2%	13%	4%	0%	5%
VA Existing	1800	Base General Service Screw-in, Outdoor LED bulb	62%	48%	45%	0%	66%	82%	65%	62%	12%	58%	57%	39%
VA Existing	1801	Outdoor Lighting Controls (Base Outdoor LED)	30%	29%	15%	0%	9%	31%	20%	20%	2%	14%	3%	11%
VA Existing	1850	Base Linear Lighting, Outdoor Fluorescent Tube	2%	8%	22%	0%	1%	1%	1%	4%	0%	1%	0%	1%
VA Existing	1851	ROB 2L4' LED Tube (base outdoor fluorescent)	2%	8%	22%	0%	1%	1%	1%	4%	0%	1%	0%	1%
VA Existing	1852	LED outdoor lighting with bi-level controls (Base Outdoor Fluorescent)	2%	8%	22%	0%	1%	1%	1%	4%	0%	1%	0%	1%
VA Existing	1853	Outdoor Lighting Controls (Base Outdoor Fluorescent)	1%	5%	7%	0%	0%	0%	0%	1%	0%	0%	0%	0%
VA Existing	1900	Base Linear Lighting, Outdoor LED Tube	3%	7%	6%	0%	12%	0%	3%	9%	10%	7%	2%	13%
VA Existing	1901	Outdoor Lighting Controls (Base Outdoor LED Tube)	2%	4%	2%	0%	2%	0%	1%	3%	2%	2%	0%	4%
VA Existing	2000	Base Water-Cooled Centrifugal Chiller, 0.58 kW/ton, 500 tons	23%	2%	1%	0%	1%	7%	9%	28%	0%	10%	11%	9%
VA Existing	2001	Centrifugal Chiller, 0.54 kW/ton, 500 tons	16%	1%	1%	0%	1%	5%	6%	19%	0%	7%	7%	6%
VA Existing	2002	Chiller Tune Up/Diagnostics	3%	0%	0%	0%	0%	0%	1%	3%	0%	0%	2%	1%
VA Existing	2003	High Efficiency Chilled Water & Condenser Water Pump Motors	4%	0%	0%	0%	0%	3%	5%	1%	0%	5%	7%	5%
VA Existing	2004	VSD for Chiller Pumps and Towers	1%	0%	0%	0%	0%	0%	0%	1%	0%	2%	4%	3%
VA Existing	2005	Ceiling/roof Insulation - Chiller	0%	0%	0%	0%	0%	1%	1%	1%	0%	0%	0%	1%
VA Existing	2006	Cool Roof - Chiller	4%	0%	0%	0%	0%	2%	4%	14%	0%	3%	5%	4%
VA Existing	2007	Duct Testing/Sealing - Chiller	23%	2%	1%	0%	1%	6%	9%	28%	0%	10%	10%	8%
VA Existing	2008	Duct/Pipe Insulation - Chiller	3%	0%	0%	0%	0%	2%	5%	7%	0%	4%	7%	6%
VA Existing	2009	EMS Optimization - Chiller	3%	0%	0%	0%	0%	1%	1%	4%	0%	2%	2%	1%
VA Existing	2010	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - Chiller	10%	1%	1%	0%	1%	1%	2%	5%	0%	2%	0%	0%
VA Existing	2011	New Economizer - Chiller	1%	0%	0%	0%	0%	4%	3%	13%	0%	3%	9%	8%
VA Existing	2012	Window Film (Standard) - Chiller	15%	1%	1%	0%	1%	4%	6%	13%	0%	8%	7%	6%
VA Existing	2013	High Efficiency Windows - Chiller	4%	1%	0%	0%	0%	1%	2%	4%	0%	2%	3%	3%
VA Existing	2100	Base DX Packaged System, EER=10.3, 10 tons	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2101	DX Packaged System, EER=10.9, 10 tons	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2102	DX Packaged System, EER=13.4, 10 tons	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2103	Geothermal Heat Pump, EER=13, 10 tons - DX	2%	3%	2%	2%	1%	3%	2%	1%	4%	2%	2%	1%
VA Existing	2104	DX Tune Up/ Advanced Diagnostics	5%	7%	5%	5%	1%	1%	2%	3%	2%	0%	7%	4%
VA Existing	2105	Refrigerant Charge Adjustment - DX	28%	7%	5%	5%	1%	1%	2%	3%	2%	0%	7%	4%
VA Existing	2106	Ceiling/roof Insulation - DX	1%	7%	17%	13%	6%	6%	3%	1%	0%	4%	3%	4%
VA Existing	2107	Cool Roof - DX	17%	27%	15%	18%	9%	34%	17%	11%	42%	22%	17%	14%
VA Existing	2108	Duct Testing/Sealing - DX	11%	18%	15%	12%	7%	19%	11%	7%	28%	14%	11%	9%
VA Existing	2109	Duct/Pipe Insulation - DX	11%	36%	17%	28%	2%	42%	19%	12%	28%	14%	11%	9%
VA Existing	2110	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	1%	1%	1%	1%	0%	0%	0%	0%	2%	1%	0%	0%
VA Existing	2111	Economizer Repair - DX	15%	22%	24%	19%	8%	10%	8%	3%	38%	10%	1%	1%
VA Existing	2112	New Economizer - DX	1%	0%	0%	0%	0%	38%	10%	12%	3%	16%	31%	26%
VA Existing	2113	Optimize Controls - DX	12%	20%	15%	12%	8%	23%	11%	8%	29%	15%	11%	9%
VA Existing	2114	Smart Thermostat - DX	32%	42%	43%	34%	19%	67%	27%	21%	0%	45%	30%	22%
VA Existing	2115	Window Film (Standard) - DX	23%	42%	20%	25%	16%	43%	23%	11%	0%	33%	24%	21%
VA Existing	2116	High Efficiency Windows - DX	6%	20%	14%	16%	8%	12%	9%	3%	0%	10%	10%	8%
VA Existing	2150	Base DX Packaged System, 2029 Standard	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2152	DX Packaged System, EER=13.4, 10 tons	35%	60%	47%	37%	23%	70%	34%	23%	88%	45%	34%	28%
VA Existing	2153	Geothermal Heat Pump, EER=13, 10 tons - DX	2%	3%	2%	2%	1%	3%	2%	1%	4%	2%	2%	1%
VA Existing	2154	DX Tune Up/ Advanced Diagnostics	5%	7%	5%	5%	1%	1%	2%	3%	2%	0%	7%	4%
VA Existing	2155	Refrigerant Charge Adjustment - DX	28%	7%	5%	5%	1%	1%	2%	3%	2%	0%	7%	4%
VA Existing	2156	Ceiling/roof Insulation - DX	1%	7%	17%	13%	6%	6%	3%	1%	0%	4%	3%	4%
VA Existing	2157	Cool Roof - DX	17%	27%	15%	18%	9%	34%	17%	11%	42%	22%	17%	14%
VA Existing	2158	Duct Testing/Sealing - DX	11%	18%	15%	12%	7%	19%	11%	7%	28%	14%	11%	9%
VA Existing	2159	Duct/Pipe Insulation - DX	11%	36%	17%	28%	2%	42%	19%	12%	28%	14%	11%	9%
VA Existing	2160	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	1%	1%	1%	1%	0%	0%	0%	0%	2%	1%	0%	0%
VA Existing	2161	Economizer Repair - DX	15%	22%	24%	19%	8%	10%	8%	3%	38%	10%	1%	1%
VA Existing	2162	New Economizer - DX	1%	0%	0%	0%	0%	38%	10%	12%	3%	16%	31%	26%
VA Existing	2163	Optimize Controls - DX	12%	20%	15%	12%	8%	23%	11%	8%	29%	15%	11%	9%
VA Existing	2164	Smart Thermostat - DX	32%	42%	43%	34%	19%	67%	27%	21%	0%	45%	30%	22%
VA Existing	2165	Window Film (Standard) - DX	23%	42%	20%	25%	16%	43%	23%	11%	0%	33%	24%	21%
VA Existing	2166	High Efficiency Windows - DX	6%	20%	14%	16%	8%	12%	9%	3%	0%	10%	10%	8%
VA Existing	2200	Base Heat Pump cooling (14.3 SEER, 8.2 HSPF)	23%	17%	15%	5%	9%	4%	21%	6%	1%	10%	28%	11%
VA Existing	2201	Heat Pump Upgrade (18 SEER, 8.2 HSPF), cooling	21%	16%	14%	4%	8%	3%	19%	6%	1%	9%	26%	10%
VA Existing	2202	Mini-Split Heat Pump (Base Heat Pump Cooling)	8%	6%	5%	2%	3%	1%	7%	2%	0%	3%	9%	4%
VA Existing	2203	Ceiling/roof Insulation (Base Heat Pump Cooling)	0%	2%	5%	2%	2%	0%	2%	0%	0%	1%	3%	1%
VA Existing	2204	Duct/Pipe Insulation (Base Heat Pump Cooling)	7%	11%	5%	3%	1%	2%	11%	3%	0%	3%	9%	3%
VA Existing	2205	Smart Thermostat (Base Heat Pump Cooling)	21%	12%	13%	4%	7%	4%	17%	6%	0%	10%	25%	8%
VA Existing	2206	Window Film (Standard) (Base Heat Pump Cooling)	15%	12%	6%	3%	6%	2%	14%	3%	0%	8%	20%	8%

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VA Existing	2207	High Efficiency Windows (Base Heat Pump Cooling)	4%	6%	4%	2%	3%	1%	5%	1%	0%	2%	9%	3%
VA Existing	2300	Base Split-System AC, SEER 14.5, <5.4 tons	8%	4%	9%	10%	7%	5%	16%	15%	5%	16%	15%	27%
VA Existing	2301	Split System Air Conditioner, SEER 16.0 ENERGY STAR, <5.4 tons	7%	3%	7%	9%	6%	4%	13%	12%	4%	14%	12%	23%
VA Existing	2302	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Residential Split-System)	8%	4%	9%	10%	7%	5%	16%	15%	5%	16%	15%	27%
VA Existing	2303	Ceiling/roof Insulation (Base Residential Split-System)	0%	0%	3%	4%	2%	0%	1%	0%	0%	1%	1%	4%
VA Existing	2304	Duct/Pipe Insulation (Base Residential Split-System)	2%	2%	3%	8%	1%	3%	9%	8%	2%	5%	5%	9%
VA Existing	2305	Smart Thermostat (Base Residential Split-System)	7%	3%	8%	10%	6%	5%	13%	14%	0%	16%	13%	21%
VA Existing	2306	Window Film (Standard) (Base Residential Split-System)	5%	3%	4%	7%	5%	3%	11%	7%	0%	12%	10%	20%
VA Existing	2400	Base PTAC cooling, EER=10.2, 1 ton	2%	1%	1%	0%	0%	2%	4%	17%	1%	4%	1%	5%
VA Existing	2401	HE PTAC, EER=9.6, 1 ton, cooling	2%	1%	1%	0%	0%	2%	4%	17%	1%	4%	1%	5%
VA Existing	2402	Ceiling/roof Insulation (Base PTAC)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
VA Existing	2404	Occupancy Sensor (hotels)	0%	0%	0%	0%	0%	0%	0%	13%	0%	0%	0%	0%
VA Existing	2405	Window Film (Standard) (Base PTAC)	2%	1%	0%	0%	0%	1%	3%	8%	0%	3%	1%	4%
VA Existing	2500	Base Room AC, CEER 10.9	0%	1%	2%	19%	1%	2%	12%	2%	0%	2%	3%	2%
VA Existing	2501	Room AC, CEER 12.0 ENERGY STAR	0%	1%	2%	17%	1%	2%	10%	1%	0%	2%	3%	2%
VA Existing	2502	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Room AC)	0%	1%	2%	19%	1%	2%	12%	2%	0%	2%	3%	2%
VA Existing	2503	Ceiling/roof Insulation (Base Room AC)	0%	0%	1%	7%	0%	0%	1%	0%	0%	0%	0%	0%
VA Existing	2505	Window Film (Standard) (Base Room AC)	0%	1%	1%	13%	1%	1%	8%	1%	0%	1%	2%	1%
VA Existing	2506	High Efficiency Windows (Base Room AC)	0%	0%	1%	8%	0%	0%	3%	0%	0%	0%	1%	1%
VA Existing	2600	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	2%	4%	2%	8%	3%	5%	2%	3%	0%	3%	5%	2%
VA Existing	2601	Ceiling/roof Insulation (Base Ductless Mini-split)	0%	0%	1%	3%	1%	0%	0%	0%	0%	0%	0%	0%
VA Existing	2603	Window Film (Standard) (Base Ductless Mini-split)	1%	2%	1%	5%	2%	3%	1%	2%	0%	2%	3%	2%
VA Existing	2604	High Efficiency Windows (Base Ductless Mini-split)	0%	1%	1%	3%	1%	1%	0%	0%	0%	1%	1%	1%
VA Existing	3100	Base Open refrigerated/freezer cases	4%	12%	4%	29%	0%	0%	7%	21%	0%	1%	5%	0%
VA Existing	3101	Efficient compressor motor, open cases	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3102	Bi-level LED Case Lighting (self-contained units), open cases	2%	2%	1%	29%	0%	0%	4%	9%	0%	1%	3%	0%
VA Existing	3103	Compressor VSD retrofit, open cases	2%	12%	4%	29%	0%	0%	7%	21%	0%	0%	5%	0%
VA Existing	3104	Demand Defrost Electric, open cases	0%	9%	1%	22%	0%	0%	5%	16%	0%	0%	0%	0%
VA Existing	3105	Demand Hot Gas Defrost, open cases	2%	9%	4%	22%	0%	0%	5%	16%	0%	0%	5%	0%
VA Existing	3106	Electronically commutated evaporator fan motor, open cases	2%	3%	1%	8%	0%	0%	4%	3%	0%	1%	3%	0%
VA Existing	3107	High-efficiency fan motors, open cases	3%	12%	2%	17%	0%	0%	7%	21%	0%	1%	5%	0%
VA Existing	3108	Insulated suction lines, open cases	2.0%	5.9%	1.9%	14.7%	0.0%	0.0%	3.5%	10.5%	0.0%	0%	3%	0%
VA Existing	3109	LED Display Lighting, open cases	2.7%	10.6%	2.3%	29.1%	0.0%	0.1%	3.2%	16.4%	0.0%	1%	5%	0%
VA Existing	3110	Multiplex Compressor System, open cases	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3111	Night covers for display cases, open cases	4.0%	3.1%	0.8%	29.4%	0.0%	0.1%	6.0%	3.8%	0.0%	1%	5%	0%
VA Existing	3112	Oversized Air Cooled Condenser, open cases	2.0%	5.9%	1.9%	14.7%	0.0%	0.0%	3.5%	10.5%	0.0%	0%	3%	0%
VA Existing	3113	Refrigeration Coil Cleaning, open cases	2.0%	5.9%	1.9%	14.7%	0.0%	0.0%	3.5%	10.5%	0.0%	0%	3%	0%
VA Existing	3114	Refrigeration Commissioning, open cases	2%	6%	2%	15%	0%	0%	4%	10%	0%	0%	3%	0%
VA Existing	3200	Base Closed refrigerated/freezer cases	6.8%	37.7%	9.8%	52.9%	0.3%	15.8%	13.9%	19.9%	0.0%	8%	31%	2%
VA Existing	3201	Efficient compressor motor, base closed cases	0.0%	0.0%	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0%	0%	0%
VA Existing	3202	Energy-Star Refrigerator/Freezer, base closed cases	4%	24%	6%	34%	0%	10%	9%	13%	0%	5%	20%	1%
VA Existing	3203	Anti-sweat (humidistat) controls, base closed cases	0.0%	0.0%	0.0%	14.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0%	0%	0%
VA Existing	3204	Bi-level LED Case Lighting (self-contained units), base closed cases	3.4%	7.9%	3.9%	52.9%	0.3%	15.8%	8.3%	8.1%	0.0%	8%	20%	2%
VA Existing	3205	Compressor VSD retrofit, base closed cases	4%	38%	10%	53%	0%	12%	14%	20%	0%	6%	31%	2%
VA Existing	3206	Demand Defrost Electric, base closed cases	0.0%	28.3%	1.9%	39.7%	0.2%	0.0%	10.4%	14.9%	0.0%	0%	0%	0%
VA Existing	3207	Demand Hot Gas Defrost, base closed cases	3.9%	28.3%	9.8%	39.7%	0.2%	12.0%	10.4%	14.9%	0.0%	6%	31%	2%
VA Existing	3208	Electronically commutated evaporator fan motor, base closed cases	4%	9%	4%	14%	0%	0%	7%	3%	0%	8%	17%	0%
VA Existing	3209	Freezer-Cooler Replacement Gaskets, base closed cases	3.4%	18.8%	4.9%	26.5%	0.1%	7.9%	7.0%	9.9%	0.0%	4%	15%	1%
VA Existing	3210	High R-Value Glass Doors, base closed cases	0.0%	0.0%	9.8%	50.2%	0.0%	0.0%	0.0%	0.0%	0.0%	4%	31%	2%
VA Existing	3211	High-efficiency fan motors, base closed cases	4%	38%	5%	30%	0%	16%	14%	20%	0%	6%	31%	2%
VA Existing	3212	Insulated suction lines, base closed cases	3.4%	18.8%	4.9%	26.5%	0.1%	7.9%	7.0%	9.9%	0.0%	4%	15%	1%
VA Existing	3213	LED Display Lighting, base closed cases	4.6%	33.8%	6.0%	52.3%	0.3%	15.0%	6.4%	15.6%	0.0%	8%	31%	1%
VA Existing	3214	Low or Anti-Sweat Door Film, base closed cases	5.4%	30.2%	7.8%	42.3%	0.2%	12.6%	11.1%	15.9%	0.0%	6%	24%	2%
VA Existing	3215	Multiplex Compressor System, base closed cases	0.0%	0.0%	0.0%	5.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0%	0%	0%
VA Existing	3216	Oversized Air Cooled Condenser, base closed cases	3.4%	18.8%	4.9%	26.5%	0.1%	7.9%	7.0%	9.9%	0.0%	4%	15%	1%
VA Existing	3217	Refrigeration Coil Cleaning, base closed cases	3.4%	18.8%	4.9%	26.5%	0.1%	7.9%	7.0%	9.9%	0.0%	4%	15%	1%
VA Existing	3218	Refrigeration Commissioning, base closed cases	3.4%	18.8%	4.9%	26.5%	0.1%	7.9%	7.0%	9.9%	0.0%	4%	15%	1%
VA Existing	3300	Base Walk-in refrigeration/freezer units	25.0%	85.3%	6.8%	67.6%	5.0%	12.7%	29.7%	52.6%	0.0%	11%	5%	6%
VA Existing	3301	Efficient compressor motor, walk-ins	0.0%	0.0%	0.0%	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0%	0%	0%
VA Existing	3302	Auto-closer on main door to walk-in freezer	12.5%	42.6%	3.4%	33.8%	2.5%	6.3%	14.8%	26.3%	0.0%	6%	3%	3%
VA Existing	3303	Compressor VSD retrofit, walk-ins	14.5%	85.3%	6.8%	67.6%	0.0%	9.6%	29.7%	52.6%	0.0%	9%	5%	6%
VA Existing	3304	Demand Defrost Electric, walk-ins	0%	64%	1%	51%	4%	0%	22%	39%	0%	0%	0%	0%
VA Existing	3305	Demand Hot Gas Defrost, walk-ins	14.5%	64.0%	6.8%	50.7%	3.7%	9.6%	22.2%	39.4%	0.0%	9%	5%	6%
VA Existing	3306	Electronically commutated evaporator fan motor, walk-ins	15.2%	21.4%	2.5%	18.1%	0.0%	0.0%	16.0%	8.1%	0.0%	11%	3%	1%
VA Existing	3307	Evaporator fan controller for MT walk-ins	3.6%	31.5%	2.2%	15.0%	0.0%	2.2%	9.0%	3.5%	0.0%	11%	2%	1%
VA Existing	3308	Floating head pressure controls, walk-ins	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0%	0%	0%
VA Existing	3309	Freezer-Cooler Replacement Gaskets, walk-ins	12.5%	42.6%	3.4%	33.8%	2.5%	6.3%	14.8%	26.3%	0.0%	6%	3%	3%
VA Existing	3310	High-efficiency fan motors, walk-ins	16.0%	85.3%	3.3%	38.5%	2.4%	12.7%	29.7%	52.6%	0.0%	9%	5%	6%

Commercial Elec Measure Inputs			APPLICABILITY*INCOMPLETE*FEASIBILITY (percent)												
Segment	Measure #	Measure Description	Office Building Type 3	Restaurant Building Type 3	Retail Building Type 3	Grocery Building Type 3	Warehouse Building Type 3	Education Building Type 3	Health Building Type 3	Lodging Building Type 3	Data Centers Building Type	Non-Jurisdictional uilding Type 1	Religious Worship uilding Type 1	Misc uilding Type 1
VA Existing	3311	Insulated suction lines, walk-ins	12.5%	42.6%	3.4%	33.8%	2.5%	6.3%	14.8%	26.3%	0.0%	6%	3%	3%
VA Existing	3312	Multiplex Compressor System, walk-ins	0.0%	0.0%	0.0%	7.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0%	0%	0%
VA Existing	3313	Oversized Air Cooled Condenser, walk-ins	12.5%	42.6%	3.4%	33.8%	2.5%	6.3%	14.8%	26.3%	0.0%	6%	3%	3%
VA Existing	3314	Refrigeration Coil Cleaning, walk-ins	12.5%	42.6%	3.4%	33.8%	2.5%	6.3%	14.8%	26.3%	0.0%	6%	3%	3%
VA Existing	3315	Refrigeration Commissioning, walk-ins	12.5%	42.6%	3.4%	33.8%	2.5%	6.3%	14.8%	26.3%	0.0%	6%	3%	3%
VA Existing	3316	Strip curtains for walk-ins	2.7%	27.5%	3.2%	33.8%	0.1%	0.0%	11.0%	19.1%	0.0%	11%	2%	3%
VA Existing	3400	Base Large Cold Storage Area	0.3%	5.0%	1.7%	26.6%	7.5%	0.0%	3.8%	10.1%	0.0%	0%	4%	0%
VA Existing	3401	Efficient compressor motor, base large cold storage	0.0%	0.0%	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0%	0%	0%
VA Existing	3402	Auto-closer on main door to walk-in freezer, base large cold storage	0%	3%	1%	13%	4%	0%	2%	5%	0%	0%	2%	0%
VA Existing	3403	Compressor VSD retrofit, base large cold storage	0.2%	5.0%	1.7%	26.6%	0.0%	0.0%	3.8%	10.1%	0.0%	0%	4%	0%
VA Existing	3404	Electronically commutated evaporator fan motor, base large cold storage	0.2%	1.3%	0.6%	7.1%	0.0%	0.0%	2.0%	1.6%	0.0%	0%	2%	0%
VA Existing	3405	Evaporator fan controller for MT walk-ins, base large cold storage	0%	2%	1%	6%	0%	0%	1%	1%	0%	0%	2%	0%
VA Existing	3406	High-efficiency fan motors, base large cold storage	0.2%	5.0%	0.8%	15.2%	3.6%	0.0%	3.8%	10.1%	0.0%	0%	4%	0%
VA Existing	3407	Insulated suction lines, base large cold storage	0.2%	2.5%	0.9%	13.3%	3.8%	0.0%	1.9%	5.0%	0.0%	0%	2%	0%
VA Existing	3408	Multiplex Compressor System, base large cold storage	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%
VA Existing	3409	Oversized Air Cooled Condenser, base large cold storage	0.2%	2.5%	0.9%	13.3%	3.8%	0.0%	1.9%	5.0%	0.0%	0%	2%	0%
VA Existing	3410	Refrigeration Coil Cleaning, base large cold storage	0.2%	2.5%	0.9%	13.3%	3.8%	0.0%	1.9%	5.0%	0.0%	0%	2%	0%
VA Existing	3411	Refrigeration Commissioning, base large cold storage	0.2%	2.5%	0.9%	13.3%	3.8%	0.0%	1.9%	5.0%	0.0%	0%	2%	0%
VA Existing	3412	Strip curtains for walk-ins, base large cold storage	0.0%	1.6%	0.8%	13.3%	0.2%	0.0%	1.4%	3.7%	0.0%	0%	1%	0%
VA Existing	3500	Base Reach-in Refrigerator/Freezer, Federal Standard	3.4%	12.4%	1.5%	52.9%	0.3%	15.8%	8.3%	0.9%	0.0%	7%	31%	2%
VA Existing	3501	Energy Star solid door reach-in refrigerator/freezer	2%	7%	1%	29%	0%	9%	5%	0%	0%	4%	17%	1%
VA Existing	3502	Freezer-Cooler Replacement Gaskets, base reach-in	1.7%	6.2%	0.8%	26.5%	0.1%	7.9%	4.2%	0.4%	0.0%	3%	15%	1%
VA Existing	3503	Refrigeration Coil Cleaning, base base reach-in	1.7%	6.2%	0.8%	26.5%	0.1%	7.9%	4.2%	0.4%	0.0%	3%	15%	1%
VA Existing	3600	Base Glass Door Reach-in Refrigerator/Freezer, Federal Standard	3.4%	25.3%	8.3%	0.0%	0.0%	0.0%	5.6%	19.0%	0.0%	1%	0%	1%
VA Existing	3601	Energy Star glass door reach-in refrigerator/freezer	1.8%	13.6%	4.5%	0.0%	0.0%	0.0%	3.0%	10.3%	0.0%	0%	0%	0%
VA Existing	3602	Bi-level LED Case Lighting, base glass-door reach-in	2%	5%	3%	0%	0%	0%	3%	8%	0%	1%	0%	1%
VA Existing	3603	Freezer-Cooler Replacement Gaskets, base glass-door reach-in	1.7%	12.6%	4.1%	0.0%	0.0%	0.0%	2.8%	9.5%	0.0%	0%	0%	0%
VA Existing	3604	Refrigeration Coil Cleaning, base glass-door reach-in	1.7%	12.6%	4.1%	0.0%	0.0%	0.0%	2.8%	9.5%	0.0%	0%	0%	0%
VA Existing	3700	Base Ice Maker, Federal Standard	17.4%	70.2%	7.4%	41.1%	7.8%	25.7%	20.5%	80.5%	0.0%	13%	50%	3%
VA Existing	3701	Energy Star Ice Machines	11.1%	44.9%	4.7%	26.3%	5.0%	16.4%	13.1%	51.5%	0.0%	9%	32%	2%
VA Existing	3702	Refrigeration Coil Cleaning, base ice maker	8.7%	35.1%	3.7%	20.6%	3.9%	12.8%	10.3%	40.3%	0.0%	7%	25%	2%
VA Existing	3800	Base Residential-Type Refrigerator/Freezer, Federal Standard	75.3%	37.9%	59.7%	22.7%	61.6%	86.5%	58.6%	67.6%	97.9%	81%	70%	78%
VA Existing	3801	Energy Star refrigerator/freezer	40.6%	20.5%	32.2%	12.3%	33.3%	46.7%	31.6%	36.5%	52.9%	44%	38%	42%
VA Existing	3802	Refrigeration Coil Cleaning, residential-type refrigerator	37.6%	19.0%	29.9%	11.4%	30.8%	43.2%	29.3%	33.8%	49.0%	40%	35%	39%
VA Existing	3900	Base Compact Refrigerator, Federal Standard	39.1%	15.2%	31.4%	8.1%	25.8%	13.6%	47.4%	55.9%	0.0%	15%	15%	10%
VA Existing	3901	Energy Star Compact Refrigerator	31.3%	12.2%	25.1%	6.5%	20.7%	10.9%	37.9%	44.7%	0.0%	12%	12%	8%
VA Existing	3902	Refrigeration Coil Cleaning, compact refrigerator	19.6%	7.6%	15.7%	4.1%	12.9%	6.8%	23.7%	27.9%	0.0%	8%	7%	5%
VA Existing	4000	Base Computer Network Server	70.9%	54.7%	48.9%	50.9%	80.0%	31.1%	69.2%	80.9%	100.0%	37%	73%	32%
VA Existing	4001	Energy Star server	60.7%	54.2%	25.1%	49.9%	79.2%	25.8%	65.3%	43.6%	85.6%	33%	67%	29%
VA Existing	4002	Server Power Management Enabling	42.5%	32.8%	29.3%	30.5%	48.0%	18.6%	41.5%	48.5%	60.0%	22%	44%	19%
VA Existing	4100	Base Desktop PC	91.2%	56.5%	77.5%	54.9%	90.2%	42.1%	97.9%	89.6%	21.2%	67%	90%	78%
VA Existing	4101	Energy Star or Better PC	78.1%	55.9%	39.8%	53.8%	89.4%	34.9%	92.3%	48.3%	18.1%	60%	83%	72%
VA Existing	4102	PC Network Power Management Enabling	51%	32%	44%	31%	51%	24%	55%	50%	12%	38%	51%	44%
VA Existing	4200	Base Laptop PC	89.6%	48.8%	45.1%	21.4%	87.7%	37.3%	77.9%	83.3%	96.5%	44%	86%	35%
VA Existing	4201	Energy Star or Better Laptop	48.7%	26.5%	24.5%	11.6%	47.7%	20.3%	42.4%	45.3%	52.5%	24%	47%	19%
VA Existing	4202	Laptop Network Power Management Enabling	26.0%	14.1%	13.1%	6.2%	25.4%	10.8%	22.6%	24.1%	28.0%	13%	25%	10%
VA Existing	4300	Base Monitor, LCD	90.5%	62.0%	75.7%	64.4%	78.6%	95.2%	84.8%	87.4%	96.5%	71%	88%	47%
VA Existing	4301	Energy Star or Better Monitor - LCD	52.7%	60.3%	47.2%	63.0%	77.5%	79.6%	80.0%	37.6%	56.2%	51%	75%	40%
VA Existing	4302	Monitor Power Management Enabling - LCD	31.1%	25.7%	13.2%	45.8%	4.0%	10.1%	18.8%	48.5%	33.2%	18%	14%	7%
VA Existing	4303	Plug-load controls - Commercial Smart Strip (base monitor LCD)	56.3%	48.9%	49.1%	28.7%	31.6%	75.1%	35.0%	58.9%	18.5%	71%	37%	26%
VA Existing	4400	Base Imaging	84.7%	43.0%	60.8%	53.0%	64.7%	39.3%	90.0%	81.3%	100.0%	52%	91%	51%
VA Existing	4401	Energy Star or Better Imaging Equipment	36.2%	6.9%	39.3%	8.5%	10.3%	9.3%	14.4%	13.0%	42.8%	26%	54%	30%
VA Existing	5000	Base Water Heater, Resistance Heater, Standard Standby Wattage	80.8%	49.6%	81.9%	50.6%	82.1%	76.0%	75.3%	37.8%	90.6%	60%	58%	41%
VA Existing	5001	High Efficiency Water Heater (electric)	28.3%	17.4%	28.2%	17.7%	28.8%	25.8%	26.3%	13.2%	31.7%	21%	20%	14%
VA Existing	5002	Heat Pump Water Heater (air source)	32.3%	19.8%	32.7%	20.2%	32.9%	30.4%	30.1%	15.1%	36.2%	24%	23%	17%
VA Existing	5003	Tankless Water Heater	6.1%	3.7%	6.1%	3.8%	6.2%	5.7%	5.6%	2.8%	6.8%	4%	4%	3%
VA Existing	5004	Solar Water Heater	3.1%	0.5%	0.2%	0.5%	2.0%	0.4%	0.8%	0.4%	3.4%	1%	0%	0%
VA Existing	5005	Demand controlled circulating systems	47.8%	37.2%	24.5%	36.8%	31.2%	57.0%	56.5%	28.4%	53.7%	40%	43%	31%
VA Existing	5006	Heat Recovery Unit	8.1%	39.7%	4.1%	40.4%	8.2%	11.4%	60.2%	7.6%	9.1%	4%	3%	2%
VA Existing	5007	Hot Water Pipe Insulation	42.9%	37.5%	67.2%	50.2%	16.1%	37.9%	33.1%	32.3%	0.0%	38%	55%	35%
VA Existing	5008	Low Flow Faucet Aerators	16.2%	9.9%	16.4%	10.1%	16.4%	15.2%	15.1%	7.6%	18.1%	12%	12%	8%
VA Existing	5009	Low Flow Showerheads	16.2%	9.9%	16.4%	10.1%	16.4%	15.2%	15.1%	7.6%	18.1%	12%	12%	8%
VA Existing	5010	Low-flow pre-rinse spray valve	80.8%	49.6%	81.9%	50.6%	82.1%	76.0%	75.3%	37.8%	90.6%	60%	58%	41%
VA Existing	5011	Recirculation Pump Timer Clock - Controls for Central Domestic Hot Water	17.0%	17.4%	17.2%	17.7%	5.8%	26.6%	26.3%	26.5%	19.0%	19%	20%	14%
VA Existing	6000	Base Non-Refrigerated Vending Machines, Federal Standard	26.0%	8.5%	11.2%	23.9%	38.3%	17.7%	21.0%	32.7%	0.0%	16%	27%	13%
VA Existing	6001	Vending Misers (Non-Refrigerated)	23.0%	8.4%	9.0%	20.4%	21.7%	16.3%	20.1%	30.0%	0.0%	14%	27%	13%
VA Existing	6100	Base Refrigerated Vending Machines, Federal Standard	31.6%	16.4%	17.2%	27.2%	41.7%	21.1%	38.0%	46.8%	0.0%	22%	31%	19%
VA Existing	6101	Vending Misers (Refrigerated glass-front units)	19.5%	11.4%	9.7%	16.3%	16.6%	13.6%	25.5%	30.1%	0.0%	13%	22%	13%

Commercial Elec Measure Inputs			APPLICABILITY*INCOMPLETE*FEASIBILITY (percent)											
Segment	Measure #	Measure Description	Office Building Type 3	Restaurant Building Type 3	Retail Building Type 3	Grocery Building Type 3	Warehouse Building Type 3	Education Building Type 3	Health Building Type 3	Lodging Building Type 3	Data Centers Building Type	Non-Jurisdictional uilding Type 1	Religious Worship uilding Type 1	Misc uilding Type 1
VA Existing	6102	Vending Misers (Refrigerated units)	19.5%	11.4%	9.7%	16.3%	16.6%	13.6%	25.5%	30.1%	0.0%	13%	22%	13%
VA Existing	6200	Base Combi Oven	20.5%	28.2%	3.7%	24.6%	2.1%	9.6%	20.4%	29.9%	0.0%	13%	28%	12%
VA Existing	6201	Electric Combination Oven	18.4%	18.8%	3.3%	16.4%	1.4%	8.6%	13.6%	19.9%	0.0%	11%	25%	11%
VA Existing	6300	Base Convection Oven	3.5%	54.0%	9.8%	58.9%	9.5%	87.0%	22.6%	56.7%	2.0%	51%	38%	39%
VA Existing	6301	Energy Star Convection Oven	0.0%	36.0%	9.8%	39.3%	6.3%	87.0%	15.0%	37.8%	0.0%	0%	0%	0%
VA Existing	6400	Base Fryer	7.4%	19.4%	1.6%	15.6%	0.7%	7.0%	11.0%	15.4%	0.0%	9%	4%	12%
VA Existing	6401	Efficient Fryer	0.0%	15.5%	1.6%	12.5%	0.5%	0.0%	8.8%	12.3%	0.0%	5%	4%	12%
VA Existing	6500	Base Griddle	7.5%	10.4%	2.3%	6.9%	0.3%	12.6%	14.3%	22.9%	0.0%	11%	8%	11%
VA Existing	6501	Energy Star griddle	6.0%	8.3%	1.8%	5.5%	0.3%	10.1%	11.4%	18.3%	0.0%	9%	7%	9%
VA Existing	6600	Base Hot Food Holding Cabinet	0.4%	41.6%	2.6%	57.6%	0.0%	25.3%	29.0%	40.4%	0.0%	12%	41%	7%
VA Existing	6601	Energy Star hot food holding cabinet	0.3%	33.3%	2.1%	46.1%	0.0%	20.3%	23.2%	32.3%	0.0%	10%	33%	5%
VA Existing	6700	Base Steamer	8.5%	14.7%	2.0%	10.8%	0.0%	7.0%	14.7%	9.1%	0.0%	6%	2%	4%
VA Existing	6701	Efficient Steamer	0.0%	10.7%	1.6%	7.9%	0.0%	5.3%	10.7%	6.6%	0.0%	0%	0%	0%
VA Existing	7000	Base Electric Boiler, Federal Standard	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%	0.2%	0.0%	0%	0%	0%
VA Existing	7001	Ceiling/roof Insulation (electric boiler)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0%	0%	0%
VA Existing	7002	Duct/Pipe Insulation (electric boiler)	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%	0.2%	0.0%	0%	0%	0%
VA Existing	7100	Base Electric Furnace, Federal Standard	0.8%	0.8%	0.3%	0.6%	0.7%	0.0%	1.0%	0.3%	0.0%	1%	0%	2%
VA Existing	7101	Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons, heating	0.8%	0.7%	0.3%	0.6%	0.6%	0.0%	1.0%	0.3%	0.0%	1%	0%	2%
VA Existing	7102	Ceiling/roof Insulation (base furnace)	0.1%	0.2%	0.1%	0.2%	0.2%	0.0%	0.1%	0.0%	0.0%	0%	0%	0%
VA Existing	7103	Duct/Pipe Insulation (base furnace)	0.8%	0.8%	0.3%	0.6%	0.7%	0.0%	1.0%	0.3%	0.0%	1%	0%	2%
VA Existing	7104	Smart Thermostat (Base Furnace Heating)	0.7%	0.6%	0.3%	0.6%	0.6%	0.0%	0.9%	0.3%	0.0%	1%	0%	2%
VA Existing	7200	Base Heating Air-Source Heat Pump, SEER 15.0/HSPF 8.8 w/Aux Strip Heat	23.3%	13.8%	15.5%	24.7%	9.0%	55.4%	28.8%	23.8%	0.0%	30%	17%	14%
VA Existing	7201	Air-Source Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons (base air-source heat pump heating)	21.5%	12.7%	14.3%	22.7%	8.3%	51.0%	26.5%	21.9%	0.0%	28%	16%	13%
VA Existing	7202	Ceiling/roof Insulation (base air-source heat pump heating)	2.3%	3.5%	5.7%	8.9%	2.3%	8.6%	2.5%	0.6%	0.0%	4%	2%	2%
VA Existing	7203	Duct/Pipe Insulation (base air-source heat pump heating)	23.3%	13.8%	15.5%	24.7%	9.0%	55.4%	28.8%	23.8%	0.0%	30%	17%	14%
VA Existing	7204	Smart Thermostat (Base Heat Pump Heating)	20.4%	10.0%	13.6%	23.8%	7.7%	24.6%	24.5%	22.9%	0.0%	30%	15%	14%
VA Existing	7300	Base Heating Packaged Heat Pump, IEER 13.9/COP 3.4 (w/ non-ER heating), 10 tons	18.6%	12.6%	3.4%	5.2%	3.2%	1.5%	16.6%	2.7%	0.0%	8%	4%	9%
VA Existing	7301	Packaged Heat Pump, heating, IEER 13.9/COP 3.4 (w/ non-ER heating), 10 tons	18.6%	12.6%	3.4%	5.2%	0.0%	1.5%	16.6%	0.0%	0.0%	8%	4%	9%
VA Existing	7302	Ceiling/roof Insulation (base packaged heat pump)	1.8%	3.2%	1.2%	1.9%	0.8%	0.2%	1.4%	0.1%	0.0%	1%	0%	1%
VA Existing	7303	Duct/Pipe Insulation (base packaged heat pump)	18.6%	12.6%	3.4%	5.2%	3.2%	1.5%	16.6%	2.7%	0.0%	8%	4%	9%
VA Existing	7304	Smart Thermostat (Base Rooftop/packaged heating)	16.3%	9.1%	3.0%	5.0%	2.7%	0.7%	14.1%	2.6%	0.0%	8%	3%	9%
VA Existing	7400	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	1.8%	3.6%	2.0%	7.6%	3.5%	4.8%	1.7%	3.2%	0.0%	3%	5%	2%
VA Existing	7401	Ceiling/roof Insulation (base ductless mini-split)	0.2%	0.9%	0.7%	2.7%	0.9%	0.8%	0.1%	0.1%	0.0%	0%	0%	0%
VA Existing	7403	Smart Thermostat (base packaged heat pump)	1.6%	2.6%	1.8%	7.3%	3.0%	2.1%	1.5%	3.1%	0.0%	3%	4%	2%
VA Existing	7800	Base Ventilation	88.6%	83.2%	71.1%	52.2%	40.6%	86.4%	79.4%	71.4%	94.7%	81%	88%	75%

F. NON-ADDITIVE MEASURE LEVEL RESULTS

Residential Electric Existing Construction

DSM ASSYST SUMMARY

Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
1	1000	Base Central AC, SEER2 14.3 (non-electric heat)	Single Family	0%	0%	0.0	2,648	2,648	0	15	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	1001	16 SEER (13.68 EER) Split-System Air Conditioner (CAC)	Single Family	10%	10%	113.0	2,700	2,439	0	15	88	0	103.04	0	N/A	2.38	3.30	3.45
1	1002	17 SEER (12.28 EER) Split-System Air Conditioner (CAC)	Single Family	16%	16%	512.0	2,718	2,278	0	15	156	0	182.66	0	N/A	0.89	1.23	9.25
1	1003	18 SEER Split-System Air Conditioner (CAC)	Single Family	18%	18%	512.0	2,658	2,172	0	15	200	0	235.05	0	N/A	0.98	1.36	8.39
1	1005	AC Maintenance and/or tune-up (CAC)	Single Family	2%	2%	108.0	2,682	2,629	0	4	8	0	9.26	0	N/A	0.13	0.23	16.20
1	1006	Ceiling R-0 to R-38 Insulation (CAC)	Single Family	63%	63%	1,108.9	2,648	979	0	20	22	0	26.36	0	N/A	1.95	2.62	5.29
1	1007	Ceiling R-0 to R-49 Insulation (CAC)	Single Family	64%	64%	1,372.8	2,648	941	0	20	15	0	17.98	0	N/A	1.61	2.16	6.40
1	1008	Ceiling R-11 to R-38 Insulaton (CAC)	Single Family	14%	14%	845.2	2,648	2,280	0	20	16	0	18.64	0	N/A	0.56	0.76	18.29
1	1009	Ceiling R-11 to R-49 Insulation (CAC)	Single Family	15%	15%	1,108.9	2,648	2,240	0	20	12	0	13.79	0	N/A	0.48	0.64	21.62
1	1010	Ceiling R-19 to R-38 Insulation (CAC)	Single Family	7%	7%	653.4	2,648	2,451	0	20	25	0	29.45	0	N/A	0.39	0.52	26.44
1	1011	Ceiling R-19 to R-49 Insulation (CAC)	Single Family	9%	9%	917.1	2,648	2,405	0	20	21	0	24.23	0	N/A	0.34	0.46	30.07
1	1012	Roof deck insulation, R-19 (CAC)	Single Family	63%	63%	2,591.8	2,682	991	0	20	21	0	24.88	0	N/A	0.84	1.13	12.20
1	1013	Radiant Barrier (CAC)	Single Family	8%	8%	559.5	2,669	2,456	0	25	49	0	57.95	0	N/A	0.58	0.76	20.82
1	1017	Wall Blow-in R-0 to R-13 Insulation (CAC)	Single Family	25%	25%	835.0	2,648	1,991	0	20	24	0	27.78	0	N/A	1.02	1.37	10.11
1	1018	Cool Roof (CAC)	Single Family	13%	13%	478.5	2,724	2,380	0	15	113	0	132.41	0	N/A	0.74	1.03	11.07
1	1019	Duct Insulation (CAC)	Single Family	6%	6%	62.8	2,810	2,639	0	20	4	0	4.22	0	N/A	3.53	4.73	2.92
1	1020	Duct Testing and Sealing (CAC)	Single Family	6%	6%	370.7	2,787	2,617	0	18	13	0	15.08	0	N/A	0.55	0.74	17.39
1	1022	Smart Thermostat (CAC)	Single Family	8%	8%	169.9	2,709	2,482	0	11	70	0	82.07	0	N/A	1.04	1.52	5.94
1	1023	Comprehensive Shell Air Sealing - Inf. Reduction (CAC)	Single Family	15%	15%	483.4	2,826	2,409	0	11	101	0	118.20	0	N/A	0.67	0.98	9.22
1	1024	Self Install Weatherization (CAC)	Single Family	4%	4%	75.0	2,691	2,590	0	10	24	0	28.70	0	N/A	0.95	1.42	5.90
1	1026	Exterior Door Replacement (CAC)	Single Family	3%	3%	27.8	2,679	2,606	0	20	4	0	4.11	0	N/A	3.38	4.54	3.05
1	1027	ENERGY STAR Ceiling Fans (CAC)	Single Family	1%	1%	496.2	2,662	2,643	0	15	2	0	2.26	3	N/A	0.04	0.05	212.34
1	1028	Window Film (CAC)	Single Family	6%	6%	639.5	2,656	2,494	0	10	43	0	50.37	0	N/A	0.18	0.27	31.36
1	1029	Windows - Adding Storm Windows (CAC)	Single Family	25%	25%	3,188.6	2,787	2,091	0	20	78	0	91.62	0	N/A	0.28	0.38	36.41
1	1030	WINDOWS - Single Pane Clear to Energy Star Double Pane (CAC)	Single Family	25%	25%	694.1	2,648	1,986	0	20	93	0	108.80	0	N/A	1.23	1.66	8.34
1	1031	WINDOWS - Double-Glazed Clear to Energy Star (CAC)	Single Family	23%	23%	401.5	3,128	2,421	0	20	63	0	73.75	0	N/A	2.28	3.06	4.52
1	1100	Base Room AC, CEER 10.9 (non-electric heat)	Single Family	0%	0%	0.0	1,206	1,206	0	9	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	1101	Energy Star Room Air Conditioner - CEER 12 (RAC)	Single Family	8%	8%	127.0	1,216	1,117	0	9	2	0	1.80	0	N/A	0.50	0.75	10.18
1	1102	Ductless mini-split heat pump SEER 19.0/HSPF 9.4 (RAC)	Single Family	37%	37%	3,705.3	1,206	766	0	16	6	0	6.65	1	N/A	0.13	0.18	66.92
1	1103	Ductless mini-split heat pump SEER 22.0/HSPF10.0 (RAC)	Single Family	45%	45%	4,851.1	1,206	661	0	16	7	0	8.23	1	N/A	0.12	0.17	70.83
1	1104	Ceiling R-0 to R-38 Insulation (RAC)	Single Family	19%	19%	1,108.9	1,206	982	0	20	0	0	0.14	0	N/A	0.26	0.35	39.27
1	1105	Ceiling R-0 to R-49 Insulation (RAC)	Single Family	19%	19%	1,372.8	1,206	977	0	20	0	0	0.10	1	N/A	0.22	0.29	47.63
1	1106	Ceiling R-11 to R-38 Insulaton (RAC)	Single Family	4%	4%	845.2	1,206	1,157	0	20	0	0	0.10	2	N/A	0.08	0.10	136.44
1	1107	Ceiling R-11 to R-49 Insulation (RAC)	Single Family	5%	5%	1,108.9	1,206	1,152	0	20	0	0	0.08	2	N/A	0.06	0.09	161.07
1	1108	Ceiling R-19 to R-38 Insulation (RAC)	Single Family	2%	2%	653.4	1,206	1,184	0	20	0	0	0.18	3	N/A	0.04	0.06	230.02
1	1109	Ceiling R-19 to R-49 Insulation (RAC)	Single Family	2%	2%	917.1	1,206	1,178	0	20	0	0	0.11	3	N/A	0.04	0.05	258.60
1	1110	Roof deck insulation, R-19 (RAC)	Single Family	19%	19%	2,591.8	1,211	985	0	20	0	0	0.14	1	N/A	0.11	0.15	91.44
1	1111	Radiant Barrier (RAC)	Single Family	8%	8%	559.5	1,216	1,119	0	25	1	0	1.08	0	N/A	0.26	0.35	45.70
1	1115	Wall Blow-in R-0 to R-13 Insulation (RAC)	Single Family	25%	25%	835.0	1,206	907	0	20	0	0	0.52	0	N/A	0.46	0.62	22.20
1	1116	Cool Roof (RAC)	Single Family	13%	13%	478.5	1,241	1,084	0	15	2	0	2.46	0	N/A	0.34	0.47	24.31
1	1117	Comprehensive Shell Air Sealing - Inf. Reduction (RAC)	Single Family	11%	11%	483.4	1,266	1,126	0	11	1	0	1.62	0	N/A	0.22	0.33	27.45
1	1118	Self Install Weatherization (RAC)	Single Family	4%	4%	75.0	1,226	1,180	0	10	0	0	0.53	0	N/A	0.43	0.65	12.94
1	1120	Exterior Door Replacement (RAC)	Single Family	3%	3%	27.8	1,220	1,187	0	20	0	0	0.08	0	N/A	1.54	2.07	6.69
1	1121	ENERGY STAR Ceiling Fans (RAC)	Single Family	1%	1%	496.2	1,220	1,202	0	15	0	0	0.09	3	N/A	0.04	0.05	219.44
1	1122	Window Film (RAC)	Single Family	6%	6%	639.5	1,210	1,136	0	10	1	0	0.94	1	N/A	0.08	0.12	68.84
1	1123	Windows - Adding Storm Windows (RAC)	Single Family	25%	25%	3,188.6	1,270	952	0	20	1	0	1.70	1	N/A	0.13	0.17	79.93
1	1124	WINDOWS - Single Pane Clear to Energy Star Double Pane (RAC)	Single Family	25%	25%	694.1	1,206	905	0	20	2	0	2.02	0	N/A	0.56	0.76	18.32
1	1125	WINDOWS - Double-Glazed Clear to Energy Star (RAC)	Single Family	23%	23%	401.5	1,425	1,103	0	20	1	0	1.37	0	N/A	1.04	1.40	9.91
1	1126	Recycling of non-efficient window AC unit (RAC)	Single Family	100%	100%	335.2	1,206	0	0	4	9	0	10.93	0	N/A	0.96	1.70	2.21
1	1200	Base Dehumidifier (40 pints/day, 1.5 liters/kWh)	Single Family	0%	0%	100.0	2,532	2,532	0	12	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	1201	10% better than Energy Star Dehumidifier ROB (35-45 pints/day)	Single Family	10%	10%	10.0	2,584	2,326	0	12	43	0	50.58	0	N/A	21.79	31.28	0.31
1	1300	Base Air Cleaner, PM 2.5 CADR = 200, CADR/Watt 1.9	Single Family	0%	0%	0.0	428	428	22	9	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	1301	Energy Star Air Cleaner, PM 2.5 CADR = 200, CADR/Watt 2.9	Single Family	66%	66%	56.7	592	199	10	9	57	3	11.69	0	271.81	2.18	6.68	1.15
1	1400	Base Furnace Fan - Furnace & CAC	Single Family	0%	0%	0.0	549	549	325	18	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	1401	ECM Furnace Fan (variable speed motor)	Single Family	50%	50%	4,200.0	610	305	181	18	107	63	0.00	1	2,199.03	0.05	0.12	109.57
1	1500	Base Air-Source Heat Pump, SEER2 14.3/HSPF2 7.5 w/Aux Strip Heat	Single Family	0%	0%	0.0	5,873	5,873	3,600	15	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	1501	Heat pump upgrade to (16 SEER, 9.2 HSPF) (HP heat/cool)	Single Family	9%	9%	141.1	6,046	5,505	3,374	15	165	101	27.78	0	40.27	2.80	5.48	2.08
1	1502	Heat pump upgrade to (18 SEER, 10 HSPF) (HP heat/cool)	Single Family	14%	14%	440.1	5,873	5,041	3,090	15	373	229	62.87	0	81.62	1.38	2.70	4.21
1	1503	Ground Source Heat Pump EER 17.1/COP 3.6 ENERGY STAR (HP heat/cool	Single Family	26%	26%	8,865.4	5,873	4,351	2,667	15	136	84	22.99	1	899.31	0.13	0.25	46.38
1	1505	Heat pump tune up (HP heat/cool)	Single Family	2%	2%	108.0	5,949	5,831	3,574	4	19	11	3.14	0	141.67	0.26	0.52	7.31
1	1506	Ceiling R-0 to R-38 Insulation (HP heat/cool)	Single Family	53%	53%	1,108.9	5,873	2,732	1,675	20	45	28	7.59	0	54.49	2.53	4.92	2.81
1	1507	Ceiling R-0 to R-49 Insulation (HP heat/cool)	Single Family	55%	55%	1,372.8	5,873	2,640	1,618	20	31	19	5.21	0	65.54	2.10	4.09	3.38
1	1508	Ceiling R-11 to R-38 Insulaton (HP heat/cool)	Single Family	16%	16%	845.2	5,873	4,951	3,035	20	42	26	7.15	0	141.50	0.97	1.90	7.30
1	1509	Ceiling R-11 to R-49 Insulation (HP heat/cool)	Single Family	17%	17%	1,108.9	5,873	4,852	2,974	20	31	19	5.28	0	167.60	0.82	1.60	8.64
1	1510	Ceiling R-19 to R-38 Insulation (HP heat/cool)	Single Family	7%	7%	653.4	5,873	5,459	3,346	20	75	46	12.63	0	243.92	0.56	1.10	12.58
1	1511	Ceiling R-19 to R-49 Insulation (HP heat/cool)	Single Family	9%	9%	917.1	5,873	5,360	3,285	20	46	28	7.83	0	276.08	0.50	0.97	14.24
1	1512	Roof deck insulation, R-19 (HP heat/cool)	Single Family	51%	51%	2,591.8	5,933	2,919	1,789	20	40	25	6.79	0	132.72	1.04	2.02	6.84
1	1513	Radiant Barrier (HP heat/cool)	Single Family	4%	4%	559.5	5,897	5,650	3,463	25	61	37	10.26	0	317.50	0.45	0.88	18.01
1	1514	Crawlspace insulation (HP heat/cool)	Single Family	36%	36%	563.8	6,771	4,313	2,644	20	196	120	32.98	0	35.40	3.89	7.58	1.83
1	1515	Basement insulation R-13 (HP heat/cool)	Single Family	23%	23%	1,212.4	6,410	4,940	3,028	20	40	24	6.66	0	127.27	1.08	2.11	6.56

Residential Electric Existing Construction

DSM ASSYST SUMMARY

Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
1	1516	Floor R-0 to R-19 Insulation-Batts (HP heat/cool)	Single Family	7%	7%	1,403.7	6,018	5,620	3,445	20	4	3	0.72	0	544.96	0.25	0.49	28.10
1	1517	Wall Blow-in R-0 to R-13 Insulation (HP heat/cool)	Single Family	17%	17%	2,676.4	5,873	4,891	2,998	20	38	23	6.35	0	420.95	0.33	0.64	21.71
1	1518	Cool Roof (HP heat/cool)	Single Family	7%	7%	478.5	5,968	5,534	3,392	15	152	93	25.62	0	169.85	0.66	1.30	8.76
1	1519	Duct Insulation (HP heat/cool)	Single Family	8%	8%	275.8	6,379	5,846	3,583	20	12	7	2.01	0	79.86	1.72	3.36	4.12
1	1520	Duct Testing and Sealing (HP heat/cool)	Single Family	8%	8%	370.7	6,305	5,778	3,542	18	43	26	7.16	0	108.60	1.18	2.31	5.60
1	1521	Smart Thermostat (HP heat/cool)	Single Family	14%	14%	169.9	6,100	5,257	3,222	11	276	169	46.53	0	31.09	2.85	5.62	1.60
1	1522	Comprehensive Shell Air Sealing - Inf. Reduction (HP heat/cool)	Single Family	28%	28%	483.4	6,664	4,806	2,946	11	478	293	80.63	0	40.13	2.21	4.35	2.07
1	1523	Self Install Weatherization (HP heat/cool)	Single Family	14%	14%	75.0	6,243	5,373	3,293	10	224	137	37.77	0	13.29	6.15	12.18	0.69
1	1525	Exterior Door Replacement (HP heat/cool)	Single Family	2%	2%	27.8	5,919	5,811	3,562	20	6	3	0.94	0	39.65	3.47	6.76	2.04
1	1526	ENERGY STAR Ceiling Fans (HP heat/cool)	Single Family	0%	0%	496.2	5,894	5,866	3,595	15	3	2	0.54	2	2,650.73	0.04	0.08	136.70
1	1527	Window Film (ASHP)	Single Family	3%	3%	639.5	5,881	5,708	3,499	10	49	30	8.21	0	571.01	0.14	0.28	29.45
1	1528	Windows - Adding Storm Windows (HP heat/cool)	Single Family	25%	25%	3,188.6	6,182	4,636	2,842	20	185	113	31.10	0	318.39	0.43	0.84	16.42
1	1529	WINDOWS - Single Pane Clear to Energy Star Double Pane (ASHP)	Single Family	25%	25%	694.1	5,873	4,404	2,700	20	219	134	36.93	0	72.96	1.89	3.68	3.76
1	1530	WINDOWS - Double-Glazed Clear to Energy Star (HP heat/cool)	Single Family	18%	18%	622.9	6,671	5,495	3,368	20	111	68	18.76	0	81.75	1.68	3.28	4.22
1	1600	Base Geothermal Heat Pump, EER 15.0 / COP 3.1	Single Family	0%	0%	6,496.6	2,560	2,560	1,569	15	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	1601	ound Source Heat Pump EER 17.1/COP 3.6 ENERGY STAR (GSHP heat/coo	Single Family	14%	14%	1,004.7	2,760	2,360	1,447	15	0	0	0.08	0	387.39	0.29	0.57	19.98
1	1603	Heat pump tune up (GSHP heat/cool)	Single Family	2%	2%	108.0	2,593	2,542	1,558	4	0	0	0.03	0	324.96	0.11	0.22	16.76
1	1604	Ceiling R-0 to R-38 Insulation (GSHP heat/cool)	Single Family	53%	53%	1,108.9	2,560	1,191	730	20	0	0	0.08	0	125.00	1.10	2.15	6.45
1	1605	Ceiling R-0 to R-49 Insulation (GSHP heat/cool)	Single Family	55%	55%	1,372.8	2,560	1,151	706	20	0	0	0.06	0	150.34	0.92	1.78	7.75
1	1606	Ceiling R-11 to R-38 Insulaton (GSHP heat/cool)	Single Family	16%	16%	845.2	2,560	2,158	1,323	20	0	0	0.08	0	324.57	0.42	0.83	16.74
1	1607	Ceiling R-11 to R-49 Insulation (GSHP heat/cool)	Single Family	17%	17%	1,108.9	2,560	2,115	1,296	20	0	0	0.06	0	384.44	0.36	0.70	19.83
1	1608	Ceiling R-19 to R-38 Insulation (GSHP heat/cool)	Single Family	7%	7%	653.4	2,560	2,380	1,459	20	1	1	0.14	0	559.49	0.25	0.48	28.85
1	1609	Ceiling R-19 to R-49 Insulation (GSHP heat/cool)	Single Family	9%	9%	917.1	2,560	2,337	1,432	20	1	0	0.09	0	633.26	0.22	0.42	32.66
1	1610	Roof deck insulation, R-19 (GSHP heat/cool)	Single Family	51%	51%	2,591.8	2,586	1,273	780	20	0	0	0.07	0	304.42	0.45	0.88	15.70
1	1611	Radiant Barrier (GSHP heat/cool)	Single Family	4%	4%	559.5	2,571	2,463	1,510	25	1	0	0.11	0	728.28	0.20	0.38	41.30
1	1612	Crawlspace insulation (GSHP heat/cool)	Single Family	36%	36%	563.8	2,952	1,880	1,153	20	2	1	0.36	0	81.21	1.70	3.30	4.19
1	1613	Basement insulation R-13 (GSHP heat/cool)	Single Family	23%	23%	1,212.4	2,794	2,154	1,320	20	0	0	0.07	0	291.93	0.47	0.92	15.06
1	1614	Floor R-0 to R-19 Insulation-Batts (GSHP heat/cool)	Single Family	7%	7%	1,403.7	2,624	2,450	1,502	20	0	0	0.01	1	1,250.02	0.11	0.21	64.46
1	1615	Wall Blow-in R-0 to R-13 Insulation (GSHP heat/cool)	Single Family	17%	17%	2,676.4	2,560	2,132	1,307	20	0	0	0.07	1	965.57	0.14	0.28	49.80
1	1616	Cool Roof (GSHP heat/cool)	Single Family	7%	7%	478.5	2,602	2,412	1,479	15	2	1	0.28	0	389.61	0.29	0.57	20.09
1	1617	Duct Insulation (GSHP heat/cool)	Single Family	8%	8%	275.8	2,781	2,549	1,562	20	0	0	0.02	0	183.19	0.75	1.46	9.45
1	1618	Duct Testing and Sealing (GSHP heat/cool)	Single Family	8%	8%	370.7	2,749	2,519	1,544	18	0	0	0.08	0	249.10	0.52	1.00	12.85
1	1619	Smart Thermostat (GSHP heat/cool)	Single Family	14%	14%	169.9	2,659	2,292	1,405	11	3	2	0.51	0	71.32	1.24	2.45	3.68
1	1620	Comprehensive Shell Air Sealing - Inf. Reduction (GSHP heat/cool)	Single Family	28%	28%	483.4	2,905	2,095	1,284	11	5	3	0.88	0	92.05	0.96	1.90	4.75
1	1621	Self Install Weatherization (GSHP heat/cool)	Single Family	14%	14%	75.0	2,722	2,342	1,436	10	2	1	0.41	0	30.49	2.68	5.31	1.57
1	1623	Exterior Door Replacement (GSHP heat/cool)	Single Family	2%	2%	27.8	2,580	2,533	1,553	20	0	0	0.01	0	90.95	1.51	2.95	4.69
1	1624	ENERGY STAR Ceiling Fans (GSHP heat/cool)	Single Family	1%	1%	496.2	2,571	2,557	1,567	15	0	0	0.01	3	5,297.84	0.02	0.04	273.21
1	1625	Window Film (GSHP)	Single Family	3%	3%	639.5	2,564	2,489	1,525	10	1	0	0.09	1	1,309.79	0.06	0.12	67.55
1	1626	Windows - Adding Storm Windows (GSHP)	Single Family	25%	25%	3,188.6	2,695	2,021	1,239	20	2	1	0.34	0	730.31	0.19	0.37	37.66
1	1627	WINDOWS - Single Pane Clear to Energy Star Double Pane (GSHP)	Single Family	25%	25%	694.1	2,560	1,920	1,177	20	2	1	0.40	0	167.35	0.82	1.60	8.63
1	1628	WINDOWS - Double-Glazed Clear to Energy Star (GSHP heat/cool)	Single Family	18%	18%	622.9	2,908	2,396	1,468	20	1	1	0.20	0	187.51	0.73	1.43	9.67
1	1700	Base Electric Furnace + Central AC (SEER 13.0)	Single Family	0%	0%	0.0	5,296	5,296	3,246	15	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	1701	Heat pump (16 SEER, 9.2 HSPF) (eFAF + CAC)	Single Family	46%	46%	446.1	5,296	2,868	1,758	15	249	152	41.90	0	28.35	3.98	7.78	1.46
1	1702	Heat pump (18 SEER, 10 HSPF) (eFAF + CAC)	Single Family	51%	51%	558.7	5,296	2,586	1,585	15	277	170	46.75	0	31.82	3.55	6.93	1.64
1	1703	Ground Source Heat Pump EER 17.1/COP 3.6 ENERGY STAR (eFAF + CAC)	Single Family	57%	57%	6,697.3	5,296	2,264	1,387	15	62	38	10.46	0	340.81	0.33	0.65	17.58
1	1705	AC Maintenance and/or tune-up (eFAF + CAC)	Single Family	2%	2%	108.0	5,364	5,258	3,223	4	4	2	0.65	0	157.09	0.23	0.46	8.10
1	1706	Ceiling R-0 to R-38 Insulation (eFAF + CAC)	Single Family	53%	53%	1,108.9	5,296	2,464	1,510	20	9	6	1.56	0	60.43	2.28	4.44	3.12
1	1707	Ceiling R-0 to R-49 Insulation (eFAF + CAC)	Single Family	55%	55%	1,372.8	5,296	2,381	1,460	20	6	4	1.07	0	72.68	1.89	3.69	3.75
1	1708	Ceiling R-11 to R-38 Insulaton (eFAF + CAC)	Single Family	16%	16%	845.2	5,296	4,465	2,737	20	9	5	1.47	0	156.91	0.88	1.71	8.09
1	1709	Ceiling R-11 to R-49 Insulation (eFAF + CAC)	Single Family	17%	17%	1,108.9	5,296	4,375	2,682	20	6	4	1.09	0	185.85	0.74	1.44	9.58
1	1710	Ceiling R-19 to R-38 Insulation (eFAF + CAC)	Single Family	7%	7%	653.4	5,296	4,923	3,018	20	15	9	2.60	0	270.48	0.51	0.99	13.95
1	1711	Ceiling R-19 to R-49 Insulation (eFAF + CAC)	Single Family	9%	9%	917.1	5,296	4,834	2,963	20	10	6	1.61	0	306.14	0.45	0.88	15.79
1	1712	Roof deck insulation, R-19 (eFAF + CAC)	Single Family	51%	51%	2,591.8	5,350	2,633	1,614	20	8	5	1.40	0	147.17	0.94	1.82	7.59
1	1713	Radiant Barrier (eFAF + CAC)	Single Family	4%	4%	559.5	5,318	5,095	3,123	25	13	8	2.11	0	352.07	0.41	0.79	19.97
1	1714	Crawlspace insulation (eFAF + CAC)	Single Family	36%	36%	563.8	6,106	3,890	2,384	20	40	25	6.79	0	39.26	3.51	6.83	2.02
1	1715	Basement insulation R-13 (eFAF + CAC)	Single Family	23%	23%	1,212.4	5,781	4,455	2,731	20	8	5	1.37	0	141.13	0.98	1.90	7.28
1	1716	Floor R-0 to R-19 Insulation-Batts (eFAF + CAC)	Single Family	7%	7%	1,403.7	5,427	5,069	3,107	20	1	1	0.15	0	604.30	0.23	0.44	31.16
1	1717	Wall Blow-in R-0 to R-13 Insulation (eFAF + CAC)	Single Family	17%	17%	835.0	5,296	4,411	2,704	20	8	5	1.31	0	145.62	0.95	1.84	7.51
1	1718	Cool Roof (eFAF + CAC)	Single Family	7%	7%	478.5	5,382	4,990	3,059	15	31	19	5.28	0	188.35	0.60	1.17	9.71
1	1719	Duct Insulation (eFAF + CAC)	Single Family	9%	9%	275.8	5,779	5,271	3,231	20	3	2	0.44	0	83.73	1.64	3.20	4.32
1	1720	Duct Testing and Sealing (eFAF + CAC)	Single Family	6%	6%	370.7	5,574	5,235	3,209	18	6	4	1.05	0	168.59	0.76	1.48	8.69
1	1722	Smart Thermostat (eFAF + CAC)	Single Family	14%	14%	169.9	5,501	4,741	2,906	11	57	35	9.58	0	34.48	2.57	5.06	1.78
1	1723	Comprehensive Shell Air Sealing - Inf. Reduction (eFAF + CAC)	Single Family	28%	28%	483.4	6,010	4,334	2,656	10	99	60	16.60	0	44.50	1.84	3.64	2.29
1	1724	Self Install Weatherization (eFAF + CAC)	Single Family	14%	14%	75.0	5,630	4,845	2,970	10	46	28	7.78	0	14.74	5.55	10.98	0.76
1	1726	Exterior Door Replacement (eFAF + CAC)	Single Family	4%	4%	27.8	5,377	5,187	3,179	20	2	1	0.38	0	22.61	6.09	11.86	1.17
1	1727	ENERGY STAR Ceiling Fans (eFAF + CAC)	Single Family	0%	0%	496.2	5,316	5,290	3,242	15	1	0	0.11	2	2,939.37	0.04	0.08	151.59
1	1728	Window Film (eFAF + CAC)	Single Family	3%	3%	639.5	5,304	5,148	3,155	10	10	6	1.69	0	633.19	0.13	0.26	32.65
1	1729	Windows - Adding Storm Windows (eFAF + CAC)	Single Family	25%	25%	3,188.6	5,575	4,181	2,563	20	38	23	6.40	0	353.05	0.39	0.76	18.21
1	1730	WINDOWS - Single Pane Clear to Energy Star Double Pane (eFAF + CAC)	Single Family	25%	25%	694.1	5,296	3,972	2,435	20	45	28	7.60	0	80.90	1.70	3.32	4.17
1	1731	WINDOWS - Double-Glazed Clear to Energy Star (eFAF + CAC)	Single Family	18%	18%	401.5	6,016	4,956	3,038	20	23	14	3.86	0	58.43	2.36	4.59	3.01

Residential Electric Existing Construction

DSM ASSYST SUMMARY

Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
1	1800	Base Electric Furnace + Room AC (EER 9.7)	Single Family	0%	0%	0.0	2,413	2,413	1,479	15	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	1801	Heat pump (16 SEER, 9.2 HSPF) (eFAF + room AC)	Single Family	52%	52%	446.1	2,413	1,156	709	15	1	1	0.18	0	54.77	2.06	4.03	2.82
1	1802	Heat pump (18 SEER, 10 HSPF) (eFAF + room AC)	Single Family	55%	55%	558.7	2,413	1,080	662	15	1	1	0.19	0	64.71	1.74	3.41	3.34
1	1803	ound Source Heat Pump EER 17.1/COP 3.6 ENERGY STAR (eFAF + room A	Single Family	60%	60%	6,697.3	2,413	959	588	15	0	0	0.04	0	710.81	0.16	0.31	36.66
1	1804	Ceiling R-0 to R-38 Insulation (eFAF + room AC)	Single Family	53%	53%	1,108.9	2,413	1,123	688	20	0	0	0.01	0	132.63	1.04	2.02	6.84
1	1805	Ceiling R-0 to R-49 Insulation (eFAF + room AC)	Single Family	55%	55%	1,372.8	2,413	1,085	665	20	0	0	0.00	0	159.53	0.86	1.68	8.23
1	1806	Ceiling R-11 to R-38 Insulaton (eFAF + room AC)	Single Family	16%	16%	845.2	2,413	2,034	1,247	20	0	0	0.01	0	344.40	0.40	0.78	17.76
1	1807	Ceiling R-11 to R-49 Insulation (eFAF + room AC)	Single Family	17%	17%	1,108.9	2,413	1,993	1,222	20	0	0	0.00	0	407.93	0.34	0.66	21.04
1	1808	Ceiling R-19 to R-38 Insulation (eFAF + room AC)	Single Family	7%	7%	653.4	2,413	2,243	1,375	20	0	0	0.01	0	593.68	0.23	0.45	30.62
1	1809	Ceiling R-19 to R-49 Insulation (eFAF + room AC)	Single Family	9%	9%	917.1	2,413	2,202	1,350	20	0	0	0.01	0	671.95	0.20	0.40	34.65
1	1810	Roof deck insulation, R-19 (eFAF + room AC)	Single Family	51%	51%	2,591.8	2,438	1,199	735	20	0	0	0.01	0	323.02	0.43	0.83	16.66
1	1811	Radiant Barrier (eFAF + room AC)	Single Family	4%	4%	559.5	2,423	2,321	1,423	25	0	0	0.01	0	772.78	0.19	0.36	43.82
1	1812	Crawlspace insulation (eFAF + room AC)	Single Family	36%	36%	563.8	2,782	1,772	1,086	20	0	0	0.03	0	86.17	1.60	3.11	4.44
1	1813	Basement insulation R-13 (eFAF + room AC)	Single Family	23%	23%	1,212.4	2,634	2,030	1,244	20	0	0	0.01	0	309.77	0.44	0.87	15.98
1	1814	Floor R-0 to R-19 Insulation-Batts (eFAF + room AC)	Single Family	7%	7%	1,403.7	2,472	2,309	1,415	20	0	0	0.00	1	1,326.40	0.10	0.20	68.40
1	1815	Wall Blow-in R-0 to R-13 Insulation (eFAF + room AC)	Single Family	17%	17%	835.0	2,413	2,010	1,232	20	0	0	0.00	0	319.64	0.43	0.84	16.48
1	1816	Cool Roof (eFAF + RAC)	Single Family	7%	7%	478.5	2,452	2,273	1,394	15	0	0	0.02	0	413.42	0.27	0.53	21.32
1	1817	Duct Insulation (eFAF + room AC)	Single Family	8%	8%	275.8	2,612	2,402	1,473	20	0	0	0.00	0	203.28	0.68	1.32	10.48
1	1818	Duct Testing and Sealing (eFAF + room AC)	Single Family	16%	16%	370.7	2,764	2,336	1,432	18	0	0	0.01	0	133.50	0.96	1.88	6.88
1	1819	Smart Thermostat (eFAF + room AC)	Single Family	14%	14%	169.9	2,506	2,160	1,324	11	0	0	0.04	0	75.67	1.17	2.31	3.90
1	1820	Comprehensive Shell Air Sealing - Inf. Reduction (eFAF + room AC)	Single Family	28%	28%	483.4	2,738	1,974	1,210	11	0	0	0.06	0	97.68	0.91	1.79	5.04
1	1821	Self Install Weatherization (eFAF + room AC)	Single Family	14%	14%	75.0	2,565	2,207	1,353	10	0	0	0.03	0	32.35	2.53	5.00	1.67
1	1823	Exterior Door Replacement (eFAF + room AC)	Single Family	4%	4%	27.8	2,450	2,363	1,449	20	0	0	0.00	0	49.62	2.78	5.41	2.56
1	1824	ENERGY STAR Ceiling Fans (eFAF + RAC)	Single Family	0%	0%	496.2	2,422	2,410	1,477	15	0	0	0.00	4	6,451.75	0.02	0.03	332.72
1	1825	Window Film (eFAF + RAC)	Single Family	3%	3%	639.5	2,416	2,345	1,438	10	0	0	0.01	1	1,389.82	0.06	0.12	71.67
1	1826	Windows - Adding Storm Windows (eFAF + room AC)	Single Family	25%	25%	3,188.6	2,540	1,905	1,168	20	0	0	0.02	0	774.93	0.18	0.35	39.96
1	1827	'INDOWS - Single Pane Clear to Energy Star Double Pane (eFAF + room A	Single Family	25%	25%	694.1	2,413	1,810	1,109	20	0	0	0.03	0	177.58	0.78	1.51	9.16
1	1828	WINDOWS - Double-Glazed Clear to Energy Star (eFAF + room AC)	Single Family	18%	18%	401.5	2,741	2,258	1,384	20	0	0	0.01	0	128.25	1.07	2.09	6.61
1	1829	Recycling of non-efficient window AC unit (eFAF + RAC)	Single Family	100%	100%	335.2	2,413	0	0	4	1	1	0.17	0	21.44	1.70	3.41	1.11
1	1900	Base Electric Baseboard Heating + Central AC (SEER 13.0)	Single Family	0%	0%	0.0	3,691	3,691	2,263	15	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	1901	Heat pump (16 SEER, 9.2 HSPF) (Elec baseboard heat + Central AC)	Single Family	46%	46%	446.1	3,691	1,999	1,225	15	13	8	2.13	0	40.67	2.77	5.42	2.10
1	1902	Heat pump (18 SEER, 10 HSPF) (Elec baseboard heat + Central AC)	Single Family	51%	51%	558.7	3,691	1,803	1,105	15	14	9	2.38	0	45.65	2.47	4.83	2.35
1	1903	urce Heat Pump EER 17.1/COP 3.6 ENERGY STAR (Elec baseboard heat +	Single Family	57%	57%	8,865.4	3,691	1,578	967	15	3	2	0.53	0	647.28	0.17	0.34	33.38
1	1905	AC Maintenance and/or tune-up (baseboard heat + CAC)	Single Family	2%	2%	108.0	3,739	3,665	2,247	4	0	0	0.03	0	225.39	0.16	0.32	11.62
1	1906	Ceiling R-0 to R-38 Insulation (Elec baseboard heat + Central AC)	Single Family	53%	53%	1,108.9	3,691	1,717	1,053	20	0	0	0.08	0	86.70	1.59	3.09	4.47
1	1907	Ceiling R-0 to R-49 Insulation (Elec baseboard heat + Central AC)	Single Family	55%	55%	1,372.8	3,691	1,660	1,017	20	0	0	0.05	0	104.28	1.32	2.57	5.38
1	1908	Ceiling R-11 to R-38 Insulaton (Elec baseboard heat + Central AC)	Single Family	16%	16%	845.2	3,691	3,112	1,907	20	0	0	0.07	0	225.12	0.61	1.19	11.61
1	1909	Ceiling R-11 to R-49 Insulation (Elec baseboard heat + Central AC)	Single Family	17%	17%	1,108.9	3,691	3,049	1,869	20	0	0	0.06	0	266.65	0.52	1.01	13.75
1	1910	Ceiling R-19 to R-38 Insulation (Elec baseboard heat + Central AC)	Single Family	7%	7%	653.4	3,691	3,431	2,103	20	1	0	0.13	0	388.06	0.35	0.69	20.01
1	1911	Ceiling R-19 to R-49 Insulation (Elec baseboard heat + Central AC)	Single Family	9%	9%	917.1	3,691	3,369	2,065	20	0	0	0.08	0	439.23	0.31	0.61	22.65
1	1912	Roof deck insulation, R-19 (Elec baseboard heat + Central AC)	Single Family	51%	51%	2,591.8	3,729	1,835	1,125	20	0	0	0.07	0	211.15	0.65	1.27	10.89
1	1913	Radiant Barrier (baseboard heat + CAC)	Single Family	4%	4%	559.5	3,707	3,551	2,177	25	1	0	0.11	0	505.13	0.28	0.55	28.65
1	1914	Crawlspace insulation (Elec baseboard heat + Central AC)	Single Family	36%	36%	563.8	4,256	2,711	1,662	20	2	1	0.35	0	56.32	2.45	4.76	2.90
1	1915	Basement insulation R-13 (Elec baseboard heat + Central AC)	Single Family	23%	23%	1,212.4	4,029	3,105	1,903	20	0	0	0.07	0	202.48	0.68	1.32	10.44
1	1916	Floor R-0 to R-19 Insulation-Batts (Elec baseboard heat + Central AC)	Single Family	7%	7%	1,403.7	3,783	3,533	2,165	20	0	0	0.01	1	867.01	0.16	0.31	44.71
1	1917	Wall Blow-in R-0 to R-13 Insulation (Elec baseboard heat + Central AC)	Single Family	17%	17%	835.0	3,691	3,075	1,885	20	0	0	0.07	0	208.93	0.66	1.28	10.77
1	1918	Cool Roof (baseboard heat + CAC)	Single Family	7%	7%	478.5	3,751	3,478	2,132	15	2	1	0.27	0	270.23	0.42	0.82	13.94
1	1919	Duct Insulation (Elec baseboard heat + Central AC)	Single Family	6%	6%	275.8	3,918	3,679	2,255	20	0	0	0.02	0	178.48	0.77	1.50	9.20
1	1920	Duct Testing and Sealing (Elec baseboard heat + Central AC)	Single Family	6%	6%	370.7	3,885	3,649	2,236	18	0	0	0.05	0	241.88	0.53	1.03	12.47
1	1922	Smart Thermostat (Elec baseboard heat + Central AC)	Single Family	14%	14%	169.9	3,834	3,304	2,025	11	3	2	0.49	0	49.46	1.79	3.53	2.55
1	1923	orehensive Shell Air Sealing - Inf. Reduction (Elec baseboard heat + Centr	Single Family	28%	28%	483.4	4,189	3,021	1,851	11	5	3	0.84	0	63.85	1.39	2.73	3.29
1	1924	Self Install Weatherization (Elec baseboard heat + Central AC)	Single Family	14%	14%	75.0	3,924	3,377	2,070	10	2	1	0.40	0	21.15	3.87	7.65	1.09
1	1926	Exterior Door Replacement (Elec baseboard heat + Central AC)	Single Family	4%	4%	27.8	3,748	3,615	2,216	20	0	0	0.02	0	32.44	4.25	8.27	1.67
1	1927	ENERGY STAR Ceiling Fans (baseboard heat + CAC)	Single Family	0%	0%	496.2	3,705	3,687	2,260	15	0	0	0.01	3	4,217.22	0.03	0.05	217.49
1	1928	Window Film (baseboard heat + CAC)	Single Family	3%	3%	639.5	3,697	3,588	2,199	10	1	0	0.09	1	908.46	0.09	0.18	46.85
1	1929	Windows - Adding Storm Windows (baseboard heat + CAC)	Single Family	25%	25%	3,188.6	3,886	2,914	1,786	20	2	1	0.33	0	506.54	0.27	0.53	26.12
1	1930	DOWS - Single Pane Clear to Energy Star Double Pane (baseboard heat +	Single Family	25%	25%	694.1	3,691	2,768	1,697	20	2	1	0.39	0	116.07	1.19	2.31	5.99
1	1931	OWS - Double-Glazed Clear to Energy Star (Elec baseboard heat + Centr	Single Family	18%	18%	401.5	4,193	3,454	2,117	20	1	1	0.20	0	83.83	1.64	3.20	4.32
1	2000	Base Electric Baseboard Heating + Room AC (EER 9.7)	Single Family	0%	0%	0.0	2,250	2,250	1,379	15	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	2001	Heat pump (16 SEER, 9.2 HSPF) (Elec baseboard heat + Room AC)	Single Family	52%	52%	446.1	2,250	1,078	661	15	6	4	1.07	0	58.74	1.92	3.75	3.03
1	2002	Heat pump (18 SEER, 10 HSPF) (Elec baseboard heat + Room AC)	Single Family	55%	55%	558.7	2,250	1,007	617	15	7	4	1.14	0	69.40	1.63	3.18	3.58
1	2003	urce Heat Pump EER 17.1/COP 3.6 ENERGY STAR (Elec baseboard heat +	Single Family	60%	60%	8,865.4	2,250	894	548	15	6	4	0.99	1	1,009.16	0.11	0.22	52.04
1	2004	Ductless mini-split heat pump SEER 19.0/HSPF 9.4 (RAC)	Single Family	53%	53%	3,705.3	2,250	1,051	644	16	20	12	3.29	0	476.94	0.25	0.48	24.60
1	2005	Ductless mini-split heat pump SEER 22.0/HSPF10.0 (RAC)	Single Family	58%	58%	4,851.1	2,250	941	577	16	21	13	3.59	0	572.11	0.21	0.40	29.50
1	2006	Ceiling R-0 to R-38 Insulation (Elec baseboard heat + Room AC)	Single Family	53%	53%	1,108.9	2,250	1,047	642	20	1	1	0.14	0	142.25	0.97	1.89	7.34
1	2007	Ceiling R-0 to R-49 Insulation (Elec baseboard heat + Room AC)	Single Family	55%	55%	1,372.8	2,250	1,011	620	20	1	0	0.10	0	171.10	0.80	1.57	8.82
1	2008	Ceiling R-11 to R-38 Insulaton (Elec baseboard heat + Room AC)	Single Family	16%	16%	845.2	2,250	1,897	1,162	20	1	0	0.13	0	369.37	0.37	0.73	19.05
1	2009	Ceiling R-11 to R-49 Insulation (Elec baseboard heat + Room AC)	Single Family	17%	17%	1,108.9	2,250	1,859	1,139	20	1	0	0.10	0	437.51	0.31	0.61	22.56
1	2010	Ceiling R-19 to R-38 Insulation (Elec baseboard heat + Room AC)	Single Family	7%	7%	653.4	2,250	2,091	1,282	20	1	1	0.23	0	636.73	0.22	0.42	32.84
1	2011	Ceiling R-19 to R-49 Insulation (Elec baseboard heat + Room AC)	Single Family	9%	9%	917.1	2,250	2,053	1,259	20	1	1	0.15	0	720.68	0.19	0.37	37.17

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Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
1	2012	Roof deck insulation, R-19 (Elec baseboard heat + Room AC)	Single Family	51%	51%	2,591.8	2,273	1,118	685	20	1	0	0.13	0	346.45	0.40	0.77	17.87
1	2013	Radiant Barrier (baseboard heat + RAC)	Single Family	4%	4%	559.5	2,259	2,164	1,327	25	1	1	0.19	1	828.82	0.17	0.34	47.00
1	2014	Crawlspace insulation (Elec baseboard heat + Room AC)	Single Family	36%	36%	563.8	2,594	1,652	1,013	20	4	2	0.61	0	92.42	1.49	2.90	4.77
1	2015	Basement insulation R-13 (Elec baseboard heat + Room AC)	Single Family	23%	23%	1,212.4	2,456	1,892	1,160	20	1	0	0.12	0	332.23	0.41	0.81	17.13
1	2016	Floor R-0 to R-19 Insulation-Batts (Elec baseboard heat + Room AC)	Single Family	7%	7%	1,403.7	2,305	2,153	1,320	20	0	0	0.01	1	1,422.59	0.10	0.19	73.36
1	2017	Wall Blow-in R-0 to R-13 Insulation (Elec baseboard heat + Room AC)	Single Family	17%	17%	835.0	2,250	1,874	1,149	20	1	0	0.12	0	342.82	0.40	0.78	17.68
1	2018	Cool Roof (baseboard heat + RAC)	Single Family	7%	7%	478.5	2,286	2,120	1,299	15	3	2	0.48	0	443.40	0.25	0.50	22.87
1	2019	Smart Thermostat (Elec baseboard heat + Room AC)	Single Family	14%	14%	169.9	2,337	2,014	1,234	11	5	3	0.86	0	81.16	1.09	2.15	4.19
1	2020	prehensive Shell Air Sealing - Inf. Reduction (Elec baseboard heat + Roon	Single Family	28%	28%	483.4	2,553	1,841	1,128	11	9	5	1.50	0	104.76	0.85	1.67	5.40
1	2021	Self Install Weatherization (Elec baseboard heat + Room AC)	Single Family	14%	14%	75.0	2,392	2,058	1,262	10	4	3	0.70	0	34.70	2.36	4.66	1.79
1	2023	Exterior Door Replacement (Elec baseboard heat + Room AC)	Single Family	4%	4%	27.8	2,284	2,203	1,351	20	0	0	0.03	0	53.22	2.59	5.04	2.74
1	2024	ENERGY STAR Ceiling Fans (baseboard heat + RAC)	Single Family	0%	0%	496.2	2,258	2,247	1,377	15	0	0	0.01	4	6,919.61	0.02	0.03	356.85
1	2025	Window Film (baseboard heat + RAC)	Single Family	3%	3%	639.5	2,253	2,187	1,340	10	1	1	0.15	1	1,490.60	0.05	0.11	76.87
1	2026	Windows - Adding Storm Windows (baseboard heat + RAC)	Single Family	25%	25%	3,188.6	2,368	1,776	1,089	20	3	2	0.58	1	831.13	0.17	0.32	42.86
1	2027	DOWS - Single Pane Clear to Energy Star Double Pane (baseboard heat +	Single Family	25%	25%	694.1	2,250	1,687	1,034	20	4	2	0.69	0	190.45	0.72	1.41	9.82
1	2028	DOWS - Double-Glazed Clear to Energy Star (Elec baseboard heat + Roon	Single Family	18%	18%	401.5	2,556	2,105	1,290	20	2	1	0.35	0	137.55	1.00	1.95	7.09
1	2029	Recycling of non-efficient window AC unit (baseboard heat + RAC)	Single Family	100%	100%	335.2	2,250	0	0	4	19	12	3.25	0	22.99	1.58	3.18	1.19
1	2100	Base Electric Central Furnace, no cooling	Single Family	0%	0%	2,869.0	4,360	4,360	2,582	15	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	2101	High efficiency central air-source heat pump (Elec Central Furn, no cool)	Single Family	40%	40%	959.9	4,360	2,611	1,546	16	2	1	0.00	0	87.65	1.19	2.73	4.37
1	2102	Ground Source Heat Pump with Desuperheater (Elec Central Furn, no cool	Single Family	41%	41%	9,256.0	4,360	2,577	1,526	14	0	0	0.00	0	828.76	0.11	0.26	41.29
1	2103	Ceiling R-0 to R-38 Insulation (Elec Central Furn, no cool)	Single Family	18%	18%	2,407.6	4,360	3,576	2,118	20	0	0	0.00	0	490.02	0.25	0.57	24.42
1	2104	Ceiling R-0 to R-49 Insulation (Elec Central Furn, no cool)	Single Family	18%	18%	3,104.4	4,360	3,561	2,109	20	0	0	0.00	0	619.91	0.19	0.45	30.89
1	2105	Ceiling R-11 to R-38 Insulaton (Elec Central Furn, no cool)	Single Family	4%	4%	2,407.6	4,360	4,195	2,485	20	0	0	0.00	1	2,329.09	0.05	0.12	116.05
1	2106	Ceiling R-11 to R-49 Insulation (Elec Central Furn, no cool)	Single Family	4%	4%	3,104.4	4,360	4,180	2,476	20	0	0	0.00	2	2,751.54	0.04	0.10	137.10
1	2107	Ceiling R-19 to R-38 Insulation (Elec Central Furn, no cool)	Single Family	2%	2%	2,407.6	4,360	4,293	2,542	20	0	0	0.00	3	5,716.87	0.02	0.05	284.84
1	2108	Ceiling R-19 to R-49 Insulation (Elec Central Furn, no cool)	Single Family	2%	2%	3,104.4	4,360	4,278	2,534	20	0	0	0.00	4	6,020.03	0.02	0.05	299.95
1	2109	Roof deck insulation, R-19 (Elec Central Furn, no cool)	Single Family	77%	77%	2,494.7	4,428	1,038	614	20	0	0	0.00	0	117.51	1.03	2.36	5.86
1	2110	Crawlspace insulation (Elec Central Furn, no cool)	Single Family	73%	73%	1,000.6	5,956	1,591	942	20	1	1	0.00	0	36.61	3.29	7.58	1.82
1	2111	Basement insulation R-13 (Elec Central Furn, no cool)	Single Family	53%	53%	1,115.6	5,406	2,546	1,507	20	0	0	0.00	0	62.29	1.94	4.46	3.10
1	2112	Floor R-0 to R-19 Insulation-Batts (Elec Central Furn, no cool)	Single Family	51%	51%	2,227.4	5,361	2,625	1,554	20	0	0	0.00	0	130.05	0.93	2.13	6.48
1	2113	Wall Blow-in R-0 to R-13 Insulation (Elec Central Furn, no cool)	Single Family	34%	34%	1,852.2	4,360	2,890	1,711	20	0	0	0.00	0	201.13	0.60	1.38	10.02
1	2114	Duct Insulation (Elec Central Furn, no cool)	Single Family	14%	14%	275.8	5,005	4,327	2,562	20	0	0	0.00	0	64.89	1.86	4.28	3.23
1	2115	Duct Testing and Sealing (Elec Central Furn, no cool)	Single Family	13%	13%	507.7	4,870	4,249	2,516	18	0	0	0.00	0	130.59	0.86	1.98	6.51
1	2116	Heat Recovery Ventilators (Elec Central Furn, no cool)	Single Family	30%	30%	1,700.0	4,427	3,099	1,835	20	1	1	0.00	0	204.45	0.59	1.36	10.19
1	2117	Smart Thermostat (Elec Central Furn, no cool)	Single Family	13%	13%	169.0	4,514	3,946	2,337	12	0	0	0.00	0	47.54	1.77	4.07	2.37
1	2118	Comprehensive Shell Air Sealing - Inf. Reduction (Elec Central Furn, no coo	Single Family	29%	29%	464.1	4,975	3,532	2,091	11	1	1	0.00	0	51.34	1.53	3.52	2.56
1	2119	Self Install Weatherization (Elec Central Furn, no cool)	Single Family	15%	15%	75.0	4,648	3,973	2,353	10	0	0	0.00	0	17.76	4.11	9.43	0.89
1	2120	Door Weatherization (Elec Central Furn, no cool)	Single Family	7%	7%	37.5	4,499	4,173	2,471	5	0	0	0.00	0	18.35	2.23	5.05	0.91
1	2121	WINDOWS - Double-Glazed Clear to Energy Star (Elec Central Furn, no coo	Single Family	0%	0%	375.7	4,374	4,354	2,578	20	0	0	0.00	2	3,005.02	0.04	0.09	149.73
1	300	Base Interior Fluorescent Fixture 1.8 hrs/day	Single Family	0%	0%	395.3	287	287	65	32	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	301	Low bay LED fixture (base interior fluorescent fixture)	Single Family	0%	0%	684.2	287	287	65	32	0	0	0.00	N/A	N/A	0.00	0.00	N/A
1	302	LED Tube replacement for fluorescent lamps	Single Family	44%	44%	114.0	356	200	45	32	22	5	2.58	0	256.18	1.14	3.09	5.83
1	3010	Base Interior Lighting 9 Watt LED, 0.5 hrs/day	Single Family	0%	0%	133.5	155	155	35	32	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	3011	Timers (base interior LED, 0.5 hrs/day)	Single Family	15%	15%	1,463.2	156	133	30	20	0	0	0.06	6	26,101.89	0.01	0.03	497.91
1	3012	Motion/Occupance Sensor (base interior LED, 0.5 hrs/day)	Single Family	46%	46%	1,280.3	155	84	19	20	4	1	0.45	2	7,503.83	0.04	0.10	143.14
1	3013	Dimmer Switch (base interior LED, 0.5 hrs/day)	Single Family	39%	39%	1,280.3	168	102	23	20	47	11	5.34	2	8,160.32	0.03	0.09	155.66
1	3020	Base Interior Lighting 9 Watt LED, 2.5 hrs/day	Single Family	0%	0%	86.8	403	403	91	32	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	3021	Timers (base interior LED, 2.5 hrs/day)	Single Family	15%	15%	951.5	406	345	78	20	1	0	0.15	1	6,525.47	0.04	0.11	124.48
1	3022	Motion/Occupance Sensor (base interior LED, 2.5 hrs/day)	Single Family	46%	46%	832.6	403	217	49	20	10	2	1.18	0	1,875.96	0.14	0.39	35.79
1	3023	Dimmer Switch (base interior LED, 2.5 hrs/day)	Single Family	39%	39%	832.6	437	266	60	20	121	27	13.90	0	2,040.08	0.13	0.36	38.92
1	3030	Base Interior Lighting 9 Watt LED, 6 hrs/day	Single Family	0%	0%	81.4	755	755	171	16	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	3031	Timers (base interior LED, 6 hrs/day)	Single Family	15%	15%	892.2	760	646	147	20	2	1	0.28	1	3,262.74	0.08	0.22	62.24
1	3032	Motion/Occupance Sensor (base interior LED, 6 hrs/day)	Single Family	46%	46%	780.6	755	408	92	20	19	4	2.21	0	937.98	0.28	0.77	17.89
1	3033	Dimmer Switch (base interior LED, 6 hrs/day)	Single Family	39%	39%	780.6	819	499	113	20	227	51	26.07	0	1,020.04	0.26	0.71	19.46
1	3040	Base Exterior Lighting 9 Watt LED, 6 hrs/day	Single Family	0%	0%	0.0	39	39	9	16	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	3041	Timers (base exterior LED lighting)	Single Family	13%	13%	149.0	40	35	8	20	0	0	0.01	3	12,396.80	0.02	0.06	236.48
1	3042	Motion/Occupance Sensor (base exterior LED lighting)	Single Family	30%	30%	130.3	42	29	7	20	5	1	0.62	1	4,305.02	0.06	0.17	82.12
1	3043	Photocell	Single Family	13%	13%	44.7	40	35	8	20	3	1	0.30	1	3,659.43	0.07	0.20	69.81
1	4000	Base Refrigerator, Standard 2014	Single Family	0%	0%	0.0	1,873	1,873	161	18	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	4001	Refrigerator (Energy Star)	Single Family	10%	10%	106.9	1,972	1,775	153	18	109	9	15.42	0	595.85	0.98	2.99	4.31
1	4002	Refrigerator (CEE Tier 2)	Single Family	15%	15%	213.7	1,916	1,629	140	18	271	23	38.20	0	817.47	0.72	2.18	5.92
1	4100	Base Refrigerator, Standard 2029	Single Family	0%	0%	0.0	1,601	1,601	138	18	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	4101	Efficient Refrigerator (2029)	Single Family	10%	10%	106.9	1,617	1,455	125	18	161	14	22.75	0	726.76	0.80	2.45	5.26
1	4102	Super Efficient Refrigerator (2029)	Single Family	15%	15%	213.7	1,601	1,360	117	18	266	23	37.54	0	978.80	0.60	1.82	7.09
1	4200	Base Second Refrigerator, Standard 2014	Single Family	0%	0%	0.0	1,242	1,242	107	18	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	4201	2nd Refrigerator Recycling	Single Family	100%	100%	141.1	1,242	0	0	8	447	38	63.06	0	124.85	2.42	7.69	0.90
1	4300	Base Freezer, Standard 2014	Single Family	0%	0%	0.0	1,218	1,218	105	11	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	4301	Freezer (Energy Star)	Single Family	10%	10%	42.7	1,237	1,113	96	11	42	4	5.98	0	379.93	1.05	3.27	2.75
1	4400	Base Freezer, Standard 2029	Single Family	0%	0%	0.0	1,041	1,041	90	11	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	4401	Efficient Freezer (2029)	Single Family	10%	10%	42.7	1,046	942	81	11	40	3	5.66	0	449.19	0.89	2.77	3.25

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Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
1	4500	Base Second Freezer, Standard 2014	Single Family	0%	0%	0.0	1,555	1,555	134	11	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	4501	2nd Freezer Recycling	Single Family	100%	100%	141.1	1,555	0	0	8	25	2	3.56	0	99.77	3.03	9.62	0.72
1	5000	Base Clothes Washer, 2018 Standard Front Load (IMEF 1.84 / IWF 4.7)	Single Family	0%	0%	0.0	459	459	27	14	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	5001	Clothes Washer, ENERGY STAR (IMEF 2.07 / IWF 4.2)	Single Family	34%	34%	213.7	530	352	21	14	115	7	15.50	0	1,927.87	0.35	1.13	9.58
1	5100	Base Clothes Dryer, CEF 3.73	Single Family	0%	0%	0.0	124	124	7	12	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	5101	Clothes Dryer, CEF 3.93 ENERGY STAR	Single Family	23%	23%	158.9	130	99	6	16	24	1	3.23	0	8,386.55	0.09	0.29	41.68
1	5102	Clothes Dryer, CEF 4.30 CEE Tier 2	Single Family	30%	30%	291.1	127	89	5	16	34	2	4.57	1	12,202.12	0.06	0.20	60.64
1	5103	Clothes Dryer, CEF 5.20 CEE Tier 3	Single Family	42%	42%	423.3	126	73	4	16	50	3	6.71	1	12,756.49	0.06	0.19	63.39
1	5200	Base Dishwasher, Standard 2013 (<= 307 kWh)	Single Family	0%	0%	0.0	274	274	23	13	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	5201	Dishwasher, ENERGY STAR (<= 270 kWh)	Single Family	4%	4%	160.3	275	264	22	13	8	1	1.05	1	16,997.81	0.03	0.09	118.86
1	5300	Base 2-speed Pool Pump (ROB)	Single Family	0%	0%	0.0	2,010	2,010	101	10	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	5301	PV-Powered Pool Pumps ROB	Single Family	98%	98%	3,119.9	2,010	50	3	10	170	9	34.60	0	2,999.85	0.22	0.66	12.67
1	5302	Variable-Speed Pool Pump (<1 hp) ROB	Single Family	36%	36%	217.0	2,073	1,327	67	10	59	3	12.07	0	548.22	1.19	3.61	2.31
1	5400	Base Exhaust fan, 3.1 CFM/W, <2.0 sones (quiet),ASHRAE 62.2	Single Family	0%	0%	0.0	128	128	11	0	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	5401	Exhaust fan, 8.3 CFM/W, <2.0 sones (quiet),ASHRAE 62.2	Single Family	63%	63%	22.0	147	55	5	10	74	6	9.21	0	272.38	1.36	4.38	1.90
1	6000	Base LED TV	Single Family	0%	0%	0.0	392	392	30	7	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	6001	Energy Star LED TV	Single Family	60%	60%	10.9	409	164	13	7	148	11	19.43	0	54.49	5.40	17.57	0.35
1	6002	Plug Load Controls - Smart Power Strip (base LED TV)	Single Family	2%	2%	67.8	393	384	30	4	6	0	0.49	1	13,779.11	0.02	0.06	58.52
1	6100	Base LCD TV	Single Family	0%	0%	0.0	217	217	17	7	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	6101	Energy Star LCD TV	Single Family	81%	81%	9.5	270	52	4	7	44	3	5.75	0	53.62	5.49	17.86	0.35
1	6102	Plug Load Controls - Smart Power Strip (base LCD TV)	Single Family	2%	2%	59.5	218	212	16	4	1	0	0.11	1	21,816.16	0.01	0.04	92.66
1	6200	Base Other TV	Single Family	0%	0%	0.0	642	642	49	7	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	6201	Energy Star other TV	Single Family	9%	9%	8.7	650	589	45	7	8	1	1.06	0	176.72	1.66	5.42	1.14
1	6202	Plug Load Controls - Smart Power Strip (base Other TV)	Single Family	2%	2%	54.3	643	628	49	4	2	0	0.19	0	6,733.04	0.04	0.13	28.60
1	6300	Base Set-Top Box	Single Family	0%	0%	0.0	356	356	27	7	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	6500	Base Desktop PC	Single Family	0%	0%	0.0	281	281	23	7	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	6501	Energy Star Desktop PC	Single Family	13%	13%	1.3	286	248	21	7	15	1	1.81	0	38.49	7.08	23.05	0.27
1	6502	Plug Load Controls - Smart Power Strip (base Desktop PC)	Single Family	31%	20%	32.5	285	197	19	4	37	2	3.03	0	636.09	0.37	1.29	2.91
1	6600	Base Laptop PC	Single Family	0%	0%	0.0	193	193	16	7	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	6601	Energy Star Laptop PC	Single Family	18%	18%	1.9	197	162	13	7	26	2	3.26	0	61.40	4.44	14.45	0.43
1	6700	Base Monitor/Display	Single Family	0%	0%	0.0	239	239	20	7	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	6701	Energy Star Monitor	Single Family	5%	5%	2.1	251	239	20	7	0	0	0.02	0	190.32	1.43	4.66	1.33
1	7000	Base Water Heater (40 gal), Federal Standard EF 0.95	Single Family	0%	0%	0.0	3,110	3,110	886	15	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	7001	Tankless Water Heater	Single Family	12%	12%	961.8	3,119	2,740	780	20	196	56	18.45	0	844.15	0.26	0.68	20.22
1	7002	Heat Pump Water Heater - Energy Star	Single Family	59%	59%	1,068.7	3,216	1,330	379	10	944	269	88.87	0	188.19	0.68	1.85	4.51
1	7003	Solar Domestic Water Heating	Single Family	84%	84%	4,677.8	3,121	513	146	15	1,378	392	129.67	0	595.78	0.30	0.80	14.27
1	7004	DHW Tank Wrap	Single Family	3%	3%	48.1	3,129	3,029	862	5	57	16	5.41	0	159.97	0.44	1.20	3.83
1	7005	Pipe Wrap	Single Family	1%	1%	23.9	3,114	3,078	876	15	19	6	1.82	0	222.06	0.80	2.14	5.32
1	7006	Hot water turndown 5 degrees	Single Family	6%	6%	10.0	3,110	2,936	836	7	17	5	1.62	0	19.07	4.96	13.57	0.46
1	7007	Hot water turndown 10 degrees	Single Family	11%	11%	10.0	3,110	2,780	792	7	47	13	4.39	0	10.08	9.39	25.69	0.24
1	7008	Hot water turndown 15 degrees	Single Family	15%	15%	10.0	3,110	2,637	751	7	17	5	1.57	0	7.03	13.46	36.84	0.17
1	7009	Hot water turndown 20 degrees	Single Family	19%	19%	10.0	3,110	2,513	716	7	8	2	0.79	0	5.56	17.01	46.54	0.13
1	7010	Drain Water Heat Recovery (GFX)	Single Family	38%	38%	500.0	3,110	1,941	553	7	827	235	77.82	0	142.07	0.67	1.82	3.40
1	7011	Energy Star CW CEE Tier 2 (MEF=2.0)	Single Family	1%	1%	87.8	3,122	3,091	880	14	13	4	1.18	0	934.07	0.18	0.48	22.38
1	7012	Energy Star Dishwasher (EF=0.72)	Single Family	0%	0%	160.3	3,111	3,103	884	13	4	1	0.35	2	7,132.11	0.02	0.06	170.87
1	7013	Faucent Aerators	Single Family	9%	9%	32.7	3,198	2,923	832	9	132	38	12.46	0	39.49	2.97	8.10	0.95
1	7014	Low Flow Showerhead 1.5 Gal/Min	Single Family	5%	5%	49.8	3,228	3,059	871	10	36	10	3.36	0	98.20	1.30	3.55	2.35
1	8000	Base Electric Vehicle Level 1 Charger	Single Family	0%	0%	0.0	897	897	63	10	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	8001	Energy Star Electric Vehicle Level 1 Charger	Single Family	1%	1%	327.0	899	888	63	10	0	0	0.00	3	39,780.21	0.01	0.04	236.32
1	8002	Smart (Networked) Electric Vehicle Level 1 Charger	Single Family	2%	0%	327.0	899	886	63	10	0	0	0.00	2	198,784.44	0.01	0.04	190.66
1	8100	Base Electric Vehicle Level 2 Charger	Single Family	0%	0%	0.0	1,213	1,213	86	10	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	8101	Energy Star Electric Vehicle Level 2 Charger	Single Family	1%	1%	218.0	1,216	1,199	85	10	0	0	0.01	1	17,286.66	0.02	0.08	102.69
1	8102	Smart (Networked) Electric Vehicle Level 2 Charger	Single Family	2%	0%	327.0	1,217	1,196	86	10	1	0	0.00	1	129,563.72	0.02	0.07	124.27
1	9000	Base Miscellaneous	Single Family	0%	0%	0.0	1,227	1,227	102	10	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	9900	Base House Use	Single Family	0%	0%	0.0	15,045	15,045	3,050	1	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	9901	Indirect Feedback (Home Energy Reports, Opower)	Single Family	2%	2%	9.3	15,047	14,821	3,005	1	248	50	64.47	0	19.12	1.33	3.07	0.33
1	1000	Base Central AC, SEER2 14.3 (non-electric heat)	Multi-Family	0%	0%	0.0	0	0	0	15	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	1100	Base Room AC, CEER 10.9 (non-electric heat)	Multi-Family	0%	0%	0.0	922	922	0	9	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	1101	Energy Star Room Air Conditioner - CEER 12 (RAC)	Multi-Family	8%	8%	63.5	926	851	0	9	0	0	0.31	0	N/A	0.75	1.15	6.69
1	1102	Ductless mini-split heat pump SEER 19.0/HSPF 9.4 (RAC)	Multi-Family	37%	37%	1,852.7	922	585	0	16	1	0	1.09	1	N/A	0.20	0.27	43.77
1	1103	Ductless mini-split heat pump SEER 22.0/HSPF10.0 (RAC)	Multi-Family	45%	45%	2,425.5	922	506	0	16	1	0	1.35	1	N/A	0.19	0.26	46.32
1	1104	Ceiling R-0 to R-38 Insulation (RAC)	Multi-Family	19%	19%	696.0	922	750	0	20	0	0	0.02	0	N/A	0.32	0.43	32.24
1	1105	Ceiling R-0 to R-49 Insulation (RAC)	Multi-Family	19%	19%	861.6	922	747	0	20	0	0	0.02	0	N/A	0.26	0.35	39.10
1	1106	Ceiling R-11 to R-38 Insulaton (RAC)	Multi-Family	4%	4%	530.5	922	885	0	20	0	0	0.02	1	N/A	0.09	0.12	112.01
1	1107	Ceiling R-11 to R-49 Insulation (RAC)	Multi-Family	5%	5%	696.0	922	880	0	20	0	0	0.01	2	N/A	0.08	0.10	132.23
1	1108	Ceiling R-19 to R-38 Insulation (RAC)	Multi-Family	2%	2%	410.1	922	905	0	20	0	0	0.03	2	N/A	0.05	0.07	188.84
1	1109	Ceiling R-19 to R-49 Insulation (RAC)	Multi-Family	2%	2%	575.6	922	901	0	20	0	0	0.02	3	N/A	0.05	0.07	212.30
1	1110	Roof deck insulation, R-19 (RAC)	Multi-Family	19%	19%	1,626.7	926	753	0	20	0	0	0.06	1	N/A	0.14	0.18	75.07
1	1115	Wall Blow-in R-0 to R-13 Insulation (RAC)	Multi-Family	25%	25%	459.4	922	693	0	20	0	0	0.08	0	N/A	0.64	0.87	15.98
1	1116	Cool Roof (RAC)	Multi-Family	13%	13%	300.3	950	822	0	15	0	0	0.43	0	N/A	0.44	0.61	18.64

Residential Electric Existing Construction

DSM ASSYST SUMMARY

Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
1	1117	Comprehensive Shell Air Sealing - Inf. Reduction (RAC)	Multi-Family	11%	11%	247.5	980	871	0	11	0	0	0.22	0	N/A	0.34	0.50	18.16
1	1118	Self Install Weatherization (RAC)	Multi-Family	11%	11%	38.4	978	872	0	10	0	0	0.22	0	N/A	1.95	2.90	2.88
1	1120	Exterior Door Replacement (RAC)	Multi-Family	4%	4%	20.8	940	906	0	20	0	0	0.01	0	N/A	2.11	2.84	4.88
1	1121	ENERGY STAR Ceiling Fans (RAC)	Multi-Family	1%	1%	263.9	933	919	0	15	0	0	0.01	2	N/A	0.05	0.07	152.14
1	1122	Window Film (RAC)	Multi-Family	6%	6%	351.9	925	869	0	10	0	0	0.15	1	N/A	0.11	0.17	49.55
1	1123	Windows - Adding Storm Windows (RAC)	Multi-Family	25%	25%	1,754.5	971	728	0	20	0	0	0.28	1	N/A	0.18	0.24	57.53
1	1124	WINDOWS - Single Pane Clear to Energy Star Double Pane (RAC)	Multi-Family	25%	25%	381.9	922	692	0	20	0	0	0.33	0	N/A	0.78	1.05	13.18
1	1125	WINDOWS - Double-Glazed Clear to Energy Star (RAC)	Multi-Family	23%	23%	220.9	1,048	811	0	20	0	0	0.32	0	N/A	1.39	1.86	7.42
1	1126	Recycling of non-efficient window AC unit (RAC)	Multi-Family	100%	100%	167.6	922	0	0	4	2	0	1.89	0	N/A	1.47	2.60	1.45
1	1200	Base Dehumidifier (40 pints/day, 1.5 liters/kWh)	Multi-Family	0%	0%	100.0	1,243	1,243	0	12	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	1201	10% better than Energy Star Dehumidifier ROB (35-45 pints/day)	Multi-Family	10%	10%	10.0	1,269	1,142	0	12	1	0	0.91	0	N/A	10.70	15.36	0.63
1	1300	Base Air Cleaner, PM 2.5 CADR = 200, CADR/Watt 1.9	Multi-Family	0%	0%	0.0	316	316	16	9	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	1301	Energy Star Air Cleaner, PM 2.5 CADR = 200, CADR/Watt 2.9	Multi-Family	66%	66%	56.7	436	146	7	9	7	0	1.52	0	368.44	1.61	4.93	1.56
1	1400	Base Furnace Fan - Furnace & CAC	Multi-Family	0%	0%	0.0	459	459	272	18	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	1401	ECM Furnace Fan (variable speed motor)	Multi-Family	50%	50%	2,100.0	510	255	151	18	10	6	0.00	1	1,315.74	0.09	0.20	65.56
1	1500	Base Air-Source Heat Pump, SEER2 14.3/HSPF2 7.5 w/Aux Strip Heat	Multi-Family	0%	0%	0.0	3,546	3,546	2,174	15	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	1501	Heat pump upgrade to (16 SEER, 9.2 HSPF) (HP heat/cool)	Multi-Family	8%	8%	70.6	3,641	3,344	2,050	15	18	11	3.05	0	36.70	3.07	6.01	1.89
1	1502	Heat pump upgrade to (18 SEER, 10 HSPF) (HP heat/cool)	Multi-Family	13%	13%	220.0	3,546	3,088	1,893	15	41	25	6.92	0	74.18	1.52	2.97	3.83
1	1505	Heat pump tune up (HP heat/cool)	Multi-Family	2%	2%	95.7	3,601	3,529	2,163	4	2	1	0.25	0	207.42	0.18	0.35	10.70
1	1506	Ceiling R-0 to R-38 Insulation (HP heat/cool)	Multi-Family	53%	53%	696.0	3,546	1,650	1,011	20	5	3	0.92	0	56.64	2.43	4.74	2.92
1	1507	Ceiling R-0 to R-49 Insulation (HP heat/cool)	Multi-Family	55%	55%	861.6	3,546	1,594	977	20	4	2	0.63	0	68.12	2.02	3.94	3.51
1	1508	Ceiling R-11 to R-38 Insulaton (HP heat/cool)	Multi-Family	16%	16%	530.5	3,546	2,990	1,832	20	5	3	0.86	0	147.07	0.94	1.82	7.58
1	1509	Ceiling R-11 to R-49 Insulation (HP heat/cool)	Multi-Family	17%	17%	696.0	3,546	2,930	1,796	20	4	2	0.64	0	174.20	0.79	1.54	8.98
1	1510	Ceiling R-19 to R-38 Insulation (HP heat/cool)	Multi-Family	7%	7%	410.1	3,546	3,297	2,021	20	9	6	1.53	0	253.52	0.54	1.06	13.07
1	1511	Ceiling R-19 to R-49 Insulation (HP heat/cool)	Multi-Family	9%	9%	575.6	3,546	3,237	1,984	20	6	3	0.95	0	286.95	0.48	0.93	14.80
1	1512	Roof deck insulation, R-19 (HP heat/cool)	Multi-Family	26%	26%	1,626.7	3,565	2,634	1,615	20	7	4	1.10	0	269.70	0.51	0.99	13.91
1	1517	Wall Blow-in R-0 to R-13 Insulation (HP heat/cool)	Multi-Family	17%	17%	1,472.7	3,546	2,954	1,810	20	5	3	0.77	0	383.59	0.36	0.70	19.78
1	1518	Cool Roof (HP heat/cool)	Multi-Family	9%	9%	300.3	3,618	3,292	2,018	15	23	14	3.85	0	141.99	0.79	1.55	7.32
1	1519	Duct Insulation (HP heat/cool)	Multi-Family	8%	8%	304.0	3,841	3,531	2,164	20	1	1	0.23	0	151.31	0.91	1.77	7.80
1	1520	Duct Testing and Sealing (HP heat/cool)	Multi-Family	8%	8%	189.8	3,669	3,362	2,061	18	16	10	2.78	0	95.55	1.34	2.62	4.93
1	1521	Smart Thermostat (HP heat/cool)	Multi-Family	14%	14%	142.4	3,683	3,174	1,946	11	33	20	5.62	0	43.17	2.05	4.04	2.23
1	1522	Comprehensive Shell Air Sealing - Inf. Reduction (HP heat/cool)	Multi-Family	28%	28%	247.5	4,161	3,001	1,839	11	49	30	8.24	0	32.91	2.69	5.31	1.70
1	1523	Self Install Weatherization (HP heat/cool)	Multi-Family	14%	14%	38.4	3,829	3,295	2,020	10	23	14	3.79	0	11.10	7.37	14.58	0.57
1	1525	Exterior Door Replacement (HP heat/cool)	Multi-Family	2%	2%	20.8	3,581	3,515	2,155	20	1	0	0.09	0	49.15	2.80	5.46	2.53
1	1526	ENERGY STAR Ceiling Fans (HP heat/cool)	Multi-Family	1%	1%	263.9	3,572	3,538	2,169	15	1	0	0.13	1	1,204.09	0.09	0.18	62.10
1	1527	Window Film (ASHP)	Multi-Family	4%	4%	351.9	3,553	3,412	2,092	10	8	5	1.34	0	385.12	0.21	0.42	19.86
1	1528	Windows - Adding Storm Windows (HP heat/cool)	Multi-Family	25%	25%	1,754.5	3,733	2,800	1,716	20	22	14	3.76	0	290.13	0.47	0.92	14.96
1	1529	WINDOWS - Single Pane Clear to Energy Star Double Pane (ASHP)	Multi-Family	25%	25%	381.9	3,546	2,660	1,630	20	26	16	4.46	0	66.48	2.07	4.03	3.43
1	1530	WINDOWS - Double-Glazed Clear to Energy Star (HP heat/cool)	Multi-Family	23%	23%	342.8	4,028	3,119	1,912	20	25	15	4.25	0	58.19	2.37	4.61	3.00
1	1600	Base Geothermal Heat Pump, EER 15.0 / COP 3.1	Multi-Family	0%	0%	3,248.3	0	0	0	15	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	1700	Base Electric Furnace + Central AC (SEER 13.0)	Multi-Family	0%	0%	0.0	0	0	0	15	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	1800	Base Electric Furnace + Room AC (EER 9.7)	Multi-Family	0%	0%	0.0	1,845	1,845	1,131	15	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	1900	Base Electric Baseboard Heating + Central AC (SEER 13.0)	Multi-Family	0%	0%	0.0	3,126	3,126	1,916	15	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	1901	Heat pump (16 SEER, 9.2 HSPF) (Elec baseboard heat + Central AC)	Multi-Family	48%	48%	223.0	3,126	1,641	1,006	15	5	3	0.91	0	23.17	4.87	9.52	1.20
1	1902	Heat pump (18 SEER, 10 HSPF) (Elec baseboard heat + Central AC)	Multi-Family	53%	53%	279.3	3,126	1,482	908	15	6	4	1.00	0	26.22	4.30	8.41	1.35
1	1905	AC Maintenance and/or tune-up (baseboard heat + CAC)	Multi-Family	2%	2%	95.7	3,174	3,111	1,907	4	0	0	0.01	0	235.31	0.15	0.31	12.13
1	1906	Ceiling R-0 to R-38 Insulation (Elec baseboard heat + Central AC)	Multi-Family	53%	53%	696.0	3,126	1,454	891	20	0	0	0.03	0	64.26	2.14	4.17	3.31
1	1907	Ceiling R-0 to R-49 Insulation (Elec baseboard heat + Central AC)	Multi-Family	55%	55%	861.6	3,126	1,405	861	20	0	0	0.02	0	77.28	1.78	3.47	3.99
1	1908	Ceiling R-11 to R-38 Insulaton (Elec baseboard heat + Central AC)	Multi-Family	16%	16%	530.5	3,126	2,635	1,615	20	0	0	0.03	0	166.84	0.83	1.61	8.60
1	1909	Ceiling R-11 to R-49 Insulation (Elec baseboard heat + Central AC)	Multi-Family	17%	17%	696.0	3,126	2,582	1,583	20	0	0	0.02	0	197.62	0.70	1.36	10.19
1	1910	Ceiling R-19 to R-38 Insulation (Elec baseboard heat + Central AC)	Multi-Family	7%	7%	410.1	3,126	2,906	1,781	20	0	0	0.05	0	287.61	0.48	0.93	14.83
1	1911	Ceiling R-19 to R-49 Insulation (Elec baseboard heat + Central AC)	Multi-Family	9%	9%	575.6	3,126	2,853	1,749	20	0	0	0.03	0	325.53	0.42	0.82	16.79
1	1912	Roof deck insulation, R-19 (Elec baseboard heat + Central AC)	Multi-Family	26%	26%	1,626.7	3,142	2,322	1,423	20	0	0	0.04	0	305.97	0.45	0.88	15.78
1	1917	Wall Blow-in R-0 to R-13 Insulation (Elec baseboard heat + Central AC)	Multi-Family	17%	17%	459.4	3,126	2,604	1,596	20	0	0	0.03	0	135.76	1.01	1.98	7.00
1	1918	Cool Roof (baseboard heat + CAC)	Multi-Family	9%	9%	300.3	3,189	2,901	1,778	15	1	0	0.14	0	161.08	0.70	1.37	8.31
1	1919	Duct Insulation (Elec baseboard heat + Central AC)	Multi-Family	8%	8%	304.0	3,387	3,112	1,908	20	0	0	0.01	0	170.38	0.81	1.57	8.79
1	1920	Duct Testing and Sealing (Elec baseboard heat + Central AC)	Multi-Family	6%	6%	189.8	3,204	3,009	1,844	18	0	0	0.07	0	150.19	0.85	1.67	7.75
1	1922	Smart Thermostat (Elec baseboard heat + Central AC)	Multi-Family	14%	14%	142.4	3,247	2,798	1,715	11	1	1	0.20	0	48.98	1.81	3.56	2.53
1	1923	orehensive Shell Air Sealing - Inf. Reduction (Elec baseboard heat + Centr	Multi-Family	28%	28%	247.5	3,668	2,645	1,621	11	2	1	0.29	0	37.33	2.37	4.68	1.93
1	1924	Self Install Weatherization (Elec baseboard heat + Central AC)	Multi-Family	14%	14%	38.4	3,375	2,905	1,780	10	1	0	0.14	0	12.59	6.50	12.86	0.65
1	1926	Exterior Door Replacement (Elec baseboard heat + Central AC)	Multi-Family	4%	4%	20.8	3,185	3,073	1,884	20	0	0	0.01	0	28.62	4.81	9.37	1.48
1	1927	ENERGY STAR Ceiling Fans (baseboard heat + CAC)	Multi-Family	1%	1%	263.9	3,148	3,119	1,912	15	0	0	0.00	1	1,366.00	0.08	0.16	70.45
1	1928	Window Film (baseboard heat + CAC)	Multi-Family	4%	4%	351.9	3,132	3,008	1,844	10	0	0	0.05	0	436.91	0.19	0.37	22.53
1	1929	Windows - Adding Storm Windows (baseboard heat + CAC)	Multi-Family	25%	25%	1,754.5	3,290	2,468	1,513	20	1	0	0.13	0	329.14	0.42	0.81	16.97
1	1930	DOWS - Single Pane Clear to Energy Star Double Pane (baseboard heat +	Multi-Family	25%	25%	381.9	3,126	2,344	1,437	20	1	1	0.16	0	75.42	1.83	3.56	3.89
1	1931	OWS - Double-Glazed Clear to Energy Star (Elec baseboard heat + Centr	Multi-Family	23%	23%	220.9	3,551	2,749	1,685	20	1	1	0.15	0	42.55	3.24	6.30	2.19
1	2000	Base Electric Baseboard Heating + Room AC (EER 9.7)	Multi-Family	0%	0%	0.0	4,048	4,048	2,481	15	0	0	0.00	N/A	N/A	N/A	N/A	N/A
1	2001	Heat pump (16 SEER, 9.2 HSPF) (Elec baseboard heat + Room AC)	Multi-Family	43%	43%	223.0	4,048	2,299	1,409	15	3	2	0.46	0	19.68	5.73	11.21	1.01
1	2002	Heat pump (18 SEER, 10 HSPF) (Elec baseboard heat + Room AC)	Multi-Family	46%	46%	279.3	4,048	2,167	1,328	15	3	2	0.50	0	22.91	4.92	9.62	1.18
1	2004	Ductless mini-split heat pump SEER 19.0/HSPF 9.4 (RAC)	Multi-Family	49%	49%	1,852.7	4,048	2,070	1,269	16	9	6	1.57	0	144.52	0.82	1.60	7.45

Residential Electric Existing Construction

DSM ASSYST SUMMARY

Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test	Customer Payback (Years)
1	2005	Ductless mini-split heat pump SEER 22.0/HSPF10.0 (RAC)	Multi-Family	55%	55%	2,425.5	4,048	1,826	1,119	16	10	6	1.77	0	168.47	0.70	1.37	8.69
1	2006	Ceiling R-0 to R-38 Insulation (Elec baseboard heat + Room AC)	Multi-Family	53%	53%	696.0	4,048	1,883	1,154	20	0	0	0.07	0	49.62	2.78	5.41	2.56
1	2007	Ceiling R-0 to R-49 Insulation (Elec baseboard heat + Room AC)	Multi-Family	55%	55%	861.6	4,048	1,820	1,116	20	0	0	0.05	0	59.68	2.31	4.49	3.08
1	2008	Ceiling R-11 to R-38 Insulaton (Elec baseboard heat + Room AC)	Multi-Family	16%	16%	530.5	4,048	3,413	2,092	20	0	0	0.07	0	128.83	1.07	2.08	6.64
1	2009	Ceiling R-11 to R-49 Insulation (Elec baseboard heat + Room AC)	Multi-Family	17%	17%	696.0	4,048	3,344	2,050	20	0	0	0.05	0	152.60	0.90	1.76	7.87
1	2010	Ceiling R-19 to R-38 Insulation (Elec baseboard heat + Room AC)	Multi-Family	7%	7%	410.1	4,048	3,763	2,307	20	1	0	0.12	0	222.08	0.62	1.21	11.45
1	2011	Ceiling R-19 to R-49 Insulation (Elec baseboard heat + Room AC)	Multi-Family	9%	9%	575.6	4,048	3,695	2,265	20	0	0	0.08	0	251.36	0.55	1.07	12.96
1	2012	Roof deck insulation, R-19 (Elec baseboard heat + Room AC)	Multi-Family	26%	26%	1,626.7	4,069	3,007	1,843	20	1	0	0.09	0	236.26	0.58	1.14	12.18
1	2017	Wall Blow-in R-0 to R-13 Insulation (Elec baseboard heat + Room AC)	Multi-Family	17%	17%	459.4	4,048	3,372	2,067	20	0	0	0.06	0	104.83	1.31	2.56	5.41
1	2018	Cool Roof (baseboard heat + RAC)	Multi-Family	9%	9%	300.3	4,130	3,758	2,303	15	2	1	0.31	0	124.38	0.91	1.77	6.41
1	2019	Smart Thermostat (Elec baseboard heat + Room AC)	Multi-Family	14%	14%	142.4	4,205	3,624	2,221	11	3	2	0.45	0	37.82	2.34	4.62	1.95

Residential Electric New Construction

DSM ASSYST SUMMARY

Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	evelized Co: of Avoided eak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test
4	100	Base Code Home - IRC 2018	Single Family	0%	0%	0.0	14,315	14,315	2,902	20	0	0	0.00	N/A	N/A	N/A	N/A
4	101	ode + 10% - Base Code Hom	Single Family	10%	10%	866.9	14,315	12,884	2,612	20	5	1	1.32	0	282.53	1.20	2.87

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test
1	1000	Base Linear Lighting, Fluorescent Fixture, 2L4'T12	Office	0%	0%	0.0	1.3	1.3	0.4	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1001	High Performance Lighting R/R - Combined Strategies (Base T12)	Office	82%	62%	0.2	1.1	0.2	0.1	15	10	2	1.69	0	103.35	2.44	4.17
1	1002	ROB 2L4' LED Tube (Base T12)	Office	49%	56%	0.1	1.1	0.6	0.1	14	6	2	1.54	0	28.84	6.52	9.44
1	1003	LED Troffer (Base T12)	Office	61%	69%	0.3	1.1	0.4	0.1	14	3	1	0.82	0	153.35	1.23	1.78
1	1004	LED Troffer with lamp removal (T12)	Office	79%	89%	0.2	1.1	0.2	0.0	18	4	1	1.05	0	86.77	2.61	3.75
1	1005	Lighting Control Tuneup (Base T12)	Office	6%	3%	0.0	1.1	1.1	0.3	6	1	0	0.12	0	183.49	0.94	1.95
1	1006	Network Lighting Controls (Base T12)	Office	44%	19%	1.8	1.3	0.7	0.3	9	3	0	0.32	0	2,567.14	0.10	0.20
1	1007	Occupancy Sensor (Base T12)	Office	25%	5%	0.3	1.2	0.9	0.3	10	2	0	0.07	0	1,861.90	0.27	0.63
1	1050	Base Linear Lighting, Fluorescent Fixture, 2L4'T12, integrated market	Office	0%	0%	0.0	1.3	1.3	0.4	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1051	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	Office	75%	53%	0.4	1.1	0.3	0.1	18	27	5	4.12	0	245.14	1.24	2.16
1	1100	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB	Office	0%	0%	0.0	1.2	1.2	0.3	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1101	High Performance Lighting R/R - Combined Strategies (Base T8)	Office	76%	57%	0.2	1.1	0.3	0.1	15	15	3	2.53	0	112.47	2.25	3.83
1	1102	ROB 2L4' LED Tube (Base T8)	Office	37%	42%	0.1	1.1	0.7	0.2	14	7	2	1.85	0	39.08	4.81	6.97
1	1103	LED Troffer (Base T8)	Office	52%	59%	0.3	1.1	0.5	0.1	14	4	1	1.13	0	180.61	1.04	1.51
1	1104	LED Troffer with lamp removal (T8)	Office	75%	85%	0.2	1.1	0.3	0.0	18	6	2	1.61	0	92.15	2.46	3.53
1	1105	Lighting Control Tuneup (Base T8)	Office	6%	3%	0.0	1.1	1.0	0.3	6	2	0	0.19	0	185.23	0.93	1.93
1	1106	Network Lighting Controls (Base T8)	Office	44%	19%	1.8	1.3	0.7	0.3	9	5	1	0.51	0	2,591.53	0.09	0.19
1	1107	Occupancy Sensor (Base T8)	Office	25%	5%	0.3	1.2	0.9	0.3	10	3	0	0.12	0	1,879.59	0.27	0.62
1	1150	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB, integrated market	Office	0%	0%	0.0	1.2	1.2	0.3	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1151	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	Office	68%	47%	0.4	1.1	0.4	0.2	18	39	7	5.98	0	274.97	1.10	1.92
1	1200	Base Linear Lighting, LED Tube, 2 lamp fixture	Office	0%	0%	0.0	0.6	0.6	0.2	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1201	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	Office	42%	32%	0.2	0.6	0.4	0.1	15	17	3	2.86	0	358.38	0.70	1.20
1	1202	Lighting Control Tuneup (Base LED Tube)	Office	6%	3%	0.0	0.6	0.6	0.2	6	1	0	0.13	0	330.28	0.52	1.08
1	1203	Network Lighting Controls (Base LED Tube)	Office	44%	19%	1.8	0.7	0.4	0.2	9	4	0	0.36	1	4,620.85	0.05	0.11
1	1204	Occupancy Sensor (Base LED tube)	Office	25%	5%	0.3	0.7	0.5	0.2	10	2	0	0.09	0	3,351.42	0.15	0.35
1	1225	Base Linear Lighting, LED Tube, 2 lamp fixture, 2028 Standard	Office	0%	0%	0.0	0.5	0.5	0.1	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1226	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	Office	42%	32%	0.2	0.5	0.3	0.1	15	34	7	5.74	0	407.25	0.62	1.06
1	1227	Lighting Control Tuneup (Base LED Tube)	Office	6%	3%	0.0	0.5	0.5	0.1	6	3	0	0.26	0	375.32	0.46	0.95
1	1228	Network Lighting Controls (Base LED Tube)	Office	44%	19%	1.8	0.6	0.4	0.1	9	7	1	0.72	1	5,250.97	0.05	0.10
1	1229	Occupancy Sensor (Base LED tube)	Office	25%	5%	0.3	0.6	0.5	0.2	10	4	0	0.17	0	3,808.43	0.13	0.31
1	1250	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market	Office	0%	0%	0.0	0.6	0.6	0.2	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1251	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	Office	22%	15%	0.4	0.6	0.5	0.1	18	9	2	1.34	0	1,544.38	0.20	0.34
1	1275	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market, 2028 Standarc	Office	0%	0%	0.0	0.5	0.5	0.1	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1276	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	Office	22%	15%	0.4	0.5	0.4	0.1	18	17	3	2.69	0	1,754.98	0.17	0.30
1	1300	Base General Service Screw-in, CFL	Office	0%	0%	0.0	1.6	1.6	0.4	2	0	0	0.00	N/A	N/A	N/A	N/A
1	1301	LED screw-in replacement (base CFL)	Office	29%	33%	0.1	1.6	1.1	0.3	7	7	2	1.70	0	90.01	1.15	1.74
1	1350	Base General Service Screw-in, Incandescent/halogen	Office	0%	0%	0.0	4.8	4.8	1.3	1	0	0	0.00	N/A	N/A	N/A	N/A
1	1351	LED screw-in replacement (base incandescent/halogen)	Office	73%	83%	0.1	4.8	1.3	0.2	7	35	10	8.70	0	12.23	8.46	12.77
1	1400	Base General Service Screw-in, LED bulb	Office	0%	0%	0.0	1.1	1.1	0.3	7	0	0	0.00	N/A	N/A	N/A	N/A
1	1401	LED screw-in replacement (base LED)	Office	10%	11%	0.1	1.1	1.0	0.3	7	8	2	1.97	0	385.41	0.27	0.41
1	1425	Base General Service Screw-in, LED bulb, 2028 Standard	Office	0%	0%	0.0	0.9	0.9	0.2	7	0	0	0.00	N/A	N/A	N/A	N/A
1	1426	LED screw-in replacement (base LED)	Office	2%	2%	0.1	0.9	0.9	0.2	7	1	0	0.36	1	2,445.86	0.04	0.06
1	1450	Base HID Lighting (low bay)	Office	0%	0%	0.0	2.7	2.7	0.7	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1500	Base High Bay Lighting, Fluorescent T5	Office	0%	0%	0.0	1.3	1.3	0.3	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1502	ROB 2L4' LED Tube (Base T5)	Office	39%	44%	0.1	1.3	0.8	0.2	14	2	1	0.56	0	36.78	5.11	7.41
1	1503	High Bay LED Troffer (Base T5)	Office	47%	54%	0.1	1.3	0.7	0.2	14	3	1	0.68	0	65.85	2.86	4.14
1	1504	Lighting Control Tuneup (Base T5)	Office	6%	3%	0.0	1.3	1.2	0.3	6	0	0	0.04	0	161.38	1.07	2.21
1	1505	Network Lighting Controls (Base T5)	Office	44%	19%	1.8	1.5	0.8	0.3	9	1	0	0.10	0	2,257.77	0.11	0.22
1	1506	Occupancy Sensor (Base T5)	Office	25%	5%	0.3	1.4	1.1	0.4	10	1	0	0.02	0	1,637.52	0.30	0.72
1	1525	Base High Bay Lighting, Fluorescent T5, integrated market	Office	0%	0%	0.0	1.3	1.3	0.3	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1526	High Bay Bi-Level Programmed LED Fixture	Office	63%	47%	0.1	1.3	0.5	0.2	21	7	1	1.20	0	63.11	4.96	8.37
1	1550	Base High Bay Lighting, HID lighting	Office	0%	0%	0.0	1.5	1.5	0.4	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1551	High Bay Bi-Level Programmed LED Fixture	Office	63%	47%	0.1	1.5	0.5	0.2	21	2	0	0.33	0	54.18	5.78	9.75
1	1552	High Performance Lighting R/R - Combined Strategies (base high bay HID)	Office	73%	55%	0.2	1.5	0.4	0.2	15	2	0	0.38	0	88.50	2.85	4.87
1	1575	Base High Bay Lighting, LED lighting	Office	0%	0%	0.0	0.5	0.5	0.1	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1576	Network Lighting Controls (Base high bay LED)	Office	44%	19%	1.8	0.6	0.3	0.1	9	1	0	0.13	1	5,737.38	0.04	0.09
1	1577	Occupancy Sensor (Base high bay LED)	Office	25%	5%	0.3	0.6	0.4	0.1	10	1	0	0.03	0	4,161.22	0.12	0.28
1	1600	Base CFL Exit Sign	Office	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1601	LED Exit Sign	Office	55%	55%	0.0	0.1	0.0	0.0	15	7	2	1.62	0	83.91	2.54	3.87
1	1650	Base Area Lighting, Outdoor HID	Office	0%	0%	0.0	4.7	4.7	0.7	15	0	0	0.00	N/A	N/A	N/A	N/A
1	1651	LED Outdoor Area Lighting (Base Outdoor HID)	Office	68%	68%	0.5	4.7	1.5	0.2	18	269	39	13.96	0	99.04	3.31	6.85
1	1652	LED outdoor lighting with bi-level controls (Base Outdoor HID)	Office	80%	80%	0.5	4.7	0.9	0.1	18	316	46	16.42	0	93.48	3.51	7.25
1	1653	Outdoor Lighting Controls (Base Outdoor HID)	Office	16%	73%	0.6	5.1	4.3	0.2	18	34	22	7.78	0	102.12	1.28	1.49
1	1700	Base General Service Screw-in, Outdoor CFL	Office	0%	0%	0.0	0.3	0.3	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	1701	LED outdoor lighting with bi-level controls (Base Outdoor CFL)	Office	57%	57%	0.5	0.3	0.1	0.0	18	5	1	0.24	0	1,822.29	0.18	0.37
1	1702	LED screw-in replacement (base Outdoor CFL)	Office	30%	30%	0.0	0.3	0.2	0.0	7	2	0	0.13	0	198.71	0.78	1.64
1	1703	Outdoor Lighting Controls (Base Outdoor CFL)	Office	16%	73%	0.6	0.4	0.3	0.0	18	1	0	0.16	1	1,418.30	0.09	0.11
1	1750	Base General Service Screw-in, Outdoor Incandescent/Halogen	Office	0%	0%	0.0	1.0	1.0	0.1	15	0	0	0.00	N/A	N/A	N/A	N/A
1	1751	LED outdoor lighting with bi-level controls (Base Outdoor Incandescent)	Office	85%	85%	0.5	0.3	0.1	0.0	18	20	3	1.05	0	1,189.73	0.28	0.57
1	1752	LED screw-in replacement (base Outdoor Incandescent)	Office	75%	75%	0.0	0.3	0.1	0.0	7	18	3	0.92	0	77.39	2.00	4.21

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test
1	1753	Outdoor Lighting Controls (Base Outdoor Incandescent)	Office	16%	73%	0.6	0.4	0.3	0.0	18	2	1	0.47	1	1,380.83	0.09	0.11
1	1800	Base General Service Screw-in, Outdoor LED bulb	Office	0%	0%	0.0	0.2	0.2	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	1801	Outdoor Lighting Controls (Base Outdoor LED)	Office	16%	73%	0.6	0.2	0.2	0.0	18	6	4	1.47	1	2,127.45	0.06	0.07
1	1850	Base Linear Lighting, Outdoor Fluorescent Tube	Office	0%	0%	0.0	0.6	0.6	0.1	15	0	0	0.00	N/A	N/A	N/A	N/A
1	1851	ROB 2L4' LED Tube (base outdoor fluorescent)	Office	40%	40%	0.1	0.6	0.3	0.0	15	2	0	0.11	0	200.43	1.44	2.98
1	1852	LED outdoor lighting with bi-level controls (Base Outdoor Fluorescent)	Office	63%	63%	0.5	0.6	0.2	0.0	18	3	0	0.18	0	1,017.58	0.32	0.67
1	1853	Outdoor Lighting Controls (Base Outdoor Fluorescent)	Office	16%	73%	0.6	0.6	0.5	0.0	18	0	0	0.11	1	875.36	0.15	0.17
1	1900	Base Linear Lighting, Outdoor LED Tube	Office	0%	0%	0.0	0.4	0.4	0.1	15	0	0	0.00	N/A	N/A	N/A	N/A
1	1901	Outdoor Lighting Controls (Base Outdoor LED Tube)	Office	16%	73%	0.6	0.4	0.3	0.0	18	1	0	0.13	1	1,276.47	0.10	0.12
1	2000	Base Water-Cooled Centrifugal Chiller, 0.58 kW/ton, 500 tons	Office	0%	0%	0.0	1.2	1.2	0.0	23	0	0	0.00	N/A	N/A	N/A	N/A
1	2001	Centrifugal Chiller, 0.54 kW/ton, 500 tons	Office	12%	12%	0.2	1.2	1.1	0.0	23	12	0	15.76	0	N/A	1.39	1.11
1	2002	Chiller Tune Up/Diagnostics	Office	9%	7%	0.1	1.3	1.2	0.0	5	2	0	1.18	0	N/A	0.54	0.85
1	2003	High Efficiency Chilled Water & Condenser Water Pump Motors	Office	3%	3%	0.1	1.2	1.2	0.0	20	1	0	1.11	0	N/A	0.86	0.70
1	2004	VSD for Chiller Pumps and Towers	Office	11%	9%	0.1	1.3	1.1	0.0	15	1	0	0.61	0	N/A	0.77	1.05
1	2005	Ceiling/roof Insulation - Chiller	Office	12%	12%	0.5	1.3	1.2	0.0	20	0	0	0.54	0	N/A	0.44	0.36
1	2006	Cool Roof - Chiller	Office	1%	1%	0.1	1.2	1.2	0.0	15	0	0	0.32	1	N/A	0.16	0.13
1	2007	Duct Testing/Sealing - Chiller	Office	30%	36%	0.3	1.2	0.8	0.0	18	44	0	3.62	0	N/A	0.50	1.15
1	2008	Duct/Pipe Insulation - Chiller	Office	2%	2%	0.8	1.2	1.2	0.0	10	0	0	0.57	3	N/A	0.02	0.02
1	2009	EMS Optimization - Chiller	Office	6%	6%	0.0	1.3	1.2	0.0	5	1	0	0.00	0	N/A	0.52	1.38
1	2010	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - Chiller	Office	10%	10%	0.4	0.9	0.8	0.0	10	5	0	0.00	0	N/A	0.06	0.15
1	2011	New Economizer - Chiller	Office	5%	5%	0.5	1.2	1.2	0.0	10	0	0	0.00	1	N/A	0.03	0.08
1	2012	Window Film (Standard) - Chiller	Office	16%	29%	0.2	1.2	1.0	0.0	10	15	0	9.80	0	N/A	0.42	0.56
1	2013	High Efficiency Windows - Chiller	Office	25%	47%	0.2	1.5	1.1	0.0	20	8	0	5.47	0	N/A	2.16	2.66
1	2100	Base DX Packaged System, EER=10.3, 10 tons	Office	0%	0%	0.0	2.5	2.5	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2101	DX Packaged System, EER=10.9, 10 tons	Office	6%	6%	0.2	2.5	2.3	0.0	15	28	0	35.41	0	N/A	0.98	0.82
1	2102	DX Packaged System, EER=13.4, 10 tons	Office	23%	23%	0.2	2.5	1.9	0.0	15	106	0	135.75	0	N/A	2.76	2.31
1	2103	Geothermal Heat Pump, EER=13, 10 tons - DX	Office	21%	21%	2.4	2.5	1.9	0.0	15	5	0	6.15	0	N/A	0.23	0.20
1	2104	DX Tune Up/ Advanced Diagnostics	Office	6%	5%	0.1	2.6	2.4	0.0	10	4	0	2.27	0	N/A	0.67	0.96
1	2105	Refrigerant Charge Adjustment - DX	Office	10%	10%	0.5	2.5	2.3	0.0	10	38	0	48.18	0	N/A	0.41	0.37
1	2106	Ceiling/roof Insulation - DX	Office	12%	12%	0.5	2.7	2.4	0.0	20	1	0	1.71	0	N/A	0.91	0.74
1	2107	Cool Roof - DX	Office	2%	2%	0.1	2.5	2.4	0.0	10	4	0	5.57	0	N/A	0.44	0.40
1	2108	Duct Testing/Sealing - DX	Office	22%	26%	0.3	2.5	1.9	0.0	18	32	0	2.69	0	N/A	0.74	1.73
1	2109	Duct/Pipe Insulation - DX	Office	2%	2%	0.8	2.5	2.4	0.0	10	3	0	3.82	1	N/A	0.05	0.04
1	2110	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	Office	4%	4%	0.1	2.5	2.4	0.0	10	0	0	0.00	0	N/A	0.18	0.50
1	2111	Economizer Repair - DX	Office	34%	17%	0.2	2.8	1.8	0.0	5	76	0	120.34	0	N/A	1.59	1.45
1	2113	Optimize Controls - DX	Office	6%	4%	0.0	2.6	2.4	0.0	5	10	0	2.54	0	N/A	1.42	2.87
1	2114	Smart Thermostat - DX	Office	12%	8%	0.3	2.5	2.2	0.0	8	51	0	13.50	0	N/A	0.30	0.58
1	2115	Window Film (Standard) - DX	Office	9%	16%	0.2	2.5	2.3	0.0	10	27	0	17.35	0	N/A	0.48	0.64
1	2116	High Efficiency Windows - DX	Office	26%	26%	0.2	3.5	2.6	0.0	20	31	0	39.74	0	N/A	7.89	6.40
1	2150	Base DX Packaged System, 2029 Standard	Office	0%	0%	0.0	2.5	2.5	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2152	DX Packaged System, EER=13.4, 10 tons	Office	14%	14%	0.2	2.2	1.9	0.0	15	60	0	76.73	0	N/A	1.56	1.31
1	2153	Geothermal Heat Pump, EER=13, 10 tons - DX	Office	12%	12%	2.4	2.2	1.9	0.0	15	3	0	3.22	1	N/A	0.12	0.10
1	2154	DX Tune Up/ Advanced Diagnostics	Office	6%	5%	0.1	2.6	2.4	0.0	10	4	0	2.27	0	N/A	0.67	0.96
1	2155	Refrigerant Charge Adjustment - DX	Office	10%	10%	0.5	2.5	2.3	0.0	10	38	0	48.18	0	N/A	0.41	0.37
1	2156	Ceiling/roof Insulation - DX	Office	12%	12%	0.5	2.7	2.4	0.0	20	1	0	1.71	0	N/A	0.91	0.74
1	2157	Cool Roof - DX	Office	2%	2%	0.1	2.5	2.4	0.0	10	4	0	5.57	0	N/A	0.44	0.40
1	2158	Duct Testing/Sealing - DX	Office	22%	26%	0.3	2.5	1.9	0.0	18	32	0	2.69	0	N/A	0.74	1.73
1	2159	Duct/Pipe Insulation - DX	Office	2%	2%	0.8	2.5	2.4	0.0	10	3	0	3.82	1	N/A	0.05	0.04
1	2160	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	Office	4%	4%	0.1	2.5	2.4	0.0	10	0	0	0.00	0	N/A	0.18	0.50
1	2161	Economizer Repair - DX	Office	34%	17%	0.2	2.8	1.8	0.0	5	76	0	120.34	0	N/A	1.59	1.45
1	2163	Optimize Controls - DX	Office	6%	4%	0.0	2.6	2.4	0.0	5	10	0	2.54	0	N/A	1.42	2.87
1	2164	Smart Thermostat - DX	Office	12%	8%	0.3	2.5	2.2	0.0	8	51	0	13.50	0	N/A	0.30	0.58
1	2165	Window Film (Standard) - DX	Office	9%	16%	0.2	2.5	2.3	0.0	10	27	0	17.35	0	N/A	0.48	0.64
1	2166	High Efficiency Windows - DX	Office	26%	26%	0.2	3.5	2.6	0.0	20	31	0	39.74	0	N/A	7.89	6.40
1	2200	Base Heat Pump cooling (14.3 SEER, 8.2 HSPF)	Office	0%	0%	0.0	2.2	2.2	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2201	Heat Pump Upgrade (18 SEER, 8.2 HSPF), cooling	Office	14%	14%	0.3	2.2	1.9	0.0	15	35	0	44.48	0	N/A	1.32	1.11
1	2202	Mini-Split Heat Pump (Base Heat Pump Cooling)	Office	10%	10%	0.8	2.2	2.0	0.0	15	9	0	11.27	0	N/A	0.30	0.25
1	2203	Ceiling/roof Insulation (Base Heat Pump Cooling)	Office	12%	12%	0.5	2.5	2.2	0.0	20	1	0	0.99	0	N/A	0.81	0.66
1	2204	Duct/Pipe Insulation (Base Heat Pump Cooling)	Office	2%	2%	0.8	2.2	2.2	0.0	10	2	0	2.21	2	N/A	0.04	0.04
1	2205	Smart Thermostat (Base Heat Pump Cooling)	Office	12%	8%	0.3	2.2	2.0	0.0	8	30	0	7.81	0	N/A	0.27	0.52
1	2206	Window Film (Standard) (Base Heat Pump Cooling)	Office	9%	16%	0.2	2.2	2.0	0.0	10	15	0	10.04	0	N/A	0.43	0.58
1	2207	High Efficiency Windows (Base Heat Pump Cooling)	Office	26%	26%	0.2	2.7	2.0	0.0	20	16	0	20.21	0	N/A	6.22	5.04
1	2300	Base Split-System AC, SEER 14.5, <5.4 tons	Office	0%	0%	0.0	2.0	2.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2301	Split System Air Conditioner, SEER 16.0 ENERGY STAR, <5.4 tons	Office	10%	10%	0.4	2.0	1.8	0.0	15	7	0	9.17	0	N/A	0.50	0.42
1	2302	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Residential Split-System	Office	20%	20%	0.8	2.0	1.6	0.0	15	17	0	21.48	0	N/A	0.55	0.46
1	2303	Ceiling/roof Insulation (Base Residential Split-System)	Office	12%	12%	0.5	2.3	2.0	0.0	20	0	0	0.31	0	N/A	0.75	0.61
1	2304	Duct/Pipe Insulation (Base Residential Split-System)	Office	2%	2%	0.8	2.0	2.0	0.0	10	1	0	0.70	2	N/A	0.04	0.04
1	2305	Smart Thermostat (Base Residential Split-System)	Office	12%	8%	0.3	2.0	1.8	0.0	8	9	0	2.46	0	N/A	0.25	0.48
1	2306	Window Film (Standard) (Base Residential Split-System)	Office	16%	29%	0.2	2.1	1.7	0.0	10	9	0	5.67	0	N/A	0.71	0.95
1	2400	Base PTAC cooling, EER=10.2, 1 ton	Office	0%	0%	0.0	2.6	2.6	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test
1	2401	HE PTAC, EER=9.6, 1 ton, cooling	Office	14%	14%	0.4	2.6	2.3	0.0	15	5	0	6.14	0	N/A	1.15	0.96
1	2402	Ceiling/roof Insulation (Base PTAC)	Office	12%	12%	0.5	3.0	2.6	0.0	20	0	0	0.13	0	N/A	0.98	0.79
1	2405	Window Film (Standard) (Base PTAC)	Office	9%	16%	0.2	2.7	2.4	0.0	10	2	0	1.29	0	N/A	0.52	0.69
1	2500	Base Room AC, CEER 10.9	Office	0%	0%	0.0	1.1	1.1	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2501	Room AC, CEER 12.0 ENERGY STAR	Office	2%	2%	0.2	1.1	1.1	0.0	15	0	0	0.05	1	N/A	0.10	0.09
1	2502	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Room AC)	Office	30%	30%	0.3	1.1	0.8	0.0	15	1	0	0.77	0	N/A	1.35	1.13
1	2503	Ceiling/roof Insulation (Base Room AC)	Office	12%	12%	0.5	1.2	1.1	0.0	20	0	0	0.01	0	N/A	0.41	0.33
1	2505	Window Film (Standard) (Base Room AC)	Office	16%	29%	0.2	1.1	1.0	0.0	10	0	0	0.14	0	N/A	0.39	0.52
1	2506	High Efficiency Windows (Base Room AC)	Office	11%	20%	0.2	1.2	1.1	0.0	20	0	0	0.03	0	N/A	0.75	0.92
1	2600	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	Office	0%	0%	0.0	1.8	1.8	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2601	Ceiling/roof Insulation (Base Ductless Mini-split)	Office	12%	12%	0.5	2.0	1.7	0.0	20	0	0	0.06	0	N/A	0.65	0.53
1	2603	Window Film (Standard) (Base Ductless Mini-split)	Office	16%	29%	0.2	1.8	1.5	0.0	10	2	0	1.15	0	N/A	0.62	0.83
1	2604	High Efficiency Windows (Base Ductless Mini-split)	Office	25%	47%	0.2	2.2	1.6	0.0	20	1	0	0.64	0	N/A	3.20	3.93
1	3100	Base Open refrigerated/freezer cases	Office	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
1	3102	Bi-level LED Case Lighting (self-contained units), open cases	Office	11%	11%	0.0	0.0	0.0	0.0	8	0	0	0.00	0	158.77	1.54	3.09
1	3103	Compressor VSD retrofit, open cases	Office	7%	6%	0.0	0.0	0.0	0.0	13	0	0	0.00	0	350.45	1.12	2.43
1	3105	Demand Hot Gas Defrost, open cases	Office	3%	3%	0.0	0.0	0.0	0.0	10	0	0	0.00	0	2,138.90	0.14	0.28
1	3106	Electronically commutated evaporator fan motor, open cases	Office	27%	16%	0.0	0.0	0.0	0.0	15	0	0	0.00	0	380.19	1.59	3.46
1	3107	High-efficiency fan motors, open cases	Office	4%	4%	0.0	0.0	0.0	0.0	15	0	0	0.00	0	566.56	0.73	1.42
1	3108	Insulated suction lines, open cases	Office	0%	0%	0.0	0.0	0.0	0.0	11	0	0	0.00	0	3,191.58	0.10	0.20
1	3109	LED Display Lighting, open cases	Office	7%	7%	0.0	0.0	0.0	0.0	8	0	0	0.00	0	203.97	1.20	2.41
1	3111	Night covers for display cases, open cases	Office	11%	0%	0.0	0.0	0.0	0.0	5	0	0	0.00	0	N/A	0.60	1.59
1	3112	Oversized Air Cooled Condenser, open cases	Office	8%	8%	0.0	0.0	0.0	0.0	16	0	0	0.00	0	216.59	1.99	3.88
1	3113	Refrigeration Coil Cleaning, open cases	Office	23%	23%	0.0	0.0	0.0	0.0	5	0	0	0.00	0	139.24	1.15	2.34
1	3114	Refrigeration Commissioning, open cases	Office	3%	3%	0.0	0.0	0.0	0.0	3	0	0	0.00	0	233.17	0.44	0.87
1	3200	Base Closed refrigerated/freezer cases	Office	0%	0%	0.0	0.1	0.1	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
1	3202	Energy-Star Refrigerator/Freezer, base closed cases	Office	10%	10%	0.0	0.1	0.1	0.0	12	0	0	0.02	0	320.24	1.08	2.12
1	3204	Bi-level LED Case Lighting (self-contained units), base closed cases	Office	11%	11%	0.0	0.1	0.1	0.0	8	0	0	0.02	0	145.94	1.67	3.36
1	3205	Compressor VSD retrofit, base closed cases	Office	7%	6%	0.0	0.1	0.1	0.0	13	0	0	0.01	0	322.13	1.21	2.65
1	3207	Demand Hot Gas Defrost, base closed cases	Office	3%	3%	0.0	0.1	0.1	0.0	10	0	0	0.01	0	1,966.08	0.15	0.30
1	3208	Electronically commutated evaporator fan motor, base closed cases	Office	23%	14%	0.0	0.1	0.1	0.0	15	0	0	0.03	0	402.68	1.50	3.27
1	3209	Freezer-Cooler Replacement Gaskets, base closed cases	Office	7%	7%	0.0	0.1	0.1	0.0	4	0	0	0.01	0	45.03	2.91	5.91
1	3211	High-efficiency fan motors, base closed cases	Office	4%	4%	0.0	0.1	0.1	0.0	15	0	0	0.01	0	520.79	0.79	1.54
1	3212	Insulated suction lines, base closed cases	Office	0%	0%	0.0	0.1	0.1	0.0	11	0	0	0.00	0	2,854.71	0.11	0.22
1	3213	LED Display Lighting, base closed cases	Office	7%	7%	0.0	0.1	0.1	0.0	8	0	0	0.02	0	187.49	1.30	2.62
1	3214	Low or Anti-Sweat Door Film, base closed cases	Office	5%	5%	0.0	0.1	0.1	0.0	10	0	0	0.01	0	110.39	2.68	5.34
1	3216	Oversized Air Cooled Condenser, base closed cases	Office	8%	8%	0.0	0.1	0.1	0.0	16	0	0	0.01	0	199.09	2.17	4.22
1	3217	Refrigeration Coil Cleaning, base closed cases	Office	23%	23%	0.0	0.1	0.1	0.0	5	0	0	0.05	0	127.99	1.25	2.55
1	3218	Refrigeration Commissioning, base closed cases	Office	5%	5%	0.0	0.1	0.1	0.0	3	0	0	0.01	0	105.81	0.96	1.92
1	3300	Base Walk-in refrigeration/freezer units	Office	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
1	3302	Auto-closer on main door to walk-in freezer	Office	1%	1%	0.0	0.0	0.0	0.0	8	0	0	0.00	0	465.04	0.52	1.05
1	3303	Compressor VSD retrofit, walk-ins	Office	7%	6%	0.0	0.0	0.0	0.0	13	0	0	0.01	0	134.79	2.90	6.33
1	3305	Demand Hot Gas Defrost, walk-ins	Office	3%	3%	0.0	0.0	0.0	0.0	10	0	0	0.01	0	822.67	0.36	0.72
1	3306	Electronically commutated evaporator fan motor, walk-ins	Office	23%	14%	0.0	0.0	0.0	0.0	15	0	0	0.03	0	168.49	3.59	7.81
1	3307	Evaporator fan controller for MT walk-ins	Office	1%	1%	0.0	0.0	0.0	0.0	16	0	0	0.00	1	8,402.88	0.05	0.10
1	3309	Freezer-Cooler Replacement Gaskets, walk-ins	Office	1%	1%	0.0	0.0	0.0	0.0	4	0	0	0.00	0	61.42	2.13	4.33
1	3310	High-efficiency fan motors, walk-ins	Office	6%	6%	0.0	0.0	0.0	0.0	15	0	0	0.01	0	144.22	2.85	5.57
1	3311	Insulated suction lines, walk-ins	Office	0%	0%	0.0	0.0	0.0	0.0	11	0	0	0.00	0	611.27	0.52	1.04
1	3313	Oversized Air Cooled Condenser, walk-ins	Office	8%	8%	0.0	0.0	0.0	0.0	16	0	0	0.01	0	166.61	2.59	5.05
1	3314	Refrigeration Coil Cleaning, walk-ins	Office	23%	23%	0.0	0.0	0.0	0.0	5	0	0	0.05	0	93.72	1.71	3.48
1	3315	Refrigeration Commissioning, walk-ins	Office	3%	3%	0.0	0.0	0.0	0.0	3	0	0	0.00	0	89.68	1.13	2.27
1	3316	Strip curtains for walk-ins	Office	4%	4%	0.0	0.0	0.0	0.0	4	0	0	0.00	0	97.09	1.35	2.74
1	3400	Base Large Cold Storage Area	Office	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
1	3402	Auto-closer on main door to walk-in freezer, base large cold storage	Office	1%	1%	0.0	0.0	0.0	0.0	8	0	0	0.00	0	465.04	0.52	1.05
1	3403	Compressor VSD retrofit, base large cold storage	Office	7%	6%	0.0	0.0	0.0	0.0	13	0	0	0.00	0	134.79	2.90	6.33
1	3404	Electronically commutated evaporator fan motor, base large cold storage	Office	23%	14%	0.0	0.0	0.0	0.0	15	0	0	0.00	0	168.49	3.59	7.81
1	3405	Evaporator fan controller for MT walk-ins, base large cold storage	Office	1%	1%	0.0	0.0	0.0	0.0	16	0	0	0.00	1	N/A	0.05	0.10
1	3406	High-efficiency fan motors, base large cold storage	Office	4%	4%	0.0	0.0	0.0	0.0	15	0	0	0.00	0	217.91	1.89	3.69
1	3407	Insulated suction lines, base large cold storage	Office	0%	0%	0.0	0.0	0.0	0.0	11	0	0	0.00	1	N/A	0.02	0.05
1	3409	Oversized Air Cooled Condenser, base large cold storage	Office	8%	8%	0.0	0.0	0.0	0.0	16	0	0	0.00	0	83.30	5.18	10.09
1	3410	Refrigeration Coil Cleaning, base large cold storage	Office	23%	23%	0.0	0.0	0.0	0.0	5	0	0	0.00	0	70.29	2.28	4.63
1	3411	Refrigeration Commissioning, base large cold storage	Office	5%	5%	0.0	0.0	0.0	0.0	3	0	0	0.00	0	44.27	2.30	4.60
1	3412	Strip curtains for walk-ins, base large cold storage	Office	4%	4%	0.0	0.0	0.0	0.0	4	0	0	0.00	0	97.09	1.35	2.74
1	3500	Base Reach-in Refrigerator/Freezer, Federal Standard	Office	0%	0%	0.0	0.2	0.2	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	3501	Energy Star solid door reach-in refrigerator/freezer	Office	7%	7%	0.0	0.2	0.2	0.0	15	0	0	0.02	0	151.08	2.73	5.32
1	3502	Freezer-Cooler Replacement Gaskets, base reach-in	Office	3%	3%	0.0	0.2	0.2	0.0	4	0	0	0.01	0	229.62	0.57	1.16
1	3503	Refrigeration Coil Cleaning, base base reach-in	Office	2%	2%	0.0	0.2	0.2	0.0	5	0	0	0.01	0	468.36	0.34	0.70
1	3600	Base Glass Door Reach-in Refrigerator/Freezer, Federal Standard	Office	0%	0%	0.0	0.2	0.2	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	3601	Energy Star glass door reach-in refrigerator/freezer	Office	12%	12%	0.0	0.2	0.1	0.0	15	0	0	0.03	0	95.00	4.33	8.45
1	3602	Bi-level LED Case Lighting, base glass-door reach-in	Office	11%	11%	0.0	0.2	0.2	0.0	8	0	0	0.02	0	188.66	1.29	2.60

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test
1	3603	Freezer-Cooler Replacement Gaskets, base glass-door reach-in	Office	3%	3%	0.0	0.2	0.2	0.0	4	0	0	0.01	0	126.78	1.03	2.10
1	3604	Refrigeration Coil Cleaning, base glass-door reach-in	Office	2%	2%	0.0	0.2	0.2	0.0	5	0	0	0.00	0	258.59	0.62	1.26
1	3700	Base Ice Maker, Federal Standard	Office	0%	0%	0.0	0.0	0.0	0.0	10	0	0	0.00	N/A	N/A	N/A	N/A
1	3701	Energy Star Ice Machines	Office	10%	10%	0.0	0.0	0.0	0.0	10	0	0	0.02	0	311.71	0.95	1.89
1	3702	Refrigeration Coil Cleaning, base ice maker	Office	10%	10%	0.0	0.0	0.0	0.0	5	0	0	0.02	0	65.12	2.46	5.00
1	3800	Base Residential-Type Refrigerator/Freezer, Federal Standard	Office	0%	0%	0.0	0.4	0.4	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
1	3801	Energy Star refrigerator/freezer	Office	10%	10%	0.0	0.4	0.3	0.0	18	8	1	1.03	0	1,020.84	0.46	0.89
1	3802	Refrigeration Coil Cleaning, residential-type refrigerator	Office	10%	10%	0.0	0.4	0.3	0.0	5	7	1	0.96	0	557.11	0.29	0.58
1	3900	Base Compact Refrigerator, Federal Standard	Office	0%	0%	0.0	0.0	0.0	0.0	14	0	0	0.00	N/A	N/A	N/A	N/A
1	3901	Energy Star Compact Refrigerator	Office	10%	10%	0.0	0.0	0.0	0.0	14	1	0	0.09	0	669.02	0.58	1.14
1	3902	Refrigeration Coil Cleaning, compact refrigerator	Office	10%	10%	0.0	0.0	0.0	0.0	5	0	0	0.05	0	1,559.91	0.10	0.21
1	4000	Base Computer Network Server	Office	0%	0%	0.0	0.6	0.6	0.1	4	0	0	0.00	N/A	N/A	N/A	N/A
1	4001	Energy Star server	Office	33%	23%	0.0	0.6	0.4	0.1	4	64	5	4.20	0	27.20	5.73	12.64
1	4100	Base Desktop PC	Office	0%	0%	0.0	0.3	0.3	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
1	4101	Energy Star or Better PC	Office	33%	33%	0.0	0.3	0.2	0.0	4	45	5	6.52	0	132.85	0.90	1.77
1	4200	Base Laptop PC	Office	0%	0%	0.0	0.0	0.0	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
1	4201	Energy Star or Better Laptop	Office	30%	30%	0.0	0.0	0.0	0.0	4	1	0	0.08	0	69.78	1.71	3.38
1	4300	Base Monitor, LCD	Office	0%	0%	0.0	0.1	0.1	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
1	4301	Energy Star or Better Monitor - LCD	Office	21%	21%	0.0	0.1	0.0	0.0	4	3	0	0.49	0	151.15	0.79	1.56
1	4303	Plug-load controls - Commercial Smart Strip (base monitor LCD)	Office	11%	5%	0.0	0.1	0.0	0.0	10	2	0	0.06	1	9,724.43	0.05	0.12
1	4400	Base Imaging	Office	0%	0%	0.0	0.0	0.0	0.0	6	0	0	0.00	N/A	N/A	N/A	N/A
1	4401	Energy Star or Better Imaging Equipment	Office	21%	21%	0.0	0.0	0.0	0.0	6	0	0	0.03	0	65.76	2.63	5.16
1	5000	Base Water Heater, Resistance Heater, Standard Standby Wattage	Office	0%	0%	0.0	0.2	0.2	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	5001	High Efficiency Water Heater (electric)	Office	2%	2%	0.0	0.2	0.2	0.0	15	0	0	0.07	0	116.85	3.28	6.18
1	5002	Heat Pump Water Heater (air source)	Office	20%	20%	0.0	0.2	0.1	0.0	10	6	1	0.83	0	268.75	1.02	1.97
1	5003	Tankless Water Heater	Office	10%	10%	0.0	0.2	0.1	0.0	20	1	0	0.08	0	201.05	2.34	4.37
1	5004	Solar Water Heater	Office	70%	70%	0.0	0.2	0.0	0.0	20	2	0	0.27	0	217.11	2.17	4.04
1	5005	Demand controlled circulating systems	Office	5%	5%	0.2	0.2	0.2	0.0	15	2	0	0.31	3	21,720.17	0.02	0.03
1	5006	Heat Recovery Unit	Office	65%	65%	0.1	0.2	0.1	0.0	10	5	1	0.67	0	600.92	0.46	0.88
1	5007	Hot Water Pipe Insulation	Office	2%	2%	0.0	0.2	0.2	0.0	15	1	0	0.11	0	765.51	0.50	0.94
1	5008	Low Flow Faucet Aerators	Office	31%	31%	0.0	0.2	0.1	0.0	10	6	1	0.85	0	141.94	1.94	3.73
1	5011	Recirculation Pump Timer Clock - Controls for Central Domestic Hot Water	Office	3%	3%	0.0	0.2	0.2	0.0	15	0	0	0.07	0	3,609.22	0.11	0.20
1	6000	Base Non-Refrigerated Vending Machines, Federal Standard	Office	0%	0%	0.0	0.0	0.0	0.0	5	0	0	0.00	N/A	N/A	N/A	N/A
1	6001	Vending Misers (Non-Refrigerated)	Office	51%	35%	0.0	0.0	0.0	0.0	5	0	0	0.01	0	1,816.39	0.11	0.25
1	6100	Base Refrigerated Vending Machines, Federal Standard	Office	0%	0%	0.0	0.0	0.0	0.0	5	0	0	0.00	N/A	N/A	N/A	N/A
1	6101	Vending Misers (Refrigerated glass-front units)	Office	33%	23%	0.0	0.0	0.0	0.0	5	1	0	0.07	0	448.34	0.45	1.00
1	6102	Vending Misers (Refrigerated units)	Office	51%	35%	0.0	0.0	0.0	0.0	5	1	0	0.10	0	286.02	0.71	1.57
1	6200	Base Combi Oven	Office	0%	0%	0.0	0.1	0.1	0.0	12	0	0	0.00	N/A	N/A	N/A	N/A
1	6201	Electric Combination Oven	Office	54%	54%	0.0	0.2	0.1	0.0	12	8	1	1.46	0	60.16	7.50	14.30
1	6300	Base Convection Oven	Office	0%	0%	0.0	0.7	0.7	0.1	12	0	0	0.00	N/A	N/A	N/A	N/A
1	6400	Base Fryer	Office	0%	0%	0.0	0.7	0.7	0.1	12	0	0	0.00	N/A	N/A	N/A	N/A
1	6500	Base Griddle	Office	0%	0%	0.0	0.1	0.1	0.0	12	0	0	0.00	N/A	N/A	N/A	N/A
1	6501	Energy Star griddle	Office	11%	11%	0.0	0.1	0.1	0.0	12	0	0	0.07	0	199.75	2.26	4.31
1	6600	Base Hot Food Holding Cabinet	Office	0%	0%	0.0	0.2	0.2	0.0	12	0	0	0.00	N/A	N/A	N/A	N/A
1	6601	Energy Star hot food holding cabinet	Office	70%	70%	0.0	0.2	0.1	0.0	12	0	0	0.05	0	188.73	2.39	4.56
1	6700	Base Steamer	Office	0%	0%	0.0	1.9	1.9	0.2	12	0	0	0.00	N/A	N/A	N/A	N/A
1	7000	Base Electric Boiler, Federal Standard	Office	0%	0%	0.0	3.4	3.4	2.2	20	0	0	0.00	N/A	N/A	N/A	N/A
1	7001	Ceiling/roof Insulation (electric boiler)	Office	12%	12%	0.5	3.8	3.3	2.1	20	0	0	0.00	0	160.44	0.72	1.02
1	7002	Duct/Pipe Insulation (electric boiler)	Office	2%	2%	0.8	3.4	3.3	2.1	20	0	0	0.00	1	1,669.08	0.07	0.10
1	7100	Base Electric Furnace, Federal Standard	Office	0%	0%	0.0	3.4	3.4	2.2	15	0	0	0.00	N/A	N/A	N/A	N/A
1	7101	Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons, heating	Office	60%	60%	0.3	3.5	1.4	0.9	15	9	6	0.00	0	20.82	4.56	6.43
1	7102	Ceiling/roof Insulation (base furnace)	Office	12%	12%	0.5	3.8	3.3	2.1	20	0	0	0.00	0	160.44	0.72	1.02
1	7103	Duct/Pipe Insulation (base furnace)	Office	2%	2%	0.8	3.4	3.3	2.1	20	0	0	0.00	1	1,669.08	0.07	0.10
1	7104	Smart Thermostat (Base Furnace Heating)	Office	13%	8%	0.3	3.4	3.0	2.0	8	2	1	0.00	0	153.55	0.50	0.86
1	7200	Base Heating Air-Source Heat Pump, SEER 15.0/HSPF 8.8 w/Aux Strip Heat	Office	0%	0%	0.0	1.4	1.4	0.9	15	0	0	0.00	N/A	N/A	N/A	N/A
1	7201	eat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons (base air-source heat pu	Office	10%	10%	0.3	1.4	1.3	0.8	15	16	11	0.00	0	312.84	0.30	0.43
1	7202	Ceiling/roof Insulation (base air-source heat pump heating)	Office	12%	12%	0.5	1.6	1.4	0.9	20	2	1	0.00	0	385.58	0.30	0.42
1	7203	Duct/Pipe Insulation (base air-source heat pump heating)	Office	2%	2%	0.8	1.4	1.4	0.9	20	4	2	0.00	3	4,011.28	0.03	0.04
1	7204	Smart Thermostat (Base Heat Pump Heating)	Office	13%	8%	0.3	1.4	1.2	0.8	8	20	8	0.00	0	369.02	0.21	0.36
1	7300	ase Heating Packaged Heat Pump, IEER 13.9/COP 3.4 (w/ non-ER heating), 10 tor	Office	0%	0%	0.0	1.0	1.0	0.6	15	0	0	0.00	N/A	N/A	N/A	N/A
1	7301	Packaged Heat Pump, heating, IEER 13.9/COP 3.4 (w/ non-ER heating), 10 tons	Office	60%	60%	2.7	1.0	0.4	0.2	15	58	37	0.00	0	677.37	0.14	0.20
1	7302	Ceiling/roof Insulation (base packaged heat pump)	Office	12%	12%	0.5	1.1	1.0	0.6	20	1	1	0.00	0	561.54	0.20	0.29
1	7303	Duct/Pipe Insulation (base packaged heat pump)	Office	2%	2%	0.8	1.0	0.9	0.6	20	2	1	0.00	4	5,841.79	0.02	0.03
1	7304	Smart Thermostat (Base Rooftop/packaged heating)	Office	13%	8%	0.3	1.0	0.9	0.6	8	11	4	0.00	0	537.42	0.14	0.24
1	7400	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	Office	0%	0%	0.0	1.4	1.4	0.9	20	0	0	0.00	N/A	N/A	N/A	N/A
1	7401	Ceiling/roof Insulation (base ductless mini-split)	Office	12%	12%	0.5	1.6	1.4	0.9	20	0	0	0.00	0	385.58	0.30	0.42
1	7403	Smart Thermostat (base packaged heat pump)	Office	13%	8%	0.3	1.4	1.2	0.8	8	2	1	0.00	0	369.02	0.21	0.36
1	7800	Base Ventilation	Office	0%	0%	0.0	6.7	6.7	0.8	20	0	0	0.00	N/A	N/A	N/A	N/A
1	7802	Variable Speed Drive Control, base motors	Office	33%	27%	0.4	9.5	6.4	0.8	15	132	13	8.24	0	107.41	3.79	8.14
1	7803	Air Handler Optimization, 15 HP	Office	10%	10%	0.0	6.6	6.0	0.7	8	299	36	82.70	0	43.10	5.90	10.10

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test
1	7804	Demand Controlled Ventilation, 15 HP	Office	33%	62%	2.4	8.1	5.5	0.4	15	421	95	275.33	0	367.60	0.95	1.04
1	7805	Energy Recovery Ventilation (ERV)	Office	7%	7%	0.3	6.6	6.1	0.7	20	121	15	33.40	0	500.62	1.08	1.73
1	8000	Base Compressed Air	Office	0%	0%	0.0	0.0	0.0	0.0	13	0	0	0.00	N/A	N/A	N/A	N/A
1	8100	Base Process Heat	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	8200	Base Process Cooling	Office	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
1	8300	Base Electrochemical process	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	8400	Base Process Other	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	9300	Base IndustrialMotors or Pumps	Office	0%	0%	0.0	24.5	24.5	3.0	20	0	0	0.00	N/A	N/A	N/A	N/A
1	9301	High Efficiency Motor	Office	1%	1%	0.2	24.6	24.3	3.0	20	25	3	4.05	0	598.45	0.78	1.43
1	9302	Variable Speed Drive Control, base motors	Office	17%	14%	3.1	26.8	22.2	2.9	15	282	28	10.35	0	654.24	0.60	1.34
1	9900	Base Miscellaneous	Office	0%	0%	0.0	2.3	2.3	0.3	10	0	0	0.00	N/A	N/A	N/A	N/A
3	1000	Base Linear Lighting, Fluorescent Fixture, 2L4'T12	Office	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1050	Base Linear Lighting, Fluorescent Fixture, 2L4'T12, integrated market	Office	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1100	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB	Office	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1150	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB, integrated market	Office	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1200	Base Linear Lighting, LED Tube, 2 lamp fixture	Office	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1225	Base Linear Lighting, LED Tube, 2 lamp fixture, 2028 Standard	Office	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1250	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market	Office	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1275	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market, 2028 Standarc	Office	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1300	Base General Service Screw-in, CFL	Office	0%	0%	0.0	0.0	0.0	0.0	2	0	0	0.00	N/A	N/A	N/A	N/A
3	1350	Base General Service Screw-in, Incandescent/halogen	Office	0%	0%	0.0	0.0	0.0	0.0	1	0	0	0.00	N/A	N/A	N/A	N/A
3	1400	Base General Service Screw-in, LED bulb	Office	0%	0%	0.0	0.0	0.0	0.0	7	0	0	0.00	N/A	N/A	N/A	N/A
3	1425	Base General Service Screw-in, LED bulb, 2028 Standard	Office	0%	0%	0.0	0.0	0.0	0.0	7	0	0	0.00	N/A	N/A	N/A	N/A
3	1450	Base HID Lighting (low bay)	Office	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1500	Base High Bay Lighting, Fluorescent T5	Office	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1525	Base High Bay Lighting, Fluorescent T5, integrated market	Office	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1550	Base High Bay Lighting, HID lighting	Office	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1575	Base High Bay Lighting, LED lighting	Office	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1600	Base CFL Exit Sign	Office	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1650	Base Area Lighting, Outdoor HID	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	1700	Base General Service Screw-in, Outdoor CFL	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	1750	Base General Service Screw-in, Outdoor Incandescent/Halogen	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	1800	Base General Service Screw-in, Outdoor LED bulb	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	1850	Base Linear Lighting, Outdoor Fluorescent Tube	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	1900	Base Linear Lighting, Outdoor LED Tube	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	2000	Base Water-Cooled Centrifugal Chiller, 0.58 kW/ton, 500 tons	Office	0%	0%	0.0	0.0	0.0	0.0	23	0	0	0.00	N/A	N/A	N/A	N/A
3	2100	Base DX Packaged System, EER=10.3, 10 tons	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	2150	Base DX Packaged System, 2029 Standard	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	2200	Base Heat Pump cooling (14.3 SEER, 8.2 HSPF)	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	2300	Base Split-System AC, SEER 14.5, <5.4 tons	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	2400	Base PTAC cooling, EER=10.2, 1 ton	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	2500	Base Room AC, CEER 10.9	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	2600	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	3100	Base Open refrigerated/freezer cases	Office	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
3	3200	Base Closed refrigerated/freezer cases	Office	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
3	3300	Base Walk-in refrigeration/freezer units	Office	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
3	3400	Base Large Cold Storage Area	Office	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
3	3500	Base Reach-in Refrigerator/Freezer, Federal Standard	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	3600	Base Glass Door Reach-in Refrigerator/Freezer, Federal Standard	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	3700	Base Ice Maker, Federal Standard	Office	0%	0%	0.0	0.0	0.0	0.0	10	0	0	0.00	N/A	N/A	N/A	N/A
3	3800	Base Residential-Type Refrigerator/Freezer, Federal Standard	Office	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	3900	Base Compact Refrigerator, Federal Standard	Office	0%	0%	0.0	0.0	0.0	0.0	14	0	0	0.00	N/A	N/A	N/A	N/A
3	4000	Base Computer Network Server	Office	0%	0%	0.0	0.0	0.0	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
3	4100	Base Desktop PC	Office	0%	0%	0.0	0.0	0.0	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
3	4200	Base Laptop PC	Office	0%	0%	0.0	0.0	0.0	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
3	4300	Base Monitor, LCD	Office	0%	0%	0.0	0.0	0.0	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
3	4400	Base Imaging	Office	0%	0%	0.0	0.0	0.0	0.0	6	0	0	0.00	N/A	N/A	N/A	N/A
3	5000	Base Water Heater, Resistance Heater, Standard Standby Wattage	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	6000	Base Non-Refrigerated Vending Machines, Federal Standard	Office	0%	0%	0.0	0.0	0.0	0.0	5	0	0	0.00	N/A	N/A	N/A	N/A
3	6100	Base Refrigerated Vending Machines, Federal Standard	Office	0%	0%	0.0	0.0	0.0	0.0	5	0	0	0.00	N/A	N/A	N/A	N/A
3	6200	Base Combi Oven	Office	0%	0%	0.0	0.0	0.0	0.0	12	0	0	0.00	N/A	N/A	N/A	N/A
3	6300	Base Convection Oven	Office	0%	0%	0.0	0.0	0.0	0.0	12	0	0	0.00	N/A	N/A	N/A	N/A
3	6400	Base Fryer	Office	0%	0%	0.0	0.0	0.0	0.0	12	0	0	0.00	N/A	N/A	N/A	N/A
3	6500	Base Griddle	Office	0%	0%	0.0	0.0	0.0	0.0	12	0	0	0.00	N/A	N/A	N/A	N/A
3	6600	Base Hot Food Holding Cabinet	Office	0%	0%	0.0	0.0	0.0	0.0	12	0	0	0.00	N/A	N/A	N/A	N/A
3	6700	Base Steamer	Office	0%	0%	0.0	0.0	0.0	0.0	12	0	0	0.00	N/A	N/A	N/A	N/A
3	7000	Base Electric Boiler, Federal Standard	Office	0%	0%	0.0	0.0	0.0	0.0	20	0	0	0.00	N/A	N/A	N/A	N/A
3	7100	Base Electric Furnace, Federal Standard	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	7200	Base Heating Air-Source Heat Pump, SEER 15.0/HSPF 8.8 w/Aux Strip Heat	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	7300	ase Heating Packaged Heat Pump, IEER 13.9/COP 3.4 (w/ non-ER heating), 10 tor	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test
3	7400	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	Office	0%	0%	0.0	0.0	0.0	0.0	20	0	0	0.00	N/A	N/A	N/A	N/A
3	7800	Base Ventilation	Office	0%	0%	0.0	0.0	0.0	0.0	20	0	0	0.00	N/A	N/A	N/A	N/A
3	8000	Base Compressed Air	Office	0%	0%	0.0	0.0	0.0	0.0	13	0	0	0.00	N/A	N/A	N/A	N/A
3	8100	Base Process Heat	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	8200	Base Process Cooling	Office	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
3	8300	Base Electrochemical process	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	8400	Base Process Other	Office	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	9300	Base IndustrialMotors or Pumps	Office	0%	0%	0.0	0.0	0.0	0.0	20	0	0	0.00	N/A	N/A	N/A	N/A
3	9900	Base Miscellaneous	Office	0%	0%	0.0	0.0	0.0	0.0	10	0	0	0.00	N/A	N/A	N/A	N/A
1	1000	Base Linear Lighting, Fluorescent Fixture, 2L4'T12	Restaurant	0%	0%	0.0	2.2	2.2	0.6	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1001	High Performance Lighting R/R - Combined Strategies (Base T12)	Restaurant	82%	62%	0.2	1.9	0.3	0.2	15	1	0	0.22	0	61.92	4.08	6.96
1	1002	ROB 2L4' LED Tube (Base T12)	Restaurant	49%	56%	0.1	1.9	0.9	0.2	12	1	0	0.20	0	25.69	6.46	9.44
1	1003	LED Troffer (Base T12)	Restaurant	61%	69%	0.5	1.9	0.7	0.2	12	0	0	0.11	0	136.58	1.22	1.78
1	1004	LED Troffer with lamp removal (T12)	Restaurant	79%	89%	0.4	1.9	0.4	0.1	18	1	0	0.14	0	77.29	2.93	4.21
1	1005	Lighting Control Tuneup (Base T12)	Restaurant	6%	3%	0.0	1.9	1.8	0.5	6	0	0	0.00	0	109.94	1.57	3.25
1	1006	Network Lighting Controls (Base T12)	Restaurant	44%	19%	1.8	1.9	1.1	0.4	9	0	0	0.01	0	1,820.12	0.13	0.28
1	1007	Occupancy Sensor (Base T12)	Restaurant	25%	5%	0.3	1.9	1.4	0.5	10	0	0	0.00	0	1,224.78	0.41	0.96
1	1050	Base Linear Lighting, Fluorescent Fixture, 2L4'T12, integrated market	Restaurant	0%	0%	0.0	2.2	2.2	0.6	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1051	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	Restaurant	75%	53%	0.6	1.9	0.5	0.2	18	3	1	0.53	0	218.34	1.39	2.42
1	1100	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB	Restaurant	0%	0%	0.0	2.0	2.0	0.5	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1101	High Performance Lighting R/R - Combined Strategies (Base T8)	Restaurant	76%	57%	0.2	1.9	0.4	0.2	15	1	0	0.18	0	66.91	3.77	6.44
1	1102	ROB 2L4' LED Tube (Base T8)	Restaurant	37%	42%	0.1	1.9	1.2	0.3	12	1	0	0.13	0	34.56	4.80	7.02
1	1103	LED Troffer (Base T8)	Restaurant	52%	59%	0.5	1.9	0.9	0.2	12	0	0	0.08	0	159.71	1.04	1.52
1	1104	LED Troffer with lamp removal (T8)	Restaurant	75%	85%	0.4	1.9	0.5	0.1	18	0	0	0.12	0	81.49	2.78	3.99
1	1105	Lighting Control Tuneup (Base T8)	Restaurant	6%	3%	0.0	1.9	1.8	0.5	6	0	0	0.00	0	110.19	1.57	3.24
1	1106	Network Lighting Controls (Base T8)	Restaurant	44%	19%	1.8	1.9	1.1	0.4	9	0	0	0.01	0	1,824.27	0.13	0.28
1	1107	Occupancy Sensor (Base T8)	Restaurant	25%	5%	0.3	1.9	1.4	0.5	10	0	0	0.00	0	1,227.57	0.41	0.95
1	1150	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB, integrated market	Restaurant	0%	0%	0.0	2.0	2.0	0.5	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1151	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	Restaurant	68%	47%	0.6	1.9	0.6	0.3	18	3	1	0.43	0	243.15	1.25	2.18
1	1200	Base Linear Lighting, LED Tube, 2 lamp fixture	Restaurant	0%	0%	0.0	1.0	1.0	0.3	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1201	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	Restaurant	42%	32%	0.2	1.0	0.6	0.2	15	2	0	0.26	0	214.73	1.18	2.01
1	1202	Lighting Control Tuneup (Base LED Tube)	Restaurant	6%	3%	0.0	1.0	1.0	0.3	6	0	0	0.00	0	197.89	0.87	1.81
1	1203	Network Lighting Controls (Base LED Tube)	Restaurant	44%	19%	1.8	1.0	0.6	0.2	9	0	0	0.01	0	3,276.22	0.07	0.15
1	1204	Occupancy Sensor (Base LED tube)	Restaurant	25%	5%	0.3	1.0	0.8	0.3	10	0	0	0.00	0	2,204.61	0.23	0.53
1	1225	Base Linear Lighting, LED Tube, 2 lamp fixture, 2028 Standard	Restaurant	0%	0%	0.0	0.9	0.9	0.2	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1226	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	Restaurant	42%	32%	0.2	0.9	0.5	0.2	15	3	1	0.53	0	244.01	1.03	1.77
1	1227	Lighting Control Tuneup (Base LED Tube)	Restaurant	6%	3%	0.0	0.9	0.9	0.2	6	0	0	0.00	0	224.88	0.77	1.59
1	1228	Network Lighting Controls (Base LED Tube)	Restaurant	44%	19%	1.8	0.9	0.5	0.2	9	0	0	0.02	0	3,722.98	0.07	0.14
1	1229	Occupancy Sensor (Base LED tube)	Restaurant	25%	5%	0.3	0.9	0.7	0.2	10	0	0	0.01	0	2,505.24	0.20	0.47
1	1250	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market	Restaurant	0%	0%	0.0	1.0	1.0	0.3	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1251	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	Restaurant	22%	15%	0.6	1.0	0.8	0.2	18	1	0	0.12	0	1,375.55	0.22	0.38
1	1275	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market, 2028 Standarc	Restaurant	0%	0%	0.0	0.9	0.9	0.2	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1276	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	Restaurant	22%	15%	0.6	0.9	0.7	0.2	18	2	0	0.25	0	1,563.13	0.19	0.34
1	1300	Base General Service Screw-in, CFL	Restaurant	0%	0%	0.0	0.5	0.5	0.1	2	0	0	0.00	N/A	N/A	N/A	N/A
1	1301	LED screw-in replacement (base CFL)	Restaurant	29%	33%	0.0	0.5	0.4	0.1	6	0	0	0.09	0	80.17	1.12	1.70
1	1350	Base General Service Screw-in, Incandescent/halogen	Restaurant	0%	0%	0.0	1.5	1.5	0.4	1	0	0	0.00	N/A	N/A	N/A	N/A
1	1351	LED screw-in replacement (base incandescent/halogen)	Restaurant	73%	83%	0.0	1.5	0.4	0.1	6	7	2	1.68	0	10.89	8.26	12.54
1	1400	Base General Service Screw-in, LED bulb	Restaurant	0%	0%	0.0	0.3	0.3	0.1	6	0	0	0.00	N/A	N/A	N/A	N/A
1	1401	LED screw-in replacement (base LED)	Restaurant	10%	11%	0.0	0.3	0.3	0.1	6	1	0	0.13	0	343.28	0.26	0.40
1	1425	Base General Service Screw-in, LED bulb, 2028 Standard	Restaurant	0%	0%	0.0	0.3	0.3	0.1	6	0	0	0.00	N/A	N/A	N/A	N/A
1	1426	LED screw-in replacement (base LED)	Restaurant	2%	2%	0.0	0.3	0.3	0.1	6	0	0	0.02	1	2,178.48	0.04	0.06
1	1450	Base HID Lighting (low bay)	Restaurant	0%	0%	0.0	4.5	4.5	1.2	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1500	Base High Bay Lighting, Fluorescent T5	Restaurant	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1501	High Performance Lighting R/R - Combined Strategies (Base T5)	Restaurant	73%	55%	0.2	0.0	0.0	0.0	15	0	0	0.00	1	3,755.09	0.07	0.11
1	1502	ROB 2L4' LED Tube (Base T5)	Restaurant	39%	44%	0.0	0.0	0.0	0.0	12	0	0	0.00	0	32.76	5.07	7.41
1	1503	High Bay LED Troffer (Base T5)	Restaurant	47%	54%	0.0	0.0	0.0	0.0	12	0	0	0.00	0	58.66	2.83	4.14
1	1504	Lighting Control Tuneup (Base T5)	Restaurant	6%	3%	0.0	0.0	0.0	0.0	6	0	0	0.00	1	5,910.68	0.03	0.06
1	1505	Network Lighting Controls (Base T5)	Restaurant	44%	19%	1.8	0.0	0.0	0.0	9	0	0	0.00	11	97,854.24	0.00	0.01
1	1506	Occupancy Sensor (Base T5)	Restaurant	25%	5%	0.3	0.0	0.0	0.0	10	0	0	0.00	4	65,847.24	0.01	0.02
1	1525	Base High Bay Lighting, Fluorescent T5, integrated market	Restaurant	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1526	High Bay Bi-Level Programmed LED Fixture	Restaurant	63%	47%	0.0	0.0	0.0	0.0	18	0	0	0.00	0	57.48	5.01	8.51
1	1550	Base High Bay Lighting, HID lighting	Restaurant	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1551	High Bay Bi-Level Programmed LED Fixture	Restaurant	63%	47%	0.0	0.0	0.0	0.0	18	0	0	0.00	0	49.35	5.84	9.91
1	1552	High Performance Lighting R/R - Combined Strategies (base high bay HID)	Restaurant	73%	55%	0.2	0.0	0.0	0.0	15	0	0	0.00	1	3,241.45	0.08	0.13
1	1575	Base High Bay Lighting, LED lighting	Restaurant	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1576	Network Lighting Controls (Base high bay LED)	Restaurant	44%	19%	1.8	0.0	0.0	0.0	9	0	0	0.00	29	248,664.90	0.00	0.00
1	1577	Occupancy Sensor (Base high bay LED)	Restaurant	25%	5%	0.3	0.0	0.0	0.0	10	0	0	0.00	9	167,329.47	0.00	0.01
1	1600	Base CFL Exit Sign	Restaurant	0%	0%	0.0	0.1	0.1	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1601	LED Exit Sign	Restaurant	55%	55%	0.0	0.1	0.0	0.0	15	2	0	0.35	0	104.37	2.04	3.11
1	1650	Base Area Lighting, Outdoor HID	Restaurant	0%	0%	0.0	3.2	3.2	0.5	15	0	0	0.00	N/A	N/A	N/A	N/A

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

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1	1651	LED Outdoor Area Lighting (Base Outdoor HID)	Restaurant	68%	68%	0.3	3.2	1.0	0.1	15	14	2	0.70	0	99.04	2.91	6.03
1	1652	LED outdoor lighting with bi-level controls (Base Outdoor HID)	Restaurant	80%	80%	0.4	3.2	0.6	0.1	15	16	2	0.83	0	93.48	3.09	6.39
1	1653	Outdoor Lighting Controls (Base Outdoor HID)	Restaurant	16%	73%	0.4	3.4	2.9	0.1	18	2	1	0.49	0	104.79	1.25	1.45
1	1700	Base General Service Screw-in, Outdoor CFL	Restaurant	0%	0%	0.0	0.2	0.2	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	1701	LED outdoor lighting with bi-level controls (Base Outdoor CFL)	Restaurant	57%	57%	0.4	0.2	0.1	0.0	15	0	0	0.01	0	1,822.29	0.16	0.33
1	1702	LED screw-in replacement (base Outdoor CFL)	Restaurant	30%	30%	0.0	0.2	0.2	0.0	6	0	0	0.01	0	198.71	0.68	1.43
1	1703	Outdoor Lighting Controls (Base Outdoor CFL)	Restaurant	16%	73%	0.4	0.2	0.2	0.0	18	0	0	0.01	1	1,455.43	0.09	0.10
1	1750	Base General Service Screw-in, Outdoor Incandescent/Halogen	Restaurant	0%	0%	0.0	0.7	0.7	0.1	15	0	0	0.00	N/A	N/A	N/A	N/A
1	1751	LED outdoor lighting with bi-level controls (Base Outdoor Incandescent)	Restaurant	85%	85%	0.4	0.2	0.0	0.0	15	2	0	0.09	0	1,189.73	0.24	0.50
1	1752	LED screw-in replacement (base Outdoor Incandescent)	Restaurant	75%	75%	0.0	0.2	0.1	0.0	6	2	0	0.08	0	77.39	1.76	3.68
1	1753	Outdoor Lighting Controls (Base Outdoor Incandescent)	Restaurant	16%	73%	0.4	0.3	0.2	0.0	18	0	0	0.05	1	1,416.98	0.09	0.11
1	1800	Base General Service Screw-in, Outdoor LED bulb	Restaurant	0%	0%	0.0	0.2	0.2	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	1801	Outdoor Lighting Controls (Base Outdoor LED)	Restaurant	16%	73%	0.4	0.2	0.1	0.0	18	0	0	0.10	1	2,183.14	0.06	0.07
1	1850	Base Linear Lighting, Outdoor Fluorescent Tube	Restaurant	0%	0%	0.0	0.4	0.4	0.1	15	0	0	0.00	N/A	N/A	N/A	N/A
1	1851	ROB 2L4' LED Tube (base outdoor fluorescent)	Restaurant	40%	40%	0.0	0.4	0.2	0.0	13	1	0	0.03	0	200.43	1.29	2.68
1	1852	LED outdoor lighting with bi-level controls (Base Outdoor Fluorescent)	Restaurant	63%	63%	0.4	0.4	0.1	0.0	15	1	0	0.05	0	1,017.58	0.28	0.59
1	1853	Outdoor Lighting Controls (Base Outdoor Fluorescent)	Restaurant	16%	73%	0.4	0.4	0.3	0.0	18	0	0	0.04	1	898.27	0.15	0.17
1	1900	Base Linear Lighting, Outdoor LED Tube	Restaurant	0%	0%	0.0	0.3	0.3	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	1901	Outdoor Lighting Controls (Base Outdoor LED Tube)	Restaurant	16%	73%	0.4	0.3	0.2	0.0	18	0	0	0.02	1	1,309.88	0.10	0.12
1	2000	Base Water-Cooled Centrifugal Chiller, 0.58 kW/ton, 500 tons	Restaurant	0%	0%	0.0	1.9	1.9	0.0	23	0	0	0.00	N/A	N/A	N/A	N/A
1	2001	Centrifugal Chiller, 0.54 kW/ton, 500 tons	Restaurant	12%	12%	0.2	2.0	1.7	0.0	23	0	0	0.22	0	N/A	2.23	1.77
1	2002	Chiller Tune Up/Diagnostics	Restaurant	9%	7%	0.1	2.1	1.9	0.0	5	0	0	0.01	0	N/A	0.86	1.36
1	2005	Ceiling/roof Insulation - Chiller	Restaurant	12%	12%	1.3	2.1	1.8	0.0	20	0	0	0.09	1	N/A	0.26	0.21
1	2007	Duct Testing/Sealing - Chiller	Restaurant	20%	24%	0.3	1.9	1.6	0.0	18	0	0	0.03	0	N/A	0.53	1.22
1	2009	EMS Optimization - Chiller	Restaurant	6%	6%	0.0	2.0	1.9	0.0	5	0	0	0.00	0	N/A	0.83	2.21
1	2010	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - Chiller	Restaurant	7%	8%	0.4	2.0	1.8	0.0	10	0	0	0.00	0	N/A	0.09	0.25
1	2012	Window Film (Standard) - Chiller	Restaurant	10%	18%	0.3	1.9	1.7	0.0	10	0	0	0.09	0	N/A	0.27	0.37
1	2013	High Efficiency Windows - Chiller	Restaurant	14%	25%	0.2	2.1	1.8	0.0	20	0	0	0.07	0	N/A	1.08	1.32
1	2100	Base DX Packaged System, EER=10.3, 10 tons	Restaurant	0%	0%	0.0	2.7	2.7	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2101	DX Packaged System, EER=10.9, 10 tons	Restaurant	6%	6%	0.2	2.7	2.5	0.0	15	6	0	7.02	0	N/A	1.07	0.90
1	2102	DX Packaged System, EER=13.4, 10 tons	Restaurant	23%	23%	0.2	2.7	2.1	0.0	15	21	0	26.90	0	N/A	3.02	2.53
1	2103	Geothermal Heat Pump, EER=13, 10 tons - DX	Restaurant	21%	21%	2.4	2.7	2.1	0.0	15	1	0	1.22	0	N/A	0.26	0.22
1	2104	DX Tune Up/ Advanced Diagnostics	Restaurant	6%	5%	0.1	2.8	2.7	0.0	10	1	0	0.38	0	N/A	0.73	1.05
1	2105	Refrigerant Charge Adjustment - DX	Restaurant	10%	10%	0.5	2.9	2.6	0.0	10	1	0	1.58	0	N/A	0.49	0.44
1	2106	Ceiling/roof Insulation - DX	Restaurant	12%	12%	1.3	2.9	2.6	0.0	20	1	0	1.69	0	N/A	0.36	0.29
1	2107	Cool Roof - DX	Restaurant	7%	7%	0.2	2.7	2.5	0.0	10	3	0	3.74	0	N/A	0.63	0.57
1	2108	Duct Testing/Sealing - DX	Restaurant	22%	26%	0.3	2.7	2.1	0.0	18	6	0	0.50	0	N/A	0.83	1.93
1	2109	Duct/Pipe Insulation - DX	Restaurant	2%	2%	0.3	2.7	2.6	0.0	10	1	0	1.43	1	N/A	0.13	0.12
1	2110	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	Restaurant	4%	4%	0.6	2.7	2.6	0.0	10	0	0	0.00	1	N/A	0.04	0.11
1	2111	Economizer Repair - DX	Restaurant	15%	7%	1.2	2.8	2.4	0.0	5	5	0	8.07	0	N/A	0.14	0.12
1	2113	Optimize Controls - DX	Restaurant	6%	4%	0.0	2.8	2.6	0.0	5	2	0	0.50	0	N/A	1.56	3.14
1	2114	Smart Thermostat - DX	Restaurant	12%	8%	0.3	2.8	2.4	0.0	8	8	0	2.12	0	N/A	0.34	0.66
1	2115	Window Film (Standard) - DX	Restaurant	10%	18%	0.3	2.7	2.4	0.0	10	6	0	4.08	0	N/A	0.39	0.52
1	2116	High Efficiency Windows - DX	Restaurant	14%	14%	0.2	2.9	2.5	0.0	20	5	0	6.05	0	N/A	2.36	1.91
1	2150	Base DX Packaged System, 2029 Standard	Restaurant	0%	0%	0.0	2.7	2.7	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2152	DX Packaged System, EER=13.4, 10 tons	Restaurant	14%	14%	0.2	2.4	2.1	0.0	15	12	0	15.20	0	N/A	1.71	1.43
1	2153	Geothermal Heat Pump, EER=13, 10 tons - DX	Restaurant	12%	12%	2.4	2.4	2.1	0.0	15	1	0	0.64	1	N/A	0.13	0.11
1	2154	DX Tune Up/ Advanced Diagnostics	Restaurant	6%	5%	0.1	2.8	2.7	0.0	10	1	0	0.38	0	N/A	0.73	1.05
1	2155	Refrigerant Charge Adjustment - DX	Restaurant	10%	10%	0.5	2.9	2.6	0.0	10	1	0	1.58	0	N/A	0.49	0.44
1	2156	Ceiling/roof Insulation - DX	Restaurant	12%	12%	1.3	2.9	2.6	0.0	20	1	0	1.69	0	N/A	0.36	0.29
1	2157	Cool Roof - DX	Restaurant	7%	7%	0.2	2.7	2.5	0.0	10	3	0	3.74	0	N/A	0.63	0.57
1	2158	Duct Testing/Sealing - DX	Restaurant	22%	26%	0.3	2.7	2.1	0.0	18	6	0	0.50	0	N/A	0.83	1.93
1	2159	Duct/Pipe Insulation - DX	Restaurant	2%	2%	0.3	2.7	2.6	0.0	10	1	0	1.43	1	N/A	0.13	0.12
1	2160	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	Restaurant	4%	4%	0.6	2.7	2.6	0.0	10	0	0	0.00	1	N/A	0.04	0.11
1	2161	Economizer Repair - DX	Restaurant	15%	7%	1.2	2.8	2.4	0.0	5	5	0	8.07	0	N/A	0.14	0.12
1	2163	Optimize Controls - DX	Restaurant	6%	4%	0.0	2.8	2.6	0.0	5	2	0	0.50	0	N/A	1.56	3.14
1	2164	Smart Thermostat - DX	Restaurant	12%	8%	0.3	2.8	2.4	0.0	8	8	0	2.12	0	N/A	0.34	0.66
1	2165	Window Film (Standard) - DX	Restaurant	10%	18%	0.3	2.7	2.4	0.0	10	6	0	4.08	0	N/A	0.39	0.52
1	2166	High Efficiency Windows - DX	Restaurant	14%	14%	0.2	2.9	2.5	0.0	20	5	0	6.05	0	N/A	2.36	1.91
1	2200	Base Heat Pump cooling (14.3 SEER, 8.2 HSPF)	Restaurant	0%	0%	0.0	2.4	2.4	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2201	Heat Pump Upgrade (18 SEER, 8.2 HSPF), cooling	Restaurant	14%	14%	0.3	2.4	2.1	0.0	15	3	0	3.93	0	N/A	1.45	1.22
1	2202	Mini-Split Heat Pump (Base Heat Pump Cooling)	Restaurant	10%	10%	0.8	2.4	2.2	0.0	15	1	0	1.00	0	N/A	0.33	0.27
1	2203	Ceiling/roof Insulation (Base Heat Pump Cooling)	Restaurant	12%	12%	1.3	2.6	2.3	0.0	20	0	0	0.44	0	N/A	0.32	0.26
1	2204	Duct/Pipe Insulation (Base Heat Pump Cooling)	Restaurant	2%	2%	0.3	2.4	2.4	0.0	10	0	0	0.37	1	N/A	0.12	0.11
1	2205	Smart Thermostat (Base Heat Pump Cooling)	Restaurant	12%	8%	0.3	2.5	2.2	0.0	8	2	0	0.55	0	N/A	0.30	0.59
1	2206	Window Film (Standard) (Base Heat Pump Cooling)	Restaurant	10%	18%	0.3	2.4	2.2	0.0	10	2	0	1.05	0	N/A	0.35	0.46
1	2207	High Efficiency Windows (Base Heat Pump Cooling)	Restaurant	14%	14%	0.2	2.6	2.2	0.0	20	1	0	1.56	0	N/A	2.12	1.72
1	2300	Base Split-System AC, SEER 14.5, <5.4 tons	Restaurant	0%	0%	0.0	2.2	2.2	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2301	Split System Air Conditioner, SEER 16.0 ENERGY STAR, <5.4 tons	Restaurant	10%	10%	0.4	2.2	2.0	0.0	15	0	0	0.55	0	N/A	0.55	0.46
1	2302	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Residential Split-System	Restaurant	20%	20%	0.8	2.2	1.8	0.0	15	1	0	1.28	0	N/A	0.60	0.50

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test
1	2303	Ceiling/roof Insulation (Base Residential Split-System)	Restaurant	12%	12%	1.3	2.4	2.1	0.0	20	0	0	0.09	0	N/A	0.30	0.24
1	2304	Duct/Pipe Insulation (Base Residential Split-System)	Restaurant	2%	2%	0.3	2.2	2.2	0.0	10	0	0	0.08	1	N/A	0.11	0.10
1	2305	Smart Thermostat (Base Residential Split-System)	Restaurant	12%	8%	0.3	2.3	2.0	0.0	8	0	0	0.12	0	N/A	0.28	0.54
1	2306	Window Film (Standard) (Base Residential Split-System)	Restaurant	10%	18%	0.3	2.2	2.0	0.0	10	0	0	0.22	0	N/A	0.32	0.42
1	2400	Base PTAC cooling, EER=10.2, 1 ton	Restaurant	0%	0%	0.0	2.9	2.9	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2401	HE PTAC, EER=9.6, 1 ton, cooling	Restaurant	14%	14%	0.4	2.9	2.5	0.0	15	0	0	0.26	0	N/A	1.26	1.05
1	2402	Ceiling/roof Insulation (Base PTAC)	Restaurant	12%	12%	1.3	3.2	2.8	0.0	20	0	0	0.03	0	N/A	0.39	0.32
1	2405	Window Film (Standard) (Base PTAC)	Restaurant	10%	18%	0.3	2.9	2.6	0.0	10	0	0	0.06	0	N/A	0.42	0.55
1	2500	Base Room AC, CEER 10.9	Restaurant	0%	0%	0.0	1.2	1.2	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2501	Room AC, CEER 12.0 ENERGY STAR	Restaurant	2%	2%	0.2	1.2	1.2	0.0	15	0	0	0.02	1	N/A	0.11	0.10
1	2502	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Room AC)	Restaurant	30%	30%	0.3	1.2	0.8	0.0	15	0	0	0.25	0	N/A	1.48	1.24
1	2503	Ceiling/roof Insulation (Base Room AC)	Restaurant	12%	12%	1.3	1.3	1.2	0.0	20	0	0	0.01	1	N/A	0.16	0.13
1	2505	Window Film (Standard) (Base Room AC)	Restaurant	10%	18%	0.3	1.2	1.1	0.0	10	0	0	0.03	0	N/A	0.17	0.23
1	2506	High Efficiency Windows (Base Room AC)	Restaurant	6%	11%	0.2	1.3	1.2	0.0	20	0	0	0.01	0	N/A	0.28	0.35
1	2600	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	Restaurant	0%	0%	0.0	1.9	1.9	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2601	Ceiling/roof Insulation (Base Ductless Mini-split)	Restaurant	12%	12%	1.3	2.1	1.9	0.0	20	0	0	0.07	0	N/A	0.26	0.21
1	2603	Window Film (Standard) (Base Ductless Mini-split)	Restaurant	10%	18%	0.3	1.9	1.8	0.0	10	0	0	0.18	0	N/A	0.28	0.37
1	2604	High Efficiency Windows (Base Ductless Mini-split)	Restaurant	14%	25%	0.2	2.1	1.8	0.0	20	0	0	0.13	0	N/A	1.09	1.34
1	3100	Base Open refrigerated/freezer cases	Restaurant	0%	0%	0.0	1.1	1.1	0.1	16	0	0	0.00	N/A	N/A	N/A	N/A
1	3102	Bi-level LED Case Lighting (self-contained units), open cases	Restaurant	11%	11%	0.0	1.2	1.1	0.1	8	0	0	0.02	0	205.33	1.19	2.39
1	3103	Compressor VSD retrofit, open cases	Restaurant	7%	6%	0.0	1.1	1.0	0.1	13	0	0	0.03	0	482.93	0.81	1.77
1	3104	Demand Defrost Electric, open cases	Restaurant	8%	8%	0.1	1.1	1.1	0.1	10	0	0	0.06	0	1,207.76	0.24	0.49
1	3105	Demand Hot Gas Defrost, open cases	Restaurant	3%	3%	0.1	1.1	1.1	0.1	10	0	0	0.02	0	2,878.18	0.10	0.20
1	3106	Electronically commutated evaporator fan motor, open cases	Restaurant	27%	16%	0.1	1.4	1.0	0.1	15	1	0	0.05	0	455.23	1.33	2.89
1	3107	High-efficiency fan motors, open cases	Restaurant	4%	4%	0.0	1.1	1.1	0.1	15	0	0	0.04	0	770.19	0.53	1.04
1	3108	Insulated suction lines, open cases	Restaurant	0%	0%	0.0	1.1	1.1	0.1	11	0	0	0.00	0	4,276.19	0.08	0.15
1	3109	LED Display Lighting, open cases	Restaurant	7%	7%	0.0	1.1	1.0	0.1	8	0	0	0.06	0	277.89	0.88	1.77
1	3111	Night covers for display cases, open cases	Restaurant	11%	0%	0.0	1.2	1.1	0.1	5	0	0	0.00	0	N/A	0.48	1.29
1	3112	Oversized Air Cooled Condenser, open cases	Restaurant	8%	8%	0.0	1.2	1.1	0.1	16	0	0	0.04	0	290.19	1.49	2.90
1	3113	Refrigeration Coil Cleaning, open cases	Restaurant	23%	23%	0.1	1.3	1.0	0.1	5	1	0	0.12	0	186.56	0.86	1.75
1	3114	Refrigeration Commissioning, open cases	Restaurant	3%	3%	0.0	1.1	1.1	0.1	3	0	0	0.01	0	312.41	0.33	0.65
1	3200	Base Closed refrigerated/freezer cases	Restaurant	0%	0%	0.0	5.7	5.7	0.6	16	0	0	0.00	N/A	N/A	N/A	N/A
1	3202	Energy-Star Refrigerator/Freezer, base closed cases	Restaurant	10%	10%	0.2	5.9	5.3	0.6	12	8	1	0.98	0	320.24	1.08	2.12
1	3204	Bi-level LED Case Lighting (self-contained units), base closed cases	Restaurant	11%	11%	0.1	6.2	5.5	0.6	8	3	0	0.41	0	140.87	1.73	3.48
1	3205	Compressor VSD retrofit, base closed cases	Restaurant	7%	6%	0.1	5.7	5.3	0.6	13	8	1	0.48	0	331.31	1.18	2.57
1	3206	Demand Defrost Electric, base closed cases	Restaurant	8%	8%	0.4	5.8	5.3	0.6	10	7	1	0.93	0	828.58	0.36	0.71
1	3207	Demand Hot Gas Defrost, base closed cases	Restaurant	3%	3%	0.3	5.7	5.6	0.6	10	2	0	0.29	0	1,974.58	0.15	0.30
1	3208	Electronically commutated evaporator fan motor, base closed cases	Restaurant	23%	14%	0.4	6.9	5.3	0.6	15	9	1	0.68	0	365.52	1.65	3.60
1	3209	Freezer-Cooler Replacement Gaskets, base closed cases	Restaurant	7%	7%	0.0	5.9	5.5	0.6	4	4	0	0.53	0	45.03	2.91	5.91
1	3211	High-efficiency fan motors, base closed cases	Restaurant	4%	4%	0.1	5.7	5.4	0.6	15	5	1	0.62	0	528.39	0.78	1.52
1	3212	Insulated suction lines, base closed cases	Restaurant	0%	0%	0.0	5.7	5.7	0.6	11	0	0	0.01	0	2,854.71	0.11	0.22
1	3213	LED Display Lighting, base closed cases	Restaurant	7%	7%	0.1	5.7	5.3	0.6	8	8	1	1.01	0	190.65	1.28	2.57
1	3214	Low or Anti-Sweat Door Film, base closed cases	Restaurant	5%	5%	0.0	5.7	5.5	0.6	10	5	0	0.58	0	110.39	2.68	5.34
1	3216	Oversized Air Cooled Condenser, base closed cases	Restaurant	8%	8%	0.1	5.9	5.4	0.6	16	5	1	0.66	0	199.09	2.17	4.22
1	3217	Refrigeration Coil Cleaning, base closed cases	Restaurant	23%	23%	0.2	6.4	4.9	0.5	5	16	2	2.02	0	127.99	1.25	2.55
1	3218	Refrigeration Commissioning, base closed cases	Restaurant	5%	5%	0.0	5.8	5.5	0.6	3	3	0	0.40	0	105.81	0.96	1.92
1	3300	Base Walk-in refrigeration/freezer units	Restaurant	0%	0%	0.0	32.1	32.1	3.5	16	0	0	0.00	N/A	N/A	N/A	N/A
1	3302	Auto-closer on main door to walk-in freezer	Restaurant	1%	1%	0.2	32.4	31.9	3.4	8	11	1	1.41	0	465.04	0.52	1.05
1	3303	Compressor VSD retrofit, walk-ins	Restaurant	7%	6%	0.3	32.1	30.0	3.3	13	103	9	6.19	0	138.63	2.82	6.15
1	3304	Demand Defrost Electric, walk-ins	Restaurant	8%	8%	1.0	32.8	30.2	3.3	10	93	10	11.92	0	346.71	0.85	1.70
1	3305	Demand Hot Gas Defrost, walk-ins	Restaurant	3%	3%	0.8	32.3	31.5	3.4	10	29	3	3.77	0	826.23	0.36	0.71
1	3306	Electronically commutated evaporator fan motor, walk-ins	Restaurant	23%	14%	1.0	39.0	29.8	3.6	15	111	7	8.69	0	152.95	3.95	8.61
1	3307	Evaporator fan controller for MT walk-ins	Restaurant	1%	1%	1.5	32.2	32.1	3.5	16	3	0	0.37	1	8,412.38	0.05	0.10
1	3309	Freezer-Cooler Replacement Gaskets, walk-ins	Restaurant	1%	1%	0.0	32.3	31.9	3.4	4	10	1	1.31	0	61.42	2.13	4.33
1	3310	High-efficiency fan motors, walk-ins	Restaurant	6%	6%	0.3	32.1	30.2	3.2	15	94	10	11.98	0	147.40	2.79	5.45
1	3311	Insulated suction lines, walk-ins	Restaurant	0%	0%	0.0	32.1	32.1	3.5	11	1	0	0.10	0	611.27	0.52	1.04
1	3313	Oversized Air Cooled Condenser, walk-ins	Restaurant	8%	8%	0.5	33.5	30.8	3.3	16	66	7	8.43	0	166.61	2.59	5.05
1	3314	Refrigeration Coil Cleaning, walk-ins	Restaurant	23%	23%	0.9	36.3	27.9	3.0	5	203	22	25.95	0	93.72	1.71	3.48
1	3315	Refrigeration Commissioning, walk-ins	Restaurant	3%	3%	0.1	32.5	31.7	3.4	3	20	2	2.53	0	89.68	1.13	2.27
1	3316	Strip curtains for walk-ins	Restaurant	4%	4%	0.1	33.0	31.7	3.4	4	21	2	2.65	0	97.95	1.34	2.72
1	3400	Base Large Cold Storage Area	Restaurant	0%	0%	0.0	10.8	10.8	1.2	16	0	0	0.00	N/A	N/A	N/A	N/A
1	3402	Auto-closer on main door to walk-in freezer, base large cold storage	Restaurant	1%	1%	0.1	10.8	10.7	1.2	8	0	0	0.03	0	465.04	0.52	1.05
1	3403	Compressor VSD retrofit, base large cold storage	Restaurant	7%	6%	0.1	10.8	10.1	1.1	13	2	0	0.12	0	138.63	2.82	6.15
1	3404	Electronically commutated evaporator fan motor, base large cold storage	Restaurant	23%	14%	0.3	13.1	10.0	1.2	15	2	0	0.17	0	152.95	3.95	8.61
1	3405	Evaporator fan controller for MT walk-ins, base large cold storage	Restaurant	1%	1%	0.5	10.8	10.7	1.2	16	0	0	0.01	1	8,412.38	0.05	0.10
1	3406	High-efficiency fan motors, base large cold storage	Restaurant	4%	4%	0.1	10.8	10.3	1.1	15	1	0	0.16	0	221.10	1.86	3.63
1	3407	Insulated suction lines, base large cold storage	Restaurant	0%	0%	0.2	10.8	10.8	1.2	11	0	0	0.00	1	13,522.83	0.02	0.05
1	3409	Oversized Air Cooled Condenser, base large cold storage	Restaurant	8%	8%	0.1	11.2	10.3	1.1	16	1	0	0.17	0	83.30	5.18	10.09
1	3410	Refrigeration Coil Cleaning, base large cold storage	Restaurant	23%	23%	0.2	12.2	9.4	1.0	5	4	0	0.51	0	70.29	2.28	4.63
1	3411	Refrigeration Commissioning, base large cold storage	Restaurant	5%	5%	0.0	11.0	10.5	1.1	3	1	0	0.10	0	44.27	2.30	4.60

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Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test
1	3412	Strip curtains for walk-ins, base large cold storage	Restaurant	4%	4%	0.0	11.1	10.6	1.1	4	0	0	0.05	0	97.95	1.34	2.72
1	3500	Base Reach-in Refrigerator/Freezer, Federal Standard	Restaurant	0%	0%	0.0	4.7	4.7	0.5	15	0	0	0.00	N/A	N/A	N/A	N/A
1	3501	Energy Star solid door reach-in refrigerator/freezer	Restaurant	7%	7%	0.1	4.9	4.5	0.5	15	1	0	0.17	0	151.08	2.73	5.32
1	3502	Freezer-Cooler Replacement Gaskets, base reach-in	Restaurant	3%	3%	0.0	4.8	4.6	0.5	4	1	0	0.06	0	229.62	0.57	1.16
1	3503	Refrigeration Coil Cleaning, base base reach-in	Restaurant	2%	2%	0.1	4.8	4.7	0.5	5	0	0	0.04	0	468.36	0.34	0.70
1	3600	Base Glass Door Reach-in Refrigerator/Freezer, Federal Standard	Restaurant	0%	0%	0.0	6.2	6.2	0.7	15	0	0	0.00	N/A	N/A	N/A	N/A
1	3601	Energy Star glass door reach-in refrigerator/freezer	Restaurant	12%	12%	0.1	6.6	5.8	0.6	15	6	1	0.78	0	95.00	4.33	8.45
1	3602	Bi-level LED Case Lighting, base glass-door reach-in	Restaurant	11%	11%	0.2	6.8	6.0	0.7	8	2	0	0.29	0	182.29	1.34	2.69
1	3603	Freezer-Cooler Replacement Gaskets, base glass-door reach-in	Restaurant	3%	3%	0.0	6.3	6.1	0.7	4	1	0	0.17	0	126.78	1.03	2.10
1	3604	Refrigeration Coil Cleaning, base glass-door reach-in	Restaurant	2%	2%	0.0	6.3	6.1	0.7	5	1	0	0.12	0	258.59	0.62	1.26
1	3700	Base Ice Maker, Federal Standard	Restaurant	0%	0%	0.0	1.9	1.9	0.2	10	0	0	0.00	N/A	N/A	N/A	N/A
1	3701	Energy Star Ice Machines	Restaurant	10%	10%	0.1	2.0	1.8	0.2	10	5	1	0.63	0	311.71	0.95	1.89
1	3702	Refrigeration Coil Cleaning, base ice maker	Restaurant	2%	2%	0.0	1.9	1.9	0.2	5	1	0	0.10	0	339.31	0.47	0.96
1	3800	Base Residential-Type Refrigerator/Freezer, Federal Standard	Restaurant	0%	0%	0.0	0.6	0.6	0.1	18	0	0	0.00	N/A	N/A	N/A	N/A
1	3801	Energy Star refrigerator/freezer	Restaurant	10%	10%	0.1	0.6	0.5	0.1	18	1	0	0.09	0	1,020.84	0.46	0.89
1	3802	Refrigeration Coil Cleaning, residential-type refrigerator	Restaurant	2%	2%	0.0	0.6	0.6	0.1	5	0	0	0.02	0	2,902.84	0.06	0.11
1	3900	Base Compact Refrigerator, Federal Standard	Restaurant	0%	0%	0.0	0.1	0.1	0.0	14	0	0	0.00	N/A	N/A	N/A	N/A
1	3901	Energy Star Compact Refrigerator	Restaurant	10%	10%	0.0	0.1	0.1	0.0	14	0	0	0.01	0	669.02	0.58	1.14
1	3902	Refrigeration Coil Cleaning, compact refrigerator	Restaurant	2%	2%	0.0	0.1	0.1	0.0	5	0	0	0.00	1	8,127.95	0.02	0.04
1	4000	Base Computer Network Server	Restaurant	0%	0%	0.0	0.3	0.3	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
1	4001	Energy Star server	Restaurant	33%	23%	0.0	0.3	0.2	0.0	4	3	0	0.19	0	28.46	5.48	12.08
1	4100	Base Desktop PC	Restaurant	0%	0%	0.0	0.1	0.1	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
1	4101	Energy Star or Better PC	Restaurant	33%	33%	0.0	0.1	0.0	0.0	4	1	0	0.10	0	139.02	0.86	1.69
1	4200	Base Laptop PC	Restaurant	0%	0%	0.0	0.0	0.0	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
1	4201	Energy Star or Better Laptop	Restaurant	30%	30%	0.0	0.0	0.0	0.0	4	0	0	0.01	0	69.78	1.71	3.38
1	4300	Base Monitor, LCD	Restaurant	0%	0%	0.0	0.0	0.0	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
1	4301	Energy Star or Better Monitor - LCD	Restaurant	21%	21%	0.0	0.0	0.0	0.0	4	0	0	0.02	0	164.37	0.73	1.43
1	4303	Plug-load controls - Commercial Smart Strip (base monitor LCD)	Restaurant	11%	5%	0.0	0.0	0.0	0.0	10	0	0	0.00	1	9,919.29	0.05	0.12
1	4400	Base Imaging	Restaurant	0%	0%	0.0	0.0	0.0	0.0	6	0	0	0.00	N/A	N/A	N/A	N/A
1	4401	Energy Star or Better Imaging Equipment	Restaurant	21%	21%	0.0	0.0	0.0	0.0	6	0	0	0.00	0	61.68	2.81	5.50
1	5000	Base Water Heater, Resistance Heater, Standard Standby Wattage	Restaurant	0%	0%	0.0	4.5	4.5	0.5	15	0	0	0.00	N/A	N/A	N/A	N/A
1	5001	High Efficiency Water Heater (electric)	Restaurant	2%	2%	0.0	4.5	4.4	0.5	15	1	0	0.13	0	149.06	2.57	4.84
1	5002	Heat Pump Water Heater (air source)	Restaurant	20%	20%	0.4	4.5	3.6	0.4	10	10	1	1.48	0	342.85	0.80	1.55
1	5003	Tankless Water Heater	Restaurant	10%	10%	0.1	4.5	4.0	0.5	20	1	0	0.14	0	256.48	1.84	3.42
1	5004	Solar Water Heater	Restaurant	70%	70%	1.1	4.5	1.3	0.2	20	1	0	0.13	0	276.96	1.70	3.17
1	5005	Demand controlled circulating systems	Restaurant	5%	5%	0.5	4.5	4.2	0.5	15	5	1	0.69	0	1,831.92	0.21	0.39
1	5006	Heat Recovery Unit	Restaurant	65%	65%	0.1	4.5	1.6	0.2	10	65	8	9.63	0	21.83	12.61	24.27
1	5007	Hot Water Pipe Insulation	Restaurant	2%	2%	0.1	4.5	4.4	0.5	15	2	0	0.28	0	485.57	0.79	1.49
1	5008	Low Flow Faucet Aerators	Restaurant	7%	7%	0.0	4.7	4.4	0.5	10	2	0	0.27	0	109.20	2.52	4.85
1	5010	Low-flow pre-rinse spray valve	Restaurant	14%	14%	0.1	4.5	3.8	0.5	5	18	2	2.59	0	84.46	1.76	3.47
1	5011	Recirculation Pump Timer Clock - Controls for Central Domestic Hot Water	Restaurant	3%	3%	0.1	4.5	4.4	0.5	15	1	0	0.20	0	301.20	1.27	2.40
1	6000	Base Non-Refrigerated Vending Machines, Federal Standard	Restaurant	0%	0%	0.0	0.0	0.0	0.0	5	0	0	0.00	N/A	N/A	N/A	N/A
1	6001	Vending Misers (Non-Refrigerated)	Restaurant	51%	35%	0.0	0.0	0.0	0.0	5	0	0	0.00	0	1,927.86	0.11	0.23
1	6100	Base Refrigerated Vending Machines, Federal Standard	Restaurant	0%	0%	0.0	0.0	0.0	0.0	5	0	0	0.00	N/A	N/A	N/A	N/A
1	6101	Vending Misers (Refrigerated glass-front units)	Restaurant	33%	23%	0.0	0.0	0.0	0.0	5	0	0	0.00	0	465.89	0.44	0.96
1	6102	Vending Misers (Refrigerated units)	Restaurant	51%	35%	0.0	0.0	0.0	0.0	5	0	0	0.00	0	303.58	0.67	1.48
1	6200	Base Combi Oven	Restaurant	0%	0%	0.0	4.3	4.3	0.4	12	0	0	0.00	N/A	N/A	N/A	N/A
1	6201	Electric Combination Oven	Restaurant	54%	54%	0.1	5.2	2.4	0.2	12	30	3	5.28	0	52.15	8.66	16.50
1	6300	Base Convection Oven	Restaurant	0%	0%	0.0	2.2	2.2	0.2	12	0	0	0.00	N/A	N/A	N/A	N/A
1	6301	Energy Star Convection Oven	Restaurant	14%	14%	0.0	2.4	2.0	0.2	12	7	1	1.19	0	127.58	3.54	6.74
1	6400	Base Fryer	Restaurant	0%	0%	0.0	2.7	2.7	0.2	12	0	0	0.00	N/A	N/A	N/A	N/A
1	6401	Efficient Fryer	Restaurant	8%	8%	0.2	2.7	2.5	0.2	12	2	0	0.34	0	1,198.18	0.38	0.72
1	6500	Base Griddle	Restaurant	0%	0%	0.0	3.1	3.1	0.3	12	0	0	0.00	N/A	N/A	N/A	N/A
1	6501	Energy Star griddle	Restaurant	11%	11%	0.1	3.1	2.8	0.2	12	2	0	0.29	0	199.75	2.26	4.31
1	6600	Base Hot Food Holding Cabinet	Restaurant	0%	0%	0.0	2.2	2.2	0.2	12	0	0	0.00	N/A	N/A	N/A	N/A
1	6601	Energy Star hot food holding cabinet	Restaurant	70%	70%	0.3	2.5	0.8	0.1	12	33	3	5.86	0	188.73	2.39	4.56
1	6700	Base Steamer	Restaurant	0%	0%	0.0	2.3	2.3	0.2	12	0	0	0.00	N/A	N/A	N/A	N/A
1	6701	Efficient Steamer	Restaurant	79%	79%	0.7	2.9	0.6	0.1	12	14	1	2.44	0	328.65	1.37	2.62
1	7000	Base Electric Boiler, Federal Standard	Restaurant	0%	0%	0.0	12.0	12.0	7.8	20	0	0	0.00	N/A	N/A	N/A	N/A
1	7001	Ceiling/roof Insulation (electric boiler)	Restaurant	12%	12%	1.3	13.2	11.6	7.5	20	0	0	0.00	0	123.73	0.93	1.32
1	7002	Duct/Pipe Insulation (electric boiler)	Restaurant	2%	2%	0.3	12.0	11.8	7.6	20	0	0	0.00	0	187.25	0.61	0.87
1	7100	Base Electric Furnace, Federal Standard	Restaurant	0%	0%	0.0	12.0	12.0	7.8	15	0	0	0.00	N/A	N/A	N/A	N/A
1	7101	Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons, heating	Restaurant	60%	60%	0.3	12.6	5.1	3.3	15	3	2	0.00	0	5.84	16.25	22.93
1	7102	Ceiling/roof Insulation (base furnace)	Restaurant	12%	12%	1.3	13.2	11.6	7.5	20	0	0	0.00	0	123.73	0.93	1.32
1	7103	Duct/Pipe Insulation (base furnace)	Restaurant	2%	2%	0.3	12.0	11.8	7.6	20	0	0	0.00	0	187.25	0.61	0.87
1	7104	Smart Thermostat (Base Furnace Heating)	Restaurant	13%	8%	0.3	12.5	10.9	7.4	8	1	0	0.00	0	42.23	1.81	3.11
1	7200	Base Heating Air-Source Heat Pump, SEER 15.0/HSPF 8.8 w/Aux Strip Heat	Restaurant	0%	0%	0.0	5.0	5.0	3.2	15	0	0	0.00	N/A	N/A	N/A	N/A
1	7201	eat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons (base air-source heat pu	Restaurant	10%	10%	0.3	5.0	4.5	2.9	15	4	2	0.00	0	87.74	1.08	1.53
1	7202	Ceiling/roof Insulation (base air-source heat pump heating)	Restaurant	12%	12%	1.3	5.5	4.8	3.1	20	1	1	0.00	0	297.35	0.39	0.55
1	7203	Duct/Pipe Insulation (base air-source heat pump heating)	Restaurant	2%	2%	0.3	5.0	4.9	3.2	20	1	1	0.00	0	450.02	0.26	0.36

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Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test
1	7204	Smart Thermostat (Base Heat Pump Heating)	Restaurant	13%	8%	0.3	5.2	4.5	3.1	8	4	2	0.00	0	101.49	0.75	1.29
1	7300	ase Heating Packaged Heat Pump, IEER 13.9/COP 3.4 (w/ non-ER heating), 10 tor	Restaurant	0%	0%	0.0	3.4	3.4	2.2	15	0	0	0.00	N/A	N/A	N/A	N/A
1	7301	Packaged Heat Pump, heating, IEER 13.9/COP 3.4 (w/ non-ER heating), 10 tons	Restaurant	60%	60%	2.7	3.4	1.4	0.9	15	15	10	0.00	0	189.98	0.50	0.70
1	7302	Ceiling/roof Insulation (base packaged heat pump)	Restaurant	12%	12%	1.3	3.8	3.3	2.1	20	1	1	0.00	0	433.04	0.27	0.38
1	7303	Duct/Pipe Insulation (base packaged heat pump)	Restaurant	2%	2%	0.3	3.4	3.4	2.2	20	0	0	0.00	0	655.38	0.18	0.25
1	7304	Smart Thermostat (Base Rooftop/packaged heating)	Restaurant	13%	8%	0.3	3.6	3.1	2.1	8	2	1	0.00	0	147.81	0.52	0.89
1	7400	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	Restaurant	0%	0%	0.0	5.0	5.0	3.2	20	0	0	0.00	N/A	N/A	N/A	N/A
1	7401	Ceiling/roof Insulation (base ductless mini-split)	Restaurant	12%	12%	1.3	5.5	4.8	3.1	20	0	0	0.00	0	297.35	0.39	0.55
1	7403	Smart Thermostat (base packaged heat pump)	Restaurant	13%	8%	0.3	5.2	4.5	3.1	8	1	0	0.00	0	101.49	0.75	1.29
1	7800	Base Ventilation	Restaurant	0%	0%	0.0	10.5	10.5	1.3	20	0	0	0.00	N/A	N/A	N/A	N/A
1	7801	High Efficiency Motor	Restaurant	1%	1%	0.1	10.5	10.3	1.3	20	5	1	1.37	0	429.21	1.26	2.02
1	7803	Air Handler Optimization, 15 HP	Restaurant	10%	10%	0.0	10.3	9.3	1.1	8	49	6	13.52	0	27.60	9.22	15.77
1	7804	Demand Controlled Ventilation, 15 HP	Restaurant	33%	62%	2.4	10.3	6.9	0.5	15	148	34	97.12	0	289.29	1.20	1.32
1	7805	Energy Recovery Ventilation (ERV)	Restaurant	7%	7%	0.3	10.3	9.6	1.2	20	34	4	9.46	0	352.76	1.53	2.46
1	7806	Separate Makeup Air / Exhaust Hoods AC	Restaurant	25%	25%	1.5	10.3	7.8	0.9	15	98	12	27.04	0	452.44	0.97	1.57
1	8000	Base Compressed Air	Restaurant	0%	0%	0.0	0.0	0.0	0.0	13	0	0	0.00	N/A	N/A	N/A	N/A
1	8100	Base Process Heat	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	8200	Base Process Cooling	Restaurant	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
1	8300	Base Electrochemical process	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	8400	Base Process Other	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	9300	Base IndustrialMotors or Pumps	Restaurant	0%	0%	0.0	2.7	2.7	0.3	20	0	0	0.00	N/A	N/A	N/A	N/A
1	9301	High Efficiency Motor	Restaurant	1%	1%	0.0	2.8	2.7	0.3	20	0	0	0.01	0	421.70	1.11	2.02
1	9302	Variable Speed Drive Control, base motors	Restaurant	17%	14%	0.2	3.0	2.5	0.3	15	0	0	0.02	0	461.00	0.85	1.90
1	9900	Base Miscellaneous	Restaurant	0%	0%	0.0	2.7	2.7	0.3	10	0	0	0.00	N/A	N/A	N/A	N/A
3	1000	Base Linear Lighting, Fluorescent Fixture, 2L4'T12	Restaurant	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1050	Base Linear Lighting, Fluorescent Fixture, 2L4'T12, integrated market	Restaurant	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1100	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB	Restaurant	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1150	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB, integrated market	Restaurant	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1200	Base Linear Lighting, LED Tube, 2 lamp fixture	Restaurant	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1225	Base Linear Lighting, LED Tube, 2 lamp fixture, 2028 Standard	Restaurant	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1250	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market	Restaurant	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1275	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market, 2028 Standarc	Restaurant	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1300	Base General Service Screw-in, CFL	Restaurant	0%	0%	0.0	0.0	0.0	0.0	2	0	0	0.00	N/A	N/A	N/A	N/A
3	1350	Base General Service Screw-in, Incandescent/halogen	Restaurant	0%	0%	0.0	0.0	0.0	0.0	1	0	0	0.00	N/A	N/A	N/A	N/A
3	1400	Base General Service Screw-in, LED bulb	Restaurant	0%	0%	0.0	0.0	0.0	0.0	6	0	0	0.00	N/A	N/A	N/A	N/A
3	1425	Base General Service Screw-in, LED bulb, 2028 Standard	Restaurant	0%	0%	0.0	0.0	0.0	0.0	6	0	0	0.00	N/A	N/A	N/A	N/A
3	1450	Base HID Lighting (low bay)	Restaurant	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1500	Base High Bay Lighting, Fluorescent T5	Restaurant	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1525	Base High Bay Lighting, Fluorescent T5, integrated market	Restaurant	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1550	Base High Bay Lighting, HID lighting	Restaurant	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1575	Base High Bay Lighting, LED lighting	Restaurant	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1600	Base CFL Exit Sign	Restaurant	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1650	Base Area Lighting, Outdoor HID	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	1700	Base General Service Screw-in, Outdoor CFL	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	1750	Base General Service Screw-in, Outdoor Incandescent/Halogen	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	1800	Base General Service Screw-in, Outdoor LED bulb	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	1850	Base Linear Lighting, Outdoor Fluorescent Tube	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	1900	Base Linear Lighting, Outdoor LED Tube	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	2000	Base Water-Cooled Centrifugal Chiller, 0.58 kW/ton, 500 tons	Restaurant	0%	0%	0.0	0.0	0.0	0.0	23	0	0	0.00	N/A	N/A	N/A	N/A
3	2100	Base DX Packaged System, EER=10.3, 10 tons	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	2150	Base DX Packaged System, 2029 Standard	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	2200	Base Heat Pump cooling (14.3 SEER, 8.2 HSPF)	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	2300	Base Split-System AC, SEER 14.5, <5.4 tons	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	2400	Base PTAC cooling, EER=10.2, 1 ton	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	2500	Base Room AC, CEER 10.9	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	2600	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	3100	Base Open refrigerated/freezer cases	Restaurant	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
3	3200	Base Closed refrigerated/freezer cases	Restaurant	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
3	3300	Base Walk-in refrigeration/freezer units	Restaurant	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
3	3400	Base Large Cold Storage Area	Restaurant	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
3	3500	Base Reach-in Refrigerator/Freezer, Federal Standard	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	3600	Base Glass Door Reach-in Refrigerator/Freezer, Federal Standard	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	3700	Base Ice Maker, Federal Standard	Restaurant	0%	0%	0.0	0.0	0.0	0.0	10	0	0	0.00	N/A	N/A	N/A	N/A
3	3800	Base Residential-Type Refrigerator/Freezer, Federal Standard	Restaurant	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	3900	Base Compact Refrigerator, Federal Standard	Restaurant	0%	0%	0.0	0.0	0.0	0.0	14	0	0	0.00	N/A	N/A	N/A	N/A
3	4000	Base Computer Network Server	Restaurant	0%	0%	0.0	0.0	0.0	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
3	4100	Base Desktop PC	Restaurant	0%	0%	0.0	0.0	0.0	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
3	4200	Base Laptop PC	Restaurant	0%	0%	0.0	0.0	0.0	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
3	4300	Base Monitor, LCD	Restaurant	0%	0%	0.0	0.0	0.0	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
3	4400	Base Imaging	Restaurant	0%	0%	0.0	0.0	0.0	0.0	6	0	0	0.00	N/A	N/A	N/A	N/A

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test
3	5000	Base Water Heater, Resistance Heater, Standard Standby Wattage	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	6000	Base Non-Refrigerated Vending Machines, Federal Standard	Restaurant	0%	0%	0.0	0.0	0.0	0.0	5	0	0	0.00	N/A	N/A	N/A	N/A
3	6100	Base Refrigerated Vending Machines, Federal Standard	Restaurant	0%	0%	0.0	0.0	0.0	0.0	5	0	0	0.00	N/A	N/A	N/A	N/A
3	6200	Base Combi Oven	Restaurant	0%	0%	0.0	0.0	0.0	0.0	12	0	0	0.00	N/A	N/A	N/A	N/A
3	6300	Base Convection Oven	Restaurant	0%	0%	0.0	0.0	0.0	0.0	12	0	0	0.00	N/A	N/A	N/A	N/A
3	6400	Base Fryer	Restaurant	0%	0%	0.0	0.0	0.0	0.0	12	0	0	0.00	N/A	N/A	N/A	N/A
3	6500	Base Griddle	Restaurant	0%	0%	0.0	0.0	0.0	0.0	12	0	0	0.00	N/A	N/A	N/A	N/A
3	6600	Base Hot Food Holding Cabinet	Restaurant	0%	0%	0.0	0.0	0.0	0.0	12	0	0	0.00	N/A	N/A	N/A	N/A
3	6700	Base Steamer	Restaurant	0%	0%	0.0	0.0	0.0	0.0	12	0	0	0.00	N/A	N/A	N/A	N/A
3	7000	Base Electric Boiler, Federal Standard	Restaurant	0%	0%	0.0	0.0	0.0	0.0	20	0	0	0.00	N/A	N/A	N/A	N/A
3	7100	Base Electric Furnace, Federal Standard	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	7200	Base Heating Air-Source Heat Pump, SEER 15.0/HSPF 8.8 w/Aux Strip Heat	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	7300	ase Heating Packaged Heat Pump, IEER 13.9/COP 3.4 (w/ non-ER heating), 10 tor	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	7400	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	Restaurant	0%	0%	0.0	0.0	0.0	0.0	20	0	0	0.00	N/A	N/A	N/A	N/A
3	7800	Base Ventilation	Restaurant	0%	0%	0.0	0.0	0.0	0.0	20	0	0	0.00	N/A	N/A	N/A	N/A
3	8000	Base Compressed Air	Restaurant	0%	0%	0.0	0.0	0.0	0.0	13	0	0	0.00	N/A	N/A	N/A	N/A
3	8100	Base Process Heat	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	8200	Base Process Cooling	Restaurant	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
3	8300	Base Electrochemical process	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	8400	Base Process Other	Restaurant	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	9300	Base IndustrialMotors or Pumps	Restaurant	0%	0%	0.0	0.0	0.0	0.0	20	0	0	0.00	N/A	N/A	N/A	N/A
3	9900	Base Miscellaneous	Restaurant	0%	0%	0.0	0.0	0.0	0.0	10	0	0	0.00	N/A	N/A	N/A	N/A
1	1000	Base Linear Lighting, Fluorescent Fixture, 2L4'T12	Retail	0%	0%	0.0	3.0	3.0	0.8	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1001	High Performance Lighting R/R - Combined Strategies (Base T12)	Retail	82%	62%	0.2	2.5	0.5	0.3	15	9	2	1.46	0	46.16	5.47	9.33
1	1002	ROB 2L4' LED Tube (Base T12)	Retail	49%	56%	0.1	2.5	1.3	0.3	12	5	2	1.33	0	25.60	6.48	9.47
1	1003	LED Troffer (Base T12)	Retail	61%	69%	0.7	2.5	1.0	0.2	12	3	1	0.70	0	136.12	1.22	1.78
1	1004	LED Troffer with lamp removal (T12)	Retail	79%	89%	0.5	2.5	0.5	0.1	18	4	1	0.90	0	77.02	2.94	4.22
1	1005	Lighting Control Tuneup (Base T12)	Retail	6%	3%	0.0	2.5	2.4	0.6	6	1	0	0.05	0	81.96	2.11	4.36
1	1006	Network Lighting Controls (Base T12)	Retail	44%	19%	1.8	2.6	1.5	0.6	9	1	0	0.09	0	1,318.24	0.19	0.38
1	1007	Occupancy Sensor (Base T12)	Retail	25%	5%	0.3	2.6	2.0	0.7	10	0	0	0.02	0	884.46	0.56	1.32
1	1050	Base Linear Lighting, Fluorescent Fixture, 2L4'T12, integrated market	Retail	0%	0%	0.0	3.0	3.0	0.8	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1051	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	Retail	75%	53%	0.8	2.5	0.6	0.3	18	23	4	3.55	0	217.60	1.39	2.43
1	1100	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB	Retail	0%	0%	0.0	2.6	2.6	0.7	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1101	High Performance Lighting R/R - Combined Strategies (Base T8)	Retail	76%	57%	0.2	2.3	0.6	0.3	15	6	1	0.99	0	53.21	4.75	8.10
1	1102	ROB 2L4' LED Tube (Base T8)	Retail	37%	42%	0.1	2.3	1.5	0.4	12	3	1	0.72	0	36.74	4.52	6.60
1	1103	LED Troffer (Base T8)	Retail	52%	59%	0.7	2.3	1.1	0.3	12	2	1	0.44	0	169.80	0.98	1.43
1	1104	LED Troffer with lamp removal (T8)	Retail	75%	85%	0.5	2.3	0.6	0.1	18	2	1	0.63	0	86.63	2.62	3.75
1	1105	Lighting Control Tuneup (Base T8)	Retail	6%	3%	0.0	2.3	2.2	0.6	6	0	0	0.04	0	87.63	1.97	4.08
1	1106	Network Lighting Controls (Base T8)	Retail	44%	19%	1.8	2.4	1.4	0.5	9	1	0	0.06	0	1,409.49	0.17	0.36
1	1107	Occupancy Sensor (Base T8)	Retail	25%	5%	0.3	2.4	1.8	0.6	10	0	0	0.02	0	945.69	0.53	1.24
1	1150	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB, integrated market	Retail	0%	0%	0.0	2.6	2.6	0.7	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1151	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	Retail	68%	47%	0.8	2.3	0.8	0.3	18	15	3	2.33	0	258.51	1.17	2.05
1	1200	Base Linear Lighting, LED Tube, 2 lamp fixture	Retail	0%	0%	0.0	1.4	1.4	0.4	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1201	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	Retail	42%	32%	0.2	1.4	0.8	0.3	15	19	4	3.22	0	160.07	1.58	2.69
1	1202	Lighting Control Tuneup (Base LED Tube)	Retail	6%	3%	0.0	1.4	1.3	0.4	6	1	0	0.08	0	147.52	1.17	2.42
1	1203	Network Lighting Controls (Base LED Tube)	Retail	44%	19%	1.8	1.4	0.8	0.3	9	1	0	0.13	0	2,372.83	0.10	0.21
1	1204	Occupancy Sensor (Base LED tube)	Retail	25%	5%	0.3	1.4	1.1	0.4	10	1	0	0.03	0	1,592.02	0.31	0.74
1	1225	Base Linear Lighting, LED Tube, 2 lamp fixture, 2028 Standard	Retail	0%	0%	0.0	1.2	1.2	0.3	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1226	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	Retail	42%	32%	0.2	1.2	0.7	0.2	15	28	6	4.72	0	181.90	1.39	2.37
1	1227	Lighting Control Tuneup (Base LED Tube)	Retail	6%	3%	0.0	1.2	1.2	0.3	6	1	0	0.12	0	167.64	1.03	2.13
1	1228	Network Lighting Controls (Base LED Tube)	Retail	44%	19%	1.8	1.3	0.7	0.3	9	2	0	0.19	0	2,696.39	0.09	0.19
1	1229	Occupancy Sensor (Base LED tube)	Retail	25%	5%	0.3	1.3	1.0	0.3	10	1	0	0.05	0	1,809.12	0.28	0.65
1	1250	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market	Retail	0%	0%	0.0	1.4	1.4	0.4	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1251	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	Retail	22%	15%	0.8	1.4	1.1	0.3	18	10	2	1.51	0	1,370.86	0.22	0.39
1	1275	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market, 2028 Standarc	Retail	0%	0%	0.0	1.2	1.2	0.3	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1276	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	Retail	22%	15%	0.8	1.2	1.0	0.3	18	14	3	2.21	0	1,557.79	0.19	0.34
1	1300	Base General Service Screw-in, CFL	Retail	0%	0%	0.0	1.3	1.3	0.3	2	0	0	0.00	N/A	N/A	N/A	N/A
1	1301	LED screw-in replacement (base CFL)	Retail	29%	33%	0.1	1.3	0.9	0.2	6	3	1	0.71	0	79.90	1.13	1.71
1	1350	Base General Service Screw-in, Incandescent/halogen	Retail	0%	0%	0.0	3.7	3.7	1.0	1	0	0	0.00	N/A	N/A	N/A	N/A
1	1351	LED screw-in replacement (base incandescent/halogen)	Retail	73%	83%	0.1	3.7	1.0	0.2	6	50	15	12.60	0	10.85	8.28	12.59
1	1400	Base General Service Screw-in, LED bulb	Retail	0%	0%	0.0	0.8	0.8	0.2	6	0	0	0.00	N/A	N/A	N/A	N/A
1	1401	LED screw-in replacement (base LED)	Retail	10%	11%	0.1	0.9	0.8	0.2	6	2	1	0.51	0	342.11	0.26	0.40
1	1425	Base General Service Screw-in, LED bulb, 2028 Standard	Retail	0%	0%	0.0	0.7	0.7	0.2	6	0	0	0.00	N/A	N/A	N/A	N/A
1	1426	LED screw-in replacement (base LED)	Retail	2%	2%	0.1	0.7	0.7	0.2	6	0	0	0.12	1	2,171.05	0.04	0.06
1	1450	Base HID Lighting (low bay)	Retail	0%	0%	0.0	6.1	6.1	1.6	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1500	Base High Bay Lighting, Fluorescent T5	Retail	0%	0%	0.0	6.6	6.6	1.8	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1501	High Performance Lighting R/R - Combined Strategies (Base T5)	Retail	73%	55%	0.4	6.6	1.8	0.8	15	44	9	7.31	0	39.44	6.40	10.93
1	1502	ROB 2L4' LED Tube (Base T5)	Retail	39%	44%	0.3	6.6	4.0	1.0	12	23	7	5.89	0	32.64	5.08	7.43
1	1503	High Bay LED Troffer (Base T5)	Retail	47%	54%	0.6	6.6	3.5	0.8	12	29	9	7.20	0	58.46	2.84	4.15
1	1504	Lighting Control Tuneup (Base T5)	Retail	6%	3%	0.0	6.6	6.2	1.7	6	1	0	0.11	0	31.04	5.56	11.51

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test
1	1505	Network Lighting Controls (Base T5)	Retail	44%	19%	1.8	6.8	3.8	1.5	9	2	0	0.17	0	499.26	0.49	1.01
1	1506	Occupancy Sensor (Base T5)	Retail	25%	5%	0.3	6.9	5.2	1.7	10	1	0	0.04	0	334.98	1.49	3.50
1	1525	Base High Bay Lighting, Fluorescent T5, integrated market	Retail	0%	0%	0.0	6.6	6.6	1.8	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1526	High Bay Bi-Level Programmed LED Fixture	Retail	63%	47%	0.5	6.6	2.5	0.9	18	38	8	6.34	0	57.29	5.03	8.54
1	1550	Base High Bay Lighting, HID lighting	Retail	0%	0%	0.0	7.6	7.6	2.0	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1551	High Bay Bi-Level Programmed LED Fixture	Retail	63%	47%	0.5	7.7	2.9	1.1	18	4	1	0.74	0	49.19	5.86	9.94
1	1552	High Performance Lighting R/R - Combined Strategies (base high bay HID)	Retail	73%	55%	0.4	7.6	2.1	0.9	15	5	1	0.86	0	34.04	7.42	12.66
1	1575	Base High Bay Lighting, LED lighting	Retail	0%	0%	0.0	2.6	2.6	0.7	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1600	Base CFL Exit Sign	Retail	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1601	LED Exit Sign	Retail	55%	55%	0.0	0.0	0.0	0.0	15	2	0	0.40	0	100.10	2.13	3.24
1	1650	Base Area Lighting, Outdoor HID	Retail	0%	0%	0.0	3.1	3.1	0.5	15	0	0	0.00	N/A	N/A	N/A	N/A
1	1651	LED Outdoor Area Lighting (Base Outdoor HID)	Retail	68%	68%	0.3	3.1	1.0	0.1	18	38	6	2.00	0	99.04	3.31	6.85
1	1652	LED outdoor lighting with bi-level controls (Base Outdoor HID)	Retail	80%	80%	0.4	3.1	0.6	0.1	18	45	7	2.35	0	93.48	3.51	7.25
1	1653	Outdoor Lighting Controls (Base Outdoor HID)	Retail	16%	73%	0.4	3.5	2.9	0.1	18	3	2	0.79	0	99.13	1.32	1.54
1	1700	Base General Service Screw-in, Outdoor CFL	Retail	0%	0%	0.0	0.2	0.2	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	1701	LED outdoor lighting with bi-level controls (Base Outdoor CFL)	Retail	57%	57%	0.4	0.2	0.1	0.0	18	1	0	0.05	0	1,822.29	0.18	0.37
1	1702	LED screw-in replacement (base Outdoor CFL)	Retail	30%	30%	0.0	0.2	0.2	0.0	7	0	0	0.03	0	198.71	0.78	1.64
1	1703	Outdoor Lighting Controls (Base Outdoor CFL)	Retail	16%	73%	0.4	0.3	0.2	0.0	18	0	0	0.02	1	1,376.87	0.10	0.11
1	1750	Base General Service Screw-in, Outdoor Incandescent/Halogen	Retail	0%	0%	0.0	0.7	0.7	0.1	15	0	0	0.00	N/A	N/A	N/A	N/A
1	1751	LED outdoor lighting with bi-level controls (Base Outdoor Incandescent)	Retail	85%	85%	0.4	0.2	0.0	0.0	18	6	1	0.30	0	1,189.73	0.28	0.57
1	1752	LED screw-in replacement (base Outdoor Incandescent)	Retail	75%	75%	0.0	0.2	0.1	0.0	7	5	1	0.26	0	77.39	2.00	4.21
1	1753	Outdoor Lighting Controls (Base Outdoor Incandescent)	Retail	16%	73%	0.4	0.3	0.2	0.0	18	0	0	0.10	1	1,340.50	0.10	0.11
1	1800	Base General Service Screw-in, Outdoor LED bulb	Retail	0%	0%	0.0	0.1	0.1	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	1801	Outdoor Lighting Controls (Base Outdoor LED)	Retail	16%	73%	0.4	0.2	0.1	0.0	18	1	1	0.20	1	2,065.30	0.06	0.07
1	1850	Base Linear Lighting, Outdoor Fluorescent Tube	Retail	0%	0%	0.0	0.4	0.4	0.1	15	0	0	0.00	N/A	N/A	N/A	N/A
1	1851	ROB 2L4' LED Tube (base outdoor fluorescent)	Retail	40%	40%	0.0	0.4	0.2	0.0	15	6	1	0.33	0	200.43	1.44	2.98
1	1852	LED outdoor lighting with bi-level controls (Base Outdoor Fluorescent)	Retail	63%	63%	0.4	0.4	0.1	0.0	18	10	1	0.53	0	1,017.58	0.32	0.67
1	1853	Outdoor Lighting Controls (Base Outdoor Fluorescent)	Retail	16%	73%	0.4	0.4	0.3	0.0	18	1	1	0.22	1	849.79	0.15	0.18
1	1900	Base Linear Lighting, Outdoor LED Tube	Retail	0%	0%	0.0	0.2	0.2	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	1901	Outdoor Lighting Controls (Base Outdoor LED Tube)	Retail	16%	73%	0.4	0.3	0.2	0.0	18	0	0	0.04	1	1,239.18	0.11	0.12
1	2000	Base Water-Cooled Centrifugal Chiller, 0.58 kW/ton, 500 tons	Retail	0%	0%	0.0	1.9	1.9	0.0	23	0	0	0.00	N/A	N/A	N/A	N/A
1	2001	Centrifugal Chiller, 0.54 kW/ton, 500 tons	Retail	12%	12%	0.2	2.0	1.7	0.0	23	0	0	0.51	0	N/A	2.23	1.77
1	2002	Chiller Tune Up/Diagnostics	Retail	9%	7%	0.1	2.1	1.9	0.0	5	0	0	0.03	0	N/A	0.87	1.37
1	2005	Ceiling/roof Insulation - Chiller	Retail	12%	12%	1.3	2.1	1.8	0.0	20	0	0	0.12	1	N/A	0.25	0.20
1	2007	Duct Testing/Sealing - Chiller	Retail	21%	25%	0.3	1.9	1.5	0.0	18	1	0	0.08	0	N/A	0.55	1.27
1	2009	EMS Optimization - Chiller	Retail	6%	6%	0.0	2.0	1.9	0.0	5	0	0	0.00	0	N/A	0.83	2.21
1	2010	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - Chiller	Retail	6%	6%	0.4	1.5	1.5	0.0	10	0	0	0.00	0	N/A	0.06	0.16
1	2012	Window Film (Standard) - Chiller	Retail	13%	23%	0.1	1.9	1.7	0.0	10	0	0	0.17	0	N/A	1.16	1.55
1	2013	High Efficiency Windows - Chiller	Retail	14%	25%	0.1	2.0	1.7	0.0	20	0	0	0.13	0	N/A	3.42	4.19
1	2100	Base DX Packaged System, EER=10.3, 10 tons	Retail	0%	0%	0.0	3.2	3.2	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2101	DX Packaged System, EER=10.9, 10 tons	Retail	6%	6%	0.2	3.2	3.0	0.0	15	18	0	23.55	0	N/A	1.28	1.08
1	2102	DX Packaged System, EER=13.4, 10 tons	Retail	23%	23%	0.2	3.2	2.5	0.0	15	71	0	90.29	0	N/A	3.63	3.04
1	2103	Geothermal Heat Pump, EER=13, 10 tons - DX	Retail	21%	21%	2.4	3.2	2.6	0.0	15	3	0	4.09	0	N/A	0.31	0.26
1	2104	DX Tune Up/ Advanced Diagnostics	Retail	6%	5%	0.1	3.4	3.2	0.0	10	2	0	1.05	0	N/A	0.88	1.27
1	2105	Refrigerant Charge Adjustment - DX	Retail	10%	10%	0.5	3.5	3.2	0.0	10	3	0	4.39	0	N/A	0.59	0.53
1	2106	Ceiling/roof Insulation - DX	Retail	12%	12%	1.3	3.5	3.1	0.0	20	15	0	18.70	0	N/A	0.43	0.35
1	2107	Cool Roof - DX	Retail	13%	13%	0.2	3.4	2.9	0.0	10	14	0	17.50	0	N/A	1.46	1.31
1	2108	Duct Testing/Sealing - DX	Retail	22%	26%	0.3	3.2	2.5	0.0	18	22	0	1.79	0	N/A	0.98	2.28
1	2109	Duct/Pipe Insulation - DX	Retail	2%	2%	0.8	3.3	3.2	0.0	10	2	0	2.88	1	N/A	0.06	0.06
1	2110	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	Retail	5%	5%	0.1	3.3	3.1	0.0	10	0	0	0.00	0	N/A	0.33	0.88
1	2111	Economizer Repair - DX	Retail	33%	16%	0.2	3.6	2.4	0.0	5	59	0	93.48	0	N/A	2.01	1.83
1	2113	Optimize Controls - DX	Retail	6%	4%	0.0	3.4	3.2	0.0	5	6	0	1.69	0	N/A	1.87	3.77
1	2114	Smart Thermostat - DX	Retail	12%	8%	0.3	3.3	2.9	0.0	8	34	0	9.05	0	N/A	0.39	0.77
1	2115	Window Film (Standard) - DX	Retail	2%	4%	0.1	3.2	3.2	0.0	10	3	0	1.69	0	N/A	0.30	0.40
1	2116	High Efficiency Windows - DX	Retail	14%	14%	0.1	3.9	3.3	0.0	20	15	0	19.67	0	N/A	10.21	8.28
1	2150	Base DX Packaged System, 2029 Standard	Retail	0%	0%	0.0	3.2	3.2	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2152	DX Packaged System, EER=13.4, 10 tons	Retail	14%	14%	0.2	2.9	2.5	0.0	15	40	0	51.03	0	N/A	2.05	1.72
1	2153	Geothermal Heat Pump, EER=13, 10 tons - DX	Retail	12%	12%	2.4	2.9	2.6	0.0	15	2	0	2.14	1	N/A	0.16	0.14
1	2154	DX Tune Up/ Advanced Diagnostics	Retail	6%	5%	0.1	3.4	3.2	0.0	10	2	0	1.05	0	N/A	0.88	1.27
1	2155	Refrigerant Charge Adjustment - DX	Retail	10%	10%	0.5	3.5	3.2	0.0	10	3	0	4.39	0	N/A	0.59	0.53
1	2156	Ceiling/roof Insulation - DX	Retail	12%	12%	1.3	3.5	3.1	0.0	20	15	0	18.70	0	N/A	0.43	0.35
1	2157	Cool Roof - DX	Retail	13%	13%	0.2	3.4	2.9	0.0	10	14	0	17.50	0	N/A	1.46	1.31
1	2158	Duct Testing/Sealing - DX	Retail	22%	26%	0.3	3.2	2.5	0.0	18	22	0	1.79	0	N/A	0.98	2.28
1	2159	Duct/Pipe Insulation - DX	Retail	2%	2%	0.8	3.3	3.2	0.0	10	2	0	2.88	1	N/A	0.06	0.06
1	2160	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	Retail	5%	5%	0.1	3.3	3.1	0.0	10	0	0	0.00	0	N/A	0.33	0.88
1	2161	Economizer Repair - DX	Retail	33%	16%	0.2	3.6	2.4	0.0	5	59	0	93.48	0	N/A	2.01	1.83
1	2163	Optimize Controls - DX	Retail	6%	4%	0.0	3.4	3.2	0.0	5	6	0	1.69	0	N/A	1.87	3.77
1	2164	Smart Thermostat - DX	Retail	12%	8%	0.3	3.3	2.9	0.0	8	34	0	9.05	0	N/A	0.39	0.77
1	2165	Window Film (Standard) - DX	Retail	2%	4%	0.1	3.2	3.2	0.0	10	3	0	1.69	0	N/A	0.30	0.40
1	2166	High Efficiency Windows - DX	Retail	14%	14%	0.1	3.9	3.3	0.0	20	15	0	19.67	0	N/A	10.21	8.28

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test
1	2200	Base Heat Pump cooling (14.3 SEER, 8.2 HSPF)	Retail	0%	0%	0.0	2.9	2.9	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2201	Heat Pump Upgrade (18 SEER, 8.2 HSPF), cooling	Retail	14%	14%	0.3	2.9	2.5	0.0	15	11	0	14.48	0	N/A	1.74	1.46
1	2202	Mini-Split Heat Pump (Base Heat Pump Cooling)	Retail	10%	10%	0.8	2.9	2.6	0.0	15	3	0	3.67	0	N/A	0.39	0.33
1	2203	Ceiling/roof Insulation (Base Heat Pump Cooling)	Retail	12%	12%	1.3	3.1	2.8	0.0	20	4	0	5.30	0	N/A	0.38	0.31
1	2204	Duct/Pipe Insulation (Base Heat Pump Cooling)	Retail	2%	2%	0.8	2.9	2.9	0.0	10	1	0	0.82	1	N/A	0.06	0.05
1	2205	Smart Thermostat (Base Heat Pump Cooling)	Retail	12%	8%	0.3	2.9	2.6	0.0	8	10	0	2.56	0	N/A	0.35	0.69
1	2206	Window Film (Standard) (Base Heat Pump Cooling)	Retail	2%	4%	0.1	2.9	2.8	0.0	10	1	0	0.48	0	N/A	0.27	0.36
1	2207	High Efficiency Windows (Base Heat Pump Cooling)	Retail	14%	14%	0.1	3.1	2.6	0.0	20	4	0	4.90	0	N/A	8.05	6.52
1	2300	Base Split-System AC, SEER 14.5, <5.4 tons	Retail	0%	0%	0.0	2.6	2.6	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2301	Split System Air Conditioner, SEER 16.0 ENERGY STAR, <5.4 tons	Retail	10%	10%	0.4	2.7	2.4	0.0	15	4	0	5.04	0	N/A	0.66	0.55
1	2302	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Residential Split-System	Retail	20%	20%	0.8	2.6	2.1	0.0	15	9	0	11.81	0	N/A	0.72	0.60
1	2303	Ceiling/roof Insulation (Base Residential Split-System)	Retail	12%	12%	1.3	2.9	2.5	0.0	20	2	0	2.81	0	N/A	0.35	0.28
1	2304	Duct/Pipe Insulation (Base Residential Split-System)	Retail	2%	2%	0.8	2.7	2.6	0.0	10	0	0	0.43	1	N/A	0.05	0.05
1	2305	Smart Thermostat (Base Residential Split-System)	Retail	12%	8%	0.3	2.7	2.4	0.0	8	5	0	1.36	0	N/A	0.32	0.63
1	2306	Window Film (Standard) (Base Residential Split-System)	Retail	13%	23%	0.1	2.7	2.4	0.0	10	3	0	1.67	0	N/A	1.62	2.16
1	2400	Base PTAC cooling, EER=10.2, 1 ton	Retail	0%	0%	0.0	3.5	3.5	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2401	HE PTAC, EER=9.6, 1 ton, cooling	Retail	14%	14%	0.4	3.5	3.0	0.0	15	1	0	0.78	0	N/A	1.51	1.26
1	2402	Ceiling/roof Insulation (Base PTAC)	Retail	12%	12%	1.3	3.8	3.3	0.0	20	0	0	0.27	0	N/A	0.46	0.37
1	2405	Window Film (Standard) (Base PTAC)	Retail	2%	4%	0.1	3.5	3.4	0.0	10	0	0	0.02	0	N/A	0.32	0.43
1	2500	Base Room AC, CEER 10.9	Retail	0%	0%	0.0	1.5	1.5	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2501	Room AC, CEER 12.0 ENERGY STAR	Retail	2%	2%	0.2	1.5	1.4	0.0	15	0	0	0.12	1	N/A	0.14	0.11
1	2502	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Room AC)	Retail	30%	30%	0.3	1.5	1.0	0.0	15	2	0	2.05	0	N/A	1.78	1.49
1	2503	Ceiling/roof Insulation (Base Room AC)	Retail	12%	12%	1.3	1.6	1.4	0.0	20	0	0	0.33	1	N/A	0.19	0.16
1	2505	Window Film (Standard) (Base Room AC)	Retail	13%	23%	0.1	1.5	1.3	0.0	10	0	0	0.19	0	N/A	0.89	1.19
1	2506	High Efficiency Windows (Base Room AC)	Retail	5%	9%	0.1	1.5	1.4	0.0	20	0	0	0.05	0	N/A	0.90	1.10
1	2600	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	Retail	0%	0%	0.0	2.3	2.3	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2601	Ceiling/roof Insulation (Base Ductless Mini-split)	Retail	12%	12%	1.3	2.5	2.2	0.0	20	0	0	0.58	0	N/A	0.31	0.25
1	2603	Window Film (Standard) (Base Ductless Mini-split)	Retail	13%	23%	0.1	2.4	2.1	0.0	10	1	0	0.34	0	N/A	1.42	1.89
1	2604	High Efficiency Windows (Base Ductless Mini-split)	Retail	14%	25%	0.1	2.5	2.1	0.0	20	0	0	0.27	0	N/A	4.16	5.11
1	3100	Base Open refrigerated/freezer cases	Retail	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
1	3102	Bi-level LED Case Lighting (self-contained units), open cases	Retail	11%	11%	0.0	0.0	0.0	0.0	8	0	0	0.00	0	156.87	1.56	3.13
1	3103	Compressor VSD retrofit, open cases	Retail	7%	6%	0.0	0.0	0.0	0.0	13	0	0	0.00	0	360.44	1.08	2.37
1	3104	Demand Defrost Electric, open cases	Retail	8%	8%	0.0	0.0	0.0	0.0	10	0	0	0.00	0	861.53	0.34	0.68
1	3105	Demand Hot Gas Defrost, open cases	Retail	3%	3%	0.0	0.0	0.0	0.0	10	0	0	0.00	0	2,161.67	0.14	0.27
1	3106	Electronically commutated evaporator fan motor, open cases	Retail	27%	16%	0.0	0.1	0.0	0.0	15	0	0	0.00	0	352.26	1.72	3.74
1	3107	High-efficiency fan motors, open cases	Retail	4%	4%	0.0	0.0	0.0	0.0	15	0	0	0.00	0	562.89	0.73	1.43
1	3108	Insulated suction lines, open cases	Retail	0%	0%	0.0	0.0	0.0	0.0	11	0	0	0.00	0	3,191.58	0.10	0.20
1	3109	LED Display Lighting, open cases	Retail	7%	7%	0.0	0.0	0.0	0.0	8	0	0	0.00	0	203.16	1.20	2.41
1	3111	Night covers for display cases, open cases	Retail	11%	0%	0.0	0.0	0.0	0.0	5	0	0	0.00	0	N/A	0.65	1.73
1	3112	Oversized Air Cooled Condenser, open cases	Retail	8%	8%	0.0	0.0	0.0	0.0	16	0	0	0.00	0	216.59	1.99	3.88
1	3113	Refrigeration Coil Cleaning, open cases	Retail	23%	23%	0.0	0.1	0.0	0.0	5	0	0	0.01	0	139.24	1.15	2.34
1	3114	Refrigeration Commissioning, open cases	Retail	3%	3%	0.0	0.0	0.0	0.0	3	0	0	0.00	0	233.17	0.44	0.87
1	3200	Base Closed refrigerated/freezer cases	Retail	0%	0%	0.0	0.7	0.7	0.1	16	0	0	0.00	N/A	N/A	N/A	N/A
1	3202	Energy-Star Refrigerator/Freezer, base closed cases	Retail	10%	10%	0.0	0.7	0.6	0.1	12	1	0	0.11	0	320.24	1.08	2.12
1	3204	Bi-level LED Case Lighting (self-contained units), base closed cases	Retail	11%	11%	0.0	0.7	0.6	0.1	8	1	0	0.08	0	144.19	1.69	3.40
1	3205	Compressor VSD retrofit, base closed cases	Retail	7%	6%	0.0	0.7	0.6	0.1	13	1	0	0.05	0	331.31	1.18	2.57
1	3206	Demand Defrost Electric, base closed cases	Retail	8%	8%	0.1	0.7	0.7	0.1	10	0	0	0.03	0	791.92	0.37	0.74
1	3207	Demand Hot Gas Defrost, base closed cases	Retail	3%	3%	0.0	0.7	0.7	0.1	10	0	0	0.04	0	1,987.00	0.15	0.30
1	3208	Electronically commutated evaporator fan motor, base closed cases	Retail	23%	14%	0.0	0.8	0.6	0.1	15	1	0	0.10	0	377.00	1.60	3.49
1	3209	Freezer-Cooler Replacement Gaskets, base closed cases	Retail	7%	7%	0.0	0.7	0.6	0.1	4	0	0	0.06	0	45.03	2.91	5.91
1	3210	High R-Value Glass Doors, base closed cases	Retail	2%	2%	0.0	0.7	0.7	0.1	10	0	0	0.03	0	2,407.67	0.12	0.24
1	3211	High-efficiency fan motors, base closed cases	Retail	4%	4%	0.0	0.7	0.7	0.1	15	0	0	0.03	0	517.40	0.80	1.55
1	3212	Insulated suction lines, base closed cases	Retail	0%	0%	0.0	0.7	0.7	0.1	11	0	0	0.00	0	2,854.71	0.11	0.22
1	3213	LED Display Lighting, base closed cases	Retail	7%	7%	0.0	0.7	0.6	0.1	8	1	0	0.08	0	186.75	1.31	2.63
1	3214	Low or Anti-Sweat Door Film, base closed cases	Retail	5%	5%	0.0	0.7	0.6	0.1	10	0	0	0.06	0	110.39	2.68	5.34
1	3216	Oversized Air Cooled Condenser, base closed cases	Retail	8%	8%	0.0	0.7	0.6	0.1	16	1	0	0.07	0	199.09	2.17	4.22
1	3217	Refrigeration Coil Cleaning, base closed cases	Retail	23%	23%	0.0	0.8	0.6	0.1	5	2	0	0.22	0	127.99	1.25	2.55
1	3218	Refrigeration Commissioning, base closed cases	Retail	5%	5%	0.0	0.7	0.7	0.1	3	0	0	0.04	0	105.81	0.96	1.92
1	3300	Base Walk-in refrigeration/freezer units	Retail	0%	0%	0.0	0.3	0.3	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
1	3302	Auto-closer on main door to walk-in freezer	Retail	1%	1%	0.0	0.3	0.3	0.0	8	0	0	0.00	0	465.04	0.52	1.05
1	3303	Compressor VSD retrofit, walk-ins	Retail	7%	6%	0.0	0.3	0.3	0.0	13	0	0	0.02	0	138.63	2.82	6.15
1	3304	Demand Defrost Electric, walk-ins	Retail	8%	8%	0.0	0.3	0.3	0.0	10	0	0	0.01	0	331.37	0.89	1.78
1	3305	Demand Hot Gas Defrost, walk-ins	Retail	3%	3%	0.0	0.3	0.3	0.0	10	0	0	0.01	0	831.43	0.36	0.71
1	3306	Electronically commutated evaporator fan motor, walk-ins	Retail	23%	14%	0.0	0.4	0.3	0.0	15	0	0	0.04	0	157.75	3.83	8.35
1	3307	Evaporator fan controller for MT walk-ins	Retail	1%	1%	0.0	0.3	0.3	0.0	16	0	0	0.00	1	8,410.41	0.05	0.10
1	3309	Freezer-Cooler Replacement Gaskets, walk-ins	Retail	1%	1%	0.0	0.3	0.3	0.0	4	0	0	0.00	0	61.42	2.13	4.33
1	3310	High-efficiency fan motors, walk-ins	Retail	6%	6%	0.0	0.3	0.3	0.0	15	0	0	0.02	0	142.80	2.88	5.62
1	3311	Insulated suction lines, walk-ins	Retail	0%	0%	0.0	0.3	0.3	0.0	11	0	0	0.00	0	611.27	0.52	1.04
1	3313	Oversized Air Cooled Condenser, walk-ins	Retail	8%	8%	0.0	0.3	0.3	0.0	16	0	0	0.02	0	166.61	2.59	5.05
1	3314	Refrigeration Coil Cleaning, walk-ins	Retail	23%	23%	0.0	0.4	0.3	0.0	5	1	0	0.07	0	93.72	1.71	3.48

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Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test
1	3315	Refrigeration Commissioning, walk-ins	Retail	3%	3%	0.0	0.3	0.3	0.0	3	0	0	0.01	0	89.68	1.13	2.27
1	3316	Strip curtains for walk-ins	Retail	4%	4%	0.0	0.3	0.3	0.0	4	0	0	0.01	0	98.53	1.33	2.70
1	3400	Base Large Cold Storage Area	Retail	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
1	3402	Auto-closer on main door to walk-in freezer, base large cold storage	Retail	1%	1%	0.0	0.0	0.0	0.0	8	0	0	0.00	0	465.04	0.52	1.05
1	3403	Compressor VSD retrofit, base large cold storage	Retail	7%	6%	0.0	0.0	0.0	0.0	13	0	0	0.00	0	138.63	2.82	6.15
1	3404	Electronically commutated evaporator fan motor, base large cold storage	Retail	23%	14%	0.0	0.0	0.0	0.0	15	0	0	0.00	0	157.75	3.83	8.35
1	3405	Evaporator fan controller for MT walk-ins, base large cold storage	Retail	1%	1%	0.0	0.0	0.0	0.0	16	0	0	0.00	1	8,410.41	0.05	0.10
1	3406	High-efficiency fan motors, base large cold storage	Retail	4%	4%	0.0	0.0	0.0	0.0	15	0	0	0.00	0	216.50	1.90	3.71
1	3407	Insulated suction lines, base large cold storage	Retail	0%	0%	0.0	0.0	0.0	0.0	11	0	0	0.00	1	13,522.83	0.02	0.05
1	3409	Oversized Air Cooled Condenser, base large cold storage	Retail	8%	8%	0.0	0.0	0.0	0.0	16	0	0	0.00	0	83.30	5.18	10.09
1	3410	Refrigeration Coil Cleaning, base large cold storage	Retail	23%	23%	0.0	0.0	0.0	0.0	5	0	0	0.00	0	70.29	2.28	4.63
1	3411	Refrigeration Commissioning, base large cold storage	Retail	5%	5%	0.0	0.0	0.0	0.0	3	0	0	0.00	0	44.27	2.30	4.60
1	3412	Strip curtains for walk-ins, base large cold storage	Retail	4%	4%	0.0	0.0	0.0	0.0	4	0	0	0.00	0	98.53	1.33	2.70
1	3500	Base Reach-in Refrigerator/Freezer, Federal Standard	Retail	0%	0%	0.0	7.2	7.2	0.8	15	0	0	0.00	N/A	N/A	N/A	N/A
1	3501	Energy Star solid door reach-in refrigerator/freezer	Retail	7%	7%	0.1	7.4	6.9	0.7	15	1	0	0.11	0	151.08	2.73	5.32
1	3502	Freezer-Cooler Replacement Gaskets, base reach-in	Retail	3%	3%	0.1	7.3	7.1	0.8	4	0	0	0.04	0	229.62	0.57	1.16
1	3503	Refrigeration Coil Cleaning, base base reach-in	Retail	2%	2%	0.1	7.3	7.1	0.8	5	0	0	0.03	0	468.36	0.34	0.70
1	3600	Base Glass Door Reach-in Refrigerator/Freezer, Federal Standard	Retail	0%	0%	0.0	2.2	2.2	0.2	15	0	0	0.00	N/A	N/A	N/A	N/A
1	3601	Energy Star glass door reach-in refrigerator/freezer	Retail	12%	12%	0.0	2.3	2.0	0.2	15	3	0	0.32	0	95.00	4.33	8.45
1	3602	Bi-level LED Case Lighting, base glass-door reach-in	Retail	11%	11%	0.1	2.3	2.1	0.2	8	2	0	0.22	0	186.46	1.31	2.63
1	3603	Freezer-Cooler Replacement Gaskets, base glass-door reach-in	Retail	3%	3%	0.0	2.2	2.1	0.2	4	1	0	0.07	0	126.78	1.03	2.10
1	3604	Refrigeration Coil Cleaning, base glass-door reach-in	Retail	2%	2%	0.0	2.2	2.2	0.2	5	0	0	0.05	0	258.59	0.62	1.26
1	3700	Base Ice Maker, Federal Standard	Retail	0%	0%	0.0	0.0	0.0	0.0	10	0	0	0.00	N/A	N/A	N/A	N/A
1	3701	Energy Star Ice Machines	Retail	10%	10%	0.0	0.0	0.0	0.0	10	0	0	0.00	0	311.71	0.95	1.89
1	3702	Refrigeration Coil Cleaning, base ice maker	Retail	10%	10%	0.0	0.0	0.0	0.0	5	0	0	0.00	0	65.12	2.46	5.00
1	3800	Base Residential-Type Refrigerator/Freezer, Federal Standard	Retail	0%	0%	0.0	0.1	0.1	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
1	3801	Energy Star refrigerator/freezer	Retail	10%	10%	0.0	0.1	0.1	0.0	18	0	0	0.05	0	1,020.84	0.46	0.89
1	3802	Refrigeration Coil Cleaning, residential-type refrigerator	Retail	10%	10%	0.0	0.1	0.1	0.0	5	0	0	0.05	0	557.11	0.29	0.58
1	3900	Base Compact Refrigerator, Federal Standard	Retail	0%	0%	0.0	0.0	0.0	0.0	14	0	0	0.00	N/A	N/A	N/A	N/A
1	3901	Energy Star Compact Refrigerator	Retail	10%	10%	0.0	0.0	0.0	0.0	14	0	0	0.03	0	669.02	0.58	1.14
1	3902	Refrigeration Coil Cleaning, compact refrigerator	Retail	10%	10%	0.0	0.0	0.0	0.0	5	0	0	0.02	0	1,559.91	0.10	0.21
1	4000	Base Computer Network Server	Retail	0%	0%	0.0	0.1	0.1	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
1	4001	Energy Star server	Retail	33%	23%	0.0	0.1	0.1	0.0	4	2	0	0.12	0	23.99	6.50	14.33
1	4100	Base Desktop PC	Retail	0%	0%	0.0	0.1	0.1	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
1	4101	Energy Star or Better PC	Retail	33%	33%	0.0	0.1	0.1	0.0	4	2	0	0.34	0	117.10	1.02	2.01
1	4200	Base Laptop PC	Retail	0%	0%	0.0	0.0	0.0	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
1	4201	Energy Star or Better Laptop	Retail	30%	30%	0.0	0.0	0.0	0.0	4	0	0	0.01	0	69.78	1.71	3.38
1	4300	Base Monitor, LCD	Retail	0%	0%	0.0	0.0	0.0	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
1	4301	Energy Star or Better Monitor - LCD	Retail	21%	21%	0.0	0.0	0.0	0.0	4	0	0	0.04	0	152.53	0.78	1.54
1	4303	Plug-load controls - Commercial Smart Strip (base monitor LCD)	Retail	11%	5%	0.0	0.0	0.0	0.0	10	0	0	0.00	1	9,755.48	0.05	0.12
1	4400	Base Imaging	Retail	0%	0%	0.0	0.0	0.0	0.0	6	0	0	0.00	N/A	N/A	N/A	N/A
1	4401	Energy Star or Better Imaging Equipment	Retail	21%	21%	0.0	0.0	0.0	0.0	6	0	0	0.01	0	69.11	2.50	4.91
1	5000	Base Water Heater, Resistance Heater, Standard Standby Wattage	Retail	0%	0%	0.0	0.6	0.6	0.1	15	0	0	0.00	N/A	N/A	N/A	N/A
1	5001	High Efficiency Water Heater (electric)	Retail	2%	2%	0.0	0.6	0.6	0.1	15	1	0	0.10	0	97.71	3.92	7.39
1	5002	Heat Pump Water Heater (air source)	Retail	20%	20%	0.0	0.6	0.5	0.1	10	8	1	1.16	0	224.80	1.22	2.36
1	5003	Tankless Water Heater	Retail	10%	10%	0.0	0.6	0.5	0.1	20	1	0	0.11	0	168.17	2.80	5.22
1	5004	Solar Water Heater	Retail	70%	70%	0.1	0.6	0.2	0.0	20	0	0	0.02	0	181.60	2.59	4.83
1	5005	Demand controlled circulating systems	Retail	5%	5%	0.3	0.6	0.6	0.1	15	2	0	0.22	1	7,046.22	0.05	0.10
1	5006	Heat Recovery Unit	Retail	65%	65%	0.1	0.6	0.2	0.0	10	3	0	0.47	0	165.61	1.66	3.20
1	5007	Hot Water Pipe Insulation	Retail	2%	2%	0.0	0.6	0.6	0.1	15	2	0	0.24	0	189.04	2.03	3.82
1	5008	Low Flow Faucet Aerators	Retail	31%	31%	0.0	0.8	0.5	0.1	10	8	1	1.20	0	39.12	7.04	13.54
1	5011	Recirculation Pump Timer Clock - Controls for Central Domestic Hot Water	Retail	3%	3%	0.0	0.6	0.6	0.1	15	1	0	0.09	0	1,194.47	0.32	0.60
1	6000	Base Non-Refrigerated Vending Machines, Federal Standard	Retail	0%	0%	0.0	0.0	0.0	0.0	5	0	0	0.00	N/A	N/A	N/A	N/A
1	6001	Vending Misers (Non-Refrigerated)	Retail	51%	35%	0.0	0.0	0.0	0.0	5	0	0	0.00	0	1,739.25	0.12	0.26
1	6100	Base Refrigerated Vending Machines, Federal Standard	Retail	0%	0%	0.0	0.0	0.0	0.0	5	0	0	0.00	N/A	N/A	N/A	N/A
1	6101	Vending Misers (Refrigerated glass-front units)	Retail	33%	23%	0.0	0.0	0.0	0.0	5	0	0	0.01	0	436.19	0.46	1.03
1	6102	Vending Misers (Refrigerated units)	Retail	51%	35%	0.0	0.0	0.0	0.0	5	0	0	0.01	0	273.88	0.74	1.64
1	6200	Base Combi Oven	Retail	0%	0%	0.0	0.8	0.8	0.1	12	0	0	0.00	N/A	N/A	N/A	N/A
1	6201	Electric Combination Oven	Retail	54%	54%	0.0	0.9	0.4	0.0	12	3	0	0.57	0	60.16	7.50	14.30
1	6300	Base Convection Oven	Retail	0%	0%	0.0	0.6	0.6	0.1	12	0	0	0.00	N/A	N/A	N/A	N/A
1	6301	Energy Star Convection Oven	Retail	14%	14%	0.0	0.6	0.5	0.0	12	2	0	0.30	0	133.82	3.37	6.43
1	6400	Base Fryer	Retail	0%	0%	0.0	0.4	0.4	0.0	12	0	0	0.00	N/A	N/A	N/A	N/A
1	6401	Efficient Fryer	Retail	8%	8%	0.0	0.4	0.3	0.0	12	0	0	0.02	0	1,217.66	0.37	0.71
1	6500	Base Griddle	Retail	0%	0%	0.0	0.6	0.6	0.1	12	0	0	0.00	N/A	N/A	N/A	N/A
1	6501	Energy Star griddle	Retail	11%	11%	0.0	0.6	0.5	0.0	12	0	0	0.04	0	199.75	2.26	4.31
1	6600	Base Hot Food Holding Cabinet	Retail	0%	0%	0.0	0.7	0.7	0.1	12	0	0	0.00	N/A	N/A	N/A	N/A
1	6601	Energy Star hot food holding cabinet	Retail	70%	70%	0.1	0.8	0.2	0.0	12	2	0	0.42	0	188.73	2.39	4.56
1	6700	Base Steamer	Retail	0%	0%	0.0	1.0	1.0	0.1	12	0	0	0.00	N/A	N/A	N/A	N/A
1	6701	Efficient Steamer	Retail	79%	79%	0.3	1.2	0.2	0.0	12	3	0	0.53	0	350.31	1.29	2.46
1	7000	Base Electric Boiler, Federal Standard	Retail	0%	0%	0.0	6.8	6.8	4.4	20	0	0	0.00	N/A	N/A	N/A	N/A

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Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test
1	7001	Ceiling/roof Insulation (electric boiler)	Retail	12%	12%	1.3	7.4	6.5	4.2	20	0	0	0.00	0	223.68	0.51	0.73
1	7002	Duct/Pipe Insulation (electric boiler)	Retail	2%	2%	0.8	6.8	6.7	4.3	20	0	0	0.00	1	829.76	0.14	0.20
1	7100	Base Electric Furnace, Federal Standard	Retail	0%	0%	0.0	6.8	6.8	4.4	15	0	0	0.00	N/A	N/A	N/A	N/A
1	7101	Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons, heating	Retail	60%	60%	0.3	7.1	2.9	1.8	15	3	2	0.00	0	10.35	9.17	12.94
1	7102	Ceiling/roof Insulation (base furnace)	Retail	12%	12%	1.3	7.4	6.5	4.2	20	0	0	0.00	0	223.68	0.51	0.73
1	7103	Duct/Pipe Insulation (base furnace)	Retail	2%	2%	0.8	6.8	6.7	4.3	20	0	0	0.00	1	829.76	0.14	0.20
1	7104	Smart Thermostat (Base Furnace Heating)	Retail	13%	8%	0.3	6.9	6.0	4.1	8	1	0	0.00	0	76.38	1.00	1.72
1	7200	Base Heating Air-Source Heat Pump, SEER 15.0/HSPF 8.8 w/Aux Strip Heat	Retail	0%	0%	0.0	2.8	2.8	1.8	15	0	0	0.00	N/A	N/A	N/A	N/A
1	7201	eat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons (base air-source heat pu	Retail	10%	10%	0.3	2.8	2.6	1.7	15	8	5	0.00	0	155.52	0.61	0.86
1	7202	Ceiling/roof Insulation (base air-source heat pump heating)	Retail	12%	12%	1.3	3.1	2.7	1.7	20	4	3	0.00	0	537.56	0.21	0.30
1	7203	Duct/Pipe Insulation (base air-source heat pump heating)	Retail	2%	2%	0.8	2.8	2.8	1.8	20	2	1	0.00	1	1,994.15	0.06	0.08
1	7204	Smart Thermostat (Base Heat Pump Heating)	Retail	13%	8%	0.3	2.9	2.5	1.7	8	10	4	0.00	0	183.57	0.42	0.72
1	7300	ase Heating Packaged Heat Pump, IEER 13.9/COP 3.4 (w/ non-ER heating), 10 tor	Retail	0%	0%	0.0	1.9	1.9	1.3	15	0	0	0.00	N/A	N/A	N/A	N/A
1	7301	Packaged Heat Pump, heating, IEER 13.9/COP 3.4 (w/ non-ER heating), 10 tons	Retail	60%	60%	2.7	1.9	0.8	0.5	15	8	5	0.00	0	336.75	0.28	0.40
1	7302	Ceiling/roof Insulation (base packaged heat pump)	Retail	12%	12%	1.3	2.1	1.8	1.2	20	1	0	0.00	1	782.87	0.15	0.21
1	7303	Duct/Pipe Insulation (base packaged heat pump)	Retail	2%	2%	0.8	1.9	1.9	1.2	20	0	0	0.00	2	2,904.16	0.04	0.06
1	7304	Smart Thermostat (Base Rooftop/packaged heating)	Retail	13%	8%	0.3	2.0	1.7	1.2	8	2	1	0.00	0	267.34	0.29	0.49
1	7400	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	Retail	0%	0%	0.0	2.8	2.8	1.8	20	0	0	0.00	N/A	N/A	N/A	N/A
1	7401	Ceiling/roof Insulation (base ductless mini-split)	Retail	12%	12%	1.3	3.1	2.7	1.7	20	1	0	0.00	0	537.56	0.21	0.30
1	7403	Smart Thermostat (base packaged heat pump)	Retail	13%	8%	0.3	2.9	2.5	1.7	8	1	1	0.00	0	183.57	0.42	0.72
1	7800	Base Ventilation	Retail	0%	0%	0.0	5.5	5.5	0.7	20	0	0	0.00	N/A	N/A	N/A	N/A
1	7801	High Efficiency Motor	Retail	1%	1%	0.0	5.5	5.5	0.7	20	6	1	1.77	0	512.54	1.06	1.69
1	7803	Air Handler Optimization, 15 HP	Retail	10%	10%	0.0	5.5	4.9	0.6	8	80	10	21.97	0	52.27	4.87	8.33
1	7804	Demand Controlled Ventilation, 15 HP	Retail	33%	62%	2.4	5.5	3.7	0.3	15	183	42	119.81	0	547.86	0.63	0.70
1	7805	Energy Recovery Ventilation (ERV)	Retail	7%	7%	0.2	5.5	5.1	0.6	20	56	7	15.38	0	422.12	1.28	2.05
1	8000	Base Compressed Air	Retail	0%	0%	0.0	0.0	0.0	0.0	13	0	0	0.00	N/A	N/A	N/A	N/A
1	8100	Base Process Heat	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	8200	Base Process Cooling	Retail	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
1	8300	Base Electrochemical process	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	8400	Base Process Other	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	9300	Base IndustrialMotors or Pumps	Retail	0%	0%	0.0	67.9	67.9	8.4	20	0	0	0.00	N/A	N/A	N/A	N/A
1	9301	High Efficiency Motor	Retail	1%	1%	0.4	68.0	67.3	8.3	20	3	0	0.56	0	504.61	0.93	1.69
1	9302	Variable Speed Drive Control, base motors	Retail	17%	14%	7.2	74.1	61.6	7.9	15	39	4	1.44	0	551.65	0.71	1.59
1	9900	Base Miscellaneous	Retail	0%	0%	0.0	2.3	2.3	0.3	10	0	0	0.00	N/A	N/A	N/A	N/A
3	1000	Base Linear Lighting, Fluorescent Fixture, 2L4'T12	Retail	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1050	Base Linear Lighting, Fluorescent Fixture, 2L4'T12, integrated market	Retail	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1100	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB	Retail	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1150	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB, integrated market	Retail	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1200	Base Linear Lighting, LED Tube, 2 lamp fixture	Retail	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1225	Base Linear Lighting, LED Tube, 2 lamp fixture, 2028 Standard	Retail	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1250	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market	Retail	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1275	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market, 2028 Standarc	Retail	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1300	Base General Service Screw-in, CFL	Retail	0%	0%	0.0	0.0	0.0	0.0	2	0	0	0.00	N/A	N/A	N/A	N/A
3	1350	Base General Service Screw-in, Incandescent/halogen	Retail	0%	0%	0.0	0.0	0.0	0.0	1	0	0	0.00	N/A	N/A	N/A	N/A
3	1400	Base General Service Screw-in, LED bulb	Retail	0%	0%	0.0	0.0	0.0	0.0	6	0	0	0.00	N/A	N/A	N/A	N/A
3	1425	Base General Service Screw-in, LED bulb, 2028 Standard	Retail	0%	0%	0.0	0.0	0.0	0.0	6	0	0	0.00	N/A	N/A	N/A	N/A
3	1450	Base HID Lighting (low bay)	Retail	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1500	Base High Bay Lighting, Fluorescent T5	Retail	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1525	Base High Bay Lighting, Fluorescent T5, integrated market	Retail	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1550	Base High Bay Lighting, HID lighting	Retail	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1575	Base High Bay Lighting, LED lighting	Retail	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1600	Base CFL Exit Sign	Retail	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1650	Base Area Lighting, Outdoor HID	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	1700	Base General Service Screw-in, Outdoor CFL	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	1750	Base General Service Screw-in, Outdoor Incandescent/Halogen	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	1800	Base General Service Screw-in, Outdoor LED bulb	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	1850	Base Linear Lighting, Outdoor Fluorescent Tube	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	1900	Base Linear Lighting, Outdoor LED Tube	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	2000	Base Water-Cooled Centrifugal Chiller, 0.58 kW/ton, 500 tons	Retail	0%	0%	0.0	0.0	0.0	0.0	23	0	0	0.00	N/A	N/A	N/A	N/A
3	2100	Base DX Packaged System, EER=10.3, 10 tons	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	2150	Base DX Packaged System, 2029 Standard	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	2200	Base Heat Pump cooling (14.3 SEER, 8.2 HSPF)	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	2300	Base Split-System AC, SEER 14.5, <5.4 tons	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	2400	Base PTAC cooling, EER=10.2, 1 ton	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	2500	Base Room AC, CEER 10.9	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	2600	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	3100	Base Open refrigerated/freezer cases	Retail	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
3	3200	Base Closed refrigerated/freezer cases	Retail	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
3	3300	Base Walk-in refrigeration/freezer units	Retail	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
3	3400	Base Large Cold Storage Area	Retail	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test
3	3500	Base Reach-in Refrigerator/Freezer, Federal Standard	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	3600	Base Glass Door Reach-in Refrigerator/Freezer, Federal Standard	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	3700	Base Ice Maker, Federal Standard	Retail	0%	0%	0.0	0.0	0.0	0.0	10	0	0	0.00	N/A	N/A	N/A	N/A
3	3800	Base Residential-Type Refrigerator/Freezer, Federal Standard	Retail	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	3900	Base Compact Refrigerator, Federal Standard	Retail	0%	0%	0.0	0.0	0.0	0.0	14	0	0	0.00	N/A	N/A	N/A	N/A
3	4000	Base Computer Network Server	Retail	0%	0%	0.0	0.0	0.0	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
3	4100	Base Desktop PC	Retail	0%	0%	0.0	0.0	0.0	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
3	4200	Base Laptop PC	Retail	0%	0%	0.0	0.0	0.0	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
3	4300	Base Monitor, LCD	Retail	0%	0%	0.0	0.0	0.0	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
3	4400	Base Imaging	Retail	0%	0%	0.0	0.0	0.0	0.0	6	0	0	0.00	N/A	N/A	N/A	N/A
3	5000	Base Water Heater, Resistance Heater, Standard Standby Wattage	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	6000	Base Non-Refrigerated Vending Machines, Federal Standard	Retail	0%	0%	0.0	0.0	0.0	0.0	5	0	0	0.00	N/A	N/A	N/A	N/A
3	6100	Base Refrigerated Vending Machines, Federal Standard	Retail	0%	0%	0.0	0.0	0.0	0.0	5	0	0	0.00	N/A	N/A	N/A	N/A
3	6200	Base Combi Oven	Retail	0%	0%	0.0	0.0	0.0	0.0	12	0	0	0.00	N/A	N/A	N/A	N/A
3	6300	Base Convection Oven	Retail	0%	0%	0.0	0.0	0.0	0.0	12	0	0	0.00	N/A	N/A	N/A	N/A
3	6400	Base Fryer	Retail	0%	0%	0.0	0.0	0.0	0.0	12	0	0	0.00	N/A	N/A	N/A	N/A
3	6500	Base Griddle	Retail	0%	0%	0.0	0.0	0.0	0.0	12	0	0	0.00	N/A	N/A	N/A	N/A
3	6600	Base Hot Food Holding Cabinet	Retail	0%	0%	0.0	0.0	0.0	0.0	12	0	0	0.00	N/A	N/A	N/A	N/A
3	6700	Base Steamer	Retail	0%	0%	0.0	0.0	0.0	0.0	12	0	0	0.00	N/A	N/A	N/A	N/A
3	7000	Base Electric Boiler, Federal Standard	Retail	0%	0%	0.0	0.0	0.0	0.0	20	0	0	0.00	N/A	N/A	N/A	N/A
3	7100	Base Electric Furnace, Federal Standard	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	7200	Base Heating Air-Source Heat Pump, SEER 15.0/HSPF 8.8 w/Aux Strip Heat	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	7300	ase Heating Packaged Heat Pump, IEER 13.9/COP 3.4 (w/ non-ER heating), 10 tor	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	7400	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	Retail	0%	0%	0.0	0.0	0.0	0.0	20	0	0	0.00	N/A	N/A	N/A	N/A
3	7800	Base Ventilation	Retail	0%	0%	0.0	0.0	0.0	0.0	20	0	0	0.00	N/A	N/A	N/A	N/A
3	8000	Base Compressed Air	Retail	0%	0%	0.0	0.0	0.0	0.0	13	0	0	0.00	N/A	N/A	N/A	N/A
3	8100	Base Process Heat	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	8200	Base Process Cooling	Retail	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
3	8300	Base Electrochemical process	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	8400	Base Process Other	Retail	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
3	9300	Base IndustrialMotors or Pumps	Retail	0%	0%	0.0	0.0	0.0	0.0	20	0	0	0.00	N/A	N/A	N/A	N/A
3	9900	Base Miscellaneous	Retail	0%	0%	0.0	0.0	0.0	0.0	10	0	0	0.00	N/A	N/A	N/A	N/A
1	1000	Base Linear Lighting, Fluorescent Fixture, 2L4'T12	Grocery	0%	0%	0.0	2.2	2.2	0.6	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1001	High Performance Lighting R/R - Combined Strategies (Base T12)	Grocery	82%	62%	0.2	1.9	0.4	0.2	15	0	0	0.08	0	59.94	4.21	7.19
1	1002	ROB 2L4' LED Tube (Base T12)	Grocery	49%	56%	0.1	1.9	1.0	0.2	8	0	0	0.07	0	17.45	6.68	10.02
1	1003	LED Troffer (Base T12)	Grocery	61%	69%	0.3	1.9	0.7	0.2	8	0	0	0.04	0	92.79	1.26	1.89
1	1004	LED Troffer with lamp removal (T12)	Grocery	79%	89%	0.3	1.9	0.4	0.1	18	0	0	0.05	0	52.50	4.32	6.19
1	1005	Lighting Control Tuneup (Base T12)	Grocery	6%	3%	0.0	1.9	1.8	0.5	6	0	0	0.01	0	106.42	1.62	3.36
1	1006	Network Lighting Controls (Base T12)	Grocery	44%	19%	1.8	1.9	1.1	0.4	9	0	0	0.00	0	1,772.17	0.14	0.28
1	1007	Occupancy Sensor (Base T12)	Grocery	25%	5%	0.3	1.9	1.5	0.5	10	0	0	0.00	0	1,192.40	0.42	0.98
1	1050	Base Linear Lighting, Fluorescent Fixture, 2L4'T12, integrated market	Grocery	0%	0%	0.0	2.3	2.3	0.6	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1051	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	Grocery	75%	53%	0.4	1.9	0.5	0.2	18	1	0	0.20	0	148.33	2.04	3.57
1	1100	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB	Grocery	0%	0%	0.0	2.1	2.1	0.6	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1101	High Performance Lighting R/R - Combined Strategies (Base T8)	Grocery	76%	57%	0.2	1.9	0.5	0.2	15	0	0	0.06	0	65.80	3.84	6.55
1	1102	ROB 2L4' LED Tube (Base T8)	Grocery	37%	42%	0.1	1.9	1.2	0.3	8	0	0	0.05	0	23.85	4.89	7.33
1	1103	LED Troffer (Base T8)	Grocery	52%	59%	0.3	1.9	0.9	0.2	8	0	0	0.03	0	110.24	1.06	1.59
1	1104	LED Troffer with lamp removal (T8)	Grocery	75%	85%	0.3	1.9	0.5	0.1	18	0	0	0.04	0	56.24	4.03	5.78
1	1105	Lighting Control Tuneup (Base T8)	Grocery	6%	3%	0.0	1.9	1.8	0.5	6	0	0	0.01	0	108.37	1.59	3.30
1	1106	Network Lighting Controls (Base T8)	Grocery	44%	19%	1.8	1.9	1.1	0.4	9	0	0	0.00	0	1,804.65	0.14	0.28
1	1107	Occupancy Sensor (Base T8)	Grocery	25%	5%	0.3	1.9	1.4	0.5	10	0	0	0.00	0	1,214.25	0.41	0.96
1	1150	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB, integrated market	Grocery	0%	0%	0.0	2.1	2.1	0.6	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1151	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	Grocery	68%	47%	0.4	1.9	0.6	0.3	18	1	0	0.15	0	167.83	1.81	3.15
1	1200	Base Linear Lighting, LED Tube, 2 lamp fixture	Grocery	0%	0%	0.0	1.1	1.1	0.3	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1201	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	Grocery	42%	32%	0.2	1.1	0.6	0.2	15	7	1	1.13	0	207.85	1.22	2.07
1	1202	Lighting Control Tuneup (Base LED Tube)	Grocery	6%	3%	0.0	1.1	1.0	0.3	6	1	0	0.09	0	191.55	0.90	1.86
1	1203	Network Lighting Controls (Base LED Tube)	Grocery	44%	19%	1.8	1.1	0.6	0.2	9	0	0	0.05	0	3,189.91	0.08	0.16
1	1204	Occupancy Sensor (Base LED tube)	Grocery	25%	5%	0.3	1.1	0.8	0.3	10	0	0	0.01	0	2,146.32	0.23	0.55
1	1225	Base Linear Lighting, LED Tube, 2 lamp fixture, 2028 Standard	Grocery	0%	0%	0.0	0.9	0.9	0.3	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1226	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	Grocery	42%	32%	0.2	0.9	0.5	0.2	15	7	1	1.10	0	236.19	1.07	1.82
1	1227	Lighting Control Tuneup (Base LED Tube)	Grocery	6%	3%	0.0	0.9	0.9	0.2	6	1	0	0.09	0	217.67	0.79	1.64
1	1228	Network Lighting Controls (Base LED Tube)	Grocery	44%	19%	1.8	0.9	0.5	0.2	9	0	0	0.05	0	3,624.90	0.07	0.14
1	1229	Occupancy Sensor (Base LED tube)	Grocery	25%	5%	0.3	0.9	0.7	0.2	10	0	0	0.01	0	2,439.00	0.20	0.48
1	1250	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market	Grocery	0%	0%	0.0	1.1	1.1	0.3	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1251	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	Grocery	22%	15%	0.4	1.1	0.8	0.2	18	3	1	0.53	0	934.48	0.32	0.57
1	1275	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market, 2028 Standarc	Grocery	0%	0%	0.0	0.9	0.9	0.3	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1276	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	Grocery	22%	15%	0.4	0.9	0.7	0.2	18	3	1	0.52	0	1,061.91	0.29	0.50
1	1300	Base General Service Screw-in, CFL	Grocery	0%	0%	0.0	0.4	0.4	0.1	1	0	0	0.00	N/A	N/A	N/A	N/A
1	1301	LED screw-in replacement (base CFL)	Grocery	29%	33%	0.0	0.4	0.3	0.1	4	0	0	0.01	0	54.46	1.13	1.74
1	1350	Base General Service Screw-in, Incandescent/halogen	Grocery	0%	0%	0.0	1.2	1.2	0.3	1	0	0	0.00	N/A	N/A	N/A	N/A
1	1351	LED screw-in replacement (base incandescent/halogen)	Grocery	73%	83%	0.0	1.2	0.3	0.1	4	1	0	0.20	0	7.40	8.33	12.82

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test
1	1400	Base General Service Screw-in, LED bulb	Grocery	0%	0%	0.0	0.3	0.3	0.1	4	0	0	0.00	N/A	N/A	N/A	N/A
1	1401	LED screw-in replacement (base LED)	Grocery	10%	11%	0.0	0.3	0.3	0.1	4	0	0	0.03	0	233.20	0.26	0.41
1	1425	Base General Service Screw-in, LED bulb, 2028 Standard	Grocery	0%	0%	0.0	0.2	0.2	0.1	4	0	0	0.00	N/A	N/A	N/A	N/A
1	1426	LED screw-in replacement (base LED)	Grocery	2%	2%	0.0	0.2	0.2	0.1	4	0	0	0.00	0	1,479.95	0.04	0.06
1	1450	Base HID Lighting (low bay)	Grocery	0%	0%	0.0	4.7	4.7	1.2	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1500	Base High Bay Lighting, Fluorescent T5	Grocery	0%	0%	0.0	2.7	2.7	0.7	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1501	High Performance Lighting R/R - Combined Strategies (Base T5)	Grocery	73%	55%	0.2	2.7	0.7	0.3	15	1	0	0.16	0	48.16	5.24	8.95
1	1502	ROB 2L4' LED Tube (Base T5)	Grocery	39%	44%	0.1	2.7	1.7	0.4	8	1	0	0.13	0	22.25	5.24	7.86
1	1503	High Bay LED Troffer (Base T5)	Grocery	47%	54%	0.2	2.7	1.4	0.3	8	1	0	0.16	0	39.85	2.93	4.39
1	1504	Lighting Control Tuneup (Base T5)	Grocery	6%	3%	0.0	2.7	2.5	0.7	6	0	0	0.01	0	75.81	2.28	4.71
1	1505	Network Lighting Controls (Base T5)	Grocery	44%	19%	1.8	2.7	1.5	0.6	9	0	0	0.00	0	1,262.46	0.19	0.40
1	1506	Occupancy Sensor (Base T5)	Grocery	25%	5%	0.3	2.7	2.0	0.7	10	0	0	0.00	0	849.44	0.59	1.38
1	1525	Base High Bay Lighting, Fluorescent T5, integrated market	Grocery	0%	0%	0.0	2.7	2.7	0.7	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1526	High Bay Bi-Level Programmed LED Fixture	Grocery	63%	47%	0.1	2.7	1.0	0.4	12	1	0	0.14	0	39.05	5.42	9.35
1	1550	Base High Bay Lighting, HID lighting	Grocery	0%	0%	0.0	3.1	3.1	0.8	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1551	High Bay Bi-Level Programmed LED Fixture	Grocery	63%	47%	0.1	3.1	1.2	0.4	12	1	0	0.10	0	33.53	6.31	10.89
1	1552	High Performance Lighting R/R - Combined Strategies (base high bay HID)	Grocery	73%	55%	0.2	3.1	0.9	0.4	15	1	0	0.12	0	41.57	6.07	10.36
1	1575	Base High Bay Lighting, LED lighting	Grocery	0%	0%	0.0	1.1	1.1	0.3	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1576	Network Lighting Controls (Base high bay LED)	Grocery	44%	19%	1.8	1.1	0.6	0.2	9	2	0	0.15	0	3,208.15	0.08	0.16
1	1577	Occupancy Sensor (Base high bay LED)	Grocery	25%	5%	0.3	1.1	0.8	0.3	10	1	0	0.04	0	2,158.58	0.23	0.54
1	1600	Base CFL Exit Sign	Grocery	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
1	1601	LED Exit Sign	Grocery	55%	55%	0.0	0.0	0.0	0.0	15	0	0	0.00	0	59.28	3.59	5.48
1	1650	Base Area Lighting, Outdoor HID	Grocery	0%	0%	0.0	5.4	5.4	0.8	15	0	0	0.00	N/A	N/A	N/A	N/A
1	1700	Base General Service Screw-in, Outdoor CFL	Grocery	0%	0%	0.0	0.4	0.4	0.1	15	0	0	0.00	N/A	N/A	N/A	N/A
1	1750	Base General Service Screw-in, Outdoor Incandescent/Halogen	Grocery	0%	0%	0.0	1.1	1.1	0.2	15	0	0	0.00	N/A	N/A	N/A	N/A
1	1800	Base General Service Screw-in, Outdoor LED bulb	Grocery	0%	0%	0.0	0.3	0.3	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	1850	Base Linear Lighting, Outdoor Fluorescent Tube	Grocery	0%	0%	0.0	0.7	0.7	0.1	15	0	0	0.00	N/A	N/A	N/A	N/A
1	1900	Base Linear Lighting, Outdoor LED Tube	Grocery	0%	0%	0.0	0.4	0.4	0.1	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2000	Base Water-Cooled Centrifugal Chiller, 0.58 kW/ton, 500 tons	Grocery	0%	0%	0.0	1.6	1.6	0.0	23	0	0	0.00	N/A	N/A	N/A	N/A
1	2001	Centrifugal Chiller, 0.54 kW/ton, 500 tons	Grocery	12%	12%	0.1	1.6	1.4	0.0	23	0	0	0.03	0	N/A	2.23	1.77
1	2002	Chiller Tune Up/Diagnostics	Grocery	9%	7%	0.0	1.7	1.5	0.0	5	0	0	0.00	0	N/A	0.86	1.36
1	2003	High Efficiency Chilled Water & Condenser Water Pump Motors	Grocery	3%	3%	0.0	1.6	1.5	0.0	20	0	0	0.01	0	N/A	1.34	1.08
1	2004	VSD for Chiller Pumps and Towers	Grocery	11%	9%	0.1	1.6	1.4	0.0	15	0	0	0.02	0	N/A	1.15	1.56
1	2005	Ceiling/roof Insulation - Chiller	Grocery	12%	12%	1.5	1.7	1.5	0.0	20	0	0	0.02	1	N/A	0.19	0.15
1	2006	Cool Roof - Chiller	Grocery	8%	8%	0.2	1.6	1.4	0.0	15	0	0	0.01	0	N/A	0.56	0.47
1	2007	Duct Testing/Sealing - Chiller	Grocery	9%	11%	0.3	1.6	1.4	0.0	18	0	0	0.00	0	N/A	0.24	0.57
1	2008	Duct/Pipe Insulation - Chiller	Grocery	2%	2%	0.3	1.6	1.5	0.0	10	0	0	0.01	1	N/A	0.08	0.07
1	2009	EMS Optimization - Chiller	Grocery	6%	6%	0.0	1.6	1.5	0.0	5	0	0	0.00	0	N/A	0.68	1.81
1	2010	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - Chiller	Grocery	11%	11%	0.3	1.6	1.5	0.0	10	0	0	0.00	0	N/A	0.14	0.38
1	2011	New Economizer - Chiller	Grocery	7%	8%	0.4	1.7	1.6	0.0	10	0	0	0.00	0	N/A	0.07	0.19
1	2012	Window Film (Standard) - Chiller	Grocery	1%	2%	0.2	1.6	1.5	0.0	10	0	0	0.00	1	N/A	0.03	0.04
1	2013	High Efficiency Windows - Chiller	Grocery	1%	2%	0.2	1.6	1.5	0.0	20	0	0	0.00	1	N/A	0.09	0.11
1	2100	Base DX Packaged System, EER=10.3, 10 tons	Grocery	0%	0%	0.0	2.5	2.5	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2101	DX Packaged System, EER=10.9, 10 tons	Grocery	6%	6%	0.1	2.5	2.3	0.0	15	2	0	2.98	0	N/A	1.20	1.01
1	2102	DX Packaged System, EER=13.4, 10 tons	Grocery	23%	23%	0.2	2.5	1.9	0.0	15	9	0	11.44	0	N/A	3.40	2.84
1	2103	Geothermal Heat Pump, EER=13, 10 tons - DX	Grocery	21%	21%	2.0	2.5	2.0	0.0	15	0	0	0.52	0	N/A	0.29	0.24
1	2104	DX Tune Up/ Advanced Diagnostics	Grocery	6%	5%	0.1	2.6	2.4	0.0	10	0	0	0.17	0	N/A	0.83	1.18
1	2105	Refrigerant Charge Adjustment - DX	Grocery	10%	10%	0.4	2.7	2.4	0.0	10	1	0	0.72	0	N/A	0.55	0.49
1	2106	Ceiling/roof Insulation - DX	Grocery	12%	12%	1.5	2.7	2.4	0.0	20	2	0	2.32	0	N/A	0.30	0.25
1	2107	Cool Roof - DX	Grocery	15%	15%	0.2	2.5	2.1	0.0	10	3	0	3.73	0	N/A	1.14	1.03
1	2108	Duct Testing/Sealing - DX	Grocery	22%	26%	0.3	2.5	1.9	0.0	18	3	0	0.23	0	N/A	0.92	2.13
1	2109	Duct/Pipe Insulation - DX	Grocery	2%	2%	0.3	2.5	2.4	0.0	10	1	0	0.75	1	N/A	0.12	0.11
1	2110	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	Grocery	1%	1%	0.0	2.5	2.5	0.0	10	0	0	0.00	0	N/A	1.13	3.04
1	2111	Economizer Repair - DX	Grocery	2%	1%	0.0	2.5	2.4	0.0	5	0	0	0.77	0	N/A	1.88	1.71
1	2113	Optimize Controls - DX	Grocery	6%	4%	0.0	2.6	2.4	0.0	5	1	0	0.21	0	N/A	1.44	2.89
1	2114	Smart Thermostat - DX	Grocery	12%	8%	0.2	2.5	2.2	0.0	8	4	0	1.17	0	N/A	0.37	0.72
1	2115	Window Film (Standard) - DX	Grocery	9%	16%	0.2	2.5	2.3	0.0	10	2	0	1.55	0	N/A	0.48	0.65
1	2116	High Efficiency Windows - DX	Grocery	1%	1%	0.2	2.5	2.5	0.0	20	0	0	0.21	1	N/A	0.22	0.18
1	2150	Base DX Packaged System, 2029 Standard	Grocery	0%	0%	0.0	2.5	2.5	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2152	DX Packaged System, EER=13.4, 10 tons	Grocery	14%	14%	0.2	2.2	1.9	0.0	15	5	0	6.47	0	N/A	1.92	1.61
1	2153	Geothermal Heat Pump, EER=13, 10 tons - DX	Grocery	12%	12%	2.0	2.2	2.0	0.0	15	0	0	0.27	1	N/A	0.15	0.13
1	2154	DX Tune Up/ Advanced Diagnostics	Grocery	6%	5%	0.1	2.6	2.4	0.0	10	0	0	0.17	0	N/A	0.83	1.18
1	2155	Refrigerant Charge Adjustment - DX	Grocery	10%	10%	0.4	2.7	2.4	0.0	10	1	0	0.72	0	N/A	0.55	0.49
1	2156	Ceiling/roof Insulation - DX	Grocery	12%	12%	1.5	2.7	2.4	0.0	20	2	0	2.32	0	N/A	0.30	0.25
1	2157	Cool Roof - DX	Grocery	15%	15%	0.2	2.5	2.1	0.0	10	3	0	3.73	0	N/A	1.14	1.03
1	2158	Duct Testing/Sealing - DX	Grocery	22%	26%	0.3	2.5	1.9	0.0	18	3	0	0.23	0	N/A	0.92	2.13
1	2159	Duct/Pipe Insulation - DX	Grocery	2%	2%	0.3	2.5	2.4	0.0	10	1	0	0.75	1	N/A	0.12	0.11
1	2160	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	Grocery	1%	1%	0.0	2.5	2.5	0.0	10	0	0	0.00	0	N/A	1.13	3.04
1	2161	Economizer Repair - DX	Grocery	2%	1%	0.0	2.5	2.4	0.0	5	0	0	0.77	0	N/A	1.88	1.71
1	2163	Optimize Controls - DX	Grocery	6%	4%	0.0	2.6	2.4	0.0	5	1	0	0.21	0	N/A	1.44	2.89

Commercial Electric Existing Construction

DSM ASSYST SUMMARY

Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test
1	2164	Smart Thermostat - DX	Grocery	12%	8%	0.2	2.5	2.2	0.0	8	4	0	1.17	0	N/A	0.37	0.72
1	2165	Window Film (Standard) - DX	Grocery	9%	16%	0.2	2.5	2.3	0.0	10	2	0	1.55	0	N/A	0.48	0.65
1	2166	High Efficiency Windows - DX	Grocery	1%	1%	0.2	2.5	2.5	0.0	20	0	0	0.21	1	N/A	0.22	0.18
1	2200	Base Heat Pump cooling (14.3 SEER, 8.2 HSPF)	Grocery	0%	0%	0.0	2.2	2.2	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2201	Heat Pump Upgrade (18 SEER, 8.2 HSPF), cooling	Grocery	14%	14%	0.3	2.2	1.9	0.0	15	1	0	0.72	0	N/A	1.33	1.12
1	2202	Mini-Split Heat Pump (Base Heat Pump Cooling)	Grocery	10%	10%	0.7	2.2	2.0	0.0	15	0	0	0.18	0	N/A	0.37	0.31
1	2203	Ceiling/roof Insulation (Base Heat Pump Cooling)	Grocery	12%	12%	1.5	2.4	2.1	0.0	20	0	0	0.26	0	N/A	0.27	0.22
1	2204	Duct/Pipe Insulation (Base Heat Pump Cooling)	Grocery	2%	2%	0.3	2.2	2.2	0.0	10	0	0	0.08	1	N/A	0.11	0.10
1	2205	Smart Thermostat (Base Heat Pump Cooling)	Grocery	12%	8%	0.2	2.2	2.0	0.0	8	0	0	0.13	0	N/A	0.33	0.64
1	2206	Window Film (Standard) (Base Heat Pump Cooling)	Grocery	9%	16%	0.2	2.2	2.0	0.0	10	0	0	0.17	0	N/A	0.43	0.58
1	2207	High Efficiency Windows (Base Heat Pump Cooling)	Grocery	1%	1%	0.2	2.2	2.2	0.0	20	0	0	0.02	1	N/A	0.20	0.16
1	2300	Base Split-System AC, SEER 14.5, <5.4 tons	Grocery	0%	0%	0.0	2.0	2.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2301	Split System Air Conditioner, SEER 16.0 ENERGY STAR, <5.4 tons	Grocery	10%	10%	0.4	2.1	1.9	0.0	15	1	0	0.99	0	N/A	0.50	0.42
1	2302	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Residential Split-System	Grocery	20%	20%	0.7	2.0	1.6	0.0	15	2	0	2.32	0	N/A	0.68	0.57
1	2303	Ceiling/roof Insulation (Base Residential Split-System)	Grocery	12%	12%	1.5	2.2	1.9	0.0	20	0	0	0.54	1	N/A	0.25	0.20
1	2304	Duct/Pipe Insulation (Base Residential Split-System)	Grocery	2%	2%	0.3	2.0	2.0	0.0	10	0	0	0.17	1	N/A	0.10	0.09
1	2305	Smart Thermostat (Base Residential Split-System)	Grocery	12%	8%	0.2	2.0	1.8	0.0	8	1	0	0.27	0	N/A	0.30	0.59
1	2306	Window Film (Standard) (Base Residential Split-System)	Grocery	1%	2%	0.2	2.0	2.0	0.0	10	0	0	0.04	1	N/A	0.04	0.06
1	2400	Base PTAC cooling, EER=10.2, 1 ton	Grocery	0%	0%	0.0	2.7	2.7	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2500	Base Room AC, CEER 10.9	Grocery	0%	0%	0.0	1.4	1.4	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2501	Room AC, CEER 12.0 ENERGY STAR	Grocery	2%	2%	0.2	1.4	1.3	0.0	15	0	0	0.25	1	N/A	0.13	0.11
1	2502	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Room AC)	Grocery	30%	30%	0.3	1.4	1.0	0.0	15	3	0	4.19	0	N/A	1.67	1.40
1	2503	Ceiling/roof Insulation (Base Room AC)	Grocery	12%	12%	1.5	1.5	1.3	0.0	20	1	0	0.65	1	N/A	0.17	0.14
1	2505	Window Film (Standard) (Base Room AC)	Grocery	1%	2%	0.2	1.4	1.3	0.0	10	0	0	0.05	2	N/A	0.03	0.04
1	2600	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	Grocery	0%	0%	0.0	1.8	1.8	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	2601	Ceiling/roof Insulation (Base Ductless Mini-split)	Grocery	12%	12%	1.5	1.9	1.7	0.0	20	0	0	0.34	1	N/A	0.22	0.18
1	2603	Window Film (Standard) (Base Ductless Mini-split)	Grocery	1%	2%	0.2	1.8	1.8	0.0	10	0	0	0.03	1	N/A	0.04	0.05
1	2604	High Efficiency Windows (Base Ductless Mini-split)	Grocery	1%	2%	0.2	1.8	1.8	0.0	20	0	0	0.02	1	N/A	0.10	0.12
1	3100	Base Open refrigerated/freezer cases	Grocery	0%	0%	0.0	6.1	6.1	0.7	16	0	0	0.00	N/A	N/A	N/A	N/A
1	3101	Efficient compressor motor, open cases	Grocery	12%	12%	0.1	6.9	6.1	0.7	15	0	0	0.04	0	111.46	3.69	7.21
1	3102	Bi-level LED Case Lighting (self-contained units), open cases	Grocery	11%	11%	0.2	6.1	5.4	0.6	8	9	1	1.12	0	226.90	1.08	2.16
1	3103	Compressor VSD retrofit, open cases	Grocery	7%	6%	0.2	6.1	5.7	0.6	13	5	0	0.31	0	485.99	0.80	1.75
1	3104	Demand Defrost Electric, open cases	Grocery	8%	8%	0.7	6.2	5.8	0.6	10	5	0	0.59	0	1,215.42	0.24	0.48
1	3105	Demand Hot Gas Defrost, open cases	Grocery	3%	3%	0.5	6.2	6.0	0.6	10	1	0	0.19	0	2,896.44	0.10	0.20
1	3106	Electronically commutated evaporator fan motor, open cases	Grocery	27%	16%	0.6	7.6	5.6	0.7	15	7	0	0.54	0	460.66	1.31	2.86
1	3107	High-efficiency fan motors, open cases	Grocery	4%	4%	0.2	6.2	6.0	0.6	15	2	0	0.23	0	761.75	0.54	1.05
1	3108	Insulated suction lines, open cases	Grocery	0%	0%	0.0	6.1	6.1	0.7	11	0	0	0.00	0	4,303.32	0.07	0.15
1	3109	LED Display Lighting, open cases	Grocery	7%	7%	0.1	6.1	5.7	0.6	8	6	1	0.71	0	281.49	0.87	1.74
1	3110	Multiplex Compressor System, open cases	Grocery	14%	14%	0.9	7.0	6.0	0.6	14	1	0	0.18	0	752.02	0.52	1.02
1	3111	Night covers for display cases, open cases	Grocery	11%	0%	0.2	6.1	5.5	0.7	5	8	0	0.00	0	N/A	0.44	1.18
1	3112	Oversized Air Cooled Condenser, open cases	Grocery	8%	8%	0.2	6.4	5.9	0.6	16	3	0	0.42	0	292.03	1.48	2.88
1	3113	Refrigeration Coil Cleaning, open cases	Grocery	23%	23%	0.3	6.9	5.3	0.6	5	10	1	1.29	0	187.75	0.85	1.74
1	3114	Refrigeration Commissioning, open cases	Grocery	3%	3%	0.1	6.2	6.0	0.7	3	1	0	0.13	0	314.40	0.32	0.65
1	3200	Base Closed refrigerated/freezer cases	Grocery	0%	0%	0.0	9.2	9.2	1.0	16	0	0	0.00	N/A	N/A	N/A	N/A
1	3201	Efficient compressor motor, base closed cases	Grocery	9%	9%	0.1	10.1	9.2	1.0	15	1	0	0.07	0	104.66	3.93	7.67
1	3202	Energy-Star Refrigerator/Freezer, base closed cases	Grocery	10%	10%	0.3	9.6	8.7	0.9	12	13	1	1.69	0	320.24	1.08	2.12
1	3203	Anti-sweat (humidistat) controls, base closed cases	Grocery	5%	5%	0.2	9.6	9.1	1.0	12	3	0	0.38	0	298.11	1.16	2.28
1	3204	Bi-level LED Case Lighting (self-contained units), base closed cases	Grocery	11%	11%	0.2	9.2	8.2	0.9	8	24	3	3.04	0	154.68	1.58	3.17
1	3205	Compressor VSD retrofit, base closed cases	Grocery	7%	6%	0.2	9.2	8.6	0.9	13	14	1	0.83	0	331.31	1.18	2.57
1	3206	Demand Defrost Electric, base closed cases	Grocery	8%	8%	0.7	9.4	8.7	0.9	10	13	1	1.61	0	828.58	0.36	0.71
1	3207	Demand Hot Gas Defrost, base closed cases	Grocery	3%	3%	0.5	9.3	9.1	1.0	10	4	0	0.51	0	1,974.58	0.15	0.30
1	3208	Electronically commutated evaporator fan motor, base closed cases	Grocery	23%	14%	0.7	11.1	8.5	1.0	15	16	1	1.24	0	367.25	1.65	3.59
1	3209	Freezer-Cooler Replacement Gaskets, base closed cases	Grocery	7%	7%	0.0	9.5	8.9	1.0	4	7	1	0.92	0	45.03	2.91	5.91
1	3210	High R-Value Glass Doors, base closed cases	Grocery	2%	2%	0.4	9.2	9.1	1.0	10	3	0	0.41	0	2,405.67	0.12	0.24
1	3211	High-efficiency fan motors, base closed cases	Grocery	4%	4%	0.2	9.4	9.0	1.0	15	5	1	0.62	0	519.31	0.79	1.55
1	3212	Insulated suction lines, base closed cases	Grocery	0%	0%	0.0	9.2	9.2	1.0	11	0	0	0.01	0	2,854.71	0.11	0.22
1	3213	LED Display Lighting, base closed cases	Grocery	7%	7%	0.1	9.2	8.6	0.9	8	15	2	1.91	0	191.90	1.27	2.56
1	3214	Low or Anti-Sweat Door Film, base closed cases	Grocery	5%	5%	0.1	9.3	8.9	1.0	10	8	1	1.00	0	110.39	2.68	5.34
1	3215	Multiplex Compressor System, base closed cases	Grocery	14%	14%	0.9	10.6	9.1	1.0	14	4	0	0.48	0	512.67	0.76	1.49
1	3216	Oversized Air Cooled Condenser, base closed cases	Grocery	8%	8%	0.2	9.6	8.8	1.0	16	9	1	1.14	0	199.09	2.17	4.22
1	3217	Refrigeration Coil Cleaning, base closed cases	Grocery	23%	23%	0.3	10.4	8.0	0.9	5	27	3	3.50	0	127.99	1.25	2.55
1	3218	Refrigeration Commissioning, base closed cases	Grocery	5%	5%	0.1	9.5	9.0	1.0	3	5	1	0.69	0	105.81	0.96	1.92
1	3300	Base Walk-in refrigeration/freezer units	Grocery	0%	0%	0.0	43.1	43.1	4.6	16	0	0	0.00	N/A	N/A	N/A	N/A
1	3301	Efficient compressor motor, walk-ins	Grocery	9%	9%	0.2	47.3	43.0	4.6	15	3	0	0.42	0	43.79	9.40	18.34
1	3302	Auto-closer on main door to walk-in freezer	Grocery	1%	1%	0.3	43.4	42.8	4.6	8	9	1	1.13	0	465.04	0.52	1.05
1	3303	Compressor VSD retrofit, walk-ins	Grocery	7%	6%	0.4	43.1	40.3	4.4	13	82	8	4.98	0	138.63	2.82	6.15
1	3304	Demand Defrost Electric, walk-ins	Grocery	8%	8%	1.4	44.0	40.5	4.4	10	75	8	9.58	0	346.71	0.85	1.70
1	3305	Demand Hot Gas Defrost, walk-ins	Grocery	3%	3%	1.0	43.4	42.3	4.6	10	24	3	3.03	0	826.23	0.36	0.71
1	3306	Electronically commutated evaporator fan motor, walk-ins	Grocery	23%	14%	1.3	52.1	39.9	4.8	15	95	6	7.41	0	153.67	3.93	8.57
1	3307	Evaporator fan controller for MT walk-ins	Grocery	1%	1%	2.1	43.3	43.1	4.6	16	1	0	0.18	1	8,406.14	0.05	0.10

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Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test
1	3308	Floating head pressure controls, walk-ins	Grocery	7%	7%	0.9	46.2	43.0	4.6	14	3	0	0.39	0	238.91	1.63	3.20
1	3309	Freezer-Cooler Replacement Gaskets, walk-ins	Grocery	1%	1%	0.0	43.4	42.8	4.6	4	8	1	1.05	0	61.42	2.13	4.33
1	3310	High-efficiency fan motors, walk-ins	Grocery	6%	6%	0.4	44.3	41.6	4.5	15	44	5	5.63	0	143.60	2.87	5.59
1	3311	Insulated suction lines, walk-ins	Grocery	0%	0%	0.0	43.1	43.1	4.6	11	1	0	0.08	0	611.27	0.52	1.04
1	3312	Multiplex Compressor System, walk-ins	Grocery	14%	14%	1.7	49.4	42.4	4.6	14	22	2	2.84	0	214.52	1.82	3.56
1	3313	Oversized Air Cooled Condenser, walk-ins	Grocery	8%	8%	0.7	44.9	41.3	4.4	16	53	6	6.77	0	166.61	2.59	5.05
1	3314	Refrigeration Coil Cleaning, walk-ins	Grocery	23%	23%	1.2	48.7	37.5	4.0	5	163	18	20.86	0	93.72	1.71	3.48
1	3315	Refrigeration Commissioning, walk-ins	Grocery	3%	3%	0.1	43.7	42.6	4.6	3	16	2	2.03	0	89.68	1.13	2.27
1	3316	Strip curtains for walk-ins	Grocery	4%	4%	0.2	44.0	42.2	4.5	4	26	3	3.27	0	98.66	1.33	2.70
1	3400	Base Large Cold Storage Area	Grocery	0%	0%	0.0	1.9	1.9	0.2	16	0	0	0.00	N/A	N/A	N/A	N/A
1	3401	Efficient compressor motor, base large cold storage	Grocery	9%	9%	0.0	2.1	1.9	0.2	15	0	0	0.01	0	43.79	9.40	18.34
1	3402	Auto-closer on main door to walk-in freezer, base large cold storage	Grocery	1%	1%	0.0	2.0	1.9	0.2	8	0	0	0.02	0	465.04	0.52	1.05
1	3403	Compressor VSD retrofit, base large cold storage	Grocery	7%	6%	0.0	1.9	1.8	0.2	13	1	0	0.09	0	138.63	2.82	6.15
1	3404	Electronically commutated evaporator fan motor, base large cold storage	Grocery	23%	14%	0.1	2.4	1.8	0.2	15	2	0	0.13	0	153.67	3.93	8.57
1	3405	Evaporator fan controller for MT walk-ins, base large cold storage	Grocery	1%	1%	0.1	2.0	1.9	0.2	16	0	0	0.00	1	8,406.14	0.05	0.10
1	3406	High-efficiency fan motors, base large cold storage	Grocery	4%	4%	0.0	2.0	1.9	0.2	15	1	0	0.07	0	217.30	1.89	3.70
1	3407	Insulated suction lines, base large cold storage	Grocery	0%	0%	0.0	2.0	1.9	0.2	11	0	0	0.00	1	13,522.83	0.02	0.05
1	3408	Multiplex Compressor System, base large cold storage	Grocery	14%	14%	0.1	2.2	1.9	0.2	14	0	0	0.05	0	214.52	1.82	3.56
1	3409	Oversized Air Cooled Condenser, base large cold storage	Grocery	8%	8%	0.0	2.0	1.9	0.2	16	1	0	0.12	0	83.30	5.18	10.09
1	3410	Refrigeration Coil Cleaning, base large cold storage	Grocery	23%	23%	0.0	2.2	1.7	0.2	5	3	0	0.37	0	70.29	2.28	4.63
1	3411	Refrigeration Commissioning, base large cold storage	Grocery	5%	5%	0.0	2.0	1.9	0.2	3	1	0	0.07	0	44.27	2.30	4.60
1	3412	Strip curtains for walk-ins, base large cold storage	Grocery	4%	4%	0.0	2.0	1.9	0.2	4	0	0	0.06	0	98.66	1.33	2.70
1	3500	Base Reach-in Refrigerator/Freezer, Federal Standard	Grocery	0%	0%	0.0	9.6	9.6	1.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	3501	Energy Star solid door reach-in refrigerator/freezer	Grocery	7%	7%	0.1	9.9	9.2	1.0	15	9	1	1.09	0	151.08	2.73	5.32
1	3502	Freezer-Cooler Replacement Gaskets, base reach-in	Grocery	3%	3%	0.1	9.7	9.5	1.0	4	3	0	0.43	0	229.62	0.57	1.16
1	3503	Refrigeration Coil Cleaning, base base reach-in	Grocery	2%	2%	0.1	9.7	9.5	1.0	5	2	0	0.28	0	468.36	0.34	0.70
1	3600	Base Glass Door Reach-in Refrigerator/Freezer, Federal Standard	Grocery	0%	0%	0.0	11.3	11.3	1.2	15	0	0	0.00	N/A	N/A	N/A	N/A
1	3700	Base Ice Maker, Federal Standard	Grocery	0%	0%	0.0	0.4	0.4	0.0	10	0	0	0.00	N/A	N/A	N/A	N/A
1	3701	Energy Star Ice Machines	Grocery	10%	10%	0.0	0.4	0.3	0.0	10	0	0	0.05	0	311.71	0.95	1.89
1	3702	Refrigeration Coil Cleaning, base ice maker	Grocery	2%	2%	0.0	0.4	0.4	0.0	5	0	0	0.01	0	339.31	0.47	0.96
1	3800	Base Residential-Type Refrigerator/Freezer, Federal Standard	Grocery	0%	0%	0.0	0.7	0.7	0.1	18	0	0	0.00	N/A	N/A	N/A	N/A
1	3801	Energy Star refrigerator/freezer	Grocery	10%	10%	0.1	0.7	0.6	0.1	18	0	0	0.05	0	1,020.84	0.46	0.89
1	3802	Refrigeration Coil Cleaning, residential-type refrigerator	Grocery	2%	2%	0.0	0.7	0.7	0.1	5	0	0	0.01	0	2,902.84	0.06	0.11
1	3900	Base Compact Refrigerator, Federal Standard	Grocery	0%	0%	0.0	0.1	0.1	0.0	14	0	0	0.00	N/A	N/A	N/A	N/A
1	3901	Energy Star Compact Refrigerator	Grocery	10%	10%	0.0	0.1	0.1	0.0	14	0	0	0.00	0	669.02	0.58	1.14
1	3902	Refrigeration Coil Cleaning, compact refrigerator	Grocery	2%	2%	0.0	0.1	0.1	0.0	5	0	0	0.00	1	8,127.95	0.02	0.04
1	4000	Base Computer Network Server	Grocery	0%	0%	0.0	0.2	0.2	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
1	4001	Energy Star server	Grocery	33%	23%	0.0	0.2	0.1	0.0	4	1	0	0.09	0	28.36	5.50	12.13
1	4100	Base Desktop PC	Grocery	0%	0%	0.0	0.1	0.1	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
1	4101	Energy Star or Better PC	Grocery	33%	33%	0.0	0.1	0.1	0.0	4	1	0	0.10	0	138.53	0.86	1.70
1	4200	Base Laptop PC	Grocery	0%	0%	0.0	0.0	0.0	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
1	4201	Energy Star or Better Laptop	Grocery	30%	30%	0.0	0.0	0.0	0.0	4	0	0	0.00	0	69.78	1.71	3.38
1	4300	Base Monitor, LCD	Grocery	0%	0%	0.0	0.0	0.0	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
1	4301	Energy Star or Better Monitor - LCD	Grocery	21%	21%	0.0	0.0	0.0	0.0	4	0	0	0.01	0	164.58	0.73	1.43
1	4303	Plug-load controls - Commercial Smart Strip (base monitor LCD)	Grocery	11%	5%	0.0	0.0	0.0	0.0	10	0	0	0.00	1	9,518.14	0.05	0.13
1	4400	Base Imaging	Grocery	0%	0%	0.0	0.0	0.0	0.0	6	0	0	0.00	N/A	N/A	N/A	N/A
1	4401	Energy Star or Better Imaging Equipment	Grocery	21%	21%	0.0	0.0	0.0	0.0	6	0	0	0.00	0	61.68	2.81	5.50
1	5000	Base Water Heater, Resistance Heater, Standard Standby Wattage	Grocery	0%	0%	0.0	0.2	0.2	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	5001	High Efficiency Water Heater (electric)	Grocery	2%	2%	0.0	0.2	0.2	0.0	15	0	0	0.00	0	134.24	2.86	5.38
1	5002	Heat Pump Water Heater (air source)	Grocery	20%	20%	0.0	0.2	0.1	0.0	10	0	0	0.05	0	308.76	0.89	1.72
1	5003	Tankless Water Heater	Grocery	10%	10%	0.0	0.2	0.2	0.0	20	0	0	0.00	0	230.98	2.04	3.80
1	5004	Solar Water Heater	Grocery	70%	70%	0.0	0.2	0.1	0.0	20	0	0	0.00	0	249.43	1.89	3.52
1	5005	Demand controlled circulating systems	Grocery	5%	5%	0.3	0.2	0.2	0.0	15	0	0	0.02	4	30,331.39	0.01	0.02
1	5006	Heat Recovery Unit	Grocery	65%	65%	0.1	0.2	0.1	0.0	10	2	0	0.30	0	541.57	0.51	0.98
1	5007	Hot Water Pipe Insulation	Grocery	2%	2%	0.0	0.2	0.2	0.0	15	0	0	0.01	0	306.55	1.25	2.35
1	5008	Low Flow Faucet Aerators	Grocery	12%	12%	0.0	0.2	0.2	0.0	10	0	0	0.02	0	397.25	0.69	1.33
1	5010	Low-flow pre-rinse spray valve	Grocery	11%	11%	0.0	0.2	0.2	0.0	5	0	0	0.06	0	100.01	1.49	2.93
1	5011	Recirculation Pump Timer Clock - Controls for Central Domestic Hot Water	Grocery	3%	3%	0.0	0.2	0.2	0.0	15	0	0	0.01	1	4,994.33	0.08	0.14
1	6000	Base Non-Refrigerated Vending Machines, Federal Standard	Grocery	0%	0%	0.0	0.0	0.0	0.0	5	0	0	0.00	N/A	N/A	N/A	N/A
1	6001	Vending Misers (Non-Refrigerated)	Grocery	51%	35%	0.0	0.0	0.0	0.0	5	0	0	0.00	0	1,789.47	0.11	0.25
1	6100	Base Refrigerated Vending Machines, Federal Standard	Grocery	0%	0%	0.0	0.1	0.1	0.0	5	0	0	0.00	N/A	N/A	N/A	N/A
1	6101	Vending Misers (Refrigerated glass-front units)	Grocery	33%	23%	0.0	0.1	0.1	0.0	5	0	0	0.02	0	444.10	0.46	1.01
1	6102	Vending Misers (Refrigerated units)	Grocery	51%	35%	0.0	0.1	0.0	0.0	5	0	0	0.02	0	281.79	0.72	1.59
1	6200	Base Combi Oven	Grocery	0%	0%	0.0	2.7	2.7	0.2	12	0	0	0.00	N/A	N/A	N/A	N/A
1	6201	Electric Combination Oven	Grocery	54%	54%	0.1	3.3	1.5	0.1	12	13	1	2.23	0	52.15	8.66	16.50
1	6300	Base Convection Oven	Grocery	0%	0%	0.0	0.7	0.7	0.1	12	0	0	0.00	N/A	N/A	N/A	N/A
1	6301	Energy Star Convection Oven	Grocery	14%	14%	0.0	0.8	0.6	0.1	12	2	0	0.31	0	127.58	3.54	6.74
1	6400	Base Fryer	Grocery	0%	0%	0.0	1.3	1.3	0.1	12	0	0	0.00	N/A	N/A	N/A	N/A
1	6401	Efficient Fryer	Grocery	8%	8%	0.1	1.3	1.2	0.1	12	1	0	0.10	0	1,198.18	0.38	0.72
1	6500	Base Griddle	Grocery	0%	0%	0.0	2.0	2.0	0.2	12	0	0	0.00	N/A	N/A	N/A	N/A

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Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	Levelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test
1	6501	Energy Star griddle	Grocery	11%	11%	0.0	2.0	1.8	0.2	12	1	0	0.09	0	199.75	2.26	4.31
1	6600	Base Hot Food Holding Cabinet	Grocery	0%	0%	0.0	1.5	1.5	0.1	12	0	0	0.00	N/A	N/A	N/A	N/A
1	6601	Energy Star hot food holding cabinet	Grocery	70%	70%	0.2	1.8	0.5	0.0	12	24	2	4.30	0	188.73	2.39	4.56
1	6700	Base Steamer	Grocery	0%	0%	0.0	0.8	0.8	0.1	12	0	0	0.00	N/A	N/A	N/A	N/A
1	6701	Efficient Steamer	Grocery	79%	79%	0.2	1.0	0.2	0.0	12	3	0	0.47	0	328.65	1.37	2.62
1	7000	Base Electric Boiler, Federal Standard	Grocery	0%	0%	0.0	6.2	6.2	4.0	20	0	0	0.00	N/A	N/A	N/A	N/A
1	7001	Ceiling/roof Insulation (electric boiler)	Grocery	12%	12%	1.5	6.7	5.9	3.8	20	0	0	0.00	0	264.25	0.44	0.62
1	7002	Duct/Pipe Insulation (electric boiler)	Grocery	2%	2%	0.3	6.2	6.1	3.9	20	0	0	0.00	0	363.45	0.32	0.45
1	7100	Base Electric Furnace, Federal Standard	Grocery	0%	0%	0.0	6.2	6.2	4.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	7101	Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons, heating	Grocery	60%	60%	0.3	6.5	2.6	1.7	15	1	1	0.00	0	11.33	8.37	11.82
1	7102	Ceiling/roof Insulation (base furnace)	Grocery	12%	12%	1.5	6.7	5.9	3.8	20	0	0	0.00	0	264.25	0.44	0.62
1	7103	Duct/Pipe Insulation (base furnace)	Grocery	2%	2%	0.3	6.2	6.1	3.9	20	0	0	0.00	0	363.45	0.32	0.45
1	7104	Smart Thermostat (Base Furnace Heating)	Grocery	13%	8%	0.2	6.2	5.4	3.7	8	0	0	0.00	0	69.21	1.11	1.90
1	7200	Base Heating Air-Source Heat Pump, SEER 15.0/HSPF 8.8 w/Aux Strip Heat	Grocery	0%	0%	0.0	2.6	2.6	1.7	15	0	0	0.00	N/A	N/A	N/A	N/A
1	7201	eat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons (base air-source heat pu	Grocery	10%	10%	0.3	2.6	2.3	1.5	15	3	2	0.00	0	170.31	0.56	0.79
1	7202	Ceiling/roof Insulation (base air-source heat pump heating)	Grocery	12%	12%	1.5	2.8	2.5	1.6	20	1	1	0.00	0	635.08	0.18	0.26
1	7203	Duct/Pipe Insulation (base air-source heat pump heating)	Grocery	2%	2%	0.3	2.6	2.5	1.6	20	1	0	0.00	1	873.48	0.13	0.19
1	7204	Smart Thermostat (Base Heat Pump Heating)	Grocery	13%	8%	0.2	2.6	2.3	1.5	8	3	1	0.00	0	166.34	0.46	0.79
1	7300	ase Heating Packaged Heat Pump, IEER 13.9/COP 3.4 (w/ non-ER heating), 10 tor	Grocery	0%	0%	0.0	1.8	1.8	1.1	15	0	0	0.00	N/A	N/A	N/A	N/A
1	7301	Packaged Heat Pump, heating, IEER 13.9/COP 3.4 (w/ non-ER heating), 10 tons	Grocery	60%	60%	2.2	1.8	0.7	0.5	15	2	2	0.00	0	301.76	0.31	0.44
1	7302	Ceiling/roof Insulation (base packaged heat pump)	Grocery	12%	12%	1.5	1.9	1.7	1.1	20	0	0	0.00	1	924.89	0.12	0.18
1	7303	Duct/Pipe Insulation (base packaged heat pump)	Grocery	2%	2%	0.3	1.8	1.7	1.1	20	0	0	0.00	1	1,272.09	0.09	0.13
1	7304	Smart Thermostat (Base Rooftop/packaged heating)	Grocery	13%	8%	0.2	1.8	1.6	1.1	8	0	0	0.00	0	242.25	0.32	0.54
1	7400	Base Ductless Mini-Split Heat Pump, SEER 15.0/HSPF 8.8	Grocery	0%	0%	0.0	2.6	2.6	1.7	20	0	0	0.00	N/A	N/A	N/A	N/A
1	7401	Ceiling/roof Insulation (base ductless mini-split)	Grocery	12%	12%	1.5	2.8	2.5	1.6	20	0	0	0.00	0	635.08	0.18	0.26
1	7403	Smart Thermostat (base packaged heat pump)	Grocery	13%	8%	0.2	2.6	2.3	1.5	8	1	0	0.00	0	166.34	0.46	0.79
1	7800	Base Ventilation	Grocery	0%	0%	0.0	3.1	3.1	0.4	20	0	0	0.00	N/A	N/A	N/A	N/A
1	7801	High Efficiency Motor	Grocery	1%	1%	0.0	3.1	3.0	0.4	20	1	0	0.19	0	407.50	1.33	2.13
1	7803	Air Handler Optimization, 15 HP	Grocery	10%	10%	0.0	3.0	2.7	0.3	8	7	1	1.87	0	94.50	2.69	4.61
1	7804	Demand Controlled Ventilation, 15 HP	Grocery	33%	62%	2.4	3.0	2.0	0.1	15	22	5	14.58	0	990.56	0.35	0.38
1	7805	Energy Recovery Ventilation (ERV)	Grocery	7%	7%	0.1	3.0	2.8	0.3	20	5	1	1.31	0	334.92	1.61	2.59
1	7806	Separate Makeup Air / Exhaust Hoods AC	Grocery	25%	25%	0.3	3.0	2.3	0.3	15	0	0	0.09	0	309.84	1.41	2.30
1	8000	Base Compressed Air	Grocery	0%	0%	0.0	0.0	0.0	0.0	13	0	0	0.00	N/A	N/A	N/A	N/A
1	8100	Base Process Heat	Grocery	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	8200	Base Process Cooling	Grocery	0%	0%	0.0	0.0	0.0	0.0	16	0	0	0.00	N/A	N/A	N/A	N/A
1	8300	Base Electrochemical process	Grocery	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	8400	Base Process Other	Grocery	0%	0%	0.0	0.0	0.0	0.0	15	0	0	0.00	N/A	N/A	N/A	N/A
1	9300	Base IndustrialMotors or Pumps	Grocery	0%	0%	0.0	0.0	0.0	0.0	20	0	0	0.00	N/A	N/A	N/A	N/A
1	9900	Base Miscellaneous	Grocery	0%	0%	0.0	2.5	2.5	0.3	10	0	0	0.00	N/A	N/A	N/A	N/A
3	1000	Base Linear Lighting, Fluorescent Fixture, 2L4'T12	Grocery	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1050	Base Linear Lighting, Fluorescent Fixture, 2L4'T12, integrated market	Grocery	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1100	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB	Grocery	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1150	Base Linear Lighting, Fluorescent Fixture, 2L4'T8, 1 EB, integrated market	Grocery	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1200	Base Linear Lighting, LED Tube, 2 lamp fixture	Grocery	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1225	Base Linear Lighting, LED Tube, 2 lamp fixture, 2028 Standard	Grocery	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1250	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market	Grocery	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1275	Base Linear Lighting, LED Tube, 2 lamp fixture, integrated market, 2028 Standarc	Grocery	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1300	Base General Service Screw-in, CFL	Grocery	0%	0%	0.0	0.0	0.0	0.0	1	0	0	0.00	N/A	N/A	N/A	N/A
3	1350	Base General Service Screw-in, Incandescent/halogen	Grocery	0%	0%	0.0	0.0	0.0	0.0	1	0	0	0.00	N/A	N/A	N/A	N/A
3	1400	Base General Service Screw-in, LED bulb	Grocery	0%	0%	0.0	0.0	0.0	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
3	1425	Base General Service Screw-in, LED bulb, 2028 Standard	Grocery	0%	0%	0.0	0.0	0.0	0.0	4	0	0	0.00	N/A	N/A	N/A	N/A
3	1450	Base HID Lighting (low bay)	Grocery	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A
3	1500	Base High Bay Lighting, Fluorescent T5	Grocery	0%	0%	0.0	0.0	0.0	0.0	18	0	0	0.00	N/A	N/A	N/A	N/A

Commercial Electric New Construction

DSM ASSYST SUMMARY

Segment	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	System Second Peak Tech. Potential MW	Levelized Cost of Conserved Energy $/kWH	.evelized Cos of Avoided Peak Capacit $/kW	Total Resource Cost Test (TRC)	Participant Test
4	100	Base Bldg Design - 15%	Office	0%	0%	0.0	18.7	18.7	3.0	20	0	0	0.00	N/A	N/A	N/A	N/A
4	200	Base Bldg Design - 30%	Office	0%	0%	0.0	18.7	18.7	3.0	20	0	0	0.00	N/A	N/A	N/A	N/A
4	201	High Performance Building/Int Design - Tier 2 30% - Office	Office	30%	30%	3.4	18.7	13.1	2.1	20	82	13	17.73	0	361.55	1.09	1.80
4	300	Base Bldg Design - 50%	Office	0%	0%	0.0	18.7	18.7	3.0	20	0	0	0.00	N/A	N/A	N/A	N/A
4	301	High Performance Building/Int Design - Tier 3 50% - Office	Office	50%	50%	6.0	18.7	9.3	1.5	20	15	2	3.28	0	379.63	1.04	1.72
4	400	Base Bldg Design - 70%	Office	0%	0%	0.0	18.7	18.7	3.0	20	0	0	0.00	N/A	N/A	N/A	N/A
4	100	Base Bldg Design - 15%	Restaurant	0%	0%	0.0	45.1	45.1	7.3	20	0	0	0.00	N/A	N/A	N/A	N/A
4	102	High Performance Building/Int Design - Tier 1 15% - Restaurant	Restaurant	15%	15%	3.0	45.1	38.3	6.2	20	6	1	1.26	0	256.84	1.53	2.54
4	200	Base Bldg Design - 30%	Restaurant	0%	0%	0.0	45.1	45.1	7.3	20	0	0	0.00	N/A	N/A	N/A	N/A
4	202	High Performance Building/Int Design - Tier 2 30% - Restaurant	Restaurant	30%	30%	4.2	45.1	31.6	5.1	20	9	2	2.02	0	183.46	2.15	3.56
4	300	Base Bldg Design - 50%	Restaurant	0%	0%	0.0	45.1	45.1	7.3	20	0	0	0.00	N/A	N/A	N/A	N/A
4	302	High Performance Building/Int Design - Tier 3 50% - Restaurant	Restaurant	50%	50%	7.4	45.1	22.6	3.6	20	4	1	0.76	0	192.63	2.04	3.39
4	400	Base Bldg Design - 70%	Restaurant	0%	0%	0.0	45.1	45.1	7.3	20	0	0	0.00	N/A	N/A	N/A	N/A
4	402	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Restaurant	Restaurant	70%	70%	11.6	45.1	13.5	2.2	20	1	0	0.12	0	216.22	1.82	3.02
4	100	Base Bldg Design - 15%	Retail	0%	0%	0.0	15.5	15.5	2.5	20	0	0	0.00	N/A	N/A	N/A	N/A
4	200	Base Bldg Design - 30%	Retail	0%	0%	0.0	15.5	15.5	2.5	20	0	0	0.00	N/A	N/A	N/A	N/A
4	203	High Performance Building/Int Design - Tier 2 30% - Retail	Retail	30%	30%	2.5	15.5	10.9	1.8	20	26	4	5.64	0	316.28	1.24	2.06
4	300	Base Bldg Design - 50%	Retail	0%	0%	0.0	15.5	15.5	2.5	20	0	0	0.00	N/A	N/A	N/A	N/A
4	303	High Performance Building/Int Design - Tier 3 50% - Retail	Retail	50%	50%	4.4	15.5	7.8	1.3	20	4	1	0.94	0	332.10	1.19	1.96
4	400	Base Bldg Design - 70%	Retail	0%	0%	0.0	15.5	15.5	2.5	20	0	0	0.00	N/A	N/A	N/A	N/A
4	403	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Retail	Retail	70%	70%	6.9	15.5	4.7	0.8	20	1	0	0.15	0	372.76	1.06	1.75
4	100	Base Bldg Design - 15%	Grocery	0%	0%	0.0	53.2	53.2	8.6	20	0	0	0.00	N/A	N/A	N/A	N/A
4	104	High Performance Building/Int Design - Tier 1 15% - Grocery	Grocery	15%	15%	1.5	53.2	45.2	7.3	20	5	1	1.12	0	113.05	3.48	5.77
4	200	Base Bldg Design - 30%	Grocery	0%	0%	0.0	53.2	53.2	8.6	20	0	0	0.00	N/A	N/A	N/A	N/A
4	204	High Performance Building/Int Design - Tier 2 30% - Grocery	Grocery	30%	30%	2.2	53.2	37.2	6.0	20	8	1	1.80	0	80.75	4.88	8.08
4	300	Base Bldg Design - 50%	Grocery	0%	0%	0.0	53.2	53.2	8.6	20	0	0	0.00	N/A	N/A	N/A	N/A
4	304	High Performance Building/Int Design - Tier 3 50% - Grocery	Grocery	50%	50%	3.8	53.2	26.6	4.3	20	3	1	0.67	0	84.79	4.64	7.69
4	400	Base Bldg Design - 70%	Grocery	0%	0%	0.0	53.2	53.2	8.6	20	0	0	0.00	N/A	N/A	N/A	N/A
4	404	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Grocery	Grocery	70%	70%	6.0	53.2	15.9	2.6	20	0	0	0.10	0	95.17	4.14	6.85
4	100	Base Bldg Design - 15%	Warehouse	0%	0%	0.0	4.9	4.9	0.8	20	0	0	0.00	N/A	N/A	N/A	N/A
4	105	High Performance Building/Int Design - Tier 1 15% - Warehouse	Warehouse	15%	15%	1.3	4.9	4.2	0.7	20	2	0	0.43	0	1,044.80	0.38	0.62
4	200	Base Bldg Design - 30%	Warehouse	0%	0%	0.0	4.9	4.9	0.8	20	0	0	0.00	N/A	N/A	N/A	N/A
4	205	High Performance Building/Int Design - Tier 2 30% - Warehouse	Warehouse	30%	30%	1.9	4.9	3.4	0.6	20	3	1	0.69	0	746.27	0.53	0.87
4	300	Base Bldg Design - 50%	Warehouse	0%	0%	0.0	4.9	4.9	0.8	20	0	0	0.00	N/A	N/A	N/A	N/A
4	305	High Performance Building/Int Design - Tier 3 50% - Warehouse	Warehouse	50%	50%	3.3	4.9	2.5	0.4	20	1	0	0.26	0	783.58	0.50	0.83
4	400	Base Bldg Design - 70%	Warehouse	0%	0%	0.0	4.9	4.9	0.8	20	0	0	0.00	N/A	N/A	N/A	N/A
4	405	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Warehouse	Warehouse	70%	70%	5.2	4.9	1.5	0.2	20	0	0	0.04	0	879.53	0.45	0.74
4	100	Base Bldg Design - 15%	Education	0%	0%	0.0	12.2	12.2	2.0	20	0	0	0.00	N/A	N/A	N/A	N/A
4	106	High Performance Building/Int Design - Tier 1 15% - School	Education	15%	15%	2.4	12.2	10.3	1.7	20	7	1	1.61	0	775.85	0.51	0.84
4	200	Base Bldg Design - 30%	Education	0%	0%	0.0	12.2	12.2	2.0	20	0	0	0.00	N/A	N/A	N/A	N/A

G. SUPPLY-CURVE DATA

Residential Electric Existing Construction

Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost $/kWH
7009	Hot water turndown 20 degrees	16	16	0.00
7008	Hot water turndown 15 degrees	32	48	0.00
1201	10% better than Energy Star Dehumidifier ROB (35-45 pints/day)	76	123	0.01
1026	Exterior Door Replacement (CAC)	6	130	0.01
1019	Duct Insulation (CAC)	7	137	0.01
1802	Heat pump (18 SEER, 10 HSPF) (eFAF + room AC)	9	145	0.01
1702	Heat pump (18 SEER, 10 HSPF) (eFAF + CAC)	439	585	0.01
1823	Exterior Door Replacement (eFAF + room AC)	0	585	0.01
6501	Energy Star Desktop PC	28	613	0.01
7007	Hot water turndown 10 degrees	87	701	0.01
1801	Heat pump (16 SEER, 9.2 HSPF) (eFAF + room AC)	30	731	0.01
6101	Energy Star LCD TV	84	815	0.01
6001	Energy Star LED TV	286	1,101	0.01
2002	Heat pump (18 SEER, 10 HSPF) (Elec baseboard heat + Room AC)	16	1,117	0.01
1902	Heat pump (18 SEER, 10 HSPF) (Elec baseboard heat + Central AC)	23	1,140	0.01
6601	Energy Star Laptop PC	53	1,193	0.01
1025	Door Weatherization (CAC)	36	1,229	0.01
1120	Exterior Door Replacement (RAC)	0	1,229	0.01
1726	Exterior Door Replacement (eFAF + CAC)	6	1,235	0.01
1623	Exterior Door Replacement (GSHP heat/cool)	0	1,236	0.01
7006	Hot water turndown 5 degrees	32	1,267	0.01
1525	Exterior Door Replacement (HP heat/cool)	21	1,289	0.01
1701	Heat pump (16 SEER, 9.2 HSPF) (eFAF + CAC)	735	2,024	0.01
4501	2nd Freezer Recycling	48	2,072	0.02
1829	Recycling of non-efficient window AC unit (eFAF + RAC)	13	2,085	0.02
4201	2nd Refrigerator Recycling	785	2,870	0.02
1926	Exterior Door Replacement (Elec baseboard heat + Central AC)	0	2,870	0.02
7013	Faucent Aerators	241	3,111	0.02
1119	Door Weatherization (RAC)	1	3,112	0.02
1901	Heat pump (16 SEER, 9.2 HSPF) (Elec baseboard heat + Central AC)	39	3,151	0.02
1612	Crawlspace insulation (GSHP heat/cool)	8	3,159	0.02
1514	Crawlspace insulation (HP heat/cool)	333	3,493	0.02
2110	Crawlspace insulation (Elec Central Furn, no cool)	2	3,494	0.02
2023	Exterior Door Replacement (Elec baseboard heat + Room AC)	1	3,495	0.02
1301	Energy Star Air Cleaner, PM 2.5 CADR = 200, CADR/Watt 2.9	116	3,610	0.02
6201	Energy Star other TV	17	3,627	0.03
1605	Ceiling R-0 to R-49 Insulation (GSHP heat/cool)	0	3,627	0.03
2001	Heat pump (16 SEER, 9.2 HSPF) (Elec baseboard heat + Room AC)	20	3,647	0.03
1024	Self Install Weatherization (CAC)	23	3,670	0.03
1619	Smart Thermostat (GSHP heat/cool)	11	3,681	0.03
1521	Smart Thermostat (HP heat/cool)	509	4,190	0.03
6701	Energy Star Monitor	0	4,190	0.03
1501	Heat pump upgrade to (16 SEER, 9.2 HSPF) (HP heat/cool)	273	4,463	0.03
2117	Smart Thermostat (Elec Central Furn, no cool)	2	4,465	0.03
5401	Exhaust fan, 8.3 CFM/W, <2.0 sones (quiet),ASHRAE 62.2	156	4,621	0.03
1507	Ceiling R-0 to R-49 Insulation (HP heat/cool)	13	4,634	0.04
1006	Ceiling R-0 to R-38 Insulation (CAC)	12	4,646	0.04
8001	Energy Star Electric Vehicle Level 1 Charger	3	4,649	0.04
2029	Recycling of non-efficient window AC unit (baseboard heat + RAC)	46	4,695	0.04
8101	Energy Star Electric Vehicle Level 2 Charger	7	4,702	0.04
4002	Refrigerator (CEE Tier 2)	538	5,240	0.04
1524	Door Weatherization (HP heat/cool)	79	5,319	0.04

Residential Electric Existing Construction

Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost $/kW
1802	Heat pump (18 SEER, 10 HSPF) (eFAF + room AC)	5	5	10
1702	Heat pump (18 SEER, 10 HSPF) (eFAF + CAC)	269	275	10
1823	Exterior Door Replacement (eFAF + room AC)	0	275	10
1801	Heat pump (16 SEER, 9.2 HSPF) (eFAF + room AC)	18	293	11
7009	Hot water turndown 20 degrees	5	298	12
2002	Heat pump (18 SEER, 10 HSPF) (Elec baseboard heat + Room AC)	10	308	14
1902	Heat pump (18 SEER, 10 HSPF) (Elec baseboard heat + Central AC)	14	322	14
7008	Hot water turndown 15 degrees	9	331	16
1726	Exterior Door Replacement (eFAF + CAC)	4	335	18
1623	Exterior Door Replacement (GSHP heat/cool)	0	335	20
1525	Exterior Door Replacement (HP heat/cool)	13	348	21
7007	Hot water turndown 10 degrees	25	373	22
1701	Heat pump (16 SEER, 9.2 HSPF) (eFAF + CAC)	451	823	23
1829	Recycling of non-efficient window AC unit (eFAF + RAC)	8	831	26
1926	Exterior Door Replacement (Elec baseboard heat + Central AC)	0	832	32
1901	Heat pump (16 SEER, 9.2 HSPF) (Elec baseboard heat + Central AC)	24	855	34
1612	Crawlspace insulation (GSHP heat/cool)	5	861	35
1514	Crawlspace insulation (HP heat/cool)	204	1,065	36
2023	Exterior Door Replacement (Elec baseboard heat + Room AC)	0	1,065	37
2110	Crawlspace insulation (Elec Central Furn, no cool)	1	1,066	37
7006	Hot water turndown 5 degrees	9	1,075	43
1605	Ceiling R-0 to R-49 Insulation (GSHP heat/cool)	0	1,075	46
2001	Heat pump (16 SEER, 9.2 HSPF) (Elec baseboard heat + Room AC)	12	1,088	46
1619	Smart Thermostat (GSHP heat/cool)	7	1,094	47
1521	Smart Thermostat (HP heat/cool)	312	1,406	50
1501	Heat pump upgrade to (16 SEER, 9.2 HSPF) (HP heat/cool)	167	1,574	55
2117	Smart Thermostat (Elec Central Furn, no cool)	1	1,575	57
1507	Ceiling R-0 to R-49 Insulation (HP heat/cool)	8	1,583	58
2029	Recycling of non-efficient window AC unit (baseboard heat + RAC)	28	1,611	62
1524	Door Weatherization (HP heat/cool)	48	1,659	66
7013	Faucent Aerators	69	1,728	70
1622	Door Weatherization (GSHP heat/cool)	1	1,729	71
6501	Energy Star Desktop PC	2	1,731	77
1502	Heat pump upgrade to (18 SEER, 10 HSPF) (HP heat/cool)	343	2,074	83
2111	Basement insulation R-13 (Elec Central Furn, no cool)	0	2,075	86
2114	Duct Insulation (Elec Central Furn, no cool)	0	2,075	89
1617	Duct Insulation (GSHP heat/cool)	0	2,075	97
6101	Energy Star LCD TV	6	2,081	104
6001	Energy Star LED TV	22	2,103	106
1714	Crawlspace insulation (eFAF + CAC)	15	2,118	113
1519	Duct Insulation (HP heat/cool)	11	2,129	118
6601	Energy Star Laptop PC	4	2,133	125
1618	Duct Testing and Sealing (GSHP heat/cool)	1	2,134	140
1607	Ceiling R-11 to R-49 Insulation (GSHP heat/cool)	0	2,134	146
1707	Ceiling R-0 to R-49 Insulation (eFAF + CAC)	1	2,135	153
2120	Door Weatherization (Elec Central Furn, no cool)	0	2,135	154
1613	Basement insulation R-13 (GSHP heat/cool)	1	2,136	158
1722	Smart Thermostat (eFAF + CAC)	25	2,161	161
1520	Duct Testing and Sealing (HP heat/cool)	44	2,205	163
7014	Low Flow Showerhead 1.5 Gal/Min	17	2,222	173
2019	Smart Thermostat (Elec baseboard heat + Room AC)	5	2,227	173
4501	2nd Freezer Recycling	4	2,232	177

Residential Electric Existing Construction

Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost $/kWH
5302	Variable-Speed Pool Pump (<1 hp) ROB	102	5,421	0.04
1622	Door Weatherization (GSHP heat/cool)	2	5,423	0.04
1001	16 SEER (13.68 EER) Split-System Air Conditioner (CAC)	169	5,592	0.05
4301	Freezer (Energy Star)	79	5,671	0.05
1017	Wall Blow-in R-0 to R-13 Insulation (CAC)	28	5,699	0.05
9901	Indirect Feedback (Home Energy Reports, Opower)	484	6,183	0.05
7014	Low Flow Showerhead 1.5 Gal/Min	61	6,244	0.05
1502	Heat pump upgrade to (18 SEER, 10 HSPF) (HP heat/cool)	560	6,804	0.05
2111	Basement insulation R-13 (Elec Central Furn, no cool)	0	6,804	0.05
2114	Duct Insulation (Elec Central Furn, no cool)	0	6,804	0.05
1020	Duct Testing and Sealing (CAC)	24	6,828	0.05
4001	Refrigerator (Energy Star)	241	7,069	0.05
302	LED Tube replacement for fluorescent lamps	45	7,114	0.06
1118	Self Install Weatherization (RAC)	1	7,115	0.06
1007	Ceiling R-0 to R-49 Insulation (CAC)	7	7,121	0.06
1617	Duct Insulation (GSHP heat/cool)	0	7,122	0.06
1714	Crawlspace insulation (eFAF + CAC)	24	7,146	0.07
1022	Smart Thermostat (CAC)	108	7,254	0.07
1519	Duct Insulation (HP heat/cool)	18	7,272	0.07
1104	Ceiling R-0 to R-38 Insulation (RAC)	0	7,272	0.07
1126	Recycling of non-efficient window AC unit (RAC)	20	7,292	0.08
7005	Pipe Wrap	29	7,321	0.08
1618	Duct Testing and Sealing (GSHP heat/cool)	1	7,323	0.09
1607	Ceiling R-11 to R-49 Insulation (GSHP heat/cool)	0	7,323	0.09
2120	Door Weatherization (Elec Central Furn, no cool)	0	7,323	0.09
1707	Ceiling R-0 to R-49 Insulation (eFAF + CAC)	1	7,325	0.09
1613	Basement insulation R-13 (GSHP heat/cool)	1	7,326	0.10
1722	Smart Thermostat (eFAF + CAC)	41	7,367	0.10
1520	Duct Testing and Sealing (HP heat/cool)	72	7,438	0.10
1003	18 SEER Split-System Air Conditioner (CAC)	328	7,766	0.10
1115	Wall Blow-in R-0 to R-13 Insulation (RAC)	1	7,767	0.10
7002	Heat Pump Water Heater - Energy Star	1,578	9,345	0.10
2019	Smart Thermostat (Elec baseboard heat + Room AC)	8	9,353	0.11
2022	Door Weatherization (Elec baseboard heat + Room AC)	2	9,355	0.11
2104	Ceiling R-0 to R-49 Insulation (Elec Central Furn, no cool)	0	9,355	0.11
1509	Ceiling R-11 to R-49 Insulation (HP heat/cool)	14	9,369	0.11
2007	Ceiling R-0 to R-49 Insulation (Elec baseboard heat + Room AC)	0	9,369	0.11
1621	Self Install Weatherization (GSHP heat/cool)	1	9,370	0.11
1725	Door Weatherization (eFAF + CAC)	7	9,376	0.12
1604	Ceiling R-0 to R-38 Insulation (GSHP heat/cool)	1	9,377	0.12
1031	WINDOWS - Double-Glazed Clear to Energy Star (CAC)	19	9,396	0.12
1515	Basement insulation R-13 (HP heat/cool)	43	9,439	0.12
6502	Plug Load Controls - Smart Power Strip (base Desktop PC)	63	9,503	0.12
2014	Crawlspace insulation (Elec baseboard heat + Room AC)	3	9,505	0.13
1914	Crawlspace insulation (Elec baseboard heat + Central AC)	1	9,506	0.13
1523	Self Install Weatherization (HP heat/cool)	38	9,544	0.14
5001	Clothes Washer, ENERGY STAR (IMEF 2.07 / IWF 4.2)	239	9,783	0.14
1907	Ceiling R-0 to R-49 Insulation (Elec baseboard heat + Central AC)	0	9,783	0.14
1925	Door Weatherization (Elec baseboard heat + Central AC)	0	9,783	0.15
2115	Duct Testing and Sealing (Elec Central Furn, no cool)	0	9,784	0.15
1922	Smart Thermostat (Elec baseboard heat + Central AC)	2	9,786	0.15
1819	Smart Thermostat (eFAF + room AC)	1	9,786	0.15
1506	Ceiling R-0 to R-38 Insulation (HP heat/cool)	19	9,806	0.15

Residential Electric Existing Construction

Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost $/kW
2022	Door Weatherization (Elec baseboard heat + Room AC)	1	2,232	179
1509	Ceiling R-11 to R-49 Insulation (HP heat/cool)	8	2,241	180
2007	Ceiling R-0 to R-49 Insulation (Elec baseboard heat + Room AC)	0	2,241	184
2104	Ceiling R-0 to R-49 Insulation (Elec Central Furn, no cool)	0	2,241	186
1621	Self Install Weatherization (GSHP heat/cool)	1	2,242	187
1725	Door Weatherization (eFAF + CAC)	4	2,246	197
1604	Ceiling R-0 to R-38 Insulation (GSHP heat/cool)	0	2,246	198
1515	Basement insulation R-13 (HP heat/cool)	26	2,272	199
2014	Crawlspace insulation (Elec baseboard heat + Room AC)	2	2,274	204
1914	Crawlspace insulation (Elec baseboard heat + Central AC)	1	2,275	214
4201	2nd Refrigerator Recycling	68	2,342	223
1523	Self Install Weatherization (HP heat/cool)	23	2,365	227
1907	Ceiling R-0 to R-49 Insulation (Elec baseboard heat + Central AC)	0	2,366	229
9901	Indirect Feedback (Home Energy Reports, Opower)	98	2,464	233
1925	Door Weatherization (Elec baseboard heat + Central AC)	0	2,464	239
1922	Smart Thermostat (Elec baseboard heat + Central AC)	1	2,465	243
1819	Smart Thermostat (eFAF + room AC)	0	2,466	243
2115	Duct Testing and Sealing (Elec Central Furn, no cool)	0	2,466	248
1506	Ceiling R-0 to R-38 Insulation (HP heat/cool)	12	2,478	248
302	LED Tube replacement for fluorescent lamps	10	2,488	249
1601	Ground Source Heat Pump EER 17.1/COP 3.6 ENERGY STAR (GSHP heat/cool)	1	2,489	254
1616	Cool Roof (GSHP heat/cool)	3	2,492	259
7005	Pipe Wrap	8	2,500	291
1822	Door Weatherization (eFAF + room AC)	0	2,500	294
1518	Cool Roof (HP heat/cool)	120	2,620	306
1609	Ceiling R-19 to R-49 Insulation (GSHP heat/cool)	0	2,620	309
6201	Energy Star other TV	1	2,622	331
1719	Duct Insulation (eFAF + CAC)	1	2,623	347
1812	Crawlspace insulation (eFAF + room AC)	0	2,623	350
7002	Heat Pump Water Heater - Energy Star	449	3,072	362
2101	High efficiency central air-source heat pump (Elec Central Furn, no cool)	3	3,075	369
6701	Energy Star Monitor	0	3,076	378
2119	Self Install Weatherization (Elec Central Furn, no cool)	0	3,076	379
1511	Ceiling R-19 to R-49 Insulation (HP heat/cool)	12	3,087	381
5401	Exhaust fan, 8.3 CFM/W, <2.0 sones (quiet),ASHRAE 62.2	13	3,100	410
2116	Heat Recovery Ventilators (Elec Central Furn, no cool)	1	3,102	414
1620	Comprehensive Shell Air Sealing - Inf. Reduction (GSHP heat/cool)	2	3,103	416
1628	WINDOWS - Double-Glazed Clear to Energy Star (GSHP heat/cool)	1	3,104	441
1611	Radiant Barrier (GSHP heat/cool)	1	3,105	442
1805	Ceiling R-0 to R-49 Insulation (eFAF + room AC)	0	3,105	444
4002	Refrigerator (CEE Tier 2)	46	3,151	461
1301	Energy Star Air Cleaner, PM 2.5 CADR = 200, CADR/Watt 2.9	6	3,157	461
1522	Comprehensive Shell Air Sealing - Inf. Reduction (HP heat/cool)	64	3,221	495
1715	Basement insulation R-13 (eFAF + CAC)	2	3,224	500
1717	Wall Blow-in R-0 to R-13 Insulation (eFAF + CAC)	3	3,227	510
1606	Ceiling R-11 to R-38 Insulaton (GSHP heat/cool)	0	3,227	513
1627	WINDOWS - Single Pane Clear to Energy Star Double Pane (GSHP)	1	3,228	518
1530	WINDOWS - Double-Glazed Clear to Energy Star (HP heat/cool)	22	3,250	520
8001	Energy Star Electric Vehicle Level 1 Charger	0	3,250	528
4301	Freezer (Energy Star)	7	3,257	537
1709	Ceiling R-11 to R-49 Insulation (eFAF + CAC)	1	3,258	539
8101	Energy Star Electric Vehicle Level 2 Charger	1	3,258	545
1513	Radiant Barrier (HP heat/cool)	37	3,295	547

Residential Electric Existing Construction

Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost $/kWH
1601	Ground Source Heat Pump EER 17.1/COP 3.6 ENERGY STAR (GSHP heat/cool)	1	9,807	0.16
1616	Cool Roof (GSHP heat/cool)	5	9,812	0.16
7010	Drain Water Heat Recovery (GFX)	789	10,601	0.18
1822	Door Weatherization (eFAF + room AC)	0	10,601	0.18
1518	Cool Roof (HP heat/cool)	196	10,796	0.19
1105	Ceiling R-0 to R-49 Insulation (RAC)	0	10,796	0.19
1609	Ceiling R-19 to R-49 Insulation (GSHP heat/cool)	1	10,797	0.19
1719	Duct Insulation (eFAF + CAC)	2	10,798	0.21
1812	Crawlspace insulation (eFAF + room AC)	0	10,799	0.21
2101	High efficiency central air-source heat pump (Elec Central Furn, no cool)	6	10,804	0.22
3032	Motion/Occupance Sensor (base interior LED, 6 hrs/day)	35	10,840	0.22
2119	Self Install Weatherization (Elec Central Furn, no cool)	0	10,840	0.22
1511	Ceiling R-19 to R-49 Insulation (HP heat/cool)	19	10,859	0.23
3033	Dimmer Switch (base interior LED, 6 hrs/day)	441	11,299	0.24
1018	Cool Roof (CAC)	131	11,430	0.24
2116	Heat Recovery Ventilators (Elec Central Furn, no cool)	2	11,433	0.25
1009	Ceiling R-11 to R-49 Insulation (CAC)	5	11,438	0.25
1620	Comprehensive Shell Air Sealing - Inf. Reduction (GSHP heat/cool)	3	11,441	0.25
1628	WINDOWS - Double-Glazed Clear to Energy Star (GSHP heat/cool)	1	11,441	0.27
1611	Radiant Barrier (GSHP heat/cool)	2	11,443	0.27
1805	Ceiling R-0 to R-49 Insulation (eFAF + room AC)	0	11,443	0.27
1522	Comprehensive Shell Air Sealing - Inf. Reduction (HP heat/cool)	105	11,548	0.30
1715	Basement insulation R-13 (eFAF + CAC)	4	11,552	0.31
1717	Wall Blow-in R-0 to R-13 Insulation (eFAF + CAC)	5	11,557	0.31
1606	Ceiling R-11 to R-38 Insulaton (GSHP heat/cool)	0	11,557	0.31
1627	WINDOWS - Single Pane Clear to Energy Star Double Pane (GSHP)	1	11,559	0.32
1530	WINDOWS - Double-Glazed Clear to Energy Star (HP heat/cool)	36	11,595	0.32
5301	PV-Powered Pool Pumps ROB	193	11,788	0.32
1709	Ceiling R-11 to R-49 Insulation (eFAF + CAC)	1	11,789	0.33
1513	Radiant Barrier (HP heat/cool)	60	11,850	0.34
2017	Wall Blow-in R-0 to R-13 Insulation (Elec baseboard heat + Room AC)	1	11,851	0.34
2121	WINDOWS - Double-Glazed Clear to Energy Star (Elec Central Furn, no cool)	0	11,851	0.34
1610	Roof deck insulation, R-19 (GSHP heat/cool)	0	11,851	0.34
1101	Energy Star Room Air Conditioner - CEER 12 (RAC)	2	11,853	0.35
1724	Self Install Weatherization (eFAF + CAC)	4	11,857	0.35
1817	Duct Insulation (eFAF + room AC)	0	11,857	0.37
1125	WINDOWS - Double-Glazed Clear to Energy Star (RAC)	0	11,857	0.38
1529	WINDOWS - Single Pane Clear to Energy Star Double Pane (ASHP)	51	11,908	0.38
2021	Self Install Weatherization (Elec baseboard heat + Room AC)	1	11,908	0.39
1508	Ceiling R-11 to R-38 Insulaton (HP heat/cool)	19	11,927	0.39
1706	Ceiling R-0 to R-38 Insulation (eFAF + CAC)	2	11,929	0.39
1720	Duct Testing and Sealing (eFAF + CAC)	5	11,934	0.39
1013	Radiant Barrier (CAC)	48	11,981	0.40
1615	Wall Blow-in R-0 to R-13 Insulation (GSHP heat/cool)	1	11,982	0.40
1512	Roof deck insulation, R-19 (HP heat/cool)	21	12,003	0.40
7004	DHW Tank Wrap	34	12,038	0.42
1603	Heat pump tune up (GSHP heat/cool)	1	12,038	0.43

Residential Electric Existing Construction

Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost $/kW
2017	Wall Blow-in R-0 to R-13 Insulation (Elec baseboard heat + Room AC)	1	3,296	549
1610	Roof deck insulation, R-19 (GSHP heat/cool)	0	3,296	558
2121	WINDOWS - Double-Glazed Clear to Energy Star (Elec Central Furn, no cool)	0	3,296	569
1724	Self Install Weatherization (eFAF + CAC)	2	3,298	574
1817	Duct Insulation (eFAF + room AC)	0	3,298	608
1529	WINDOWS - Single Pane Clear to Energy Star Double Pane (ASHP)	31	3,330	616
7010	Drain Water Heat Recovery (GFX)	225	3,554	624
2021	Self Install Weatherization (Elec baseboard heat + Room AC)	0	3,555	630
1508	Ceiling R-11 to R-38 Insulaton (HP heat/cool)	11	3,566	633
1706	Ceiling R-0 to R-38 Insulation (eFAF + CAC)	1	3,567	636
4001	Refrigerator (Energy Star)	21	3,588	637
1720	Duct Testing and Sealing (eFAF + CAC)	3	3,591	642
1615	Wall Blow-in R-0 to R-13 Insulation (GSHP heat/cool)	1	3,591	651
1512	Roof deck insulation, R-19 (HP heat/cool)	13	3,604	651
1603	Heat pump tune up (GSHP heat/cool)	0	3,605	695
1909	Ceiling R-11 to R-49 Insulation (Elec baseboard heat + Central AC)	0	3,605	714
1920	Duct Testing and Sealing (Elec baseboard heat + Central AC)	0	3,605	715
1919	Duct Insulation (Elec baseboard heat + Central AC)	0	3,605	733
2028	WINDOWS - Double-Glazed Clear to Energy Star (Elec baseboard heat + Room AC)	1	3,605	740
1917	Wall Blow-in R-0 to R-13 Insulation (Elec baseboard heat + Central AC)	0	3,606	741
2006	Ceiling R-0 to R-38 Insulation (Elec baseboard heat + Room AC)	0	3,606	758
2103	Ceiling R-0 to R-38 Insulation (Elec Central Furn, no cool)	0	3,606	778
1517	Wall Blow-in R-0 to R-13 Insulation (HP heat/cool)	24	3,630	783
1731	WINDOWS - Double-Glazed Clear to Energy Star (eFAF + CAC)	2	3,633	796
1821	Self Install Weatherization (eFAF + room AC)	0	3,633	799
1718	Cool Roof (eFAF + CAC)	12	3,644	804
1815	Wall Blow-in R-0 to R-13 Insulation (eFAF + room AC)	0	3,644	810
5302	Variable-Speed Pool Pump (<1 hp) ROB	5	3,650	827
1626	Windows - Adding Storm Windows (GSHP)	2	3,651	857
1818	Duct Testing and Sealing (eFAF + room AC)	0	3,651	862
1924	Self Install Weatherization (Elec baseboard heat + Central AC)	0	3,651	862
1505	Heat pump tune up (HP heat/cool)	12	3,663	873
2018	Cool Roof (baseboard heat + RAC)	2	3,665	876
1614	Floor R-0 to R-19 Insulation-Batts (GSHP heat/cool)	0	3,665	899
2015	Basement insulation R-13 (Elec baseboard heat + Room AC)	0	3,666	902
1906	Ceiling R-0 to R-38 Insulation (Elec baseboard heat + Central AC)	0	3,666	931
1828	WINDOWS - Double-Glazed Clear to Energy Star (eFAF + room AC)	0	3,666	943
2118	Comprehensive Shell Air Sealing - Inf. Reduction (Elec Central Furn, no cool)	0	3,666	948
1915	Basement insulation R-13 (Elec baseboard heat + Central AC)	0	3,666	948
2106	Ceiling R-11 to R-49 Insulation (Elec Central Furn, no cool)	0	3,666	949
2109	Roof deck insulation, R-19 (Elec Central Furn, no cool)	0	3,666	959
3032	Motion/Occupance Sensor (base interior LED, 6 hrs/day)	8	3,674	966
2009	Ceiling R-11 to R-49 Insulation (Elec baseboard heat + Room AC)	0	3,674	987
1608	Ceiling R-19 to R-38 Insulation (GSHP heat/cool)	0	3,675	994
2112	Floor R-0 to R-19 Insulation-Batts (Elec Central Furn, no cool)	0	3,675	1,009
1516	Floor R-0 to R-19 Insulation-Batts (HP heat/cool)	4	3,678	1,020
1528	Windows - Adding Storm Windows (HP heat/cool)	69	3,747	1,022

Residential Electric Existing Construction

Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost $/kWH
3022	Motion/Occupance Sensor (base interior LED, 2.5 hrs/day)	19	12,057	0.44
1909	Ceiling R-11 to R-49 Insulation (Elec baseboard heat + Central AC)	0	12,057	0.44
1920	Duct Testing and Sealing (Elec baseboard heat + Central AC)	0	12,058	0.44
1919	Duct Insulation (Elec baseboard heat + Central AC)	0	12,058	0.45
2028	WINDOWS - Double-Glazed Clear to Energy Star (Elec baseboard heat + Room AC)	1	12,059	0.45
1917	Wall Blow-in R-0 to R-13 Insulation (Elec baseboard heat + Central AC)	0	12,059	0.45
5103	Clothes Dryer, CEF 5.20 CEE Tier 3	58	12,117	0.46
5102	Clothes Dryer, CEF 4.30 CEE Tier 2	55	12,172	0.46
2103	Ceiling R-0 to R-38 Insulation (Elec Central Furn, no cool)	0	12,172	0.46
2006	Ceiling R-0 to R-38 Insulation (Elec baseboard heat + Room AC)	0	12,172	0.46
1517	Wall Blow-in R-0 to R-13 Insulation (HP heat/cool)	40	12,212	0.48
3023	Dimmer Switch (base interior LED, 2.5 hrs/day)	239	12,451	0.48
1731	WINDOWS - Double-Glazed Clear to Energy Star (eFAF + CAC)	4	12,455	0.49
1821	Self Install Weatherization (eFAF + room AC)	0	12,455	0.49
1718	Cool Roof (eFAF + CAC)	19	12,474	0.49
1815	Wall Blow-in R-0 to R-13 Insulation (eFAF + room AC)	0	12,474	0.50
1626	Windows - Adding Storm Windows (GSHP)	3	12,477	0.53
1818	Duct Testing and Sealing (eFAF + room AC)	0	12,477	0.53
1924	Self Install Weatherization (Elec baseboard heat + Central AC)	0	12,477	0.53
1030	WINDOWS - Single Pane Clear to Energy Star Double Pane (CAC)	20	12,497	0.53
1505	Heat pump tune up (HP heat/cool)	19	12,516	0.54
2018	Cool Roof (baseboard heat + RAC)	4	12,520	0.54
1011	Ceiling R-19 to R-49 Insulation (CAC)	7	12,526	0.55
1614	Floor R-0 to R-19 Insulation-Batts (GSHP heat/cool)	0	12,526	0.55
2015	Basement insulation R-13 (Elec baseboard heat + Room AC)	0	12,527	0.55
5101	Clothes Dryer, CEF 3.93 ENERGY STAR	48	12,575	0.56
7003	Solar Domestic Water Heating	799	13,374	0.56
2118	Comprehensive Shell Air Sealing - Inf. Reduction (Elec Central Furn, no cool)	0	13,374	0.56
2106	Ceiling R-11 to R-49 Insulation (Elec Central Furn, no cool)	0	13,374	0.56
1008	Ceiling R-11 to R-38 Insulaton (CAC)	7	13,381	0.57
2109	Roof deck insulation, R-19 (Elec Central Furn, no cool)	0	13,381	0.57
1906	Ceiling R-0 to R-38 Insulation (Elec baseboard heat + Central AC)	0	13,381	0.57
1828	WINDOWS - Double-Glazed Clear to Energy Star (eFAF + room AC)	0	13,381	0.58
1915	Basement insulation R-13 (Elec baseboard heat + Central AC)	0	13,382	0.58
2112	Floor R-0 to R-19 Insulation-Batts (Elec Central Furn, no cool)	0	13,382	0.60
2009	Ceiling R-11 to R-49 Insulation (Elec baseboard heat + Room AC)	0	13,382	0.60
1012	Roof deck insulation, R-19 (CAC)	7	13,389	0.61
1608	Ceiling R-19 to R-38 Insulation (GSHP heat/cool)	1	13,389	0.61
2113	Wall Blow-in R-0 to R-13 Insulation (Elec Central Furn, no cool)	0	13,390	0.62
1516	Floor R-0 to R-19 Insulation-Batts (HP heat/cool)	6	13,395	0.63
1528	Windows - Adding Storm Windows (HP heat/cool)	112	13,508	0.63
2005	Ductless mini-split heat pump SEER 22.0/HSPF10.0 (RAC)	27	13,534	0.66
1116	Cool Roof (RAC)	2	13,537	0.67

Residential Electric Existing Construction

Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost $/kW
2113	Wall Blow-in R-0 to R-13 Insulation (Elec Central Furn, no cool)	0	3,747	1,042
3033	Dimmer Switch (base interior LED, 6 hrs/day)	100	3,847	1,071
2005	Ductless mini-split heat pump SEER 22.0/HSPF10.0 (RAC)	16	3,864	1,077
1918	Cool Roof (baseboard heat + CAC)	1	3,864	1,114
1711	Ceiling R-19 to R-49 Insulation (eFAF + CAC)	1	3,865	1,125
1931	WINDOWS - Double-Glazed Clear to Energy Star (Elec baseboard heat + Central AC)	0	3,865	1,130
1510	Ceiling R-19 to R-38 Insulation (HP heat/cool)	18	3,884	1,212
1816	Cool Roof (eFAF + RAC)	0	3,884	1,227
1723	Comprehensive Shell Air Sealing - Inf. Reduction (eFAF + CAC)	6	3,890	1,392
1713	Radiant Barrier (eFAF + CAC)	3	3,893	1,425
7004	DHW Tank Wrap	10	3,903	1,473
1813	Basement insulation R-13 (eFAF + room AC)	0	3,903	1,550
1730	WINDOWS - Single Pane Clear to Energy Star Double Pane (eFAF + CAC)	3	3,906	1,552
1703	Ground Source Heat Pump EER 17.1/COP 3.6 ENERGY STAR (eFAF + CAC)	17	3,923	1,595
1708	Ceiling R-11 to R-38 Insulaton (eFAF + CAC)	1	3,924	1,597
1911	Ceiling R-19 to R-49 Insulation (Elec baseboard heat + Central AC)	0	3,924	1,603
1807	Ceiling R-11 to R-49 Insulation (eFAF + room AC)	0	3,924	1,609
1712	Roof deck insulation, R-19 (eFAF + CAC)	1	3,925	1,687
1803	Ground Source Heat Pump EER 17.1/COP 3.6 ENERGY STAR (eFAF + room AC)	0	3,926	1,751
1804	Ceiling R-0 to R-38 Insulation (eFAF + room AC)	0	3,926	1,869
1923	Comprehensive Shell Air Sealing - Inf. Reduction (Elec baseboard heat + Central AC)	0	3,926	1,911
3022	Motion/Occupance Sensor (base interior LED, 2.5 hrs/day)	4	3,930	1,931
7003	Solar Domestic Water Heating	227	4,158	1,966
1820	Comprehensive Shell Air Sealing - Inf. Reduction (eFAF + room AC)	0	4,158	1,970
1503	Ground Source Heat Pump EER 17.1/COP 3.6 ENERGY STAR (HP heat/cool)	71	4,229	2,031
1401	ECM Furnace Fan (variable speed motor)	128	4,357	2,106
3023	Dimmer Switch (base interior LED, 2.5 hrs/day)	54	4,411	2,127
1827	WINDOWS - Single Pane Clear to Energy Star Double Pane (eFAF + room AC)	0	4,411	2,131
2011	Ceiling R-19 to R-49 Insulation (Elec baseboard heat + Room AC)	0	4,411	2,140
1912	Roof deck insulation, R-19 (Elec baseboard heat + Central AC)	0	4,411	2,193
2108	Ceiling R-19 to R-49 Insulation (Elec Central Furn, no cool)	0	4,411	2,245
2012	Roof deck insulation, R-19 (Elec baseboard heat + Room AC)	0	4,412	2,267
6502	Plug Load Controls - Smart Power Strip (base Desktop PC)	3	4,415	2,291
1930	WINDOWS - Single Pane Clear to Energy Star Double Pane (baseboard heat + RAC)	0	4,415	2,317
5001	Clothes Washer, ENERGY STAR (IMEF 2.07 / IWF 4.2)	14	4,429	2,355
2102	Ground Source Heat Pump with Desuperheater (Elec Central Furn, no cool)	0	4,430	2,363
1908	Ceiling R-11 to R-38 Insulaton (Elec baseboard heat + Central AC)	0	4,430	2,410
2020	Comprehensive Shell Air Sealing - Inf. Reduction (Elec baseboard heat + Room AC)	1	4,430	2,411
1716	Floor R-0 to R-19 Insulation-Batts (eFAF + CAC)	1	4,431	2,413
1705	AC Maintenance and/or tune-up (eFAF + CAC)	1	4,432	2,454
1810	Roof deck insulation, R-19 (eFAF + room AC)	0	4,432	2,524
1913	Radiant Barrier (baseboard heat + CAC)	0	4,432	2,703
1625	Window Film (GSHP)	0	4,433	2,804

Residential Electric Existing Construction

Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost $/kWH
1918	Cool Roof (baseboard heat + CAC)	1	13,538	0.68
1711	Ceiling R-19 to R-49 Insulation (eFAF + CAC)	2	13,539	0.69
1931	WINDOWS - Double-Glazed Clear to Energy Star (Elec baseboard heat + Central AC)	0	13,540	0.69
1103	Ductless mini-split heat pump SEER 22.0/HSPF10.0 (RAC)	4	13,544	0.72
1510	Ceiling R-19 to R-38 Insulation (HP heat/cool)	30	13,574	0.74
1023	Comprehensive Shell Air Sealing - Inf. Reduction (CAC)	38	13,612	0.75
1816	Cool Roof (eFAF + RAC)	0	13,612	0.75
3043	Photocell	5	13,617	0.84
1723	Comprehensive Shell Air Sealing - Inf. Reduction (eFAF + CAC)	10	13,627	0.85
1713	Radiant Barrier (eFAF + CAC)	5	13,632	0.87
1102	Ductless mini-split heat pump SEER 19.0/HSPF 9.4 (RAC)	5	13,637	0.90
1813	Basement insulation R-13 (eFAF + room AC)	0	13,637	0.95
1730	WINDOWS - Single Pane Clear to Energy Star Double Pane (eFAF + CAC)	5	13,642	0.95
1703	Ground Source Heat Pump EER 17.1/COP 3.6 ENERGY STAR (eFAF + CAC)	27	13,669	0.98
1708	Ceiling R-11 to R-38 Insulaton (eFAF + CAC)	2	13,671	0.98
1911	Ceiling R-19 to R-49 Insulation (Elec baseboard heat + Central AC)	0	13,671	0.98
1807	Ceiling R-11 to R-49 Insulation (eFAF + room AC)	0	13,671	0.99
1712	Roof deck insulation, R-19 (eFAF + CAC)	2	13,674	1.03
3031	Timers (base interior LED, 6 hrs/day)	3	13,677	1.06
1803	Ground Source Heat Pump EER 17.1/COP 3.6 ENERGY STAR (eFAF + room AC)	1	13,677	1.07
3042	Motion/Occupance Sensor (base exterior LED lighting)	9	13,686	1.10
6202	Plug Load Controls - Smart Power Strip (base Other TV)	4	13,690	1.10
1117	Comprehensive Shell Air Sealing - Inf. Reduction (RAC)	1	13,691	1.11
1029	Windows - Adding Storm Windows (CAC)	43	13,733	1.11
1804	Ceiling R-0 to R-38 Insulation (eFAF + room AC)	0	13,733	1.15
1111	Radiant Barrier (RAC)	1	13,734	1.15
1923	Comprehensive Shell Air Sealing - Inf. Reduction (Elec baseboard heat + Central AC)	1	13,735	1.17
1820	Comprehensive Shell Air Sealing - Inf. Reduction (eFAF + room AC)	0	13,735	1.21
1503	Ground Source Heat Pump EER 17.1/COP 3.6 ENERGY STAR (HP heat/cool)	116	13,851	1.24
1401	ECM Furnace Fan (variable speed motor)	216	14,066	1.25
1010	Ceiling R-19 to R-38 Insulation (CAC)	9	14,075	1.28
1005	AC Maintenance and/or tune-up (CAC)	7	14,082	1.30
1827	WINDOWS - Single Pane Clear to Energy Star Double Pane (eFAF + room AC)	0	14,082	1.31
2011	Ceiling R-19 to R-49 Insulation (Elec baseboard heat + Room AC)	0	14,082	1.31
2108	Ceiling R-19 to R-49 Insulation (Elec Central Furn, no cool)	0	14,082	1.33
1912	Roof deck insulation, R-19 (Elec baseboard heat + Central AC)	0	14,082	1.34
2012	Roof deck insulation, R-19 (Elec baseboard heat + Room AC)	0	14,083	1.39
2102	Ground Source Heat Pump with Desuperheater (Elec Central Furn, no cool)	0	14,083	1.40
1930	WINDOWS - Single Pane Clear to Energy Star Double Pane (baseboard heat + RAC)	0	14,083	1.42
1124	WINDOWS - Single Pane Clear to Energy Star Double Pane (RAC)	0	14,084	1.47
1908	Ceiling R-11 to R-38 Insulaton (Elec baseboard heat + Central AC)	0	14,084	1.48
2020	Comprehensive Shell Air Sealing - Inf. Reduction (Elec baseboard heat + Room AC)	1	14,085	1.48

Residential Electric Existing Construction

Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost $/kW
2027	WINDOWS - Single Pane Clear to Energy Star Double Pane (baseboard heat + RAC)	0	4,433	2,830
1729	Windows - Adding Storm Windows (eFAF + CAC)	6	4,439	2,874
1710	Ceiling R-19 to R-38 Insulation (eFAF + CAC)	2	4,441	3,146
1527	Window Film (ASHP)	16	4,456	3,225
1809	Ceiling R-19 to R-49 Insulation (eFAF + room AC)	0	4,456	3,278
2105	Ceiling R-11 to R-38 Insulaton (Elec Central Furn, no cool)	0	4,456	3,308
2008	Ceiling R-11 to R-38 Insulaton (Elec baseboard heat + Room AC)	0	4,457	3,456
1826	Windows - Adding Storm Windows (eFAF + room AC)	0	4,457	3,682
3043	Photocell	1	4,458	3,710
2016	Floor R-0 to R-19 Insulation-Batts (Elec baseboard heat + Room AC)	0	4,458	3,930
1905	AC Maintenance and/or tune-up (baseboard heat + CAC)	0	4,458	3,970
1929	Windows - Adding Storm Windows (baseboard heat + CAC)	0	4,458	4,088
1903	Ground Source Heat Pump EER 17.1/COP 3.6 ENERGY STAR (Elec baseboard heat + Central AC)	1	4,459	4,140
1811	Radiant Barrier (eFAF + room AC)	0	4,459	4,420
2107	Ceiling R-19 to R-38 Insulation (Elec Central Furn, no cool)	0	4,459	4,445
2013	Radiant Barrier (baseboard heat + RAC)	0	4,459	4,509
1916	Floor R-0 to R-19 Insulation-Batts (Elec baseboard heat + Central AC)	0	4,459	4,531
1910	Ceiling R-19 to R-38 Insulation (Elec baseboard heat + Central AC)	0	4,459	4,560
1624	ENERGY STAR Ceiling Fans (GSHP heat/cool)	0	4,459	4,565
3031	Timers (base interior LED, 6 hrs/day)	1	4,460	4,659
3042	Motion/Occupance Sensor (base exterior LED lighting)	2	4,462	4,835
1808	Ceiling R-19 to R-38 Insulation (eFAF + room AC)	0	4,462	4,861
2003	Ground Source Heat Pump EER 17.1/COP 3.6 ENERGY STAR (Elec baseboard heat + Room AC)	2	4,463	4,866
1806	Ceiling R-11 to R-38 Insulaton (eFAF + room AC)	0	4,463	4,873
1814	Floor R-0 to R-19 Insulation-Batts (eFAF + room AC)	0	4,464	4,876
2026	Windows - Adding Storm Windows (baseboard heat + RAC)	1	4,464	5,072
2010	Ceiling R-19 to R-38 Insulation (Elec baseboard heat + Room AC)	0	4,465	5,756
1526	ENERGY STAR Ceiling Fans (HP heat/cool)	2	4,467	5,834
5301	PV-Powered Pool Pumps ROB	10	4,476	6,383
5103	Clothes Dryer, CEF 5.20 CEE Tier 3	3	4,480	7,704
3012	Motion/Occupance Sensor (base interior LED, 0.5 hrs/day)	2	4,481	7,711
5102	Clothes Dryer, CEF 4.30 CEE Tier 2	3	4,485	7,733
3013	Dimmer Switch (base interior LED, 0.5 hrs/day)	21	4,506	8,449
3021	Timers (base interior LED, 2.5 hrs/day)	0	4,506	9,264
1928	Window Film (baseboard heat + CAC)	0	4,506	9,297
5101	Clothes Dryer, CEF 3.93 ENERGY STAR	3	4,509	9,402
1728	Window Film (eFAF + CAC)	1	4,510	9,907
7011	Energy Star CW CEE Tier 2 (MEF=2.0)	1	4,511	10,888
1727	ENERGY STAR Ceiling Fans (eFAF + CAC)	0	4,511	15,343
3041	Timers (base exterior LED lighting)	0	4,511	17,381
2025	Window Film (baseboard heat + RAC)	0	4,512	17,589
1927	ENERGY STAR Ceiling Fans (baseboard heat + CAC)	0	4,512	17,949

Residential Electric Existing Construction

Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost $/kWH
1716	Floor R-0 to R-19 Insulation-Batts (eFAF + CAC)	1	14,086	1.48
1705	AC Maintenance and/or tune-up (eFAF + CAC)	2	14,088	1.50
1810	Roof deck insulation, R-19 (eFAF + room AC)	0	14,088	1.55
1913	Radiant Barrier (baseboard heat + CAC)	0	14,088	1.66
1110	Roof deck insulation, R-19 (RAC)	0	14,088	1.71
1625	Window Film (GSHP)	1	14,089	1.72
2027	WINDOWS - Single Pane Clear to Energy Star Double Pane (baseboard heat + RAC)	1	14,089	1.73
3012	Motion/Occupance Sensor (base interior LED, 0.5 hrs/day)	7	14,097	1.75
1729	Windows - Adding Storm Windows (eFAF + CAC)	10	14,107	1.76
5201	Dishwasher, ENERGY STAR (<= 270 kWh)	18	14,125	1.79
3013	Dimmer Switch (base interior LED, 0.5 hrs/day)	93	14,218	1.92
1710	Ceiling R-19 to R-38 Insulation (eFAF + CAC)	3	14,221	1.93
2105	Ceiling R-11 to R-38 Insulaton (Elec Central Furn, no cool)	0	14,221	1.96
1527	Window Film (ASHP)	25	14,246	1.98
1809	Ceiling R-19 to R-49 Insulation (eFAF + room AC)	0	14,246	2.01
1028	Window Film (CAC)	22	14,268	2.04
3021	Timers (base interior LED, 2.5 hrs/day)	2	14,270	2.10

Residential Electric Existing Construction

Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost $/kW
5201	Dishwasher, ENERGY STAR (<= 270 kWh)	1	4,513	21,534
6202	Plug Load Controls - Smart Power Strip (base Other TV)	0	4,513	21,831
2024	ENERGY STAR Ceiling Fans (baseboard heat + RAC)	0	4,513	22,527
1824	ENERGY STAR Ceiling Fans (eFAF + RAC)	0	4,513	23,999
3011	Timers (base interior LED, 0.5 hrs/day)	0	4,513	36,836
1825	Window Film (eFAF + RAC)	0	4,513	39,260
7012	Energy Star Dishwasher (EF=0.72)	0	4,514	89,502
6002	Plug Load Controls - Smart Power Strip (base LED TV)	0	4,514	102,231
6102	Plug Load Controls - Smart Power Strip (base LCD TV)	0	4,514	284,643
1001	16 SEER (13.68 EER) Split-System Air Conditioner (CAC)	0	4,514	N/A
1003	18 SEER Split-System Air Conditioner (CAC)	0	4,514	N/A
1005	AC Maintenance and/or tune-up (CAC)	0	4,514	N/A
1006	Ceiling R-0 to R-38 Insulation (CAC)	0	4,514	N/A
1007	Ceiling R-0 to R-49 Insulation (CAC)	0	4,514	N/A
1008	Ceiling R-11 to R-38 Insulaton (CAC)	0	4,514	N/A
1009	Ceiling R-11 to R-49 Insulation (CAC)	0	4,514	N/A
1010	Ceiling R-19 to R-38 Insulation (CAC)	0	4,514	N/A

Residential Electric New Construction
Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost $/kWH
101	Code + 10% - Base Code Home	30	30	0.06
102	Code + 15% - Base Code Home	1	30	0.07

Residential Electric New Construction
Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost $/kW
101	Code + 10% - Base Code Home	6	6	282
102	Code + 15% - Base Code Home	0	6	353

Commercial Electric Existing Construction
Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost $/kWH
6201	Electric Combination Oven	211	211	0.01
4001	Energy Star server	591	801	0.01
1351	LED screw-in replacement (base incandescent/halogen)	442	1,243	0.01
1752	LED screw-in replacement (base Outdoor Incandescent)	253	1,496	0.01
3301	Efficient compressor motor, walk-ins	2	1,498	0.01
3401	Efficient compressor motor, base large cold storage	0	1,498	0.01
8004	Compressed Air - End Use Optimization	57	1,555	0.01
8101	Efficient industrial process	3	1,558	0.01
8401	Efficient industrial process	0	1,558	0.01
9303	Industrial process improved operations	32	1,590	0.01
1452	High Performance Lighting R/R - Combined Strategies (base low bay HID)	8	1,598	0.01
7101	Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons, heating	82	1,680	0.01
1526	High Bay Bi-Level Programmed LED Fixture	71	1,750	0.01
3601	Energy Star glass door reach-in refrigerator/freezer	11	1,762	0.01
8006	Compressed Air - Leak Reduction	26	1,788	0.01
3201	Efficient compressor motor, base closed cases	1	1,789	0.01
7802	Variable Speed Drive Control, base motors	202	1,991	0.01
1551	High Bay Bi-Level Programmed LED Fixture	27	2,018	0.01
1652	LED outdoor lighting with bi-level controls (Base Outdoor HID)	2,031	4,049	0.01
3409	Oversized Air Cooled Condenser, base large cold storage	2	4,051	0.01
6301	Energy Star Convection Oven	37	4,088	0.01
1002	ROB 2L4' LED Tube (Base T12)	36	4,124	0.01
8008	Compressed Air - Maintenance	24	4,148	0.02
3404	Electronically commutated evaporator fan motor, base large cold storage	3	4,151	0.02
3306	Electronically commutated evaporator fan motor, walk-ins	152	4,303	0.02
3403	Compressor VSD retrofit, base large cold storage	4	4,307	0.02
3303	Compressor VSD retrofit, walk-ins	183	4,490	0.02
3209	Freezer-Cooler Replacement Gaskets, base closed cases	12	4,502	0.02
1001	High Performance Lighting R/R - Combined Strategies (Base T12)	72	4,574	0.02
3101	Efficient compressor motor, open cases	0	4,575	0.02
7803	Air Handler Optimization, 15 HP	555	5,130	0.02
4401	Energy Star or Better Imaging Equipment	1	5,130	0.02
1101	High Performance Lighting R/R - Combined Strategies (Base T8)	132	5,262	0.02
5008	Low Flow Faucet Aerators	58	5,321	0.02
3501	Energy Star solid door reach-in refrigerator/freezer	16	5,337	0.02
1102	ROB 2L4' LED Tube (Base T8)	54	5,390	0.02
3310	High-efficiency fan motors, walk-ins	133	5,523	0.02
5010	Low-flow pre-rinse spray valve	37	5,560	0.02
3214	Low or Anti-Sweat Door Film, base closed cases	13	5,573	0.02
3411	Refrigeration Commissioning, base large cold storage	1	5,575	0.02
6601	Energy Star hot food holding cabinet	184	5,759	0.02
3410	Refrigeration Coil Cleaning, base large cold storage	7	5,766	0.02
6501	Energy Star griddle	17	5,783	0.02
3313	Oversized Air Cooled Condenser, walk-ins	106	5,889	0.02

Commercial Electric Existing Construction
Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost $/kW
7101	Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons, heating	53	53	19
1351	LED screw-in replacement (base incandescent/halogen)	133	186	25
1002	ROB 2L4' LED Tube (Base T12)	11	197	49
1752	LED screw-in replacement (base Outdoor Incandescent)	37	234	54
1452	High Performance Lighting R/R - Combined Strategies (base low bay HID)	2	235	60
1526	High Bay Bi-Level Programmed LED Fixture	14	249	62
1102	ROB 2L4' LED Tube (Base T8)	16	266	64
1551	High Bay Bi-Level Programmed LED Fixture	5	271	68
6201	Electric Combination Oven	18	289	73
3301	Efficient compressor motor, walk-ins	0	289	77
3401	Efficient compressor motor, base large cold storage	0	289	77
4001	Energy Star server	49	338	85
1001	High Performance Lighting R/R - Combined Strategies (Base T12)	14	353	88
1101	High Performance Lighting R/R - Combined Strategies (Base T8)	26	379	91
8004	Compressed Air - End Use Optimization	7	386	91
8401	Efficient industrial process	0	386	91
8101	Efficient industrial process	0	386	91
9303	Industrial process improved operations	4	390	92
1503	High Bay LED Troffer (Base T5)	13	403	93
1502	ROB 2L4' LED Tube (Base T5)	6	409	94
1652	LED outdoor lighting with bi-level controls (Base Outdoor HID)	294	703	99
1601	LED Exit Sign	8	711	102
1004	LED Troffer with lamp removal (T12)	10	721	102
8006	Compressed Air - Leak Reduction	3	724	107
1451	LED fixture (base Low bay HID)	2	726	107
3601	Energy Star glass door reach-in refrigerator/freezer	1	727	117
3201	Efficient compressor motor, base closed cases	0	727	122
8008	Compressed Air - Maintenance	3	730	130
7802	Variable Speed Drive Control, base motors	20	750	135
3409	Oversized Air Cooled Condenser, base large cold storage	0	750	135
1104	LED Troffer with lamp removal (T8)	15	765	138
1552	High Performance Lighting R/R - Combined Strategies (base high bay HID)	6	771	148
7803	Air Handler Optimization, 15 HP	67	838	149
4401	Energy Star or Better Imaging Equipment	0	838	149
5008	Low Flow Faucet Aerators	7	845	153
3209	Freezer-Cooler Replacement Gaskets, base closed cases	1	847	162
1003	LED Troffer (Base T12)	9	856	167
3101	Efficient compressor motor, open cases	0	856	167
1501	High Performance Lighting R/R - Combined Strategies (Base T5)	6	862	171
6301	Energy Star Convection Oven	3	865	174
5010	Low-flow pre-rinse spray valve	4	870	174
3501	Energy Star solid door reach-in refrigerator/freezer	2	872	176
3403	Compressor VSD retrofit, base large cold storage	0	872	180
3310	High-efficiency fan motors, walk-ins	14	886	181

Commercial Electric Existing Construction
Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost $/kWH
5006	Heat Recovery Unit	156	6,045	0.02
3309	Freezer-Cooler Replacement Gaskets, walk-ins	16	6,060	0.02
4201	Energy Star or Better Laptop	2	6,063	0.03
1601	LED Exit Sign	31	6,094	0.03
1503	High Bay LED Troffer (Base T5)	44	6,138	0.03
3216	Oversized Air Cooled Condenser, base closed cases	15	6,153	0.03
1502	ROB 2L4' LED Tube (Base T5)	20	6,172	0.03
1552	High Performance Lighting R/R - Combined Strategies (base high bay HID)	30	6,202	0.03
1004	LED Troffer with lamp removal (T12)	32	6,234	0.03
1851	ROB 2L4' LED Tube (base outdoor fluorescent)	14	6,248	0.03
3314	Refrigeration Coil Cleaning, walk-ins	311	6,559	0.03
2207	High Efficiency Windows (Base Heat Pump Cooling)	37	6,595	0.03
1451	LED fixture (base Low bay HID)	6	6,602	0.03
5001	High Efficiency Water Heater (electric)	7	6,609	0.03
3316	Strip curtains for walk-ins	47	6,656	0.03
3412	Strip curtains for walk-ins, base large cold storage	1	6,657	0.03
3312	Multiplex Compressor System, walk-ins	19	6,676	0.03
3208	Electronically commutated evaporator fan motor, base closed cases	28	6,703	0.03
1501	High Performance Lighting R/R - Combined Strategies (Base T5)	32	6,736	0.03
3702	Refrigeration Coil Cleaning, base ice maker	4	6,740	0.03
3406	High-efficiency fan motors, base large cold storage	1	6,741	0.03
3204	Bi-level LED Case Lighting (self-contained units), base closed cases	27	6,769	0.04
2116	High Efficiency Windows - DX	80	6,849	0.04
3602	Bi-level LED Case Lighting, base glass-door reach-in	6	6,855	0.04
3408	Multiplex Compressor System, base large cold storage	0	6,855	0.04
6701	Efficient Steamer	48	6,903	0.04
2113	Optimize Controls - DX	59	6,962	0.04
5004	Solar Water Heater	7	6,969	0.04
8301	Efficient industrial process	20	6,989	0.04
2102	DX Packaged System, EER=13.4, 10 tons	789	7,778	0.04
2013	High Efficiency Windows - Chiller	22	7,800	0.04
3112	Oversized Air Cooled Condenser, open cases	3	7,804	0.04
8002	Compressed Air - Cold Air Intake	5	7,808	0.04
3106	Electronically commutated evaporator fan motor, open cases	6	7,815	0.04
1104	LED Troffer with lamp removal (T8)	48	7,863	0.04
1005	Lighting Control Tuneup (Base T12)	5	7,868	0.04
1051	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	221	8,090	0.04
3603	Freezer-Cooler Replacement Gaskets, base glass-door reach-in	3	8,092	0.04
3217	Refrigeration Coil Cleaning, base closed cases	45	8,138	0.04
8201	Efficient industrial process	19	8,157	0.04
2604	High Efficiency Windows (Base Ductless Mini-split)	6	8,162	0.04
1105	Lighting Control Tuneup (Base T8)	10	8,172	0.04
3308	Floating head pressure controls, walk-ins	2	8,174	0.04
3102	Bi-level LED Case Lighting (self-contained units), open cases	9	8,183	0.04

Commercial Electric Existing Construction
Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost $/kW
1301	LED screw-in replacement (base CFL)	14	900	181
3303	Compressor VSD retrofit, walk-ins	17	917	182
3214	Low or Anti-Sweat Door Film, base closed cases	1	918	194
7001	Ceiling/roof Insulation (electric boiler)	0	918	195
3411	Refrigeration Commissioning, base large cold storage	0	918	195
7201	Air-Source Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons (base air-source heat pump heating)	133	1,051	195
3410	Refrigeration Coil Cleaning, base large cold storage	1	1,052	202
5006	Heat Recovery Unit	19	1,071	205
3313	Oversized Air Cooled Condenser, walk-ins	11	1,082	214
1851	ROB 2L4' LED Tube (base outdoor fluorescent)	2	1,084	215
4201	Energy Star or Better Laptop	0	1,084	218
1051	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	41	1,125	228
3309	Freezer-Cooler Replacement Gaskets, walk-ins	2	1,127	229
3404	Electronically commutated evaporator fan motor, base large cold storage	0	1,127	244
1151	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	35	1,162	249
3306	Electronically commutated evaporator fan motor, walk-ins	10	1,172	249
6601	Energy Star hot food holding cabinet	16	1,188	252
3216	Oversized Air Cooled Condenser, base closed cases	2	1,189	264
6501	Energy Star griddle	1	1,191	266
5001	High Efficiency Water Heater (electric)	1	1,191	272
1201	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	40	1,231	277
3314	Refrigeration Coil Cleaning, walk-ins	33	1,265	292
7104	Smart Thermostat (Base Furnace Heating)	4	1,268	303
7403	Smart Thermostat (base packaged heat pump)	13	1,282	303
3316	Strip curtains for walk-ins	5	1,287	307
3412	Strip curtains for walk-ins, base large cold storage	0	1,287	307
1103	LED Troffer (Base T8)	10	1,297	309
3312	Multiplex Compressor System, walk-ins	2	1,299	309
3702	Refrigeration Coil Cleaning, base ice maker	0	1,299	321
5004	Solar Water Heater	1	1,300	322
3406	High-efficiency fan motors, base large cold storage	0	1,300	323
7204	Smart Thermostat (Base Heat Pump Heating)	93	1,393	325
3204	Bi-level LED Case Lighting (self-contained units), base closed cases	3	1,396	329
3602	Bi-level LED Case Lighting, base glass-door reach-in	1	1,397	334
8301	Efficient industrial process	2	1,399	338
3408	Multiplex Compressor System, base large cold storage	0	1,399	343
8002	Compressed Air - Cold Air Intake	1	1,400	347
1005	Lighting Control Tuneup (Base T12)	1	1,400	363
8201	Efficient industrial process	2	1,403	365
1105	Lighting Control Tuneup (Base T8)	1	1,404	374
3112	Oversized Air Cooled Condenser, open cases	0	1,404	375
5003	Tankless Water Heater	1	1,405	388
1702	LED screw-in replacement (base Outdoor CFL)	1	1,406	393
3603	Freezer-Cooler Replacement Gaskets, base glass-door reach-in	0	1,406	396

Commercial Electric Existing Construction
Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost $/kWH
1151	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	187	8,370	0.05
5003	Tankless Water Heater	8	8,378	0.05
1003	LED Troffer (Base T12)	30	8,408	0.05
4101	Energy Star or Better PC	111	8,519	0.05
2009	EMS Optimization - Chiller	6	8,525	0.05
3205	Compressor VSD retrofit, base closed cases	20	8,545	0.05
3701	Energy Star Ice Machines	9	8,555	0.05
7801	High Efficiency Motor	18	8,573	0.05
1301	LED screw-in replacement (base CFL)	45	8,618	0.05
1201	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	198	8,816	0.06
1702	LED screw-in replacement (base Outdoor CFL)	8	8,824	0.06
2108	Duct Testing/Sealing - DX	204	9,028	0.06
6102	Vending Misers (Refrigerated units)	8	9,036	0.06
3315	Refrigeration Commissioning, walk-ins	24	9,060	0.06
7805	Energy Recovery Ventilation (ERV)	403	9,463	0.06
4301	Energy Star or Better Monitor - LCD	11	9,474	0.06
1504	Lighting Control Tuneup (Base T5)	1	9,475	0.06
2001	Centrifugal Chiller, 0.54 kW/ton, 500 tons	63	9,538	0.06
2401	HE PTAC, EER=9.6, 1 ton, cooling	72	9,610	0.06
2111	Economizer Repair - DX	270	9,880	0.07
3113	Refrigeration Coil Cleaning, open cases	9	9,889	0.07
3203	Anti-sweat (humidistat) controls, base closed cases	2	9,891	0.07
3202	Energy-Star Refrigerator/Freezer, base closed cases	16	9,907	0.08
2002	Chiller Tune Up/Diagnostics	8	9,915	0.08
3218	Refrigeration Commissioning, base closed cases	6	9,921	0.08
3502	Freezer-Cooler Replacement Gaskets, base reach-in	6	9,927	0.08
3604	Refrigeration Coil Cleaning, base glass-door reach-in	2	9,928	0.08
2502	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Room AC)	32	9,960	0.08
8102	Industrial process improved operations	8	9,968	0.08
8302	Industrial process improved operations	15	9,983	0.08
8202	Industrial process improved operations	14	9,998	0.08
3103	Compressor VSD retrofit, open cases	4	10,002	0.08
3304	Demand Defrost Electric, walk-ins	112	10,114	0.09
8402	Industrial process improved operations	3	10,116	0.09
3901	Energy Star Compact Refrigerator	3	10,120	0.09
1103	LED Troffer (Base T8)	32	10,152	0.09
5007	Hot Water Pipe Insulation	12	10,163	0.09
1202	Lighting Control Tuneup (Base LED Tube)	7	10,170	0.10
7806	Separate Makeup Air / Exhaust Hoods AC	57	10,228	0.11
2004	VSD for Chiller Pumps and Towers	7	10,235	0.11
2201	Heat Pump Upgrade (18 SEER, 8.2 HSPF), cooling	127	10,362	0.11
5011	Recirculation Pump Timer Clock - Controls for Central Domestic Hot Water	10	10,372	0.11
3801	Energy Star refrigerator/freezer	82	10,454	0.12
3211	High-efficiency fan motors, base closed cases	7	10,461	0.12
5002	Heat Pump Water Heater (air source)	64	10,525	0.12
7104	Smart Thermostat (Base Furnace Heating)	10	10,534	0.12
7403	Smart Thermostat (base packaged heat pump)	33	10,568	0.12

Commercial Electric Existing Construction
Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost $/kW
3217	Refrigeration Coil Cleaning, base closed cases	5	1,411	399
3308	Floating head pressure controls, walk-ins	0	1,412	403
3102	Bi-level LED Case Lighting (self-contained units), open cases	1	1,413	407
4101	Energy Star or Better PC	14	1,426	417
6701	Efficient Steamer	4	1,430	440
7801	High Efficiency Motor	2	1,432	447
3701	Energy Star Ice Machines	1	1,433	480
7805	Energy Recovery Ventilation (ERV)	49	1,482	484
4301	Energy Star or Better Monitor - LCD	1	1,484	489
3208	Electronically commutated evaporator fan motor, base closed cases	2	1,485	509
1504	Lighting Control Tuneup (Base T5)	0	1,485	528
3315	Refrigeration Commissioning, walk-ins	3	1,488	544
7102	Ceiling/roof Insulation (base furnace)	1	1,489	555
3205	Compressor VSD retrofit, base closed cases	2	1,491	563
7202	Ceiling/roof Insulation (base air-source heat pump heating)	17	1,508	605
7304	Smart Thermostat (Base Rooftop/packaged heating)	18	1,526	614
7401	Ceiling/roof Insulation (base ductless mini-split)	3	1,529	624
3106	Electronically commutated evaporator fan motor, open cases	0	1,529	632
3113	Refrigeration Coil Cleaning, open cases	1	1,530	637
3203	Anti-sweat (humidistat) controls, base closed cases	0	1,530	671
7301	Packaged Heat Pump, heating, IEER 13.9/COP 3.4 (w/ non-ER heating), 10 tons	105	1,636	680
3202	Energy-Star Refrigerator/Freezer, base closed cases	2	1,637	699
8102	Industrial process improved operations	1	1,638	715
8302	Industrial process improved operations	2	1,640	720
8202	Industrial process improved operations	2	1,642	720
8402	Industrial process improved operations	0	1,642	741
3218	Refrigeration Commissioning, base closed cases	1	1,643	745
3502	Freezer-Cooler Replacement Gaskets, base reach-in	1	1,643	746
6102	Vending Misers (Refrigerated units)	1	1,644	749
7002	Duct/Pipe Insulation (electric boiler)	0	1,644	753
3604	Refrigeration Coil Cleaning, base glass-door reach-in	0	1,645	756
1401	LED screw-in replacement (base LED)	12	1,657	788
5007	Hot Water Pipe Insulation	1	1,658	793
3304	Demand Defrost Electric, walk-ins	12	1,670	797
3901	Energy Star Compact Refrigerator	0	1,671	810
7804	Demand Controlled Ventilation, 15 HP	297	1,967	841
1202	Lighting Control Tuneup (Base LED Tube)	1	1,968	842
7806	Separate Makeup Air / Exhaust Hoods AC	7	1,975	899
3103	Compressor VSD retrofit, open cases	0	1,976	932
5011	Recirculation Pump Timer Clock - Controls for Central Domestic Hot Water	1	1,977	960
5002	Heat Pump Water Heater (air source)	8	1,984	1,002
3801	Energy Star refrigerator/freezer	9	1,993	1,075
3211	High-efficiency fan motors, base closed cases	1	1,994	1,081
3215	Multiplex Compressor System, base closed cases	0	1,994	1,192
7302	Ceiling/roof Insulation (base packaged heat pump)	2	1,997	1,225
9301	High Efficiency Motor	7	2,004	1,227
3402	Auto-closer on main door to walk-in freezer, base large cold storage	0	2,004	1,250

Commercial Electric Existing Construction
Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost $/kWH
2306	Window Film (Standard) (Base Residential Split-System)	52	10,620	0.12
7001	Ceiling/roof Insulation (electric boiler)	0	10,620	0.13
7201	Air-Source Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons (base air-source heat pump heating)	206	10,826	0.13
2104	DX Tune Up/ Advanced Diagnostics	13	10,839	0.13
2405	Window Film (Standard) (Base PTAC)	15	10,854	0.13
3111	Night covers for display cases, open cases	5	10,859	0.13
3215	Multiplex Compressor System, base closed cases	2	10,861	0.13
7204	Smart Thermostat (Base Heat Pump Heating)	232	11,093	0.13
3402	Auto-closer on main door to walk-in freezer, base large cold storage	0	11,093	0.13
2404	Occupancy Sensor (hotels)	33	11,126	0.14
6401	Efficient Fryer	14	11,140	0.14
3503	Refrigeration Coil Cleaning, base base reach-in	4	11,144	0.14
6101	Vending Misers (Refrigerated glass-front units)	3	11,147	0.14
2107	Cool Roof - DX	49	11,196	0.14
3302	Auto-closer on main door to walk-in freezer	13	11,209	0.14
3311	Insulated suction lines, walk-ins	1	11,209	0.15
9301	High Efficiency Motor	57	11,266	0.15
9302	Variable Speed Drive Control, base motors	647	11,913	0.16
3107	High-efficiency fan motors, open cases	1	11,915	0.16
2603	Window Film (Standard) (Base Ductless Mini-split)	9	11,923	0.16
3110	Multiplex Compressor System, open cases	1	11,924	0.16
2003	High Efficiency Chilled Water & Condenser Water Pump Motors	4	11,928	0.17
3802	Refrigeration Coil Cleaning, residential-type refrigerator	67	11,995	0.18
2506	High Efficiency Windows (Base Room AC)	1	11,996	0.18
2007	Duct Testing/Sealing - Chiller	68	12,064	0.19
7804	Demand Controlled Ventilation, 15 HP	1,309	13,373	0.19
2302	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Residential Split-System)	204	13,576	0.20
1107	Occupancy Sensor (Base T8)	12	13,589	0.20
1007	Occupancy Sensor (Base T12)	6	13,595	0.20
3305	Demand Hot Gas Defrost, walk-ins	33	13,629	0.22
2305	Smart Thermostat (Base Residential Split-System)	85	13,713	0.22
2205	Smart Thermostat (Base Heat Pump Cooling)	87	13,800	0.22
2110	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - DX	1	13,801	0.22
1401	LED screw-in replacement (base LED)	40	13,841	0.24
2012	Window Film (Standard) - Chiller	26	13,867	0.24
7304	Smart Thermostat (Base Rooftop/packaged heating)	45	13,912	0.25
2206	Window Film (Standard) (Base Heat Pump Cooling)	29	13,941	0.25
2114	Smart Thermostat - DX	201	14,142	0.25
3206	Demand Defrost Electric, base closed cases	12	14,154	0.25
3114	Refrigeration Commissioning, open cases	1	14,154	0.26
2402	Ceiling/roof Insulation (Base PTAC)	3	14,158	0.26
2115	Window Film (Standard) - DX	68	14,226	0.26
2505	Window Film (Standard) (Base Room AC)	4	14,229	0.31
1251	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	101	14,330	0.32
1852	LED outdoor lighting with bi-level controls (Base Outdoor Fluorescent)	8	14,338	0.34

Commercial Electric Existing Construction
Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost $/kW
3503	Refrigeration Coil Cleaning, base base reach-in	0	2,004	1,277
1901	Outdoor Lighting Controls (Base Outdoor LED Tube)	2	2,006	1,302
3302	Auto-closer on main door to walk-in freezer	1	2,008	1,337
3311	Insulated suction lines, walk-ins	0	2,008	1,399
3107	High-efficiency fan motors, open cases	0	2,008	1,454
3110	Multiplex Compressor System, open cases	0	2,008	1,486
9302	Variable Speed Drive Control, base motors	64	2,072	1,572
6401	Efficient Fryer	1	2,073	1,604
3802	Refrigeration Coil Cleaning, residential-type refrigerator	7	2,080	1,631
1251	RET Occ & Daylight Integral Sensor LED troffer (base linear LED integrated)	19	2,099	1,716
6101	Vending Misers (Refrigerated glass-front units)	0	2,099	1,768
3305	Demand Hot Gas Defrost, walk-ins	4	2,103	2,034
1801	Outdoor Lighting Controls (Base Outdoor LED)	12	2,115	2,189
7103	Duct/Pipe Insulation (base furnace)	1	2,115	2,278
3206	Demand Defrost Electric, base closed cases	1	2,117	2,323
7203	Duct/Pipe Insulation (base air-source heat pump heating)	23	2,140	2,352
3114	Refrigeration Commissioning, open cases	0	2,140	2,373
1852	LED outdoor lighting with bi-level controls (Base Outdoor Fluorescent)	1	2,141	2,379
3104	Demand Defrost Electric, open cases	0	2,141	3,478
1751	LED outdoor lighting with bi-level controls (Base Outdoor Incandescent)	5	2,146	3,543
1107	Occupancy Sensor (Base T8)	1	2,147	3,677
1007	Occupancy Sensor (Base T12)	0	2,147	3,750
8005	Compressed Air - Equipment Upgrade	3	2,150	3,830
1701	LED outdoor lighting with bi-level controls (Base Outdoor CFL)	1	2,151	3,844
6001	Vending Misers (Non-Refrigerated)	0	2,151	5,129
3902	Refrigeration Coil Cleaning, compact refrigerator	0	2,151	5,351
3207	Demand Hot Gas Defrost, base closed cases	0	2,152	5,859
1204	Occupancy Sensor (Base LED tube)	1	2,152	6,385
5009	Low Flow Showerheads	0	2,152	7,117
3210	High R-Value Glass Doors, base closed cases	0	2,152	7,594
5005	Demand controlled circulating systems	3	2,156	7,611
3212	Insulated suction lines, base closed cases	0	2,156	8,163
7303	Duct/Pipe Insulation (base packaged heat pump)	2	2,158	8,466
8009	Compressed Air - Zero-Loss Condensate Drain	1	2,159	8,477
1106	Network Lighting Controls (Base T8)	2	2,160	8,693
3105	Demand Hot Gas Defrost, open cases	0	2,160	8,797
1006	Network Lighting Controls (Base T12)	1	2,161	8,821
1577	Occupancy Sensor (Base high bay LED)	1	2,162	9,842
1506	Occupancy Sensor (Base T5)	0	2,162	10,260
3108	Insulated suction lines, open cases	0	2,162	12,486
3405	Evaporator fan controller for MT walk-ins, base large cold storage	0	2,162	14,324
1203	Network Lighting Controls (Base LED Tube)	1	2,163	15,007
3307	Evaporator fan controller for MT walk-ins	0	2,163	15,708
4303	Plug-load controls - Commercial Smart Strip (base monitor LCD)	0	2,164	17,513
1505	Network Lighting Controls (Base T5)	0	2,164	23,873

Commercial Electric Existing Construction
Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost $/kWH
1204	Occupancy Sensor (Base LED tube)	10	14,348	0.35
7102	Ceiling/roof Insulation (base furnace)	1	14,349	0.36
3104	Demand Defrost Electric, open cases	3	14,351	0.37
2105	Refrigerant Charge Adjustment - DX	39	14,390	0.39
7202	Ceiling/roof Insulation (base air-source heat pump heating)	27	14,417	0.39
6001	Vending Misers (Non-Refrigerated)	0	14,418	0.40
7401	Ceiling/roof Insulation (base ductless mini-split)	4	14,422	0.40
2006	Cool Roof - Chiller	5	14,427	0.42
7301	Packaged Heat Pump, heating, IEER 13.9/COP 3.4 (w/ non-ER heating), 10 tons	163	14,590	0.44
8005	Compressed Air - Equipment Upgrade	22	14,612	0.45
7002	Duct/Pipe Insulation (electric boiler)	1	14,612	0.49
2203	Ceiling/roof Insulation (Base Heat Pump Cooling)	12	14,624	0.50
2005	Ceiling/roof Insulation - Chiller	3	14,627	0.51
1751	LED outdoor lighting with bi-level controls (Base Outdoor Incandescent)	34	14,661	0.51
2601	Ceiling/roof Insulation (Base Ductless Mini-split)	3	14,663	0.53
1577	Occupancy Sensor (Base high bay LED)	14	14,678	0.53
2106	Ceiling/roof Insulation - DX	28	14,706	0.55
1506	Occupancy Sensor (Base T5)	1	14,707	0.56
1701	LED outdoor lighting with bi-level controls (Base Outdoor CFL)	7	14,714	0.56

Commercial Electric Existing Construction
Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost $/kW
1576	Network Lighting Controls (Base high bay LED)	1	2,165	28,691
3407	Insulated suction lines, base large cold storage	0	2,165	29,211
8007	Compressed Air - Low Pressure-Drop Filters	0	2,165	408,093
2001	Centrifugal Chiller, 0.54 kW/ton, 500 tons	0	2,165	N/A
2002	Chiller Tune Up/Diagnostics	0	2,165	N/A
2003	High Efficiency Chilled Water & Condenser Water Pump Motors	0	2,165	N/A
2004	VSD for Chiller Pumps and Towers	0	2,165	N/A
2005	Ceiling/roof Insulation - Chiller	0	2,165	N/A
2006	Cool Roof - Chiller	0	2,165	N/A
2007	Duct Testing/Sealing - Chiller	0	2,165	N/A
2008	Duct/Pipe Insulation - Chiller	0	2,165	N/A
2009	EMS Optimization - Chiller	0	2,165	N/A
2010	Dual Enthalpy Economizer Replaces Dry Bulb Economizer - Chiller	0	2,165	N/A
2011	New Economizer - Chiller	0	2,165	N/A
2012	Window Film (Standard) - Chiller	0	2,165	N/A
2013	High Efficiency Windows - Chiller	0	2,165	N/A
2102	DX Packaged System, EER=13.4, 10 tons	0	2,165	N/A
2104	DX Tune Up/ Advanced Diagnostics	0	2,165	N/A
2105	Refrigerant Charge Adjustment - DX	0	2,165	N/A

Commercial Electric New Construction
Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost $/kWH
209	High Performance Building/Int Design - Tier 2 30% - Data Centers	11	11	0.01
309	High Performance Building/Int Design - Tier 3 50% - Data Centers	4	15	0.01
409	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Data Centers	1	16	0.01
204	High Performance Building/Int Design - Tier 2 30% - Grocery	8	24	0.01
304	High Performance Building/Int Design - Tier 3 50% - Grocery	3	27	0.01
109	High Performance Building/Int Design - Tier 1 15% - Data Centers	7	34	0.01
404	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Grocery	0	35	0.02
104	High Performance Building/Int Design - Tier 1 15% - Grocery	5	40	0.02
202	High Performance Building/Int Design - Tier 2 30% - Restaurant	9	49	0.03
302	High Performance Building/Int Design - Tier 3 50% - Restaurant	4	53	0.03
402	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Restaurant	1	53	0.03
102	High Performance Building/Int Design - Tier 1 15% - Restaurant	6	59	0.04
213	High Performance Building/Int Design - Tier 2 30% - Industrial	36	95	0.05
313	High Performance Building/Int Design - Tier 3 50% - Industrial	6	101	0.05
203	High Performance Building/Int Design - Tier 2 30% - Retail	26	128	0.05
303	High Performance Building/Int Design - Tier 3 50% - Retail	4	132	0.05
413	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Industrial	1	133	0.06
201	High Performance Building/Int Design - Tier 2 30% - Office	82	215	0.06
403	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Retail	1	216	0.06
301	High Performance Building/Int Design - Tier 3 50% - Office	15	231	0.06
206	High Performance Building/Int Design - Tier 2 30% - School	12	243	0.09
212	High Performance Building/Int Design - Tier 2 30% - Miscellaneous	35	278	0.09
207	High Performance Building/Int Design - Tier 2 30% - Health	13	291	0.09
306	High Performance Building/Int Design - Tier 3 50% - School	5	295	0.09
312	High Performance Building/Int Design - Tier 3 50% - Miscellaneous	13	309	0.10
307	High Performance Building/Int Design - Tier 3 50% - Health	5	313	0.10
208	High Performance Building/Int Design - Tier 2 30% - Lodging	14	327	0.10
406	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - School	1	328	0.11
308	High Performance Building/Int Design - Tier 3 50% - Lodging	5	333	0.11
412	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Miscellaneous	2	335	0.11
407	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Health	1	336	0.11
408	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Lodging	1	337	0.12
205	High Performance Building/Int Design - Tier 2 30% - Warehouse	3	340	0.12
106	High Performance Building/Int Design - Tier 1 15% - School	8	348	0.13
305	High Performance Building/Int Design - Tier 3 50% - Warehouse	1	349	0.13
112	High Performance Building/Int Design - Tier 1 15% - Miscellaneous	22	371	0.13
107	High Performance Building/Int Design - Tier 1 15% - Health	8	379	0.13
210	High Performance Building/Int Design - Tier 2 30% - Non-Jurisdictional	17	396	0.13
310	High Performance Building/Int Design - Tier 3 50% - Non-Jurisdictional	6	402	0.14
108	High Performance Building/Int Design - Tier 1 15% - Lodging	9	411	0.14
405	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Warehouse	0	411	0.14
410	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Non-Jurisdictional	1	412	0.16
214	High Performance Building/Int Design - Tier 2 30% - Agricultural	8	420	0.17
105	High Performance Building/Int Design - Tier 1 15% - Warehouse	2	422	0.17
314	High Performance Building/Int Design - Tier 3 50% - Agricultural	3	425	0.18

Commercial Electric New Construction
Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost $/kW
209	High Performance Building/Int Design - Tier 2 30% - Data Centers	2	2	64
309	High Performance Building/Int Design - Tier 3 50% - Data Centers	1	2	68
409	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Data Centers	0	3	76
204	High Performance Building/Int Design - Tier 2 30% - Grocery	1	4	81
304	High Performance Building/Int Design - Tier 3 50% - Grocery	1	4	85
109	High Performance Building/Int Design - Tier 1 15% - Data Centers	1	6	90
404	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Grocery	0	6	95
104	High Performance Building/Int Design - Tier 1 15% - Grocery	1	6	113
202	High Performance Building/Int Design - Tier 2 30% - Restaurant	2	8	183
302	High Performance Building/Int Design - Tier 3 50% - Restaurant	1	9	193
402	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Restaurant	0	9	216
102	High Performance Building/Int Design - Tier 1 15% - Restaurant	1	10	257
213	High Performance Building/Int Design - Tier 2 30% - Industrial	6	15	301
313	High Performance Building/Int Design - Tier 3 50% - Industrial	1	16	316
203	High Performance Building/Int Design - Tier 2 30% - Retail	4	21	316
303	High Performance Building/Int Design - Tier 3 50% - Retail	1	21	332
413	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Industrial	0	21	355
201	High Performance Building/Int Design - Tier 2 30% - Office	13	35	362
403	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Retail	0	35	373
301	High Performance Building/Int Design - Tier 3 50% - Office	2	37	380
206	High Performance Building/Int Design - Tier 2 30% - School	2	39	554
212	High Performance Building/Int Design - Tier 2 30% - Miscellaneous	6	45	567
207	High Performance Building/Int Design - Tier 2 30% - Health	2	47	578
306	High Performance Building/Int Design - Tier 3 50% - School	1	48	582
312	High Performance Building/Int Design - Tier 3 50% - Miscellaneous	2	50	595
307	High Performance Building/Int Design - Tier 3 50% - Health	1	50	607
208	High Performance Building/Int Design - Tier 2 30% - Lodging	2	53	627
406	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - School	0	53	653
308	High Performance Building/Int Design - Tier 3 50% - Lodging	1	54	658
412	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Miscellaneous	0	54	668
407	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Health	0	54	681
408	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Lodging	0	54	739
205	High Performance Building/Int Design - Tier 2 30% - Warehouse	1	55	746
106	High Performance Building/Int Design - Tier 1 15% - School	1	56	776
305	High Performance Building/Int Design - Tier 3 50% - Warehouse	0	56	784
112	High Performance Building/Int Design - Tier 1 15% - Miscellaneous	4	60	794
107	High Performance Building/Int Design - Tier 1 15% - Health	1	61	809
210	High Performance Building/Int Design - Tier 2 30% - Non-Jurisdictional	3	64	828
310	High Performance Building/Int Design - Tier 3 50% - Non-Jurisdictional	1	65	869
108	High Performance Building/Int Design - Tier 1 15% - Lodging	1	66	877
405	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Warehouse	0	66	880
410	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Non-Jurisdictional	0	66	975
214	High Performance Building/Int Design - Tier 2 30% - Agricultural	1	68	1,038
105	High Performance Building/Int Design - Tier 1 15% - Warehouse	0	68	1,045
314	High Performance Building/Int Design - Tier 3 50% - Agricultural	0	69	1,090

Commercial Electric New Construction
Energy Supply Curve

Measure Number	Measure	Measure GWH Savings	Cumulative Measure GWH Savings	Levelized Energy Cost $/kWH
110	High Performance Building/Int Design - Tier 1 15% - Non-Jurisdictional	11	436	0.19
414	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Agricultural	0	436	0.20
114	High Performance Building/Int Design - Tier 1 15% - Agricultural	5	442	0.23
211	High Performance Building/Int Design - Tier 2 30% - Religious Worship	7	449	0.30
311	High Performance Building/Int Design - Tier 3 50% - Religious Worship	3	452	0.32
411	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Religious Worship	0	452	0.36
111	High Performance Building/Int Design - Tier 1 15% - Religious Worship	5	457	0.42

Commercial Electric New Construction
Capacity Supply Curve

Measure Number	Measure	Measure MW Savings	Cumulative Measure MW Savings	Levelized Capacity Cost $/kW
110	High Performance Building/Int Design - Tier 1 15% - Non-Jurisdictional	2	70	1,159
414	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Agricultural	0	70	1,223
114	High Performance Building/Int Design - Tier 1 15% - Agricultural	1	71	1,453
211	High Performance Building/Int Design - Tier 2 30% - Religious Worship	1	72	1,874
311	High Performance Building/Int Design - Tier 3 50% - Religious Worship	0	73	1,968
411	High Performance Building/Int Design - Tier 4 Near Zero Energy (60-75%) - Religious Worship	0	73	2,208
111	High Performance Building/Int Design - Tier 1 15% - Religious Worship	1	74	2,623

H. MEASURE-LEVEL RANKING BY ECONOMIC ENERGY SAVINGS POTENTIAL

VA Residential: All Existing Measures Ranked by Economic Potential (GWh)						
Rank	Measure Name	Building Type	Technical GWh	Measure TRC	Economic GWh	End Use
1	2nd Refrigerator Recycling	Single Family	447.35	2.42	447.35	3.00
2	Heat pump (16 SEER, 9.2 HSPF) (eFAF + CAC)	Single Family	327.69	5.25	327.69	12.00
3	2nd Refrigerator Recycling	SF LI	317.35	2.42	317.35	3.00
4	Smart Thermostat (HP heat/cool)	Single Family	254.55	2.62	254.55	12.00
5	Heat pump (16 SEER, 9.2 HSPF) (eFAF + CAC)	SF LI	232.46	5.25	232.46	12.00
6	Crawlspace insulation (HP heat/cool)	Single Family	194.88	3.87	194.88	12.00
7	Smart Thermostat (HP heat/cool)	SF LI	180.58	2.62	180.58	12.00
8	Energy Star LED TV	Single Family	148.37	5.40	148.37	11.00
9	Crawlspace insulation (HP heat/cool)	SF LI	138.25	3.87	138.25	12.00
10	Heat pump upgrade to (16 SEER, 9.2 HSPF) (HP heat/cool)	Single Family	136.05	2.31	136.05	12.00
11	Faucent Aerators	Single Family	127.05	2.85	127.05	5.00
12	Energy Star LED TV	SF LI	105.26	5.40	105.26	11.00
13	Heat pump upgrade to (16 SEER, 9.2 HSPF) (HP heat/cool)	SF LI	96.51	2.31	96.51	12.00
14	16 SEER (13.68 EER) Split-System Air Conditioner (CAC)	Single Family	91.51	2.48	91.51	1.00
15	Faucent Aerators	SF LI	90.13	2.85	90.13	5.00
16	Exhaust fan, 8.3 CFM/W, <2.0 sones (quiet),ASHRAE 62.2	Single Family	74.31	1.36	74.31	15.00
17	16 SEER (13.68 EER) Split-System Air Conditioner (CAC)	SF LI	64.92	2.48	64.92	1.00
18	Smart Thermostat (CAC)	Single Family	59.71	1.55	59.71	1.00
19	Variable-Speed Pool Pump (<1 hp) ROB	Single Family	59.29	1.19	59.29	13.00
20	Energy Star Air Cleaner, PM 2.5 CADR = 200, CADR/Watt 2.9	Single Family	57.45	2.18	57.45	13.00
21	Heat pump (16 SEER, 9.2 HSPF) (eFAF + CAC)	MH LI	55.90	14.96	55.90	12.00
22	Heat pump (16 SEER, 9.2 HSPF) (eFAF + CAC)	Multi-Family	52.84	5.20	52.84	12.00
23	Exhaust fan, 8.3 CFM/W, <2.0 sones (quiet),ASHRAE 62.2	SF LI	52.72	1.36	52.72	15.00
24	Heat pump (16 SEER, 9.2 HSPF) (eFAF + CAC)	MF LI	49.27	5.20	49.27	12.00
25	Hot water turndown 10 degrees	Single Family	46.09	9.28	46.09	5.00
26	Energy Star LCD TV	Single Family	43.93	5.49	43.93	11.00
27	10% better than Energy Star Dehumidifier ROB (35-45 pints/day)	Single Family	43.09	21.79	43.09	1.00
28	Freezer (Energy Star)	Single Family	42.44	1.05	42.44	4.00
29	Smart Thermostat (CAC)	SF LI	42.36	1.55	42.36	1.00
30	Variable-Speed Pool Pump (<1 hp) ROB	SF LI	42.06	1.19	42.06	13.00
31	Energy Star Air Cleaner, PM 2.5 CADR = 200, CADR/Watt 2.9	SF LI	40.75	2.18	40.75	13.00
32	Heat pump (18 SEER, 10 HSPF) (eFAF + CAC)	Single Family	37.93	2.41	37.93	12.00
33	Door Weatherization (HP heat/cool)	Single Family	34.46	1.51	34.46	12.00
34	Smart Thermostat (eFAF + CAC)	Single Family	33.88	1.53	33.88	12.00
35	Hot water turndown 10 degrees	SF LI	32.70	9.28	32.70	5.00
36	Low Flow Showerhead 1.5 Gal/Min	Single Family	32.24	1.18	32.24	5.00
37	Energy Star LCD TV	SF LI	31.16	5.49	31.16	11.00
38	10% better than Energy Star Dehumidifier ROB (35-45 pints/day)	SF LI	30.57	21.79	30.57	1.00
39	Smart Thermostat (HP heat/cool)	Multi-Family	30.42	1.87	30.42	12.00

VA Residential: All Existing Measures Ranked by Economic Potential (GWh)						
Rank	Measure Name	Building Type	Technical GWh	Measure TRC	Economic GWh	End Use
40	Freezer (Energy Star)	SF LI	30.11	1.05	30.11	4.00
41	Smart Thermostat (HP heat/cool)	MF LI	28.37	1.87	28.37	12.00
42	Heat pump (18 SEER, 10 HSPF) (eFAF + CAC)	SF LI	26.91	2.41	26.91	12.00
43	Energy Star Laptop PC	Single Family	26.32	4.44	26.32	15.00
44	Crawlspace insulation (eFAF + CAC)	Single Family	25.94	2.26	25.94	12.00
45	2nd Freezer Recycling	Single Family	25.23	3.03	25.23	4.00
46	Door Weatherization (HP heat/cool)	SF LI	24.44	1.51	24.44	12.00
47	Smart Thermostat (eFAF + CAC)	SF LI	24.03	1.53	24.03	12.00
48	Low Flow Showerhead 1.5 Gal/Min	SF LI	22.87	1.18	22.87	5.00
49	LED Tube replacement for fluorescent lamps	Single Family	22.42	1.14	22.42	2.00
50	Heat pump (16 SEER, 9.2 HSPF) (eFAF + room AC)	MH LI	19.91	14.90	19.91	12.00
51	Door Weatherization (CAC)	Single Family	18.72	7.60	18.72	1.00
52	Energy Star Laptop PC	SF LI	18.67	4.44	18.67	15.00
53	Crawlspace insulation (eFAF + CAC)	SF LI	18.40	2.26	18.40	12.00
54	2nd Freezer Recycling	SF LI	17.90	3.03	17.90	4.00
55	Heat pump upgrade to (16 SEER, 9.2 HSPF) (HP heat/cool)	Multi-Family	17.50	2.97	17.50	12.00
56	Heat pump (16 SEER, 9.2 HSPF) (eFAF + CAC)	Mobile Home	16.86	14.96	16.86	12.00
57	Recycling of non-efficient window AC unit (baseboard heat + RAC)	Single Family	16.70	1.37	16.70	12.00
58	Hot water turndown 5 degrees	Single Family	16.68	4.80	16.68	5.00
59	Hot water turndown 15 degrees	Single Family	16.65	13.41	16.65	5.00
60	Heat pump upgrade to (16 SEER, 9.2 HSPF) (HP heat/cool)	MF LI	16.32	2.97	16.32	12.00
61	LED Tube replacement for fluorescent lamps	SF LI	15.90	1.14	15.90	2.00
62	Wall Blow-in R-0 to R-13 Insulation (CAC)	Single Family	15.29	2.59	15.29	1.00
63	Energy Star Desktop PC	Single Family	14.61	7.08	14.61	15.00
64	Energy Star LED TV	Multi-Family	14.28	5.76	14.28	11.00
65	Duct Testing and Sealing (HP heat/cool)	Multi-Family	13.47	1.10	13.47	12.00
66	Energy Star LED TV	MF LI	13.32	5.76	13.32	11.00
67	Door Weatherization (CAC)	SF LI	13.28	7.60	13.28	1.00
68	Exhaust fan, 8.3 CFM/W, <2.0 sones (quiet),ASHRAE 62.2	Multi-Family	13.09	1.36	13.09	15.00
69	Self Install Weatherization (CAC)	Single Family	12.60	3.50	12.60	1.00
70	Heat pump (16 SEER, 9.2 HSPF) (Elec baseboard heat + Central AC)	Single Family	12.59	2.76	12.59	12.00
71	Duct Testing and Sealing (HP heat/cool)	MF LI	12.56	1.10	12.56	12.00
72	Exhaust fan, 8.3 CFM/W, <2.0 sones (quiet),ASHRAE 62.2	MF LI	12.21	1.36	12.21	15.00
73	Recycling of non-efficient window AC unit (baseboard heat + RAC)	SF LI	11.85	1.37	11.85	12.00
74	Hot water turndown 5 degrees	SF LI	11.84	4.80	11.84	5.00
75	Hot water turndown 15 degrees	SF LI	11.81	13.41	11.81	5.00
76	Duct Testing and Sealing (CAC)	Single Family	11.10	2.13	11.10	1.00
77	Wall Blow-in R-0 to R-13 Insulation (CAC)	SF LI	10.85	2.59	10.85	1.00
78	Exterior Door Replacement (HP heat/cool)	Single Family	10.83	6.76	10.83	12.00
79	Smart Thermostat (HP heat/cool)	MH LI	10.40	2.94	10.40	12.00

VA Residential: All Existing Measures Ranked by Economic Potential (GWh)						
Rank	Measure Name	Building Type	Technical GWh	Measure TRC	Economic GWh	End Use
80	Energy Star Desktop PC	SF LI	10.36	7.08	10.36	15.00
81	WINDOWS - Double-Glazed Clear to Energy Star (CAC)	Single Family	9.96	1.00	9.96	1.00
82	Door Weatherization (HP heat/cool)	Multi-Family	9.29	3.32	9.29	12.00
83	Duct Insulation (HP heat/cool)	Single Family	9.09	1.31	9.09	12.00
84	Self Install Weatherization (CAC)	SF LI	8.94	3.50	8.94	1.00
85	Heat pump (16 SEER, 9.2 HSPF) (Elec baseboard heat + Central AC)	SF LI	8.93	2.76	8.93	12.00
86	Faucent Aerators	Multi-Family	8.89	1.77	8.89	5.00
87	Door Weatherization (HP heat/cool)	MF LI	8.66	3.32	8.66	12.00
88	Hot water turndown 20 degrees	Single Family	8.45	17.01	8.45	5.00
89	Faucent Aerators	MF LI	8.29	1.77	8.29	5.00
90	Heat pump (16 SEER, 9.2 HSPF) (Elec baseboard heat + Central AC)	Multi-Family	8.11	7.34	8.11	12.00
91	Energy Star other TV	Single Family	8.06	1.66	8.06	11.00
92	Duct Testing and Sealing (CAC)	SF LI	7.87	2.13	7.87	1.00
93	Recycling of non-efficient window AC unit (eFAF + RAC)	MH LI	7.74	5.14	7.74	12.00
94	Exterior Door Replacement (HP heat/cool)	SF LI	7.68	6.76	7.68	12.00
95	Heat pump (16 SEER, 9.2 HSPF) (Elec baseboard heat + Central AC)	MF LI	7.56	7.34	7.56	12.00
96	Energy Star Air Cleaner, PM 2.5 CADR = 200, CADR/Watt 2.9	Multi-Family	7.47	1.61	7.47	13.00
97	WINDOWS - Double-Glazed Clear to Energy Star (CAC)	SF LI	7.06	1.00	7.06	1.00
98	Energy Star Air Cleaner, PM 2.5 CADR = 200, CADR/Watt 2.9	MF LI	6.96	1.61	6.96	13.00
99	Smart Thermostat (GSHP heat/cool)	Single Family	6.72	2.77	6.72	12.00
100	2nd Refrigerator Recycling	Multi-Family	6.70	1.83	6.70	3.00
101	Recycling of non-efficient window AC unit (baseboard heat + RAC)	Multi-Family	6.61	5.07	6.61	12.00
102	Duct Insulation (HP heat/cool)	SF LI	6.45	1.31	6.45	12.00
103	Ceiling R-0 to R-38 Insulation (CAC)	Single Family	6.34	3.35	6.34	1.00
104	Heat pump (16 SEER, 9.2 HSPF) (Elec baseboard heat + Room AC)	Single Family	6.34	1.91	6.34	12.00
105	Recycling of non-efficient window AC unit (baseboard heat + RAC)	MH LI	6.30	6.14	6.30	12.00
106	2nd Refrigerator Recycling	MF LI	6.25	1.83	6.25	3.00
107	Recycling of non-efficient window AC unit (baseboard heat + RAC)	MF LI	6.17	5.07	6.17	12.00
108	16 SEER (13.68 EER) Split-System Air Conditioner (CAC)	Multi-Family	6.02	2.98	6.02	1.00

VA Commercial: All Existing Measures Ranked by Economic Potential (GWh)						
Rank	**Measure Name**	**Building Type**	**Technical GWh**	**Measure TRC**	**Economic GWh**	**End Use**
1	LED outdoor lighting with bi-level controls (Base Outdoor HID)	Misc	571.02	3.51	571.02	Outdoor Lighting
2	LED outdoor lighting with bi-level controls (Base Outdoor HID)	Agricultural	400.91	3.51	400.91	Outdoor Lighting
3	Demand Controlled Ventilation, 15 HP	Health	326.15	1.32	326.15	Ventilation
4	LED outdoor lighting with bi-level controls (Base Outdoor HID)	Office	316.49	3.51	316.49	Outdoor Lighting
5	Air Handler Optimization, 15 HP	Office	278.64	5.50	278.64	Ventilation
6	LED outdoor lighting with bi-level controls (Base Outdoor HID)	Religious Worship	267.91	3.51	267.91	Outdoor Lighting
7	Refrigeration Coil Cleaning, walk-ins	Restaurant	167.03	1.41	167.03	Refrigeration
8	Energy Star server	Education	144.48	5.78	144.48	Office Equipment
9	Refrigeration Coil Cleaning, walk-ins	Grocery	134.37	1.41	134.37	Refrigeration
10	Variable Speed Drive Control, base motors	Office	131.80	3.79	131.80	Ventilation
11	DX Packaged System, EER=13.4, 10 tons	Lodging	124.51	4.24	124.51	Cooling
12	Demand Controlled Ventilation, 15 HP	Restaurant	124.20	1.01	124.20	Ventilation
13	Energy Recovery Ventilation (ERV)	Office	117.03	1.05	117.03	Ventilation
14	LED outdoor lighting with bi-level controls (Base Outdoor HID)	Industrial	115.59	3.51	115.59	Outdoor Lighting
15	Smart Thermostat (Base Heat Pump Heating)	Lodging	106.93	1.26	106.93	Heating
16	Air Handler Optimization, 15 HP	Lodging	103.48	3.59	103.48	Ventilation
17	Energy Recovery Ventilation (ERV)	Health	101.45	1.66	101.45	Ventilation
18	Compressor VSD retrofit, walk-ins	Restaurant	101.24	2.78	101.24	Refrigeration
19	LED screw-in replacement (base incandescent/halogen)	Misc	97.96	8.62	97.96	Indoor Lighting
20	Energy Star server	Data Centers	90.60	5.73	90.60	Office Equipment
21	Air-Source Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons (base air-source heat pump heating)	Lodging	88.36	2.40	88.36	Heating
22	DX Packaged System, EER=13.4, 10 tons	Office	87.11	2.26	87.11	Cooling
23	High-efficiency fan motors, walk-ins	Restaurant	86.23	2.57	86.23	Refrigeration
24	LED screw-in replacement (base incandescent/halogen)	Religious Worship	82.64	7.70	82.64	Indoor Lighting
25	Electronically commutated evaporator fan motor, walk-ins	Restaurant	79.78	2.83	79.78	Refrigeration
26	Compressor VSD retrofit, walk-ins	Grocery	77.93	2.67	77.93	Refrigeration
27	LED screw-in replacement (base Outdoor Incandescent)	Misc	77.85	5.74	77.85	Outdoor Lighting
28	Economizer Repair - DX	Office	74.47	1.56	74.47	Cooling
29	Air Handler Optimization, 15 HP	Retail	74.13	4.54	74.13	Ventilation
30	DX Packaged System, EER=13.4, 10 tons	Misc	72.01	2.30	72.01	Cooling
31	Energy Star server	Misc	68.10	5.61	68.10	Office Equipment
32	Electronically commutated evaporator fan motor, walk-ins	Grocery	67.95	2.82	67.95	Refrigeration
33	DX Packaged System, EER=13.4, 10 tons	Retail	67.65	3.47	67.65	Cooling
34	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Residential Split-System)	Lodging	66.25	1.46	66.25	Cooling
35	Energy Star server	Office	63.74	5.73	63.74	Office Equipment
36	DX Packaged System, EER=13.4, 10 tons	Education	59.95	1.83	59.95	Cooling
37	Oversized Air Cooled Condenser, walk-ins	Restaurant	57.02	2.25	57.02	Refrigeration

VA Commercial: All Existing Measures Ranked by Economic Potential (GWh)						
Rank	**Measure Name**	**Building Type**	**Technical GWh**	**Measure TRC**	**Economic GWh**	**End Use**
38	Compressed Air - End Use Optimization	Industrial	56.07	4.95	56.07	Compressed Air
39	Energy Recovery Ventilation (ERV)	Retail	55.80	1.28	55.80	Ventilation
40	Energy Star hot food holding cabinet	Lodging	54.72	2.39	54.72	Cooking
41	Heat Recovery Unit	Restaurant	54.60	10.53	54.60	DHW
42	DX Packaged System, EER=13.4, 10 tons	Data Centers	52.37	12.31	52.37	Cooling
43	LED screw-in replacement (base Outdoor Incandescent)	Office	51.04	5.74	51.04	Outdoor Lighting
44	Electric Combination Oven	Health	50.89	8.66	50.89	Cooking
45	LED outdoor lighting with bi-level controls (Base Outdoor HID)	Lodging	50.62	3.09	50.62	Outdoor Lighting
46	LED screw-in replacement (base incandescent/halogen)	Retail	49.99	8.28	49.99	Indoor Lighting
47	Air Handler Optimization, 15 HP	Restaurant	49.44	9.32	49.44	Ventilation
48	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	Religious Worship	49.29	1.21	49.29	Indoor Lighting
49	Electric Combination Oven	Lodging	48.61	8.66	48.61	Cooking
50	Economizer Repair - DX	Data Centers	48.34	9.18	48.34	Cooling
51	LED screw-in replacement (base incandescent/halogen)	Lodging	48.09	7.99	48.09	Indoor Lighting
52	High Performance Lighting R/R - Combined Strategies (Base T8)	Religious Worship	48.05	4.19	48.05	Indoor Lighting
53	HE PTAC, EER=9.6, 1 ton, cooling	Lodging	47.15	2.96	47.15	Cooling
54	Oversized Air Cooled Condenser, walk-ins	Grocery	46.70	2.29	46.70	Refrigeration
55	LED outdoor lighting with bi-level controls (Base Outdoor HID)	Retail	45.27	3.51	45.27	Outdoor Lighting
56	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	Health	44.22	1.32	44.22	Indoor Lighting
57	Economizer Repair - DX	Retail	43.47	1.48	43.47	Cooling
58	High-efficiency fan motors, walk-ins	Grocery	43.09	2.81	43.09	Refrigeration
59	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	Religious Worship	42.53	1.07	42.53	Indoor Lighting
60	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	Office	42.37	1.21	42.37	Indoor Lighting
61	Variable Speed Drive Control, base motors	Lodging	42.13	2.78	42.13	Ventilation
62	Duct Testing/Sealing - DX	Lodging	41.66	1.89	41.66	Cooling
63	Electric Combination Oven	Religious Worship	40.94	7.50	40.94	Cooking
64	DX Packaged System, EER=13.4, 10 tons	Warehouse	39.61	4.68	39.61	Cooling
65	Heat Recovery Unit	Lodging	39.04	6.24	39.04	DHW
66	High Bay Bi-Level Programmed LED Fixture	Retail	37.84	5.03	37.84	Indoor Lighting
67	LED screw-in replacement (base incandescent/halogen)	Agricultural	36.61	8.62	36.61	Indoor Lighting
68	Centrifugal Chiller, 0.54 kW/ton, 500 tons	Lodging	36.58	4.32	36.58	Cooling
69	DX Packaged System, EER=13.4, 10 tons	Health	35.23	3.63	35.23	Cooling
70	Heat Pump Upgrade (18 SEER, 8.2 HSPF), cooling	Office	34.78	1.32	34.78	Cooling
71	LED screw-in replacement (base incandescent/halogen)	Office	34.53	8.46	34.53	Indoor Lighting
72	Energy Star hot food holding cabinet	Restaurant	33.27	2.39	33.27	Cooking
73	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	Office	31.77	1.48	31.77	Indoor Lighting
74	Energy Star hot food holding cabinet	Religious Worship	31.37	2.39	31.37	Cooking
75	Energy Recovery Ventilation (ERV)	Restaurant	31.15	1.39	31.15	Ventilation

VA Commercial: All Existing Measures Ranked by Economic Potential (GWh)						
Rank	Measure Name	Building Type	Technical GWh	Measure TRC	Economic GWh	End Use
76	LED outdoor lighting with bi-level controls (Base Outdoor HID)	Health	31.10	3.09	31.10	Outdoor Lighting
77	Heat Recovery Unit	Health	30.84	1.32	30.84	DHW
78	Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons, heating	Misc	30.65	4.66	30.65	Heating
79	Electric Combination Oven	Restaurant	29.98	8.66	29.98	Cooking
80	Energy Star hot food holding cabinet	Health	29.60	2.39	29.60	Cooking
81	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	Health	29.01	1.63	29.01	Indoor Lighting
82	High Bay LED Troffer (Base T5)	Retail	28.56	2.84	28.56	Indoor Lighting
83	Industrial process improved operations	Industrial	27.71	4.80	27.71	Motors
84	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	Retail	27.36	1.66	27.36	Indoor Lighting
85	LED screw-in replacement (base incandescent/halogen)	Health	26.98	8.09	26.98	Indoor Lighting
86	Compressed Air - Leak Reduction	Industrial	26.06	3.72	26.06	Compressed Air
87	Strip curtains for walk-ins	Grocery	25.56	1.33	25.56	Refrigeration
88	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	Misc	25.50	1.41	25.50	Indoor Lighting
89	Energy Star hot food holding cabinet	Grocery	24.45	2.39	24.45	Cooking
90	Compressed Air - Maintenance	Industrial	23.94	3.36	23.94	Compressed Air
91	Efficient Steamer	Health	22.64	1.37	22.64	Cooking
92	Low Flow Faucet Aerators	Lodging	22.47	6.71	22.47	DHW
93	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	Misc	21.20	1.73	21.20	Indoor Lighting
94	DX Packaged System, EER=13.4, 10 tons	Restaurant	21.10	3.02	21.10	Cooling
95	Window Film (Standard) - DX	Lodging	20.86	1.48	20.86	Cooling
96	Strip curtains for walk-ins	Restaurant	20.66	1.34	20.66	Refrigeration
97	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	Warehouse	20.42	1.27	20.42	Indoor Lighting
98	LED screw-in replacement (base Outdoor Incandescent)	Religious Worship	19.71	5.74	19.71	Outdoor Lighting
99	Efficient industrial process	Industrial	19.70	1.37	19.70	Process
100	Bi-level LED Case Lighting (self-contained units), base closed cases	Grocery	19.49	1.30	19.49	Refrigeration
101	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	Retail	19.22	1.58	19.22	Indoor Lighting
102	Heat Pump Upgrade (18 SEER, 8.2 HSPF), cooling	Lodging	19.16	4.05	19.16	Cooling
103	Efficient industrial process	Industrial	18.66	1.28	18.66	Process
104	Multiplex Compressor System, walk-ins	Grocery	18.60	1.53	18.60	Refrigeration
105	LED outdoor lighting with bi-level controls (Base Outdoor HID)	Warehouse	17.78	3.09	17.78	Outdoor Lighting
106	Energy Recovery Ventilation (ERV)	Misc	17.34	1.15	17.34	Ventilation
107	High Efficiency Windows - DX	Office	17.26	4.37	17.26	Cooling
108	Duct Testing/Sealing - DX	Data Centers	17.17	7.17	17.17	Cooling
109	Low-flow pre-rinse spray valve	Restaurant	17.09	1.71	17.09	DHW
110	LED screw-in replacement (base Outdoor Incandescent)	Health	16.89	5.04	16.89	Outdoor Lighting
111	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	Retail	16.53	1.29	16.53	Indoor Lighting
112	LED screw-in replacement (base CFL)	Misc	16.17	1.17	16.17	Indoor Lighting
113	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
114	Smart Thermostat (base packaged heat pump)	Lodging	16.04	1.39	16.04	Heating
115	LED outdoor lighting with bi-level controls (Base Outdoor HID)	Restaurant	15.92	3.09	15.92	Outdoor Lighting

VA Commercial: All Existing Measures Ranked by Economic Potential (GWh)						
Rank	Measure Name	Building Type	Technical GWh	Measure TRC	Economic GWh	End Use
116	Energy Star Convection Oven	Education	15.61	3.37	15.61	Cooking
117	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	Health	15.33	2.10	15.33	Indoor Lighting
118	Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons, heating	Lodging	15.05	30.86	15.05	Heating
119	ROB 2L4' LED Tube (Base T8)	Religious Worship	14.90	3.05	14.90	Indoor Lighting
120	LED Troffer with lamp removal (T8)	Religious Worship	14.89	1.43	14.89	Indoor Lighting
121	Refrigeration Coil Cleaning, base closed cases	Restaurant	14.74	1.17	14.74	Refrigeration
122	LED screw-in replacement (base Outdoor Incandescent)	Retail	14.61	5.74	14.61	Outdoor Lighting
123	Electronically commutated evaporator fan motor, base closed cases	Grocery	14.13	1.46	14.13	Refrigeration
124	LED outdoor lighting with bi-level controls (Base Outdoor HID)	Education	14.10	3.51	14.10	Outdoor Lighting
125	Duct Testing/Sealing - DX	Warehouse	13.98	2.26	13.98	Cooling
126	Efficient Steamer	Restaurant	13.87	1.37	13.87	Cooking
127	Cool Roof - DX	Warehouse	13.84	2.81	13.84	Cooling
128	High Performance Lighting R/R - Combined Strategies (Base T5)	Retail	13.79	2.02	13.79	Indoor Lighting
129	High Efficiency Windows (Base Heat Pump Cooling)	Office	13.75	5.39	13.75	Cooling
130	Cool Roof - DX	Retail	13.73	1.46	13.73	Cooling
131	LED screw-in replacement (base Outdoor Incandescent)	Education	13.73	5.74	13.73	Outdoor Lighting
132	Heat Recovery Unit	Education	13.54	1.92	13.54	DHW
133	Electric Combination Oven	Grocery	12.69	8.66	12.69	Cooking
134	High Performance Lighting R/R - Combined Strategies (Base T12)	Religious Worship	12.68	3.92	12.68	Indoor Lighting
135	High Performance Lighting R/R - Combined Strategies (Base T8)	Lodging	12.20	3.49	12.20	Indoor Lighting
136	High Performance Lighting R/R - Combined Strategies (Base T8)	Health	12.12	5.21	12.12	Indoor Lighting
137	ROB 2L4' LED Tube (Base T5)	Retail	12.05	2.62	12.05	Indoor Lighting
138	High Performance Lighting R/R - Combined Strategies (Base T8)	Office	11.83	1.76	11.83	Indoor Lighting
139	High Performance Lighting R/R - Combined Strategies (Base T8)	Education	11.77	2.29	11.77	Indoor Lighting
140	Window Film (Standard) (Base PTAC)	Lodging	11.74	1.09	11.74	Cooling
141	Demand controlled circulating systems	Lodging	11.70	1.82	11.70	DHW
142	Variable Speed Drive Control, base motors	Industrial	11.67	6.39	11.67	Ventilation
143	Centrifugal Chiller, 0.54 kW/ton, 500 tons	Office	11.65	1.31	11.65	Cooling
144	Optimize Controls - DX	Lodging	11.52	3.91	11.52	Cooling
145	High Efficiency Windows - DX	Misc	11.33	4.48	11.33	Cooling
146	Heat Pump Upgrade (18 SEER, 8.2 HSPF), cooling	Health	10.91	1.45	10.91	Cooling
147	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Residential Split-System)	Warehouse	10.87	1.67	10.87	Cooling
148	Heat Pump Upgrade (18 SEER, 8.2 HSPF), cooling	Retail	10.85	1.66	10.85	Cooling
149	Window Film (Standard) - DX	Warehouse	10.83	4.83	10.83	Cooling
150	Energy Star server	Health	10.51	5.56	10.51	Office Equipment
151	DX Packaged System, EER=13.4, 10 tons	Industrial	10.22	1.57	10.22	Cooling
152	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	Industrial	9.69	1.41	9.69	Indoor Lighting
153	Optimize Controls - DX	Office	9.64	1.42	9.64	Cooling

VA Commercial: All Existing Measures Ranked by Economic Potential (GWh)						
Rank	Measure Name	Building Type	Technical GWh	Measure TRC	Economic GWh	End Use
154	Low-flow pre-rinse spray valve	Education	9.28	8.54	9.28	DHW
155	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	Agricultural	9.19	1.73	9.19	Indoor Lighting
156	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	Lodging	9.06	1.15	9.06	Indoor Lighting
157	High Performance Lighting R/R - Combined Strategies (Base T8)	Misc	9.06	2.95	9.06	Indoor Lighting
158	High Bay Bi-Level Programmed LED Fixture	Health	8.92	5.10	8.92	Indoor Lighting
159	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Room AC)	Health	8.85	1.86	8.85	Cooling
160	Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons, heating	Office	8.83	4.56	8.83	Heating
161	Bi-level LED Case Lighting (self-contained units), open cases	Grocery	8.76	1.08	8.76	Refrigeration
162	High Efficiency Windows - DX	Lodging	8.54	8.18	8.54	Cooling
163	Energy Star solid door reach-in refrigerator/freezer	Grocery	8.53	2.73	8.53	Refrigeration
164	Freezer-Cooler Replacement Gaskets, walk-ins	Restaurant	8.47	1.77	8.47	Refrigeration
165	Energy Star Convection Oven	Health	8.46	3.54	8.46	Cooking
166	LED screw-in replacement (base CFL)	Lodging	8.45	1.09	8.45	Indoor Lighting
167	High Efficiency Windows - Chiller	Office	8.38	2.16	8.38	Cooling
168	Electric Combination Oven	Office	8.32	7.50	8.32	Cooking
169	Heat Pump Upgrade (18 SEER, 8.2 HSPF), cooling	Warehouse	8.29	2.47	8.29	Cooling
170	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	Industrial	8.28	1.73	8.28	Indoor Lighting
171	Oversized Air Cooled Condenser, base closed cases	Grocery	8.23	2.01	8.23	Refrigeration
172	High Performance Lighting R/R - Combined Strategies (Base T12)	Retail	8.18	5.14	8.18	Indoor Lighting
173	Electric Combination Oven	Misc	8.13	7.50	8.13	Cooking
174	Low Flow Faucet Aerators	Retail	8.12	7.04	8.12	DHW
175	Refrigerant Charge Adjustment - DX	Lodging	8.08	1.19	8.08	Cooling
176	DX Packaged System, EER=13.4, 10 tons	Grocery	8.02	3.04	8.02	Cooling
177	High Performance Lighting R/R - Combined Strategies (Base T12)	Office	8.00	1.93	8.00	Indoor Lighting
178	Compressor VSD retrofit, base closed cases	Restaurant	7.99	1.18	7.99	Refrigeration
179	High Efficiency Windows - DX	Retail	7.89	5.23	7.89	Cooling
180	High Performance Lighting R/R - Combined Strategies (Base T8)	Warehouse	7.81	3.09	7.81	Indoor Lighting
181	Variable Speed Drive Control, base motors	Religious Worship	7.73	2.02	7.73	Ventilation
182	High Efficiency Windows - Chiller	Lodging	7.58	3.93	7.58	Cooling
183	Low or Anti-Sweat Door Film, base closed cases	Grocery	7.52	2.58	7.52	Refrigeration
184	ROB 2L4' LED Tube (Base T8)	Office	7.43	4.87	7.43	Indoor Lighting
185	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	Warehouse	7.40	1.63	7.40	Indoor Lighting
186	High Performance Lighting R/R - Combined Strategies (Base T12)	Misc	7.32	3.52	7.32	Indoor Lighting
187	LED Exit Sign	Office	7.27	2.54	7.27	Indoor Lighting
188	High Performance Lighting R/R - Combined Strategies (Base T12)	Lodging	7.23	3.53	7.23	Indoor Lighting
189	High Performance Lighting R/R - Combined Strategies (Base T12)	Health	7.17	5.77	7.17	Indoor Lighting
190	High Bay Bi-Level Programmed LED Fixture	Office	7.17	4.96	7.17	Indoor Lighting

VA Commercial: All Existing Measures Ranked by Economic Potential (GWh)						
Rank	**Measure Name**	**Building Type**	**Technical GWh**	**Measure TRC**	**Economic GWh**	**End Use**
191	Freezer-Cooler Replacement Gaskets, base closed cases	Grocery	7.15	2.90	7.15	Refrigeration
192	ROB 2L4' LED Tube (base outdoor fluorescent)	Retail	7.05	1.58	7.05	Outdoor Lighting
193	Variable Speed Drive Control, base motors	Misc	6.98	4.18	6.98	Ventilation
194	Freezer-Cooler Replacement Gaskets, walk-ins	Grocery	6.93	1.80	6.93	Refrigeration
195	Electronically commutated evaporator fan motor, base closed cases	Restaurant	6.86	1.31	6.86	Refrigeration
196	Air Handler Optimization, 15 HP	Grocery	6.84	2.72	6.84	Ventilation
197	Heat Pump Water Heater (air source)	Retail	6.77	1.05	6.77	DHW
198	Energy Star Convection Oven	Restaurant	6.76	3.54	6.76	Cooking
199	ROB 2L4' LED Tube (Base T8)	Health	6.76	4.09	6.76	Indoor Lighting
200	LED screw-in replacement (base CFL)	Office	6.75	1.15	6.75	Indoor Lighting
201	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	Grocery	6.74	1.22	6.74	Indoor Lighting
202	High Bay LED Troffer (Base T5)	Health	6.73	2.77	6.73	Indoor Lighting
203	LED screw-in replacement (base incandescent/halogen)	Restaurant	6.67	8.26	6.67	Indoor Lighting
204	ROB 2L4' LED Tube (Base T12)	Office	6.63	7.07	6.63	Indoor Lighting
205	LED Troffer with lamp removal (T8)	Health	6.61	2.67	6.61	Indoor Lighting
206	High Bay Bi-Level Programmed LED Fixture	Warehouse	6.59	5.95	6.59	Indoor Lighting
207	ROB 2L4' LED Tube (Base T8)	Education	6.56	4.65	6.56	Indoor Lighting
208	Low Flow Faucet Aerators	Education	6.51	4.63	6.51	DHW
209	High Performance Lighting R/R - Combined Strategies (Base T8)	Retail	6.47	5.21	6.47	Indoor Lighting
210	High Bay Bi-Level Programmed LED Fixture	Religious Worship	6.46	5.01	6.46	Indoor Lighting
211	High Efficiency Motor	Retail	6.40	1.06	6.40	Ventilation
212	High Efficiency Windows - DX	Health	6.34	5.51	6.34	Cooling
213	High Performance Lighting R/R - Combined Strategies (Base T12)	Education	6.28	2.81	6.28	Indoor Lighting
214	LED screw-in replacement (base incandescent/halogen)	Industrial	6.08	8.62	6.08	Indoor Lighting
215	LED screw-in replacement (base Outdoor Incandescent)	Lodging	6.04	5.04	6.04	Outdoor Lighting
216	LED Troffer with lamp removal (T12)	Religious Worship	5.92	2.02	5.92	Indoor Lighting
217	Energy Star glass door reach-in refrigerator/freezer	Restaurant	5.87	4.16	5.87	Refrigeration
218	Electronically commutated evaporator fan motor, open cases	Grocery	5.83	1.11	5.83	Refrigeration
219	High Efficiency Motor	Industrial	5.82	3.07	5.82	Ventilation
220	LED Troffer with lamp removal (T8)	Lodging	5.79	1.68	5.79	Indoor Lighting
221	Window Film (Standard) (Base Heat Pump Cooling)	Warehouse	5.67	6.72	5.67	Cooling
222	LED Troffer with lamp removal (T8)	Office	5.62	2.17	5.62	Indoor Lighting
223	High Efficiency Windows - DX	Education	5.61	3.86	5.61	Cooling
224	Low Flow Faucet Aerators	Office	5.58	1.87	5.58	DHW
225	Energy Star griddle	Lodging	5.48	2.26	5.48	Cooking
226	ROB 2L4' LED Tube (Base T12)	Religious Worship	5.47	3.97	5.47	Indoor Lighting
227	High Performance Lighting R/R - Combined Strategies (Base T5)	Warehouse	5.28	2.12	5.28	Indoor Lighting
228	High Performance Lighting R/R - Combined Strategies (base high bay HID)	Warehouse	5.25	1.69	5.25	Indoor Lighting
229	ROB 2L4' LED Tube (Base T12)	Health	5.24	5.95	5.24	Indoor Lighting
230	Energy Star griddle	Health	5.23	2.26	5.23	Cooking

VA Commercial: All Existing Measures Ranked by Economic Potential (GWh)

Rank	Measure Name	Building Type	Technical GWh	Measure TRC	Economic GWh	End Use
231	High Performance Lighting R/R - Combined Strategies (base high bay HID)	Lodging	5.19	5.03	5.19	Indoor Lighting
232	LED Troffer (Base T12)	Religious Worship	5.18	1.33	5.18	Indoor Lighting
233	High Performance Lighting R/R - Combined Strategies (base high bay HID)	Religious Worship	5.15	1.23	5.15	Indoor Lighting
234	High Performance Lighting R/R - Combined Strategies (base high bay HID)	Retail	5.13	7.42	5.13	Indoor Lighting
235	LED Troffer (Base T8)	Health	5.12	1.10	5.12	Indoor Lighting
236	Recirculation Pump Timer Clock - Controls for Central Domestic Hot Water	Lodging	5.06	8.47	5.06	DHW
237	Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons, heating	Health	4.99	6.58	4.99	Heating
238	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Room AC)	Lodging	4.99	3.60	4.99	Cooling
239	LED Exit Sign	Misc	4.97	2.46	4.97	Indoor Lighting
240	LED Troffer (Base T8)	Office	4.91	1.14	4.91	Indoor Lighting
241	HE PTAC, EER=9.6, 1 ton, cooling	Office	4.81	1.15	4.81	Cooling
242	Electric Combination Oven	Education	4.74	7.50	4.74	Cooking
243	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Room AC)	Misc	4.65	1.17	4.65	Cooling
244	High Bay Bi-Level Programmed LED Fixture	Warehouse	4.57	5.10	4.57	Indoor Lighting
245	Refrigeration Coil Cleaning, walk-ins	Lodging	4.55	1.69	4.55	Refrigeration
246	Compressed Air - Cold Air Intake	Industrial	4.54	1.29	4.54	Compressed Air
247	Cool Roof - DX	Industrial	4.50	1.12	4.50	Cooling
248	Chiller Tune Up/Diagnostics	Lodging	4.49	1.51	4.49	Cooling
249	LED screw-in replacement (base Outdoor Incandescent)	Restaurant	4.36	5.04	4.36	Outdoor Lighting
250	ROB 2L4' LED Tube (Base T8)	Lodging	4.35	2.96	4.35	Indoor Lighting
251	Energy Star server	Agricultural	4.32	5.61	4.32	Office Equipment
252	Energy Recovery Ventilation (ERV)	Grocery	4.31	1.47	4.31	Ventilation
253	Window Film (Standard) (Base Heat Pump Cooling)	Lodging	4.28	1.14	4.28	Cooling
254	LED screw-in replacement (base Outdoor Incandescent)	Agricultural	4.27	5.74	4.27	Outdoor Lighting
255	DX Tune Up/ Advanced Diagnostics	Lodging	4.20	1.71	4.20	Cooling
256	High Efficiency Motor	Restaurant	4.14	1.05	4.14	Ventilation
257	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	Restaurant	4.12	1.66	4.12	Indoor Lighting
258	LED Troffer with lamp removal (T12)	Health	4.05	3.06	4.05	Indoor Lighting
259	High Efficiency Windows - DX	Religious Worship	4.00	1.86	4.00	Cooling
260	Centrifugal Chiller, 0.54 kW/ton, 500 tons	Misc	3.97	1.18	3.97	Cooling
261	LED Troffer with lamp removal (T12)	Retail	3.89	3.19	3.89	Indoor Lighting
262	High Efficiency Windows (Base Heat Pump Cooling)	Misc	3.87	4.02	3.87	Cooling
263	LED Troffer (Base T12)	Office	3.87	1.46	3.87	Indoor Lighting
264	High Efficiency Windows (Base Heat Pump Cooling)	Retail	3.84	8.05	3.84	Cooling
265	Optimize Controls - DX	Retail	3.81	1.11	3.81	Cooling
266	LED Exit Sign	Lodging	3.81	2.55	3.81	Indoor Lighting
267	Oversized Air Cooled Condenser, base closed cases	Restaurant	3.77	1.59	3.77	Refrigeration
268	LED Troffer with lamp removal (T12)	Office	3.73	2.34	3.73	Indoor Lighting

VA Commercial: All Existing Measures Ranked by Economic Potential (GWh)						
Rank	Measure Name	Building Type	Technical GWh	Measure TRC	Economic GWh	End Use
269	EMS Optimization - Chiller	Lodging	3.69	1.71	3.69	Cooling
270	Optimize Controls - DX	Warehouse	3.68	2.48	3.68	Cooling
271	Smart Thermostat (Base Furnace Heating)	Lodging	3.68	3.27	3.68	Heating
272	High Efficiency Windows - DX	Restaurant	3.66	1.82	3.66	Cooling
273	Air-Source Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons (base air-source heat pump heating)	Restaurant	3.65	1.08	3.65	Heating
274	LED Troffer with lamp removal (T8)	Education	3.65	1.17	3.65	Indoor Lighting
275	Refrigeration Coil Cleaning, base large cold storage	Restaurant	3.59	2.05	3.59	Refrigeration
276	High Performance Lighting R/R - Combined Strategies (Base T5)	Religious Worship	3.56	1.55	3.56	Indoor Lighting
277	Energy Star server	Religious Worship	3.56	5.61	3.56	Office Equipment
278	LED Troffer (Base T12)	Health	3.53	1.42	3.53	Indoor Lighting
279	ROB 2L4' LED Tube (Base T12)	Retail	3.53	4.35	3.53	Indoor Lighting
280	High Efficiency Windows (Base Heat Pump Cooling)	Health	3.46	4.94	3.46	Cooling
281	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
282	LED Exit Sign	Religious Worship	3.41	2.46	3.41	Indoor Lighting
283	LED Troffer with lamp removal (T12)	Lodging	3.37	1.67	3.37	Indoor Lighting
284	LED Troffer (Base T12)	Retail	3.33	1.46	3.33	Indoor Lighting
285	LED screw-in replacement (base CFL)	Religious Worship	3.33	1.05	3.33	Indoor Lighting
286	Refrigeration Coil Cleaning, base closed cases	Religious Worship	3.31	1.25	3.31	Refrigeration
287	Energy Star or Better PC	Lodging	3.29	1.01	3.29	Office Equipment
288	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Room AC)	Grocery	3.29	1.67	3.29	Cooling
289	High Performance Lighting R/R - Combined Strategies (base low bay HID)	Data Centers	3.27	6.82	3.27	Indoor Lighting
290	High Performance Lighting R/R - Combined Strategies (Base T5)	Health	3.25	2.33	3.25	Indoor Lighting
291	Efficient Steamer	Lodging	3.24	1.37	3.24	Cooking
292	Electric Combination Oven	Retail	3.23	7.50	3.23	Cooking
293	Electronically commutated evaporator fan motor, base closed cases	Religious Worship	3.18	1.33	3.18	Refrigeration
294	Low or Anti-Sweat Door Film, base closed cases	Restaurant	3.18	1.89	3.18	Refrigeration
295	High Performance Lighting R/R - Combined Strategies (base high bay HID)	Misc	3.13	1.39	3.13	Indoor Lighting
296	ROB 2L4' LED Tube (Base T12)	Lodging	3.12	3.62	3.12	Indoor Lighting
297	High Performance Lighting R/R - Combined Strategies (Base T8)	Industrial	3.11	2.66	3.11	Indoor Lighting
298	Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons, heating	Restaurant	3.11	16.25	3.11	Heating
299	High Bay Bi-Level Programmed LED Fixture	Religious Worship	3.09	4.30	3.09	Indoor Lighting
300	High Efficiency Windows (Base Heat Pump Cooling)	Lodging	3.08	11.07	3.08	Cooling
301	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	Restaurant	3.08	1.37	3.08	Indoor Lighting
302	Efficient Steamer	Retail	3.03	1.29	3.03	Cooking
303	LED Troffer (Base T12)	Lodging	2.97	1.23	2.97	Indoor Lighting
304	LED Troffer (Base T8)	Misc	2.96	1.17	2.96	Indoor Lighting
305	High Efficiency Windows (Base Heat Pump Cooling)	Religious Worship	2.95	1.67	2.95	Cooling

VA Commercial: All Existing Measures Ranked by Economic Potential (GWh)						
Rank	Measure Name	Building Type	Technical GWh	Measure TRC	Economic GWh	End Use
306	Ceiling/roof Insulation (base air-source heat pump heating)	Lodging	2.93	1.53	2.93	Heating
307	Heat Pump Upgrade (18 SEER, 8.2 HSPF), cooling	Restaurant	2.93	1.38	2.93	Cooling
308	Cool Roof - DX	Grocery	2.93	1.14	2.93	Cooling
309	Oversized Air Cooled Condenser, open cases	Grocery	2.90	1.31	2.90	Refrigeration
310	HE PTAC, EER=9.6, 1 ton, cooling	Health	2.90	1.57	2.90	Cooling
311	ROB 2L4' LED Tube (Base T8)	Misc	2.87	3.21	2.87	Indoor Lighting
312	High Bay Bi-Level Programmed LED Fixture	Lodging	2.85	2.99	2.85	Indoor Lighting
313	Heat Recovery Unit	Retail	2.84	1.48	2.84	DHW
314	ROB 2L4' LED Tube (Base T5)	Health	2.84	2.56	2.84	Indoor Lighting
315	Cool Roof - DX	Data Centers	2.82	10.33	2.82	Cooling
316	High Bay Bi-Level Programmed LED Fixture	Retail	2.82	3.73	2.82	Indoor Lighting
317	Energy Star server	Restaurant	2.82	5.48	2.82	Office Equipment
318	LED screw-in replacement (base CFL)	Retail	2.81	1.13	2.81	Indoor Lighting
319	Freezer-Cooler Replacement Gaskets, base closed cases	Restaurant	2.81	1.97	2.81	Refrigeration
320	LED Troffer with lamp removal (T8)	Misc	2.81	2.09	2.81	Indoor Lighting
321	High Performance Lighting R/R - Combined Strategies (Base T12)	Agricultural	2.80	3.11	2.80	Indoor Lighting
322	Refrigeration Coil Cleaning, base closed cases	Lodging	2.79	1.01	2.79	Refrigeration
323	ROB 2L4' LED Tube (Base T12)	Misc	2.79	4.61	2.79	Indoor Lighting
324	Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons, heating	Warehouse	2.78	5.50	2.78	Heating
325	Energy Star solid door reach-in refrigerator/freezer	Religious Worship	2.77	2.73	2.77	Refrigeration
326	Efficient Steamer	Grocery	2.67	1.37	2.67	Cooking
327	Energy Star server	Warehouse	2.63	5.47	2.63	Office Equipment
328	Efficient industrial process	Industrial	2.59	5.05	2.59	Process
329	Refrigeration Coil Cleaning, base large cold storage	Grocery	2.58	2.03	2.58	Refrigeration
330	LED Troffer (Base T12)	Misc	2.58	1.52	2.58	Indoor Lighting
331	Bi-level LED Case Lighting (self-contained units), base closed cases	Restaurant	2.57	1.41	2.57	Refrigeration
332	Window Film (Standard) (Base Residential Split-System)	Retail	2.57	1.62	2.57	Cooling
333	Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons, heating	Retail	2.57	9.17	2.57	Heating
334	Energy Star glass door reach-in refrigerator/freezer	Lodging	2.54	4.06	2.54	Refrigeration
335	High Performance Lighting R/R - Combined Strategies (Base T12)	Industrial	2.52	3.11	2.52	Indoor Lighting
336	Lighting Control Tuneup (Base T8)	Religious Worship	2.50	1.14	2.50	Indoor Lighting
337	ROB 2L4' LED Tube (Base T8)	Warehouse	2.48	3.12	2.48	Indoor Lighting
338	Energy Star hot food holding cabinet	Education	2.47	2.39	2.47	Cooking
339	Optimize Controls - DX	Health	2.46	1.20	2.46	Cooling
340	LED screw-in replacement (base Outdoor Incandescent)	Industrial	2.45	5.74	2.45	Outdoor Lighting
341	Energy Star Convection Oven	Lodging	2.43	3.54	2.43	Cooking
342	LED Troffer with lamp removal (T8)	Warehouse	2.42	2.04	2.42	Indoor Lighting
343	ROB 2L4' LED Tube (base outdoor fluorescent)	Office	2.40	1.58	2.40	Outdoor Lighting
344	Energy Star hot food holding cabinet	Retail	2.40	2.39	2.40	Cooking
345	Centrifugal Chiller, 0.54 kW/ton, 500 tons	Health	2.39	2.60	2.39	Cooling

VA Commercial: All Existing Measures Ranked by Economic Potential (GWh)

Rank	Measure Name	Building Type	Technical GWh	Measure TRC	Economic GWh	End Use
346	ROB 2L4' LED Tube (Base T12)	Education	2.39	3.90	2.39	Indoor Lighting
347	Energy Star hot food holding cabinet	Misc	2.38	2.39	2.38	Cooking
348	Energy Star glass door reach-in refrigerator/freezer	Retail	2.38	4.07	2.38	Refrigeration
349	Tankless Water Heater	Lodging	2.37	1.41	2.37	DHW
350	Energy Star or Better PC	Retail	2.34	1.02	2.34	Office Equipment
351	ROB 2L4' LED Tube (Base T8)	Retail	2.31	3.64	2.31	Indoor Lighting
352	Solar Water Heater	Lodging	2.23	1.31	2.23	DHW
353	Bi-level LED Case Lighting, base glass-door reach-in	Restaurant	2.22	1.32	2.22	Refrigeration
354	Floating head pressure controls, walk-ins	Grocery	2.21	1.17	2.21	Refrigeration
355	ROB 2L4' LED Tube (Base T5)	Office	2.21	5.11	2.21	Indoor Lighting
356	LED Troffer (Base T12)	Education	2.21	1.28	2.21	Indoor Lighting
357	High Efficiency Water Heater (electric)	Lodging	2.20	1.96	2.20	DHW
358	High Efficiency Motor	Health	2.19	1.19	2.19	Motors
359	High Bay LED Troffer (Base T5)	Office	2.18	2.30	2.18	Indoor Lighting
360	Efficient compressor motor, walk-ins	Grocery	2.17	6.22	2.17	Refrigeration
361	LED Troffer with lamp removal (T12)	Misc	2.15	2.37	2.15	Indoor Lighting
362	High Performance Lighting R/R - Combined Strategies (Base T12)	Warehouse	2.11	2.94	2.11	Indoor Lighting
363	Energy Star server	Industrial	2.09	5.61	2.09	Office Equipment
364	Energy Star server	Lodging	2.07	6.43	2.07	Office Equipment
365	Efficient Steamer	Education	2.06	1.34	2.06	Cooking
366	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Room AC)	Warehouse	2.02	4.12	2.02	Cooling
367	High Bay Bi-Level Programmed LED Fixture	Education	2.01	4.21	2.01	Indoor Lighting
368	Compressor VSD retrofit, base large cold storage	Restaurant	2.00	2.78	2.00	Refrigeration
369	Compressor VSD retrofit, walk-ins	Lodging	1.99	2.40	1.99	Refrigeration
370	Low-flow pre-rinse spray valve	Health	1.98	2.93	1.98	DHW
371	High Bay Bi-Level Programmed LED Fixture	Office	1.95	5.78	1.95	Indoor Lighting
372	Duct/Pipe Insulation - DX	Data Centers	1.95	1.13	1.95	Cooling
373	High Performance Lighting R/R - Combined Strategies (Base T5)	Misc	1.91	1.20	1.91	Indoor Lighting
374	Energy Star server	Retail	1.89	6.50	1.89	Office Equipment
375	Low Flow Faucet Aerators	Agricultural	1.89	1.32	1.89	DHW
376	LED screw-in replacement (base Outdoor Incandescent)	Data Centers	1.89	5.74	1.89	Outdoor Lighting
377	Ceiling/roof Insulation - DX	Lodging	1.88	1.79	1.88	Cooling
378	Bi-level LED Case Lighting, base glass-door reach-in	Lodging	1.86	1.29	1.86	Refrigeration
379	Low Flow Faucet Aerators	Restaurant	1.85	2.50	1.85	DHW
380	Solar Water Heater	Office	1.85	2.15	1.85	DHW
381	LED Troffer with lamp removal (T12)	Education	1.84	1.36	1.84	Indoor Lighting
382	Low-flow pre-rinse spray valve	Misc	1.81	1.02	1.81	DHW
383	Optimize Controls - DX	Data Centers	1.80	9.63	1.80	Cooling
384	LED Exit Sign	Retail	1.79	2.13	1.79	Indoor Lighting
385	Energy Star Convection Oven	Grocery	1.77	3.54	1.77	Cooking
386	LED screw-in replacement (base Outdoor Incandescent)	Warehouse	1.77	5.04	1.77	Outdoor Lighting
387	LED Troffer with lamp removal (T8)	Retail	1.75	1.84	1.75	Indoor Lighting
388	Refrigeration Coil Cleaning, base closed cases	Retail	1.74	1.25	1.74	Refrigeration

VA Commercial: All Existing Measures Ranked by Economic Potential (GWh)						
Rank	Measure Name	Building Type	Technical GWh	Measure TRC	Economic GWh	End Use
389	High Bay Bi-Level Programmed LED Fixture	Misc	1.72	3.88	1.72	Indoor Lighting
390	Bi-level LED Case Lighting, base glass-door reach-in	Retail	1.71	1.29	1.71	Refrigeration
391	Centrifugal Chiller, 0.54 kW/ton, 500 tons	Education	1.71	1.48	1.71	Cooling
392	VSD for Chiller Pumps and Towers	Lodging	1.70	2.04	1.70	Cooling
393	High-efficiency fan motors, walk-ins	Lodging	1.70	2.22	1.70	Refrigeration
394	Energy Star Convection Oven	Retail	1.69	3.37	1.69	Cooking
395	High Bay Bi-Level Programmed LED Fixture	Misc	1.65	5.23	1.65	Indoor Lighting
396	High Efficiency Windows - Chiller	Misc	1.65	1.42	1.65	Cooling
397	Electronically commutated evaporator fan motor, base large cold storage	Restaurant	1.65	2.96	1.65	Refrigeration
398	Energy Star griddle	Restaurant	1.64	2.26	1.64	Cooking
399	LED Exit Sign	Education	1.63	2.16	1.63	Indoor Lighting
400	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Room AC)	Retail	1.61	1.78	1.61	Cooling
401	High Bay Bi-Level Programmed LED Fixture	Lodging	1.59	4.02	1.59	Indoor Lighting
402	LED Exit Sign	Restaurant	1.56	2.04	1.56	Indoor Lighting
403	High Performance Lighting R/R - Combined Strategies (base high bay HID)	Office	1.56	1.96	1.56	Indoor Lighting
404	Refrigeration Coil Cleaning, base closed cases	Education	1.55	1.25	1.55	Refrigeration
405	High Performance Lighting R/R - Combined Strategies (Base LED Tube)	Restaurant	1.54	1.18	1.54	Indoor Lighting
406	Lighting Control Tuneup (Base T8)	Lodging	1.53	1.68	1.53	Indoor Lighting
407	LED Exit Sign	Agricultural	1.52	2.46	1.52	Indoor Lighting
408	High Bay LED Troffer (Base T5)	Education	1.52	2.50	1.52	Indoor Lighting
409	RET Occ & Daylight Integral Sensor LED troffer (base T12 integrated)	Grocery	1.51	2.44	1.51	Indoor Lighting
410	Energy Star griddle	Religious Worship	1.50	2.26	1.50	Cooking
411	LED Troffer with lamp removal (T8)	Industrial	1.48	2.89	1.48	Indoor Lighting
412	Hot Water Pipe Insulation	Retail	1.46	1.83	1.46	DHW
413	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
414	Compressor VSD retrofit, base large cold storage	Grocery	1.44	2.76	1.44	Refrigeration
415	Bi-level LED Case Lighting (self-contained units), base closed cases	Religious Worship	1.43	1.23	1.43	Refrigeration
416	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Residential Split-System)	Data Centers	1.42	3.23	1.42	Cooling
417	Optimize Controls - DX	Restaurant	1.40	1.14	1.40	Cooling
418	Refrigeration Coil Cleaning, walk-ins	Warehouse	1.38	1.69	1.38	Refrigeration
419	High Bay Bi-Level Programmed LED Fixture	Industrial	1.37	6.10	1.37	Indoor Lighting
420	High Performance Lighting R/R - Combined Strategies (Base T5)	Agricultural	1.36	1.20	1.36	Indoor Lighting
421	Freezer-Cooler Replacement Gaskets, base glass-door reach-in	Restaurant	1.36	1.03	1.36	Refrigeration
422	Refrigeration Coil Cleaning, base ice maker	Lodging	1.34	2.46	1.34	Refrigeration
423	Energy Star server	Grocery	1.34	5.50	1.34	Office Equipment
424	Recirculation Pump Timer Clock - Controls for Central Domestic Hot Water	Education	1.33	1.65	1.33	DHW
425	LED Troffer with lamp removal (T12)	Agricultural	1.31	3.32	1.31	Indoor Lighting

VA Commercial: All Existing Measures Ranked by Economic Potential (GWh)

Rank	Measure Name	Building Type	Technical GWh	Measure TRC	Economic GWh	End Use
426	ROB 2L4' LED Tube (base outdoor fluorescent)	Lodging	1.31	1.42	1.31	Outdoor Lighting
427	Ceiling/roof Insulation - Chiller	Lodging	1.30	1.02	1.30	Cooling
428	Energy Star solid door reach-in refrigerator/freezer	Restaurant	1.30	2.73	1.30	Refrigeration
429	High Efficiency Windows (Base Ductless Mini-split)	Lodging	1.28	5.72	1.28	Cooling
430	Electronically commutated evaporator fan motor, base large cold storage	Grocery	1.26	2.93	1.26	Refrigeration
431	High Performance Lighting R/R - Combined Strategies (Base T12)	Restaurant	1.24	3.86	1.24	Indoor Lighting
432	High Efficiency Windows (Base Heat Pump Cooling)	Restaurant	1.23	2.12	1.23	Cooling
433	High Performance Lighting R/R - Combined Strategies (Base T5)	Education	1.22	1.45	1.22	Indoor Lighting
434	Hot Water Pipe Insulation	Education	1.22	1.06	1.22	DHW
435	ROB 2L4' LED Tube (Base T12)	Agricultural	1.21	4.61	1.21	Indoor Lighting
436	High Bay LED Troffer (Base T5)	Lodging	1.20	2.50	1.20	Indoor Lighting
437	High Bay Bi-Level Programmed LED Fixture	Agricultural	1.18	5.23	1.18	Indoor Lighting
438	LED Troffer with lamp removal (T12)	Industrial	1.18	3.32	1.18	Indoor Lighting
439	Bi-level LED Case Lighting (self-contained units), base closed cases	Education	1.17	1.37	1.17	Refrigeration
440	Electronically commutated evaporator fan motor, walk-ins	Lodging	1.15	2.91	1.15	Refrigeration
441	Ceiling/roof Insulation (Base PTAC)	Lodging	1.14	1.42	1.14	Cooling
442	Ceiling/roof Insulation (Base Residential Split-System)	Lodging	1.13	1.67	1.13	Cooling
443	LED Troffer (Base T8)	Industrial	1.12	1.17	1.12	Indoor Lighting
444	Oversized Air Cooled Condenser, walk-ins	Lodging	1.12	1.94	1.12	Refrigeration
445	LED Troffer (Base T12)	Agricultural	1.12	1.52	1.12	Indoor Lighting
446	Bi-level LED Case Lighting (self-contained units), base closed cases	Lodging	1.11	1.44	1.11	Refrigeration
447	ROB 2L4' LED Tube (Base T8)	Industrial	1.11	3.26	1.11	Indoor Lighting
448	Lighting Control Tuneup (Base T8)	Health	1.10	2.85	1.10	Indoor Lighting
449	Lighting Control Tuneup (Base T12)	Religious Worship	1.09	1.75	1.09	Indoor Lighting
450	ROB 2L4' LED Tube (Base T12)	Industrial	1.09	4.61	1.09	Indoor Lighting
451	ROB 2L4' LED Tube (base outdoor fluorescent)	Misc	1.08	1.58	1.08	Outdoor Lighting
452	Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons, heating	Religious Worship	1.07	1.34	1.07	Heating
453	Electronically commutated evaporator fan motor, base closed cases	Lodging	1.07	1.51	1.07	Refrigeration
454	Oversized Air Cooled Condenser, base closed cases	Lodging	1.04	2.02	1.04	Refrigeration
455	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	Grocery	1.04	1.98	1.04	Indoor Lighting
456	High Efficiency Windows - Chiller	Religious Worship	1.03	1.03	1.03	Cooling
457	Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons, heating	Industrial	1.02	4.66	1.02	Heating
458	LED Troffer (Base T12)	Industrial	1.01	1.52	1.01	Indoor Lighting
459	High Efficiency Windows - Chiller	Health	1.00	2.15	1.00	Cooling
460	Electronically commutated evaporator fan motor, base closed cases	Retail	0.99	1.18	0.99	Refrigeration
461	High Efficiency Windows (Base Ductless Mini-split)	Office	0.98	3.19	0.98	Cooling
462	LED Troffer with lamp removal (T12)	Warehouse	0.98	2.91	0.98	Indoor Lighting
463	High Performance Lighting R/R - Combined Strategies (Base T8)	Restaurant	0.98	3.37	0.98	Indoor Lighting

VA Commercial: All Existing Measures Ranked by Economic Potential (GWh)						
Rank	Measure Name	Building Type	Technical GWh	Measure TRC	Economic GWh	End Use
464	Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons, heating	Grocery	0.98	8.37	0.98	Heating
465	Refrigeration Coil Cleaning, walk-ins	Misc	0.98	1.40	0.98	Refrigeration
466	Refrigerant Charge Adjustment - DX	Warehouse	0.97	1.37	0.97	Cooling
467	High Performance Lighting R/R - Combined Strategies (Base T5)	Lodging	0.97	2.28	0.97	Indoor Lighting
468	High-efficiency fan motors, base large cold storage	Restaurant	0.96	1.46	0.96	Refrigeration
469	Low or Anti-Sweat Door Film, base closed cases	Lodging	0.95	2.59	0.95	Refrigeration
470	Low Flow Faucet Aerators	Industrial	0.95	1.32	0.95	DHW
471	Energy Star griddle	Misc	0.93	2.26	0.93	Cooking
472	Tankless Water Heater	Education	0.92	1.15	0.92	DHW
473	Tankless Water Heater	Restaurant	0.92	1.80	0.92	DHW
474	ROB 2L4' LED Tube (Base T12)	Warehouse	0.91	4.04	0.91	Indoor Lighting
475	Freezer-Cooler Replacement Gaskets, base closed cases	Lodging	0.91	2.91	0.91	Refrigeration
476	Oversized Air Cooled Condenser, base large cold storage	Restaurant	0.90	3.61	0.90	Refrigeration
477	High Efficiency Water Heater (electric)	Restaurant	0.88	2.57	0.88	DHW
478	Energy Star solid door reach-in refrigerator/freezer	Retail	0.87	2.73	0.87	Refrigeration
479	Energy Star solid door reach-in refrigerator/freezer	Education	0.86	2.73	0.86	Refrigeration
480	LED Troffer (Base T12)	Warehouse	0.86	1.36	0.86	Indoor Lighting
481	Lighting Control Tuneup (Base T12)	Lodging	0.85	1.59	0.85	Indoor Lighting
482	High Efficiency Water Heater (electric)	Education	0.84	1.63	0.84	DHW
483	LED Exit Sign	Industrial	0.84	2.46	0.84	Indoor Lighting
484	LED screw-in replacement (base CFL)	Health	0.83	1.10	0.83	Indoor Lighting
485	High Bay Bi-Level Programmed LED Fixture	Grocery	0.82	5.42	0.82	Indoor Lighting
486	LED fixture (base Low bay HID)	Data Centers	0.81	2.12	0.81	Indoor Lighting
487	Electronically commutated evaporator fan motor, walk-ins	Agricultural	0.80	2.36	0.80	Refrigeration
488	Energy Star griddle	Education	0.79	2.26	0.79	Cooking
489	LED screw-in replacement (base incandescent/halogen)	Grocery	0.79	8.33	0.79	Indoor Lighting
490	Refrigeration Coil Cleaning, base ice maker	Religious Worship	0.77	2.46	0.77	Refrigeration
491	High Performance Lighting R/R - Combined Strategies (base high bay HID)	Health	0.76	8.53	0.76	Indoor Lighting
492	Optimize Controls - DX	Grocery	0.75	1.33	0.75	Cooling
493	Oversized Air Cooled Condenser, base closed cases	Religious Worship	0.74	1.50	0.74	Refrigeration
494	Refrigeration Commissioning, base large cold storage	Restaurant	0.73	2.12	0.73	Refrigeration
495	ROB 2L4' LED Tube (base outdoor fluorescent)	Restaurant	0.72	1.42	0.72	Outdoor Lighting
496	LED Exit Sign	Health	0.71	3.39	0.71	Indoor Lighting
497	Lighting Control Tuneup (Base T8)	Warehouse	0.69	1.31	0.69	Indoor Lighting
498	Lighting Control Tuneup (Base LED Tube)	Health	0.68	1.59	0.68	Indoor Lighting
499	Tankless Water Heater	Retail	0.67	2.55	0.67	DHW
500	High Efficiency Windows (Base Ductless Mini-split)	Misc	0.67	2.08	0.67	Cooling
501	Variable Speed Drive Control, base motors	Data Centers	0.66	8.75	0.66	Ventilation
502	Oversized Air Cooled Condenser, base large cold storage	Grocery	0.65	3.57	0.65	Refrigeration

VA Commercial: All Existing Measures Ranked by Economic Potential (GWh)						
Rank	Measure Name	Building Type	Technical GWh	Measure TRC	Economic GWh	End Use
503	Lighting Control Tuneup (Base T12)	Health	0.64	3.11	0.64	Indoor Lighting
504	High Efficiency Windows - DX	Warehouse	0.63	2.12	0.63	Cooling
505	Low or Anti-Sweat Door Film, base closed cases	Religious Worship	0.63	1.77	0.63	Refrigeration
506	LED screw-in replacement (base CFL)	Agricultural	0.63	1.17	0.63	Indoor Lighting
507	High Efficiency Water Heater (electric)	Retail	0.62	3.60	0.62	DHW
508	High Performance Lighting R/R - Combined Strategies (base high bay HID)	Agricultural	0.62	1.39	0.62	Indoor Lighting
509	High Bay LED Troffer (Base T5)	Grocery	0.62	2.93	0.62	Indoor Lighting
510	HE PTAC, EER=9.6, 1 ton, cooling	Retail	0.61	1.51	0.61	Cooling
511	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Room AC)	Office	0.61	1.35	0.61	Cooling
512	Duct/Pipe Insulation (base furnace)	Lodging	0.61	1.36	0.61	Heating
513	Refrigeration Coil Cleaning, walk-ins	Agricultural	0.61	1.71	0.61	Refrigeration
514	High Bay Bi-Level Programmed LED Fixture	Grocery	0.60	6.31	0.60	Indoor Lighting
515	Freezer-Cooler Replacement Gaskets, base glass-door reach-in	Lodging	0.60	1.03	0.60	Refrigeration
516	Electronically commutated evaporator fan motor, open cases	Restaurant	0.60	1.27	0.60	Refrigeration
517	Lighting Control Tuneup (Base T5)	Retail	0.59	2.93	0.59	Indoor Lighting
518	Compressor VSD retrofit, walk-ins	Misc	0.59	2.76	0.59	Refrigeration
519	LED Troffer with lamp removal (T12)	Restaurant	0.58	3.15	0.58	Indoor Lighting
520	Energy Star solid door reach-in refrigerator/freezer	Health	0.57	2.73	0.57	Refrigeration
521	High Efficiency Motor	Grocery	0.57	1.11	0.57	Ventilation
522	Heat Pump Upgrade (18 SEER, 8.2 HSPF), cooling	Grocery	0.57	1.33	0.57	Cooling
523	Freezer-Cooler Replacement Gaskets, base glass-door reach-in	Retail	0.56	1.03	0.56	Refrigeration
524	Lighting Control Tuneup (Base T8)	Misc	0.56	1.24	0.56	Indoor Lighting
525	Freezer-Cooler Replacement Gaskets, base closed cases	Religious Worship	0.55	1.85	0.55	Refrigeration
526	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	Data Centers	0.55	1.20	0.55	Indoor Lighting
527	Efficient compressor motor, base closed cases	Grocery	0.55	3.93	0.55	Refrigeration
528	Lighting Control Tuneup (Base T12)	Retail	0.55	2.02	0.55	Indoor Lighting
529	Energy Star or Better Laptop	Office	0.54	1.71	0.54	Office Equipment
530	ROB 2L4' LED Tube (Base T12)	Restaurant	0.54	4.37	0.54	Indoor Lighting
531	Strip curtains for walk-ins	Lodging	0.53	1.34	0.53	Refrigeration
532	Tankless Water Heater	Office	0.53	2.34	0.53	DHW
533	Energy Star griddle	Grocery	0.52	2.26	0.52	Cooking
534	DX Tune Up/ Advanced Diagnostics	Warehouse	0.52	2.04	0.52	Cooling
535	Refrigeration Commissioning, base large cold storage	Grocery	0.52	2.10	0.52	Refrigeration
536	Window Film (Standard) (Base Ductless Mini-split)	Retail	0.51	1.36	0.51	Cooling
537	High-efficiency fan motors, walk-ins	Misc	0.50	2.55	0.50	Refrigeration
538	Bi-level LED Case Lighting (self-contained units), base closed cases	Retail	0.50	1.31	0.50	Refrigeration
539	Refrigerant Charge Adjustment - DX	Data Centers	0.50	4.03	0.50	Cooling
540	LED Troffer (Base T12)	Restaurant	0.50	1.45	0.50	Indoor Lighting
541	Refrigeration Coil Cleaning, walk-ins	Retail	0.49	1.45	0.49	Refrigeration
542	High Performance Lighting R/R - Combined Strategies (base high bay HID)	Grocery	0.48	4.17	0.48	Indoor Lighting

VA Commercial: All Existing Measures Ranked by Economic Potential (GWh)						
Rank	**Measure Name**	**Building Type**	**Technical GWh**	**Measure TRC**	**Economic GWh**	**End Use**
543	High Performance Lighting R/R - Combined Strategies (Base T12)	Grocery	0.48	4.20	0.48	Indoor Lighting
544	LED Troffer with lamp removal (T8)	Restaurant	0.47	2.80	0.47	Indoor Lighting
545	High Efficiency Chilled Water & Condenser Water Pump Motors	Lodging	0.46	2.44	0.46	Cooling
546	Oversized Air Cooled Condenser, base closed cases	Retail	0.46	1.76	0.46	Refrigeration
547	Strip curtains for walk-ins, base large cold storage	Grocery	0.46	1.33	0.46	Refrigeration
548	Refrigeration Coil Cleaning, base closed cases	Health	0.45	1.25	0.45	Refrigeration
549	Tankless Water Heater	Health	0.45	1.09	0.45	DHW
550	Electronically commutated evaporator fan motor, base large cold storage	Agricultural	0.45	2.47	0.45	Refrigeration
551	Economizer Repair - DX	Grocery	0.44	1.71	0.44	Cooling
552	LED outdoor lighting with bi-level controls (Base Outdoor HID)	Data Centers	0.44	3.51	0.44	Outdoor Lighting
553	Ceiling/roof Insulation (base ductless mini split)	Lodging	0.44	1.69	0.44	Heating
554	Ceiling/roof Insulation (Base Heat Pump Cooling)	Lodging	0.43	1.55	0.43	Cooling
555	Electronically commutated evaporator fan motor, base closed cases	Health	0.43	1.33	0.43	Refrigeration
556	LED Exit Sign	Warehouse	0.42	1.64	0.42	Indoor Lighting
557	Solar Water Heater	Education	0.42	1.05	0.42	DHW
558	High Efficiency Windows - Chiller	Education	0.42	1.93	0.42	Cooling
559	Solar Water Heater	Health	0.42	1.01	0.42	DHW
560	High Bay Bi-Level Programmed LED Fixture	Health	0.42	3.79	0.42	Indoor Lighting
561	Low or Anti-Sweat Door Film, base closed cases	Retail	0.42	2.25	0.42	Refrigeration
562	High Efficiency Chilled Water & Condenser Water Pump Motors	Health	0.41	1.39	0.41	Cooling
563	High Efficiency Windows (Base Ductless Mini-split)	Retail	0.41	4.16	0.41	Cooling
564	Strip curtains for walk-ins, base large cold storage	Restaurant	0.41	1.34	0.41	Refrigeration
565	Energy Star or Better Laptop	Religious Worship	0.41	1.71	0.41	Office Equipment
566	High-efficiency fan motors, base large cold storage	Grocery	0.40	1.47	0.40	Refrigeration
567	High Efficiency Water Heater (electric)	Office	0.40	2.68	0.40	DHW
568	Freezer-Cooler Replacement Gaskets, base closed cases	Retail	0.40	2.53	0.40	Refrigeration
569	Low-flow pre-rinse spray valve	Grocery	0.39	1.34	0.39	DHW
570	Electronically commutated evaporator fan motor, walk-ins	Misc	0.38	2.85	0.38	Refrigeration
571	Energy Star griddle	Office	0.38	2.26	0.38	Cooking
572	Centrifugal Chiller, 0.54 kW/ton, 500 tons	Retail	0.38	2.13	0.38	Cooling
573	LED screw-in replacement (base CFL)	Industrial	0.38	1.17	0.38	Indoor Lighting
574	Oversized Air Cooled Condenser, walk-ins	Warehouse	0.37	2.14	0.37	Refrigeration
575	Oversized Air Cooled Condenser, base closed cases	Education	0.36	1.56	0.36	Refrigeration
576	Electronically commutated evaporator fan motor, base closed cases	Office	0.36	1.26	0.36	Refrigeration
577	LED Troffer (Base T8)	Restaurant	0.36	1.14	0.36	Indoor Lighting
578	High Performance Lighting R/R - Combined Strategies (Base T8)	Grocery	0.35	3.66	0.35	Indoor Lighting
579	Refrigeration Coil Cleaning, walk-ins	Office	0.35	1.70	0.35	Refrigeration
580	ROB 2L4' LED Tube (Base T8)	Restaurant	0.35	3.15	0.35	Indoor Lighting

VA Commercial: All Existing Measures Ranked by Economic Potential (GWh)						
Rank	Measure Name	Building Type	Technical GWh	Measure TRC	Economic GWh	End Use
581	LED screw-in replacement (base CFL)	Restaurant	0.34	1.12	0.34	Indoor Lighting
582	High Bay Bi-Level Programmed LED Fixture	Agricultural	0.34	3.88	0.34	Indoor Lighting
583	Refrigeration Coil Cleaning, base ice maker	Misc	0.34	2.46	0.34	Refrigeration
584	HE PTAC, EER=9.6, 1 ton, cooling	Data Centers	0.34	6.76	0.34	Cooling
585	Duct/Pipe Insulation (electric boiler)	Lodging	0.34	1.36	0.34	Heating
586	Oversized Air Cooled Condenser, walk-ins	Misc	0.33	2.23	0.33	Refrigeration
587	Low or Anti-Sweat Door Film, base closed cases	Education	0.33	2.00	0.33	Refrigeration
588	Electronically commutated evaporator fan motor, walk-ins	Retail	0.33	2.82	0.33	Refrigeration
589	Electronically commutated evaporator fan motor, walk-ins	Office	0.32	2.73	0.32	Refrigeration
590	Low Flow Faucet Aerators	Warehouse	0.32	2.19	0.32	DHW
591	Oversized Air Cooled Condenser, open cases	Restaurant	0.32	1.49	0.32	Refrigeration
592	Freezer-Cooler Replacement Gaskets, base closed cases	Education	0.31	2.25	0.31	Refrigeration
593	Refrigeration Coil Cleaning, base large cold storage	Agricultural	0.31	2.19	0.31	Refrigeration
594	High Performance Lighting R/R - Combined Strategies (Base T5)	Grocery	0.30	1.69	0.30	Indoor Lighting
595	RET Occ & Daylight Integral Sensor LED troffer (base T8 integrated)	Agricultural	0.30	1.30	0.30	Indoor Lighting
597	Refrigeration Coil Cleaning, base closed cases	Misc	0.29	1.03	0.29	Refrigeration
598	Separate Makeup Air / Exhaust Hoods AC	Grocery	0.29	1.20	0.29	Ventilation
599	ROB 2L4' LED Tube (base outdoor fluorescent)	Religious Worship	0.28	1.58	0.28	Outdoor Lighting
600	Energy Star hot food holding cabinet	Office	0.28	2.39	0.28	Cooking
601	Compressor VSD retrofit, walk-ins	Retail	0.28	2.68	0.28	Refrigeration
602	Bi-level LED Case Lighting, base glass-door reach-in	Health	0.28	1.26	0.28	Refrigeration
603	DX Tune Up/ Advanced Diagnostics	Data Centers	0.27	6.05	0.27	Cooling
604	High-efficiency fan motors, walk-ins	Warehouse	0.27	2.46	0.27	Refrigeration
605	High Efficiency Windows (Base Ductless Mini-split)	Education	0.27	1.79	0.27	Cooling
606	ROB 2L4' LED Tube (Base T5)	Grocery	0.27	2.76	0.27	Indoor Lighting
607	ROB 2L4' LED Tube (base outdoor fluorescent)	Education	0.26	1.58	0.26	Outdoor Lighting
608	High Efficiency Windows (Base Heat Pump Cooling)	Education	0.26	3.46	0.26	Cooling
609	Heat Pump Upgrade (18 SEER, 8.2 HSPF), cooling	Data Centers	0.26	15.60	0.26	Cooling
610	Lighting Control Tuneup (Base T8)	Retail	0.26	1.23	0.26	Indoor Lighting
611	Energy Star glass door reach-in refrigerator/freezer	Health	0.26	3.97	0.26	Refrigeration
612	Heat Pump, SEER 16.0/HSPF 9.2 ENERGY STAR, <5.4 tons, heating	Education	0.26	7.81	0.26	Heating
613	Energy Star griddle	Retail	0.25	2.26	0.25	Cooking
614	Compressor VSD retrofit, walk-ins	Agricultural	0.25	2.33	0.25	Refrigeration
615	Energy Star or Better Imaging Equipment	Religious Worship	0.25	2.53	0.25	Office Equipment
616	Variable Speed Drive Control, base motors	Education	0.25	2.31	0.25	Ventilation
617	Ceiling/roof Insulation (base packaged heat pump)	Lodging	0.25	1.16	0.25	Heating
618	Efficient industrial process	Industrial	0.24	5.05	0.24	Process

VA Commercial: All Existing Measures Ranked by Economic Potential (GWh)						
Rank	Measure Name	Building Type	Technical GWh	Measure TRC	Economic GWh	End Use
619	Refrigeration Coil Cleaning, walk-ins	Health	0.24	1.69	0.24	Refrigeration
620	Window Film (Standard) - Chiller	Retail	0.23	1.02	0.23	Cooling
621	High Efficiency Windows (Base Ductless Mini-split)	Health	0.23	2.55	0.23	Cooling
622	Energy Star Convection Oven	Warehouse	0.22	3.54	0.22	Cooking
623	Electronically commutated evaporator fan motor, walk-ins	Health	0.22	3.11	0.22	Refrigeration
624	Energy Star or Better Imaging Equipment	Office	0.22	2.63	0.22	Office Equipment
625	LED screw-in replacement (base incandescent/halogen)	Education	0.22	7.83	0.22	Indoor Lighting
626	High-efficiency fan motors, walk-ins	Agricultural	0.22	2.16	0.22	Refrigeration
627	Bi-level LED Case Lighting (self-contained units), base closed cases	Misc	0.22	1.46	0.22	Refrigeration
628	Efficient compressor motor, open cases	Grocery	0.22	2.86	0.22	Refrigeration
629	Ceiling/roof Insulation (Base Ductless Mini-split)	Lodging	0.21	1.43	0.21	Cooling
630	Centrifugal Chiller, 0.54 kW/ton, 500 tons	Warehouse	0.21	1.94	0.21	Cooling
631	Energy Star or Better Laptop	Misc	0.21	1.71	0.21	Office Equipment
632	HE PTAC, EER=9.6, 1 ton, cooling	Restaurant	0.20	1.26	0.20	Cooling
633	High Efficiency Windows - Chiller	Retail	0.20	3.42	0.20	Cooling
634	High Efficiency Windows (Base Heat Pump Cooling)	Warehouse	0.20	1.81	0.20	Cooling
635	Strip curtains for walk-ins	Misc	0.20	1.33	0.20	Refrigeration
636	Freezer-Cooler Replacement Gaskets, walk-ins	Lodging	0.20	1.83	0.20	Refrigeration
637	High Efficiency Windows (Base Ductless Mini-split)	Restaurant	0.20	1.09	0.20	Cooling
638	Ductless Mini-Split SEER 18.0/HSPF 10.0 CEE Tier 1 (Base Room AC)	Restaurant	0.20	1.48	0.20	Cooling
639	Lighting Control Tuneup (Base T12)	Warehouse	0.20	1.31	0.20	Indoor Lighting
640	Centrifugal Chiller, 0.54 kW/ton, 500 tons	Industrial	0.19	1.03	0.19	Cooling
641	Energy Star glass door reach-in refrigerator/freezer	Office	0.19	4.02	0.19	Refrigeration
642	Bi-level LED Case Lighting (self-contained units), base closed cases	Health	0.18	1.23	0.18	Refrigeration
643	ROB 2L4' LED Tube (Base T12)	Grocery	0.18	4.19	0.18	Indoor Lighting
644	Energy Star solid door reach-in refrigerator/freezer	Misc	0.18	2.73	0.18	Refrigeration
645	LED Troffer (Base T12)	Grocery	0.18	1.46	0.18	Indoor Lighting