**BEFORE THE**
**PUBLIC UTILITIES COMMISSION OF OHIO**

| | | |
|---|---|---|
| **In the Matter of the Application of Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company For Approval of Their Energy Efficiency and Peak Demand Reduction Program Portfolio Plans for 2010 through 2012 and Associated Cost Recovery Mechanisms.** | ) | **Case Nos. 09-1947-EL-POR**<br>**09-1948-EL-POR**<br>**09-1949-EL-POR** |
| **In the Matter of the Application of Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company For Approval of Their Initial Benchmark Reports.** | ) | **Case Nos. 09-1942-EL-EEC**<br>**09-1943-EL-EEC**<br>**09-1944-EL-EEC** |
| **In the Matter of the Energy Efficiency and Peak Demand Reduction Program Portfolio of Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company.** | ) | **Case Nos. 09-580-EL-EEC**<br>**09-581-EL-EEC**<br>**09-582-EL-EEC** |

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**APPENDIX D TO 3-YEAR ENERGY EFFICIENCY AND PEAK DEMAND REDUCTION PLAN AND INITIAL BENCHMARK REPORT**

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BUILDING A WORLD OF DIFFERENCE®

# Ohio Edison Company, The Toledo Edison Company, and The Cleveland Illuminating Company

# Market Potential Study Report: Energy Savings and Demand Reduction

Final Report

September 1, 2009

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Building a world of difference.

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# EXECUTIVE SUMMARY



## EXECUTIVE SUMMARY

The following report presents the results of an Energy Efficiency and Peak Demand Reduction Market Potential Study (hereinafter referred to as the "Market Study") which has been conducted by Black & Veatch ("B&V") for the three FirstEnergy Ohio operating companies, Ohio Edison Company ("OE"), The Toledo Edison Company ("TE") and The Cleveland Illuminating Company ("CEI") (hereinafter collectively referred to as the "Companies"). The study has been conducted in fulfillment of a directive of the Stipulation and Recommendation filed on February 19, 2009 in Case No. 08-935-EL-SSO which requires this analysis as an important first step in designing energy efficiency and peak demand reduction programs (hereinafter referred to as "EEPD") ultimately required under the Ohio Energy Optimization Plan ("EOP"). The B&V study team worked with FirstEnergy staff in the development of this study, and solicited input from the members of the Ohio Collaborative, a group of stakeholders established by the Public Utilities Commission of Ohio ("PUCO") to work in conjunction with the utilities in the development of their individual "EOPs".

Two scenarios were examined in this Market Study: 1) a Base Case that assumes a standard package of program incentives adopted by those customers who indicated high interest in participating according to surveys, and 2) a High Case that assumes a more aggressive package of program incentives to draw in additional customers who indicated that they were considering participating in programs. In the High Case, both incentive amounts and marketing budgets are increased. Both scenarios produce cost effective portfolios as based on the Total Resource Cost test. The High Case scenario comes closer to achieving the goals established in SB 221, as would be expected, but at a higher cost to implement the programs.

Maximum technical potential is considered to be 33% of projected electricity consumption in 2025 as based upon a recent study by the ACEEE Study conducted in March 2009.[1]

The Base Case results from the study reveal an achievable potential for energy reductions over forecasted sales in 12.6 % for OE, 11.9 % for TE and 13.5 % for CEI by 2025. The High Case results from the study reveal an achievable potential for energy reductions of 19.2 % for OE, 17.9 % for TE and 19.9 % for CEI. These achievable potential estimates are the result of a careful analysis of commercially viable technologies, stated customer intentions as gathered from statistically valid surveys, and cost effectiveness testing. The percentage savings values shown above represent a conservative estimate by company of EEPD market potential. It is likely during the process of program design some of these estimates may change.

While these estimates fall short of the 22 % goal established by the PUCO for 2025, even in the High Case, the following must be noted:

1) The analysis was intentionally developed to be conservative by limiting customer adoption of high-efficiency technologies at the end of the useful life of appliances and equipment. In reality, this plan would give customers incentives to change out old inefficient appliances before the end of their useful life. However, in this study B&V does not account

[1] . American Council for an Energy Efficient Economy; "Shaping Ohio's Energy Future: Energy Efficiency Works," March 2009, Report EO92.

for these actions which would serve to increase the timing and magnitude of efficiency savings.

2) The Companies anticipate considerable energy savings to result from Transmission and Distribution upgrades as allowed under SB 221 to contribute to the EEPD savings goals. The savings resulting from these activities are not included in this Market Study, but are expected to provide additional savings would bring the total savings potential closer to the 22% goal set by SB 221.

Tables E1-E9 present the targets established by Senate Bill 221 for the Energy Optimization Plan, and in the light blue columns, the results of the Market Study in terms of achievable energy savings in MWh and % of forecasts sales each year. Tables E1–E3 are for OE, Tables E4–E6 are for TE and Tables E7–E9 for CEI.

There is a Base Case and High Case table provided for each of the three Ohio Companies. The cumulative savings results are compared against the EEPD Case (i.e. Base, High) effected forecast to arrive at the percentage savings each year.

# EXECUTIVE SUMMARY



**Table E1 – State Energy Efficiency Targets under SB221 – OE Base Case**

| Year | State Goals Cumulative | Three Year Average Original FirstEnergy Forecast | Base Case DSM/EE Adjusted FirstEnergy Forecast[2] | State Goal Annual (MWh) | State Goal Cumulative (MWh) | DSM/EE Savings Base Case (MWh) | Percentage Achieved |
|---|---|---|---|---|---|---|---|
| 2009 | 0.3% | 25,589,549 | 25,589,549 | 76,769 | 76,769 | 190,394 | 0.7% |
| 2010 | 1% | 25,000,188 | 24,936,723 | 124,684 | 201,452 | 651,046 | 2.6% |
| 2011 | 2% | 24,569,729 | 24,289,249 | 170,025 | 371,477 | 1,088,844 | 4.5% |
| 2012 | 2% | 24,797,888 | 24,154,460 | 193,236 | 564,713 | 1,515,292 | 6.3% |
| 2013 | 3% | 25,696,905 | 24,611,844 | 221,507 | 786,219 | 1,941,889 | 7.9% |
| 2014 | 4% | 26,439,375 | 24,924,033 | 249,240 | 1,035,460 | 2,363,461 | 9.5% |
| 2015 | 5% | 26,801,837 | 24,861,623 | 248,616 | 1,284,076 | 2,451,081 | 9.9% |
| 2016 | 6% | 27,003,693 | 24,751,549 | 247,515 | 1,531,591 | 2,541,655 | 10.3% |
| 2017 | 7% | 27,228,048 | 24,775,983 | 247,760 | 1,779,351 | 2,631,032 | 10.6% |
| 2018 | 8% | 27,472,708 | 24,931,452 | 249,315 | 2,028,666 | 2,720,536 | 10.9% |
| 2019 | 10% | 27,723,768 | 25,092,694 | 501,854 | 2,530,520 | 2,810,168 | 11.2% |
| 2020 | 12% | 27,971,641 | 25,251,063 | 505,021 | 3,035,541 | 2,893,209 | 11.5% |
| 2021 | 14% | 28,226,001 | 25,418,030 | 508,361 | 3,543,901 | 2,976,062 | 11.7% |
| 2022 | 16% | 28,481,645 | 25,588,499 | 511,770 | 4,055,671 | 3,059,035 | 12.0% |
| 2023 | 18% | 28,750,482 | 25,774,379 | 515,488 | 4,571,159 | 3,142,129 | 12.2% |
| 2024 | 20% | 29,021,148 | 25,962,073 | 519,241 | 5,090,400 | 3,225,344 | 12.4% |
| 2025 | 22% | 29,312,515 | 26,170,345 | 523,407 | 5,613,807 | 3,308,681 | 12.6% |

[2] The Companies' original forecasts do not reflect this studies estimate of EEPD savings. The Companies' forecast is therefore adjusted downward to reflect both the base and high case savings in EEPD Study.

# EXECUTIVE SUMMARY



**Table E2 – State Energy Efficiency Targets under SB221 – OE High Case**

| Year | State Goals Cumulative | High Case DSM/EE Adjusted FirstEnergy Forecast[3] | State Goal Annual (MWh) | State Goal Cumulative (MWh) | DSM/EE Savings High Case (MWh) | Percentage Achieved |
|---|---|---|---|---|---|---|
| 2009 | 0.3% | 25,589,549 | 76,769 | 76,769 | 190,394 | 0.7% |
| 2010 | 1% | 24,936,723 | 124,684 | 201,452 | 792,258 | 3.2% |
| 2011 | 2% | 24,242,179 | 169,695 | 371,148 | 1,370,057 | 5.7% |
| 2012 | 2% | 24,013,652 | 192,109 | 563,257 | 1,936,605 | 8.1% |
| 2013 | 3% | 24,330,598 | 218,975 | 782,232 | 2,503,402 | 10.3% |
| 2014 | 4% | 24,502,687 | 245,027 | 1,027,259 | 3,064,720 | 12.5% |
| 2015 | 5% | 24,300,261 | 243,003 | 1,270,262 | 3,220,964 | 13.3% |
| 2016 | 6% | 24,073,998 | 240,740 | 1,511,002 | 3,380,276 | 14.0% |
| 2017 | 7% | 24,006,062 | 240,061 | 1,751,062 | 3,539,971 | 14.7% |
| 2018 | 8% | 24,092,304 | 240,923 | 1,991,985 | 3,699,908 | 15.4% |
| 2019 | 10% | 24,183,717 | 483,674 | 2,475,660 | 3,860,088 | 16.0% |
| 2020 | 12% | 24,271,652 | 485,433 | 2,961,093 | 4,012,374 | 16.5% |
| 2021 | 14% | 24,368,545 | 487,371 | 3,448,463 | 4,164,275 | 17.1% |
| 2022 | 16% | 24,469,399 | 489,388 | 3,937,851 | 4,316,408 | 17.6% |
| 2023 | 18% | 24,586,129 | 491,723 | 4,429,574 | 4,468,776 | 18.2% |
| 2024 | 20% | 24,704,662 | 494,093 | 4,923,667 | 4,621,377 | 18.7% |
| 2025 | 22% | 24,843,661 | 496,873 | 5,420,541 | 4,774,213 | 19.2% |

[3] See footnote 2:

# EXECUTIVE SUMMARY



**Table E3 - State Peak Reduction Targets Under SB221 - OE**

| Year | Three Year Average Original Forecast Peak (KW) | State Requirement Reductions | Base DSM/EE Peak Savings (kW) | High DSM/EE Peak Savings (kW) | Base DSM/EE Peak Savings[4] (%) | High DSM/EE Peak Savings[5] (%) |
|---|---|---|---|---|---|---|
| 2009 | 5,278 | 1.00% | 8 | 8 | 0.2% | 0.2% |
| 2010 | 5,204 | 1.75% | 65 | 101 | 1.3% | 1.9% |
| 2011 | 5,208 | 2.50% | 121 | 192 | 2.3% | 3.7% |
| 2012 | 5,350 | 3.25% | 176 | 282 | 3.3% | 5.4% |
| 2013 | 5,415 | 4.00% | 231 | 372 | 4.4% | 7.1% |
| 2014 | 5,464 | 4.75% | 286 | 462 | 5.4% | 8.9% |
| 2015 | 5,504 | 5.50% | 309 | 499 | 5.9% | 9.7% |
| 2016 | 5,544 | 6.25% | 333 | 536 | 6.3% | 10.5% |
| 2017 | 5,588 | 7.00% | 356 | 573 | 6.7% | 11.3% |
| 2018 | 5,634 | 7.75% | 379 | 611 | 7.2% | 12.0% |
| 2019 | 5,680 | 8.50% | 403 | 648 | 7.6% | 12.7% |
| 2020 | 5,725 | 9.25% | 426 | 685 | 8.0% | 13.4% |
| 2021 | 5,772 | 10.00% | 449 | 721 | 8.4% | 14.1% |
| 2022 | 5,818 | 10.75% | 471 | 758 | 8.7% | 14.8% |
| 2023 | 5,866 | 11.50% | 494 | 795 | 9.1% | 15.5% |
| 2024 | 5,914 | 12.25% | 517 | 832 | 9.5% | 16.1% |
| 2025 | 5,965 | 13.00% | 540 | 869 | 9.9% | 16.8% |

[4] Base Peak percentage are calculated based on Base Case DSM/EE Adjusted FirstEnergy Peak Forecast (i.e. three year average adjusted for Peak Saving in EEPD Study)
[5] High Peak percentage are calculated based on High Case DSM/EE Adjusted FirstEnergy Peak Forecast (i.e. three year average adjusted for Peak Savings in EEPD Study)

# EXECUTIVE SUMMARY



**Table E4 – State Energy Efficiency Targets Under SB221 -CEI - Base Case**

| Year | State Goals Cumulative | Three Year Average Original FirstEnergy Forecast | Base Case DSM/EE Adjusted FirstEnergy Forecast[6] | State Goal Annual (MWh) | State Goal Cumulative (MWh) | DSM/EE Savings Base Case (MWh) | Percentage Achieved |
|---|---|---|---|---|---|---|---|
| 2009 | 0.3% | 19,384,547 | 19,384,547 | 58,154 | 58,154 | 140,217 | 0.7% |
| 2010 | 1% | 18,973,711 | 18,926,972 | 94,635 | 152,788 | 495,963 | 2.6% |
| 2011 | 2% | 18,690,195 | 18,478,135 | 129,347 | 282,135 | 834,294 | 4.5% |
| 2012 | 2% | 18,819,930 | 18,329,772 | 146,638 | 428,774 | 1,163,962 | 6.4% |
| 2013 | 3% | 19,412,886 | 18,581,480 | 167,233 | 596,007 | 1,493,717 | 8.0% |
| 2014 | 4% | 19,875,286 | 18,711,295 | 187,113 | 783,120 | 1,818,768 | 9.7% |
| 2015 | 5% | 20,060,805 | 18,568,656 | 185,687 | 968,806 | 1,881,835 | 10.1% |
| 2016 | 6% | 20,140,139 | 18,408,699 | 184,087 | 1,152,893 | 1,946,787 | 10.6% |
| 2017 | 7% | 20,223,646 | 18,341,183 | 183,412 | 1,336,305 | 2,010,873 | 11.0% |
| 2018 | 8% | 20,309,952 | 18,363,454 | 183,635 | 1,519,940 | 2,075,049 | 11.3% |
| 2019 | 10% | 20,394,988 | 18,384,085 | 367,682 | 1,887,622 | 2,139,315 | 11.6% |
| 2020 | 12% | 20,473,386 | 18,398,308 | 367,966 | 2,255,588 | 2,199,193 | 12.0% |
| 2021 | 14% | 20,554,223 | 18,416,371 | 368,327 | 2,623,915 | 2,258,848 | 12.3% |
| 2022 | 16% | 20,633,188 | 18,434,069 | 368,681 | 2,992,596 | 2,318,587 | 12.6% |
| 2023 | 18% | 20,714,127 | 18,455,250 | 369,105 | 3,361,701 | 2,378,413 | 12.9% |
| 2024 | 20% | 20,793,897 | 18,475,281 | 369,506 | 3,731,207 | 2,438,323 | 13.2% |
| 2025 | 22% | 20,880,771 | 18,502,330 | 370,047 | 4,101,254 | 2,498,320 | 13.5% |

[6] See footnote 2

# EXECUTIVE SUMMARY



**Table E5 – State Energy Efficiency Targets under SB221 – CEI High Case**

| Year | State Goals Cumulative | High Case DSM/EE Adjusted FirstEnergy Forecast[7] | State Goal Annual (MWh) | State Goal Cumulative (MWh) | Sales HighCase (MWh) | Percentage Achieved |
|---|---|---|---|---|---|---|
| 2009 | 0.3% | 19,384,547 | 58,154 | 58,154 | 140,217 | 0.7% |
| 2010 | 1% | 18,926,972 | 94,635 | 152,788 | 597,634 | 3.2% |
| 2011 | 2% | 18,444,245 | 129,110 | 281,898 | 1,036,708 | 5.6% |
| 2012 | 2% | 18,228,410 | 145,827 | 427,725 | 1,467,179 | 8.0% |
| 2013 | 3% | 18,379,046 | 165,411 | 593,137 | 1,897,797 | 10.3% |
| 2014 | 4% | 18,408,058 | 184,081 | 777,217 | 2,323,371 | 12.6% |
| 2015 | 5% | 18,164,690 | 181,647 | 958,864 | 2,431,675 | 13.4% |
| 2016 | 6% | 17,922,525 | 179,225 | 1,138,090 | 2,541,929 | 14.2% |
| 2017 | 7% | 17,791,321 | 177,913 | 1,316,003 | 2,652,440 | 14.9% |
| 2018 | 8% | 17,767,938 | 177,679 | 1,493,682 | 2,763,105 | 15.6% |
| 2019 | 10% | 17,742,496 | 354,850 | 1,848,532 | 2,873,924 | 16.2% |
| 2020 | 12% | 17,710,230 | 354,205 | 2,202,737 | 2,979,273 | 16.8% |
| 2021 | 14% | 17,682,123 | 353,642 | 2,556,379 | 3,084,150 | 17.4% |
| 2022 | 16% | 17,654,072 | 353,081 | 2,909,461 | 3,189,176 | 18.1% |
| 2023 | 18% | 17,629,927 | 352,599 | 3,262,059 | 3,294,349 | 18.7% |
| 2024 | 20% | 17,604,672 | 352,093 | 3,614,153 | 3,399,670 | 19.3% |
| 2025 | 22% | 17,586,373 | 351,727 | 3,965,880 | 3,505,140 | 19.9% |

[7] See footnote 2

# EXECUTIVE SUMMARY



**Table E6 - State Peak Reduction Targets under SB221 – CEI**

| Year | Three Year Average Original Forecast Peak (KW) | State Requirements | Base DSM/EE Peak Savings (kW) | High DSM/EE Peak Savings (kW) | Base DSM/EE Peak Savings[8] (%) | High DSM/EE Peak Savings[9] (%) |
|---|---|---|---|---|---|---|
| 2009 | 4,161 | 1.00% | 6 | 6 | 0.1% | 0.1% |
| 2010 | 4,085 | 1.75% | 54 | 81 | 1.3% | 2.0% |
| 2011 | 4,108 | 2.50% | 102 | 155 | 2.5% | 3.8% |
| 2012 | 4,239 | 3.25% | 149 | 228 | 3.6% | 5.5% |
| 2013 | 4,346 | 4.00% | 196 | 301 | 4.6% | 7.2% |
| 2014 | 4,435 | 4.75% | 243 | 374 | 5.7% | 8.9% |
| 2015 | 4,489 | 5.50% | 261 | 402 | 6.1% | 9.6% |
| 2016 | 4,544 | 6.25% | 278 | 430 | 6.5% | 10.3% |
| 2017 | 4,599 | 7.00% | 296 | 458 | 6.8% | 10.9% |
| 2018 | 4,655 | 7.75% | 314 | 487 | 7.2% | 11.5% |
| 2019 | 4,711 | 8.50% | 331 | 515 | 7.5% | 12.1% |
| 2020 | 4,766 | 9.25% | 349 | 543 | 7.8% | 12.7% |
| 2021 | 4,821 | 10.00% | 366 | 571 | 8.2% | 13.3% |
| 2022 | 4,875 | 10.75% | 383 | 598 | 8.5% | 13.8% |
| 2023 | 4,931 | 11.50% | 401 | 626 | 8.8% | 14.4% |
| 2024 | 4,986 | 12.25% | 418 | 654 | 9.1% | 14.9% |
| 2025 | 5,042 | 13.00% | 436 | 682 | 9.4% | 15.5% |

[8] See footnote 4
[9] See footnote 5

# EXECUTIVE SUMMARY



**Table E7 – State Energy Efficiency Targets Under SB221 –TE Base Case**

| Year | Goals Cumulative | Three Year Average Original FirstEnergy Forecast | Base Case DSM/EE Adjusted FirstEnergy Forecast[10] | State Goal Annual (MWh) | State Goal Cumulative (MWh) | DSM/EE Savings Base Case (MWh) | Percentage Achieved |
|---|---|---|---|---|---|---|---|
| 2009 | 0.3% | 10,449,916 | 10,449,916 | 31,350 | 31,350 | 64,450 | 0.6% |
| 2010 | 1% | 10,138,593 | 10,117,109 | 50,586 | 81,935 | 242,837 | 2.4% |
| 2011 | 2% | 9,906,280 | 9,803,850 | 68,627 | 150,562 | 411,776 | 4.2% |
| 2012 | 2% | 9,995,456 | 9,755,768 | 78,046 | 228,608 | 576,018 | 5.9% |
| 2013 | 3% | 10,427,267 | 10,017,057 | 90,154 | 318,762 | 740,314 | 7.4% |
| 2014 | 4% | 10,768,864 | 10,192,829 | 101,928 | 420,690 | 900,524 | 8.8% |
| 2015 | 5% | 10,925,602 | 10,186,651 | 101,867 | 522,557 | 929,499 | 9.1% |
| 2016 | 6% | 10,991,909 | 10,135,130 | 101,351 | 623,908 | 959,229 | 9.5% |
| 2017 | 7% | 11,047,480 | 10,117,730 | 101,177 | 725,085 | 988,607 | 9.8% |
| 2018 | 8% | 11,100,206 | 10,141,095 | 101,411 | 826,496 | 1,018,027 | 10.0% |
| 2019 | 10% | 11,148,642 | 10,160,021 | 203,200 | 1,029,697 | 1,047,487 | 10.3% |
| 2020 | 12% | 11,189,808 | 10,171,768 | 203,435 | 1,233,132 | 1,075,167 | 10.6% |
| 2021 | 14% | 11,227,248 | 10,180,354 | 203,607 | 1,436,739 | 1,102,576 | 10.8% |
| 2022 | 16% | 11,260,053 | 10,184,977 | 203,700 | 1,640,439 | 1,130,024 | 11.1% |
| 2023 | 18% | 11,290,602 | 10,188,014 | 203,760 | 1,844,199 | 1,157,511 | 11.4% |
| 2024 | 20% | 11,317,924 | 10,187,887 | 203,758 | 2,047,957 | 1,185,038 | 11.6% |
| 2025 | 22% | 11,345,791 | 10,188,266 | 203,765 | 2,251,722 | 1,212,605 | 11.9% |

[10] See footnote 2

# EXECUTIVE SUMMARY



**Table E8 – State Energy Efficiency Targets under SB221 – TE High Case**

| Year | State Goals Cumulative | High Case DSM/EE Adjusted FirstEnergy Forecast[11] | State Goal Annual (MWh) | State Goal Cumulative (MWh) | Sales HighCase (MWh) | Percentage Achieved |
|---|---|---|---|---|---|---|
| 2009 | 0.3% | 10,449,916 | 31,350 | 31,350 | 64,450 | 0.6% |
| 2010 | 1% | 10,117,109 | 50,586 | 81,935 | 299,375 | 3.0% |
| 2011 | 2% | 9,785,005 | 68,495 | 150,430 | 524,448 | 5.4% |
| 2012 | 2% | 9,699,365 | 77,595 | 228,025 | 744,856 | 7.7% |
| 2013 | 3% | 9,904,374 | 89,139 | 317,165 | 965,352 | 9.7% |
| 2014 | 4% | 10,023,979 | 100,240 | 417,404 | 1,181,572 | 11.8% |
| 2015 | 5% | 9,961,676 | 99,617 | 517,021 | 1,232,191 | 12.4% |
| 2016 | 6% | 9,865,538 | 98,655 | 615,677 | 1,283,602 | 13.0% |
| 2017 | 7% | 9,815,026 | 98,150 | 713,827 | 1,335,136 | 13.6% |
| 2018 | 8% | 9,816,564 | 98,166 | 811,992 | 1,386,750 | 14.1% |
| 2019 | 10% | 9,813,479 | 196,270 | 1,008,262 | 1,438,445 | 14.7% |
| 2020 | 12% | 9,803,031 | 196,061 | 1,204,323 | 1,487,923 | 15.2% |
| 2021 | 14% | 9,789,542 | 195,791 | 1,400,113 | 1,536,860 | 15.7% |
| 2022 | 16% | 9,772,311 | 195,446 | 1,595,560 | 1,585,875 | 16.2% |
| 2023 | 18% | 9,753,716 | 195,074 | 1,790,634 | 1,634,968 | 16.8% |
| 2024 | 20% | 9,732,023 | 194,640 | 1,985,274 | 1,684,138 | 17.3% |
| 2025 | 22% | 9,710,797 | 194,216 | 2,179,490 | 1,733,387 | 17.9% |

[11] See footnote 2

# EXECUTIVE SUMMARY



**Table E9 - State Peak Reduction Targets under SB221 – TE**

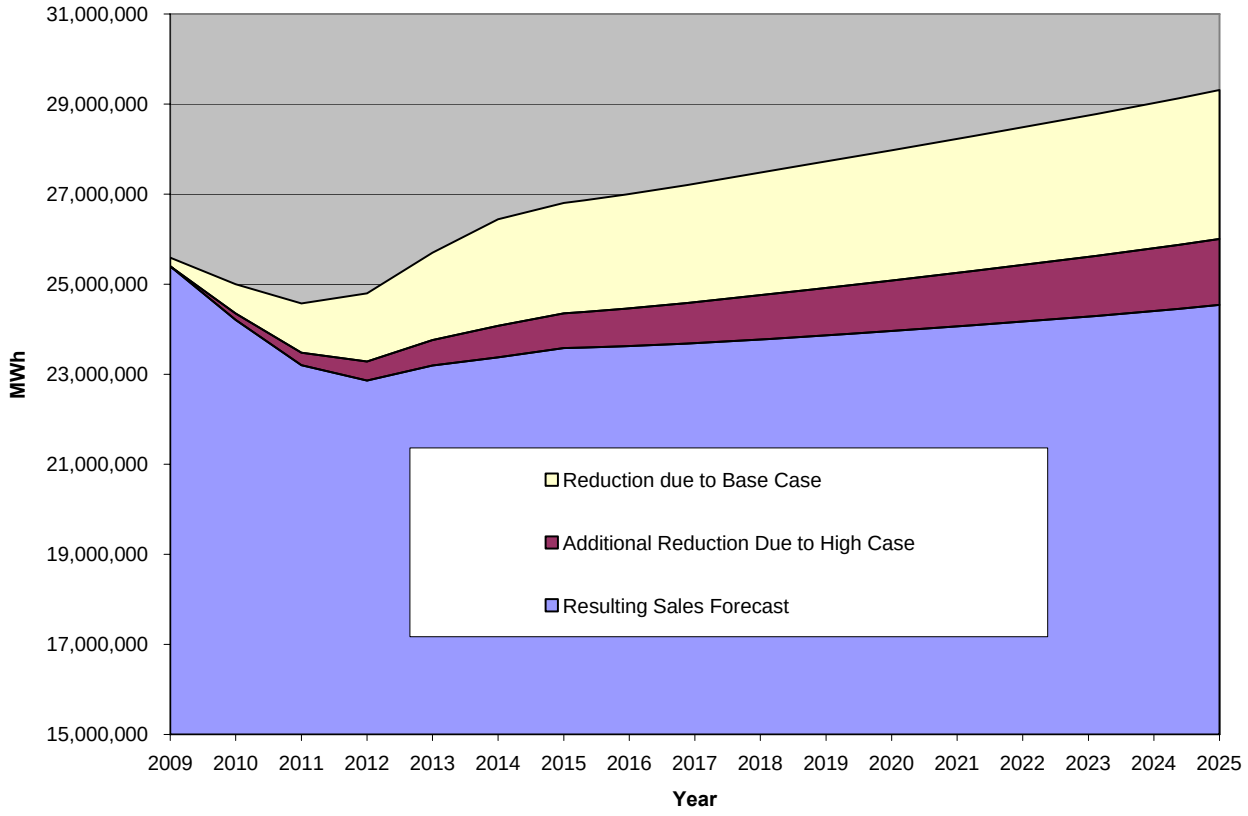
| Year | Three Year Average Original Forecast Peak (KW) | State Requirements | Base DSM/EE Peak Savings (kW) | High DSM/EE Peak Savings (kW) | Base DSM/EE Peak Savings[12] (%) | High DSM/EE Peak Savings[13] (%) |
|---|---|---|---|---|---|---|
| 2009 | 2,007 | 1.00% | 3 | 3 | 0.1% | 0.1% |
| 2010 | 1,966 | 1.75% | 26 | 40 | 1.3% | 2.0% |
| 2011 | 1,976 | 2.50% | 49 | 76 | 2.5% | 3.9% |
| 2012 | 2,027 | 3.25% | 72 | 112 | 3.6% | 5.7% |
| 2013 | 2,050 | 4.00% | 95 | 149 | 4.7% | 7.5% |
| 2014 | 2,067 | 4.75% | 117 | 185 | 5.9% | 9.5% |
| 2015 | 2,081 | 5.50% | 125 | 197 | 6.3% | 10.2% |
| 2016 | 2,094 | 6.25% | 133 | 209 | 6.7% | 10.9% |
| 2017 | 2,109 | 7.00% | 141 | 220 | 7.1% | 11.5% |
| 2018 | 2,123 | 7.75% | 149 | 232 | 7.5% | 12.1% |
| 2019 | 2,137 | 8.50% | 157 | 244 | 7.9% | 12.8% |
| 2020 | 2,149 | 9.25% | 164 | 256 | 8.2% | 13.4% |
| 2021 | 2,162 | 10.00% | 172 | 268 | 8.6% | 14.0% |
| 2022 | 2,175 | 10.75% | 180 | 280 | 8.9% | 14.6% |
| 2023 | 2,188 | 11.50% | 188 | 292 | 9.3% | 15.2% |
| 2024 | 2,201 | 12.25% | 195 | 304 | 9.7% | 15.8% |
| 2025 | 2,214 | 13.00% | 203 | 316 | 10.0% | 16.4% |

[12] See footnote 4
[13] See footnote 5

# EXECUTIVE SUMMARY



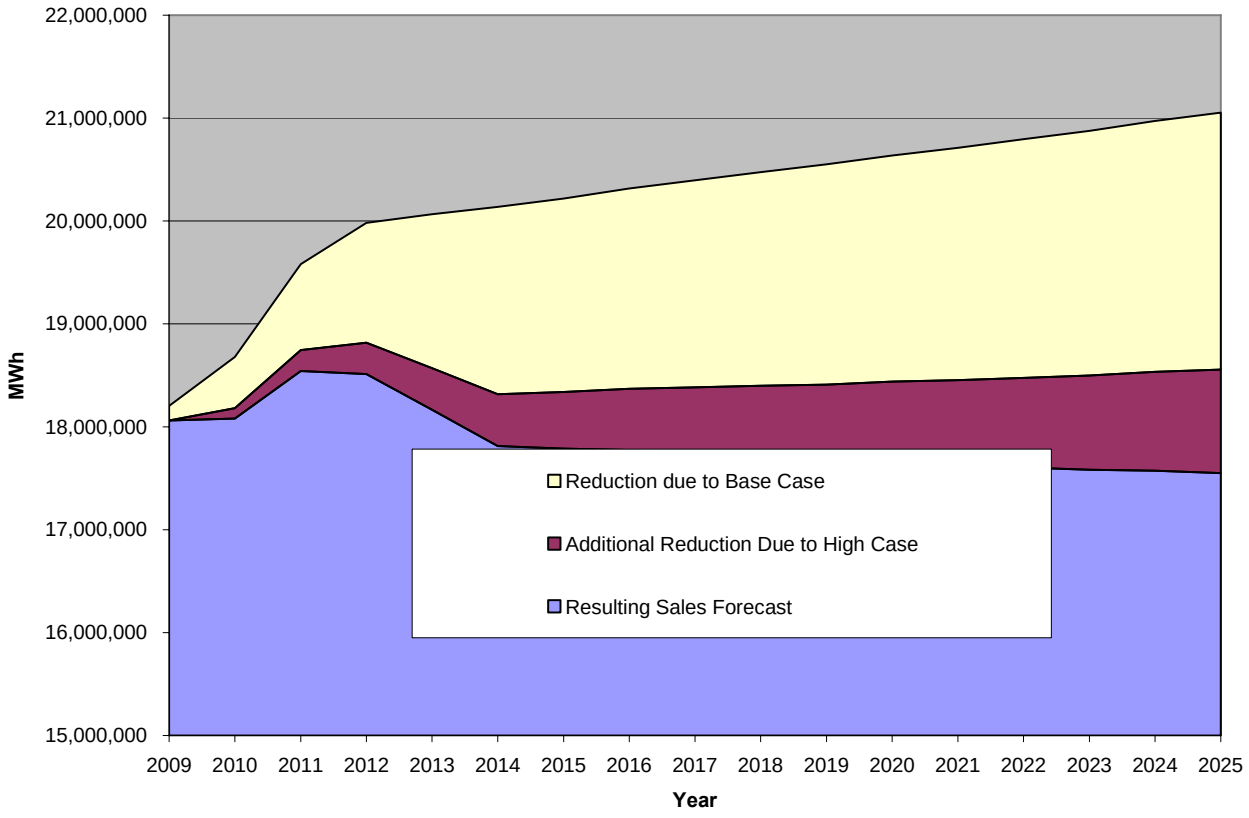
**Figure E-1 - EEPD Affected Sales Forecast (Base Case – High Case) - OE**



# EXECUTIVE SUMMARY



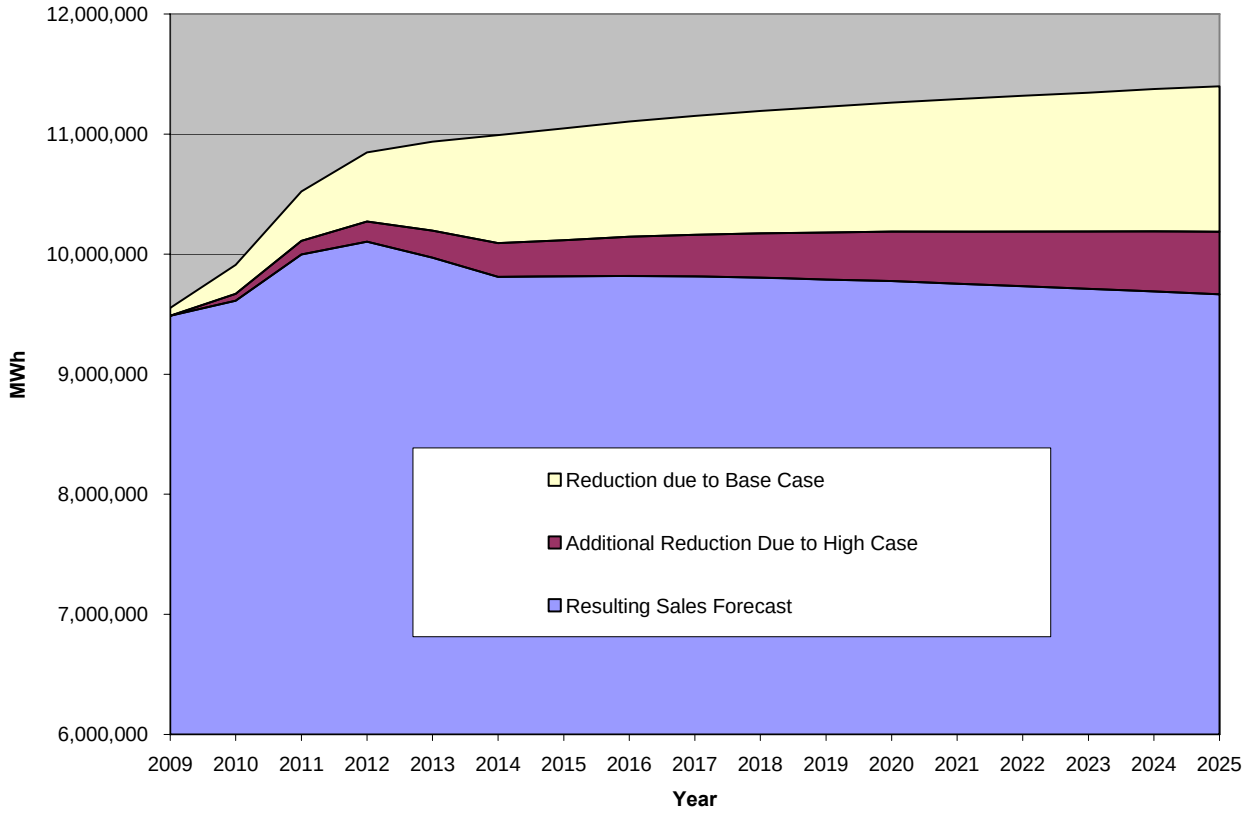
**Figure E-2 - EEPD Affected Sales Forecast (Base Case – High Case) - CEI**



# EXECUTIVE SUMMARY



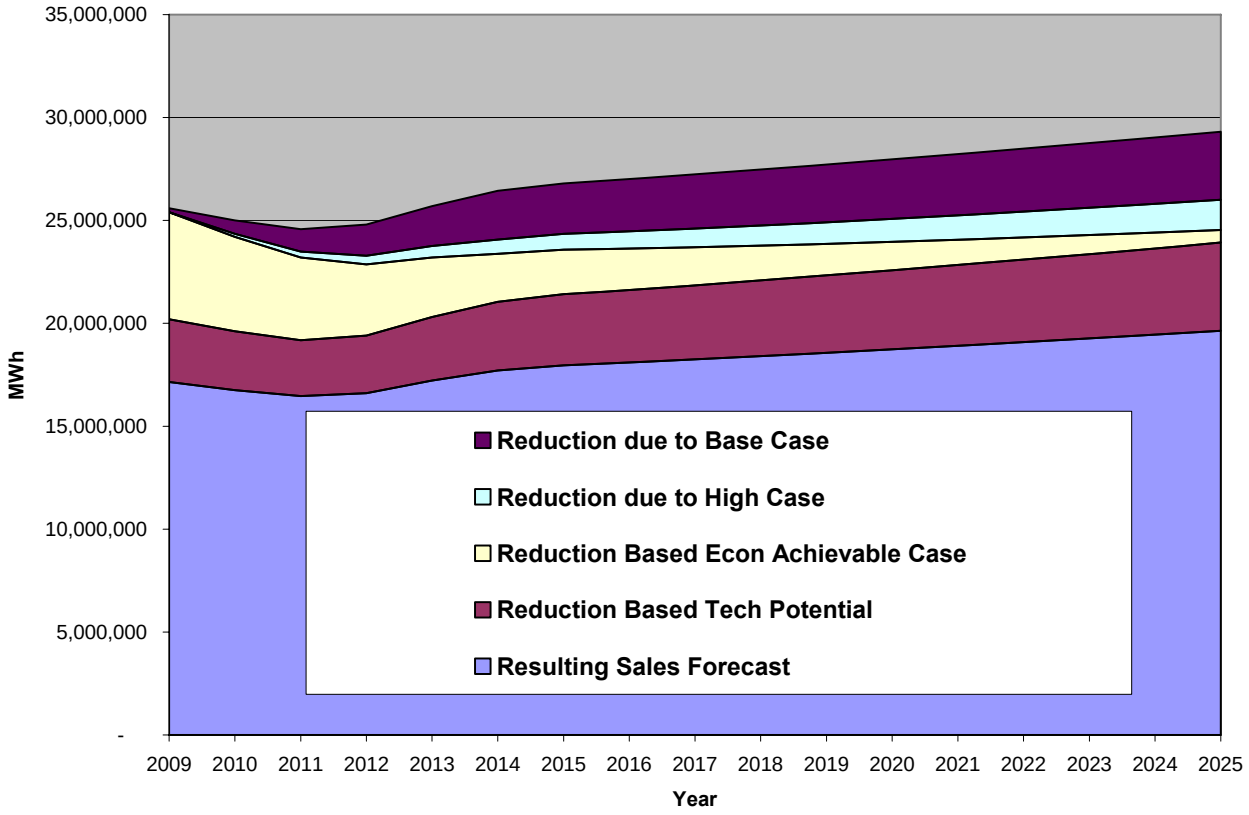
**Figure E-3 - EEPD Affected Sales Forecast (Base Case – High Case) - TE**



# EXECUTIVE SUMMARY



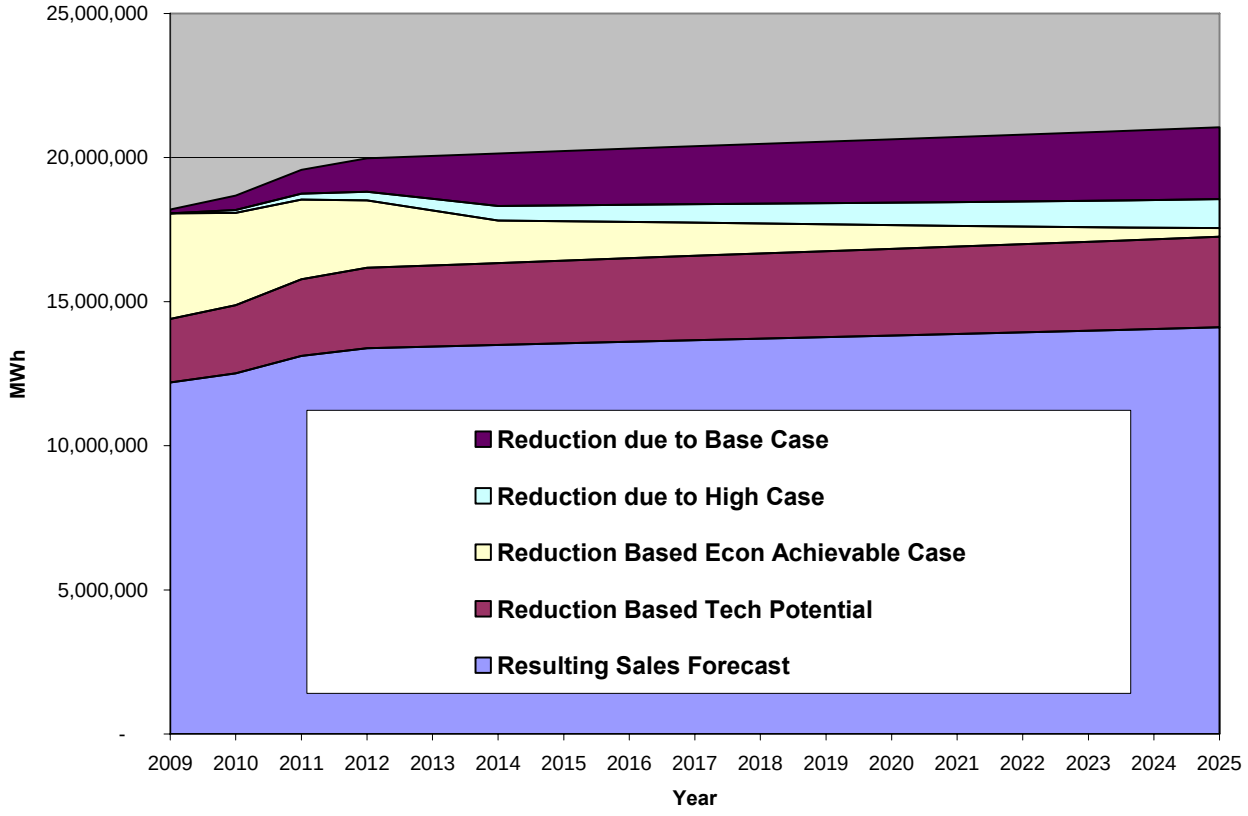
**Figure E-4 – EEPD Affected Sales Forecast with Technical Economic and Achievable Energy Savings Decrements - OE**



# EXECUTIVE SUMMARY



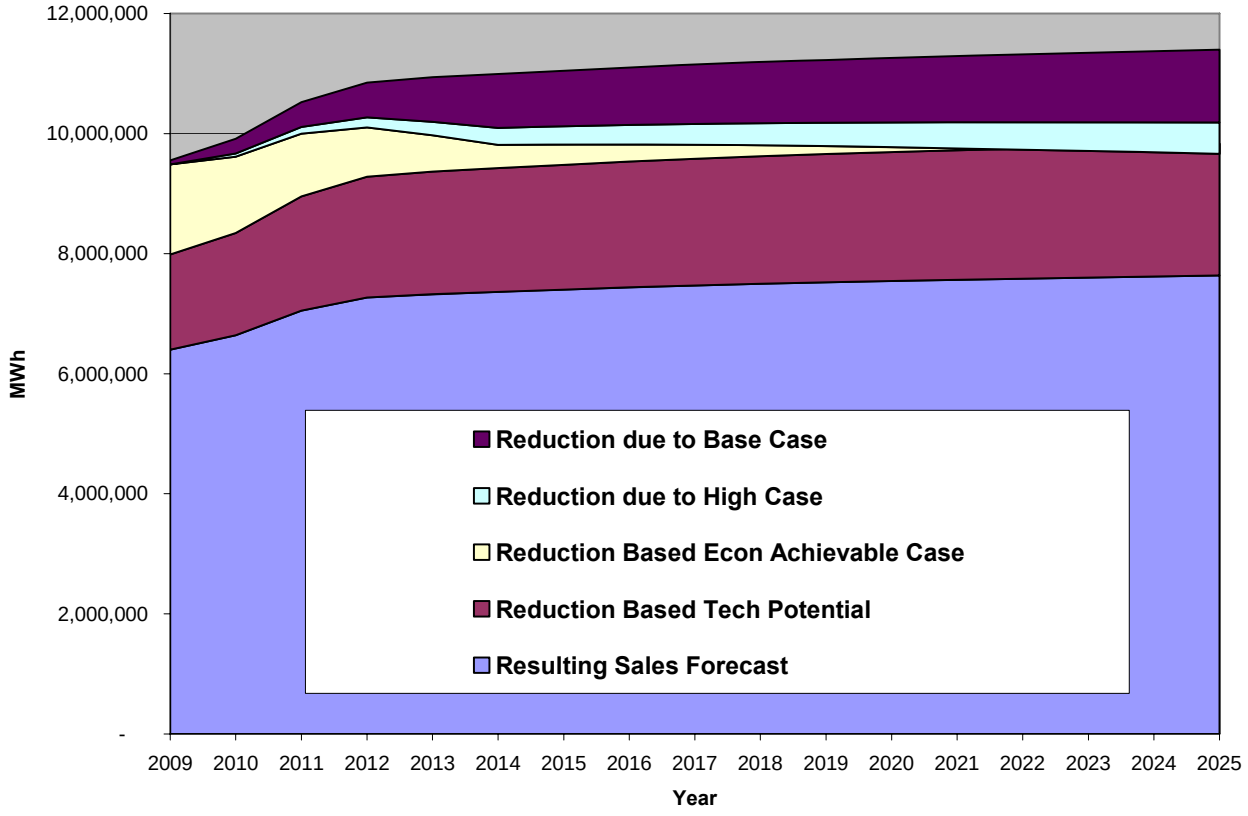
**Figure E-5 – EEPD Affected Sales Forecast with Technical Economic and Achievable Energy Savings Decrements - CEI**



# EXECUTIVE SUMMARY



**Figure E-6 – EEPD Affected Sales Forecast with Technical Economic and Achievable Energy Savings Decrements - TE**



# 1.0 INTRODUCTION



## 1.0 INTRODUCTION

### *Purpose of the Study*

This report presents the results of an analysis of energy efficiency and peak demand reduction ("EEPD") potential for the FirstEnergy Corporation operating companies in Ohio ("Companies"), namely Ohio Edison Company ("OE"), The Toledo Edison ("TE") and The Cleveland Illuminating Company ("CEI"). The Market Study was prepared in fulfillment of the Stipulation and Recommendation filed on February 19, 2009 in Case No. 08-935EL-SSO.

> *E.6.b. The Companies EEPD Program will begin with a market study to be conducted on or before September 1, 2009 that will identify potential residential, small commercial and industrial energy efficiency and peak demand reduction opportunities within the Companies' respective service areas (the "Market Study"). The Companies will accept input from Signatory Parties for purposes of the Market Study and provide a copy of the Market Study, upon request, to the Signatory Parties hereto.*

The reliable estimation of the economic potential for energy efficiency sets the upper success limit for designing the programs in-order to achieve that potential. The programs that will be designed in the next phase of this work will have as their objective, the achievement of the goals associated with SB 221, as amended July 2008.[14]

Energy savings potential is generally defined by the energy efficiency community nationally as consisting of technical, economic and market or achievable potential, which are generally defined by the energy efficiency community nationally as follows:

Such assessment shall include, but not be limited to, the following:

1) Analysis of technical potential. Each electric utility shall survey and characterize the energy-using capital stock located within its certified territory and quantify its actual and projected energy use and peak demand. Based upon the survey and characterization, the electric utility shall conduct an analysis of the technical potential for energy efficiency and peak-demand reduction obtainable from applying alternate measures.
2) Analysis of economic potential. For each alternate measure identified in its assessment of technical potential, the electric utility shall conduct an assessment of cost-effectiveness using the total resource cost test.
3) Analysis of achievable potential. For each alternate measure identified in its analysis of economic potential as cost-effective, the electric utility shall conduct an analysis of achievable potential. Such analysis shall consider the ability of the program design to

[14] *Section 4928.66 of SB 221, Revised Code, mandates that each electric utility implement energy efficiency and peak demand reduction programs to meet statutory benchmarks.*

overcome barriers to customer adoption, including, but not limited to, appropriate bundling of measures.

4) For each measure considered, the electric utility shall describe all attributes relevant to assessing its value, including, but not limited to potential energy savings or peak-demand reduction, cost, and non-energy benefits.

## *Approach*

The design of EEPD programs involves a parallel methodology that considers customer segments and preferences, appliance/end-use ownership and energy efficiency technologies and techniques that can be offered to those customer segments to achieve energy savings. The left side of Figure 1.1 presents a generic schematic diagram of the analysis process that leads from this Market Study to actual program designs.

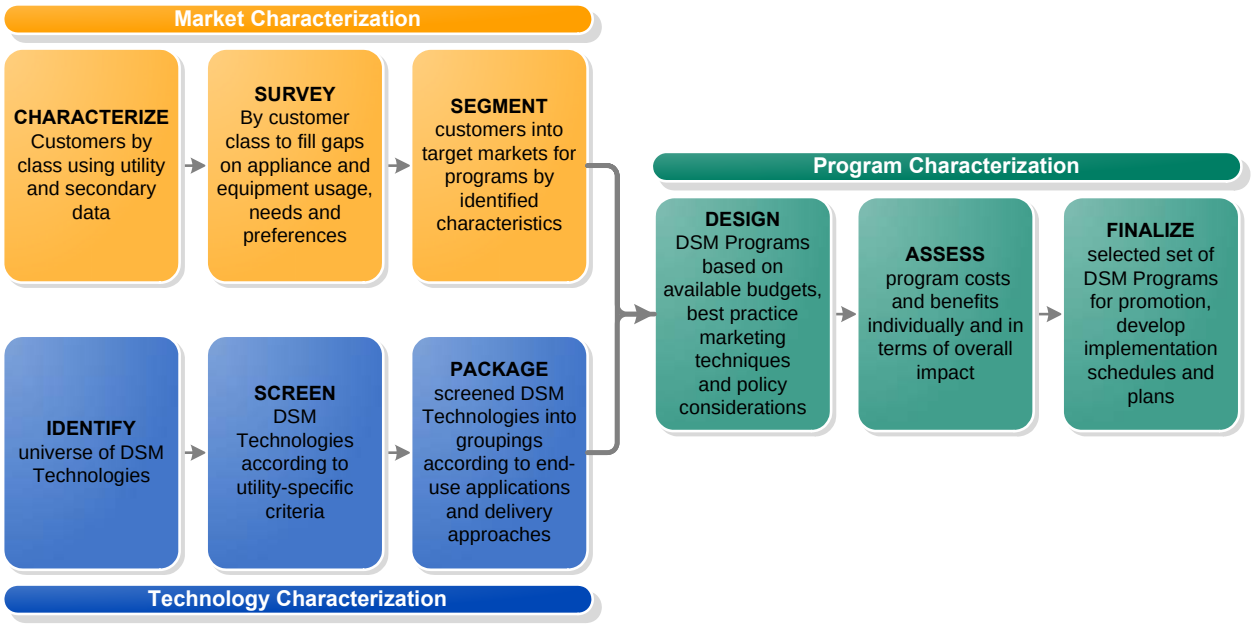



**Figure 1.1 Methodology Describing Progression from Market Study to Program Design**

The right side of the diagram summarizes the second phase of work that will culminate in an EEPD Program Portfolio Plan to be filed with the PUCO before January 1, 2010.

The Companies employed a top-down approach for determining the technical potential and a bottom-up approach, on a measure-by-measure basis, for assessing the economic and market potential for energy efficiency and peak demand reduction.

# 1.0 INTRODUCTION



## *Overview of FirstEnergy Corp*[15]

FirstEnergy Corp. is a diversified energy company headquartered in Akron, Ohio. Its seven electric utility operating companies comprise the nation's fifth largest investor-owned electric system, based on 4.5 million customers served within a 36,100 square-mile area of Ohio, Pennsylvania and New Jersey. FirstEnergy was formed in 1997 through the merger of Ohio Edison Company and its subsidiary, Pennsylvania Power Company, with Centerior Energy Corp. and its subsidiaries, The Cleveland Electric Illuminating Company and The Toledo Edison Company. Through this merger, FirstEnergy became the 11th largest investor-owned electric system in the nation, based on annual electric sales of 64 billion kilowatt-hours, and had combined assets of nearly $20 billion. The new Company employed some 10,000 employees, serving 2.1 million customers within 13,200 square miles of northern and central Ohio and western Pennsylvania. FirstEnergy had 11,681 megawatts of generating capacity and 57 transmission interconnections with 8 electric systems.

FirstEnergy nearly doubled its revenue to more than $12 billion and customers served to more than 4.3 million when it merged with GPU, Inc., based in Morristown, New Jersey, in 2001, through the purchase of its outstanding common stock. The former GPU served 2.1 million customers in a 24,000 square-mile service area in Pennsylvania and New Jersey through its three operating companies: Metropolitan Edison Company, Pennsylvania Electric Company, and Jersey Central Power & Light Company.

This Market Study covers the Ohio companies of FirstEnergy: Ohio Edison (OE), Toledo Edison (TE) and Cleveland Illuminating Company (CEI). Figure 1.2 depicts the corporate service territory.

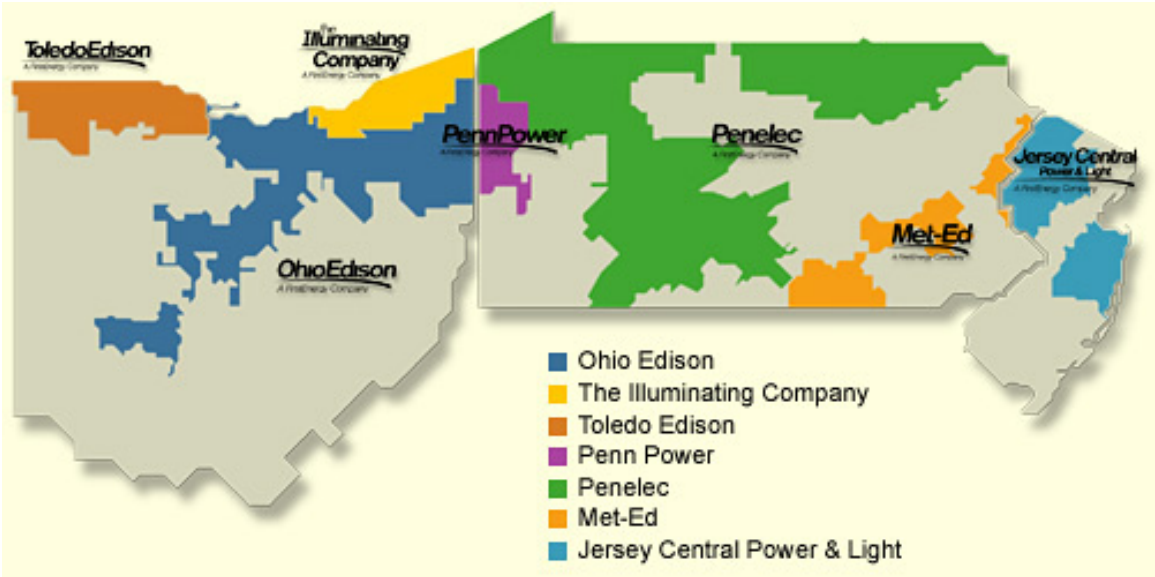



**Figure 1.2 FirstEnergy Service Territory Overview**

[15] Text from http://www.firstenergycorp.com/corporate/Corporate_Profile/Company_History.html

# 1.0 INTRODUCTION



### *Market Study Features Unique to Ohio*

The regulatory context for planning the Companies' EEPD programs includes a few variations to the generic methodology described above. These features will be taken into consideration

1) Mercantile Self-Directed Projects – SB221 allows for documented energy savings generated by large customers from self-directed projects implemented after January 1, 2006 to be counted toward the statutory benchmark targets. This Market Study therefore includes savings from the Mercantile Projects identified and projected.

2) Existing Programs – The Companies already have in place three residential customer programs that generate energy savings and achieve peak demand reductions. These programs are as follows:

   a. **Home Performance with Energy Star** – a comprehensive residential retrofit program that addresses building shell measure (weatherization), electric appliances and lighting.

   b. **Programmable Thermostat Direct Load Control Program** – a program that involves the periodic control of programmable thermostats in homes with central air conditioning during peak demand summer days.

   c. **Community Connections Program** – a program delivered by non-profit partners to FirstEnergy customers that addresses low income households.

   The Home Performance with Energy Star Program and Programmable Thermostat Direct Load Control Program are currently pending in anticipation of their possible redesign; therefore, the electric energy savings derived from these participating households are not included in this Market Study. The Community Connections program will continue during the term of the Companies' Electric Security Plan.

   Unless otherwise noted, residential participation is included in this Market Study under the label of Comprehensive Residential Programs.

3) Pre-Filed Programs – In anticipation of the need to quickly launch programs for the achievement of near-term benchmark targets, the Companies designed and filed for pre-approval of two EEPD programs:

   a. **High Efficiency Lighting Program** – a program to deliver compact fluorescent light bulbs to residential and small business customers along with educational materials regarding their proper deployment for maximum energy savings;

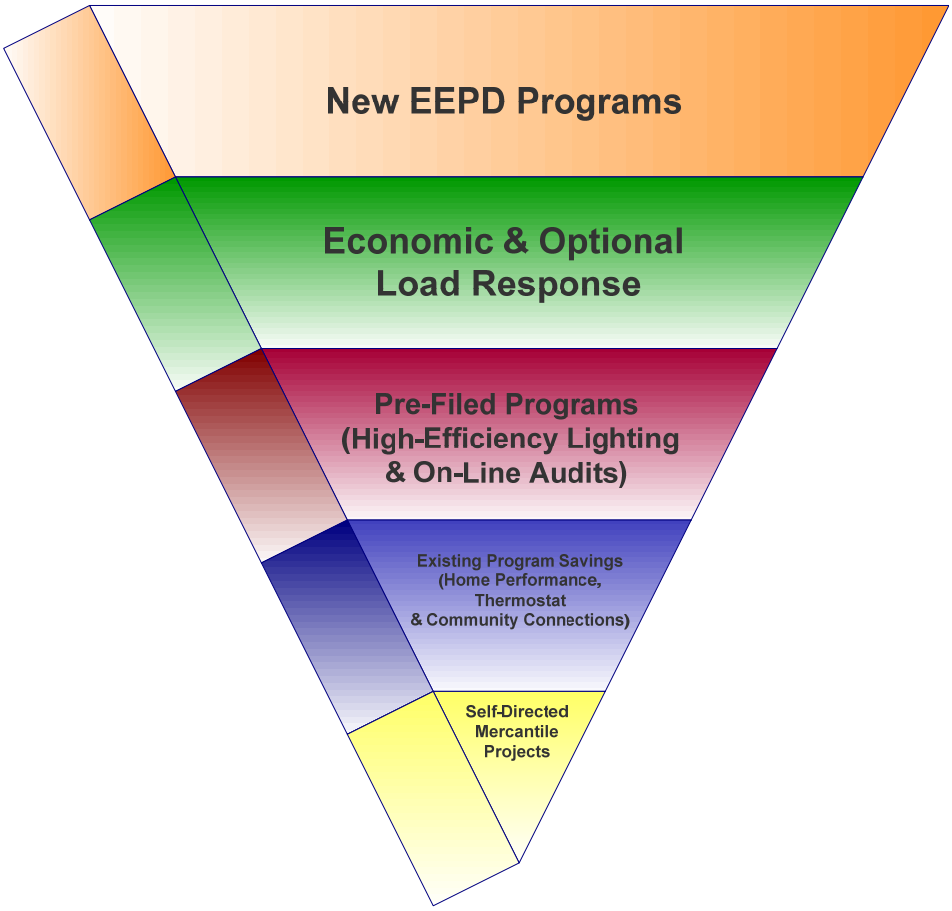
   b. **On-Line Energy Audit Program** – a home energy audit that is linked to individual customer account information to produce a customized report of energy usage and savings opportunities in the home or small business. Behavioral

savings and savings from the self-installation of low cost measures are attributable to programs of this nature.

4) T&D Programs – applicable to T&D less reductions. Although not reflected in the Market Study, the savings from these activities will serve to bring the total savings potential closer to the required twenty-two percent.

Figure 1.3 shows the various components of programs and services that make up the "building blocks" of energy savings for the EEPD Plan.

**Figure 1.3 Building Blocks of the FirstEnergy EEPD Plan**




### *Involvement of Collaborative Parties and Administrators in the Market Study*

The Market Study benefited from input from various parties involved in the Collaborative process in Ohio. Specifically, a set of questions was posed to entities that represent constituencies that have customers in common with FirstEnergy. The following groups (Table 1.1) responded to the inquiry, and provided estimates of the number of their constituents that are represented in the Companies service territory that might be affected by the programs:

# 1.0 INTRODUCTION



**Table 1.1 – Administrators/Collaborative Members**

| Administrator/Collaborative Member | Number of FirstEnergy Customers Represented |
|---|---|
| Ohio Schools Council | There are 100 districts with approximately 1,800 FirstEnergy Ohio customers |
| Council of Ohio Small Enterprises | Approximately 14,000 FirstEnergy Ohio customers represented. |
| Industrial Energy Users of Ohio | Approximately 117 FirstEnergy Ohio customers represented. |
| Ohio Manufacturers' Assoc | Over 700 FirstEnergy Ohio customers represented. |
| Ohio Hospital Association | Approximately 60 hospitals and additional numbers of health care facilities in FirstEnergy Ohio territory |
| Sierra Club | Approximately 6,000 members in the Companies, with a majority in the Cleveland area. |

The Companies appreciate the responses provided by these organizations into the Market Study process. Only a small number of the respondents were able to provide detailed information as to numbers of their members that are served by the Companies, or the general level of energy efficiency actions already taken. Even so, the responses do provide important information for schools, hospitals and businesses that are taken into account in the modeling. It is anticipated that the higher value contributions to be made by Collaborative members will be in the next phase of work; the design of new programs.

## *Organization of the Report*

Section 2.0, describes the methodology used to conduct the Market Study. Section 3.0 summarizes the characteristics of the Companies' customers as derived from Company data and surveys conducted by the study team. Section 4.0 presents information regarding a characterization of the market for energy efficiency services in the region based on research conducted earlier in 2009. Section 5.0 presents detailed results of two surveys – a residential mail survey and a small and medium commercial business telephone survey. Section 6.0 presents the detailed results of the market potential for energy savings analyses resulting from the modeling of all data collected.

# 2.0 METHODOLOGY



## 2.0 METHODOLOGY

The Market Study performed for the Companies consists of a top-down review of Technical Potential and a bottom-up analysis of Economic and Market Potential. Figure 2.1 summarizes the elements of the Market Study components.

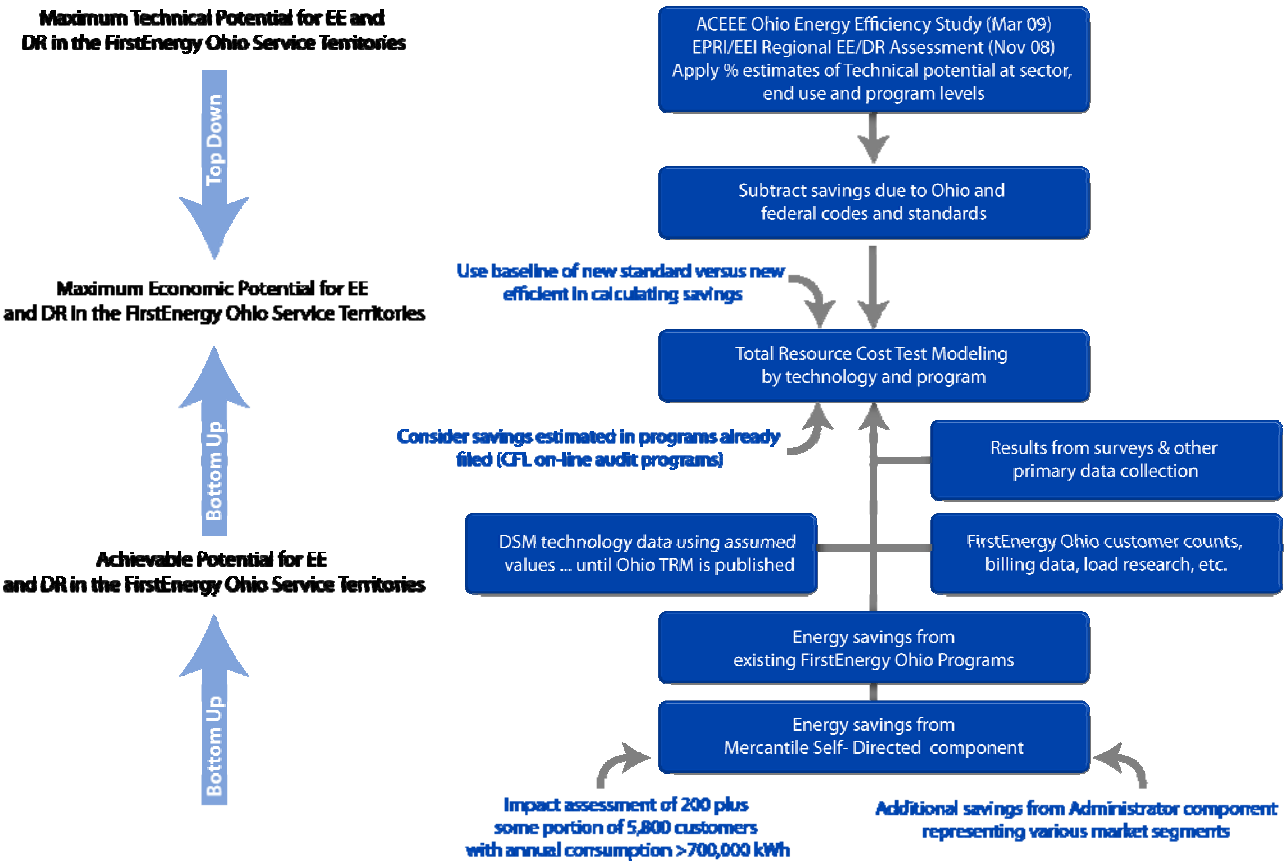



**Figure 2.1 Market Potential Study Diagram**

### *How the Three Levels of Potential are Determined*

The left side of the diagram in Figure 2.1 shows the three levels of energy efficiency potential, moving from largest to smallest, top to bottom. The right side of the diagram shows how the estimates of each of the three potential levels are estimated in this study.

Technical, economic and achievable potentials have already been estimated for the State of Ohio by the American Council for an Energy Efficient Economy (ACEEE) in a recent report entitled "Shaping Ohio's Energy Future: Energy Efficiency Works".. In addition, the Electric Power

# 2.0 METHODOLOGY



Research Institute and the Edison Electric Institute produced a study in November 2008[16] in which they conducted regional assessments of energy efficiency and demand response potential. Finally, a most recent national study conducted by McKinsey and Company (July 2009)[17] was also reviewed for insights regarding market potential. All three studies provide important recent estimates of potential that are used in this study for comparative purposes.

Economic and achievable, or market potential is determined from a bottom-up analysis that considers appropriate cost effective technologies, customer counts by sector, consumption levels by sector, measure lives, incremental costs of energy efficient options over standard equipment, and a range of other detailed assumptions and data. Critical to both of these estimates are the assumed participation rates – how many technologies can be predicted to be adopted each year by customer sector and end use? These figures were developed by the Companies' study team by surveying customers in each of the three FirstEnergy companies to assess the following:

- Current levels of measure adoption
- Likelihood of adoption of measures in the near term
- Interest levels and intentions regarding program participation

Data from residential mail surveys, commercial telephone surveys and large customer account interviews were used to assess likely participation levels for each sector by company. This method takes into account current economic conditions, customer self-reported actions already taken, and expressions of interest and intent.

All data on characteristics, technologies and likely participation or adoption behaviors were combined with actual energy usage data from the Companies for samples of customers by sector – Residential, Commercial, Industrial and Street Lighting.

### *EEDR Technology Data Sources*

The following data sources have been used in developing the key inputs to the analysis on energy efficiency and demand reduction technologies or measures.

- California Deemed Energy Database (DEER)
- Michigan Deemed Savings Database
- ACEEE Market Potential Study for Ohio (weather sensitive measures)
- B&V Energy Efficiency Technologies Database
- Pennsylvania Technical Reference Manual

Cost and savings data were considered from these sources for non-weather sensitive measures; data for weather-sensitive measures were primarily extracted from the ACEEE Market Potential Study, and through the application of regression analysis on heating and cooling degree days to transfer measure data from other sources to Ohio.

[16] EPRI, "Assessment of Achievable Potential from Energy Efficiency and Demand Response Programs in the U.S.", January 2009.
[17] McKinsey Global Energy & Materials, "Unlocking Energy Efficiency in the U.S. Economy", July 2009.

# 2.0 METHODOLOGY



**Customer Usage Data** – The Companies provided energy consumption data by customer sector for survey and analysis purposes to assess baseline usage levels from which energy savings could take place. Forecasts of usage were also provided and used as consistent with what was filed as the baseline forecast in Ohio.

**Customer Characteristics, Behavior and Intentions** – Surveys were conducted of random statistical samples of residential and business customers. Approximately 400 surveys were received from residential customers of each Company and 100 commercial customers responded to phone surveys from each of the Companies (300 total). Fourteen large managed account customers were represented in the Industrial sector analysis and a census of street lights and estimates of traffic and pedestrian signals were combined to characterize the municipal lighting sector

### *Mercantile Savings*

The Companies are in the process of contacting and interviewing 300 largest of their approximately 6,000 Mercantile customers for the purpose of identifying projects conducted between January 1, 2006 and the present. The energy savings identified and validated from these Mercantile customers will be applied to meet benchmark targets. An estimated forecasting of EEPD savings from these customers are included in the Market Study as part of the first three years of savings.

### *Savings from Programs Previously Filed by FirstEnergy*

Two programs were filed by FirstEnergy for early consideration by the PUCO. These are the High Efficiency Light Bulb Program and an On-Line Audit Program.

**The High Efficiency Light Bulb Program** provides for the direct distribution of high efficiency light bulbs to residential customers as well as developing related supporting educational and promotional materials. Energy Star qualified compact fluorescent light bulbs will be offered to residential and small commercial customers through this program. Surveys have indicated that 69% of households are amenable to using high efficiency light bulbs and can use at least four bulbs each. These technologies have been proven to be cost effective in reducing energy usage and peak demand. Residential customers and other utilities have already begun to embrace the energy savings associated with replacing existing light bulbs with such improved technologies. Additionally, manufacturers and marketers have indicated a willingness to be a part of the implementation of this program. The target beneficiaries for this program are the Companies' residential and small commercial customers, including renters and homeowners.

**The Online Home Energy Education Tool** will be offered to customers through the Companies by making Aclara Software™ available for the customers' use on their personal computers. Aclara Software™ helps residential and small business customers better understand and manage their energy usage. It provides customers with information on how their energy bill is impacted by choices on control of appliances (including heat and air conditioning) as well as choices on purchases of new appliances. The tool converts the customers' input of raw data (e.g., their energy usage characteristics) into information that customers can understand and act upon, including such information as the cost of heating and cooling their homes, the reasons their bills may have changed, and whether the customer takes service on the most favorable tariff. The Aclara Software™ has been

successfully deployed by utilities in many states, including Ohio, and surveys conducted in those states show an immediate change in customers' behavior, including their implementing measures such as replacing their air conditioning and space and water heating systems, weatherizing their homes by replacing windows and adding insulation, and installing programmable thermostats.
The energy savings estimated to be produced by these programs as presented in the filed program descriptions that are included in the Technical Potential component of this study.

The existing FirstEnergy Ohio residential programs (i.e. Home Performance with Energy Star and the Programmable Thermostat Direct Load Control Program) are pending in anticipation of their possible redesign. Therefore, savings from residential programs are addressed in the new programs under the label of Comprehensive Residential Programs.

### *Key Parameters Used in this Study*

The study team examined all PUCO documents and Ohio Legislative directives regarding the Market Study and lists below the assumptions used for the key study parameters.

1) **Template for the Filing**. The filing document for the Market Study contains sections consistent with the required elements as shown in 08-888-EL-ORD; Section 4901:1-39-03 Program planning requirements.

2) **Study time period**: The legislated target for the EEPD programs is 22% energy savings by 2025. The Market Study is therefore carried out through 2025. The energy savings resulting from measures installed that extend beyond 2025 are accounted for until the end of each measure's useful life. This represents the full value of the cumulative savings over the useful life of those measures. However, avoided capacity and energy prices are held constant at their 2025 values.

3) **Budget Cap**: There is no budget cap or constraint for the EEPD budgets either annually or in total over the 25 year period. Therefore, the avoided costs provide the only economic throttle on the cost effectiveness of the study.

4) **Renewables** and Customer Renewable energy measures are not part of the Market Study as they are addressed in other proceedings.

5) **List of measures**. The PUCO has requested the Ohio utilities to collaborate on a list of measures to be included in an Ohio Technical Reference Manual. However, the manual is not yet available to be included in this Market Study due September 1, 2009. Therefore, B&V has used its own list of EEPD measures in the analysis. This list is generally consistent with lists previously used by B&V to perform other studies including studies in Pennsylvania.

6) **Program time period**. The EEPD program plan to be submitted before January 1, 2010 is for a three year portfolio of programs. However, the directives do not limit the Market

# 2.0 METHODOLOGY



Study to a three year program portfolio. The Market Potential Study is therefore carried out until 2025.

7) **Economic tests.** The Total Resource Cost test is to be applied to the measures, programs and portfolio of programs in the Market Study as part of the Economic Potential. The Utility Cost test and the Participant tests are also included to provide reference.

8) **Avoided Costs -** Avoided generation costs are derived from the following sources:

a. For avoided energy costs, the study team used wholesale energy prices fromthe Department of Energy, Energy Information Administration's 2009 Annual Energy Outlook (AEO) low oil prices case. (The AEO low oil price case was used to be consistent with previously performed study for FirstEnergy Pennsylvania). The AEO represents a national average energy price, so for a better representation of the energy price that Ohio customers would see, a Cinergy Hub equivalent price was derived by applying a ratio based on three years of historic national average and Cinergy Hub prices.

b. For capacity, the team has used a combination of market prices for MISO in the early years, and Western PJM prices for years 2011 and beyond. As indicated in a press release July 31, 2009, FirstEnergy plans to convert its transmission assets into PJM with the approval of the Federal Energy Regulatory Commission (FERC). For transmission and distribution, the team is including marginal T&D costs by creating a T&D number the Companies based on a PJM cost of transmission capacity used in the Pennsylvania ACT 129 filing of approximately $15 per kW-year and $5 per kW-yr distribution avoid cost.

# 3.0 CUSTOMER CHARACTERIZATION



## 3.0 CUSTOMER CHARACTERIZATION

This section addresses the following elements of the project assignment:

### *Characterization of FirstEnergy Ohio*

This section describes characteristics of the customers of the Companies based upon data from FirstEnergy and from surveys conducted by the study team. The purpose of this analysis is to determine the numbers and types of customers by Company that are available to participate in energy efficiency programs. In addition, some commentary is made regarding the existing market for energy efficiency services in the FirstEnergy services territory as a context within which the Market Study analysis is conducted.

### *Data Sources*

B&V utilized the Companies' data and primary data collected from customer surveys and interviews as the basis for the information in this chapter. B&V received a sample download of the Companies' customer databases for each Company with data on all customers including billed sales and consumption, demand and revenue. B&V has summarized this data for the year 2008. Table 3.1 provides an overview of the Companies' 2008 combined customer and sales information.

**Table 3.1 FirstEnergy 2008 Ohio Combined Customer & Sales Information**

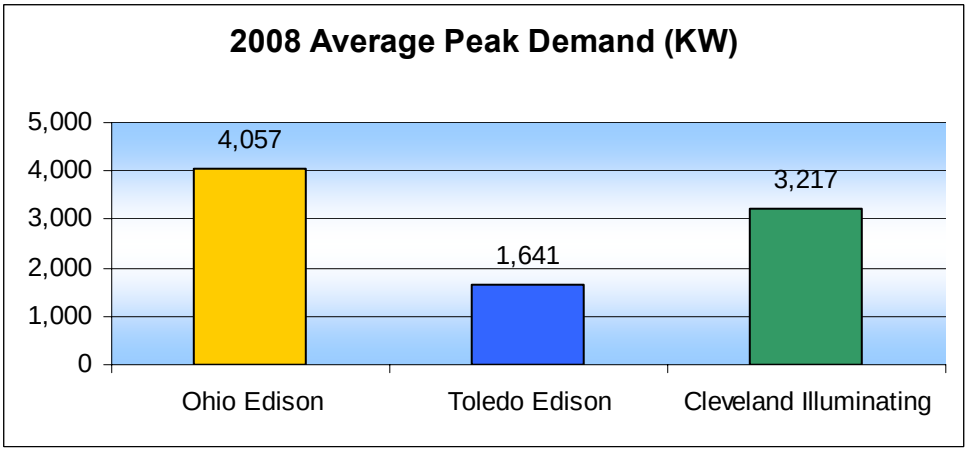
| FirstEnergy Ohio Operating Information | |
|---|---|
| **Total Customers (2008 Average)** | **2,108,966** |
| Residential | 1,867,540 |
| Residential % of Total Customers | 88.6% |
| Residential MWh per Customer | 9 |
| Commercial | 235,219 |
| Commercial % of Total Customers | 11.2% |
| Commercial MWh per Customer | 63 |
| Industrial | 3,376 |
| Industrial % of Total Customers | 0.2% |
| Industrial MWh per Customer | 6,596 |
| Street Lighting | 2,832 |
| Street Lighting % of Total | 0.1% |
| Street Lighting MWh per Customer | 131 |
| **2008 Electric Sales (MWh)** | **54,862,109** |
| *Source: FirstEnergy* | |

The average peak loads for 2008 can be found in Figure 3.1.

# 3.0 CUSTOMER CHARACTERIZATION

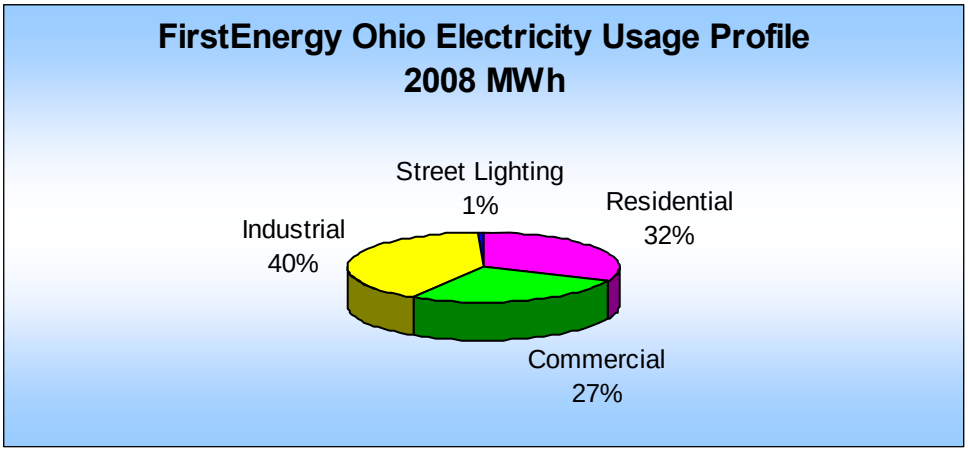


**Figure 3.1 FirstEnergy Ohio Combined 2008 Average Peak Loads**




The percentage contribution of the Companies' major classes can be found in Figure 3.2.

**Figure 3.2 FirstEnergy Ohio Combined 2008 MWh Usage**




For large commercial and industrial customers with kW demands greater than 700kW and managed by the Companies' account managers, B&V has applied a different methodology. The customer account data provided by the Companies allowed B&V to identify these customers and their account managers. B&V recognized that the Companies' account managers have working relationships with each of their accounts that have allowed them to obtain a great deal of energy related information about their customers. Rather than attempt to identify and then contact the appropriate individual(s) at these businesses in an effort to collect data, and potentially interfere with the relationship with their account managers, we chose to work through the Companies' account managers to secure the necessary information. The account managers were able to provide valuable on-point information that we have been able to incorporate into our analyses.

# 3.0 CUSTOMER CHARACTERIZATION



For the Companies' National Account customers, we chose a two-pronged approach. These customers are typically commercial customers in terms of demand and energy consumption, and were eligible for inclusion in B&V's telephone surveys. In addition to the surveys, and since the Companies have National Account representatives that provide a single point of contact for the customer and are very knowledgeable of the customers energy related information, we chose to interview these Company representatives.

## *Customers and MWh Sales*

The following tables and charts identify the number of customers, and sales by operating company.

**Table 3.2 – Ohio Edison Operating Information**

| Ohio Edison Operating Information | |
|---|---|
| **Total Customers (2008 Average)** | **1,040,518** |
| Residential | 924,968 |
| Residential % of Total Customers | 88.9% |
| Residential MWh per Customer | 10 |
| Commercial | 112,701 |
| Commercial % of Total Customers | 10.8% |
| Commercial MWh per Customer | 64 |
| Industrial | 923 |
| Industrial % of Total Customers | 0.1% |
| Industrial MWh per Customer | 9,454 |
| Street Lighting | 1,926 |
| Street Lighting % of Total | 0.2% |
| Street Lighting MWh per Customer | 76 |
| **2008 Electric Sales (MWh)** | **25,278,976** |
| *Source: FirstEnergy* | |

# 3.0 CUSTOMER CHARACTERIZATION



**Figure 3.3 – Ohio Edison Electricity Use (MWh)**

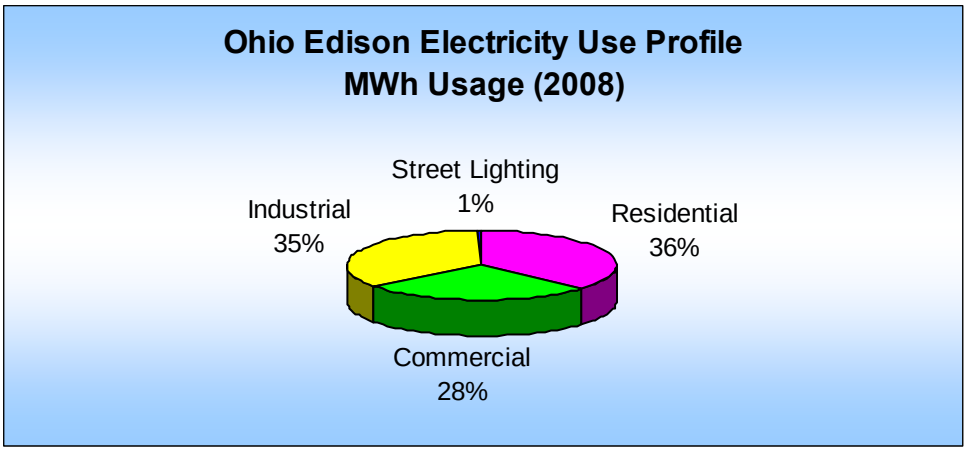



**Table 3.3 – Toledo Edison Operating Information**

| Toledo Edison Operating Information | |
|---|---|
| **Total Customers (2008 Average)** | **312,642** |
| Residential | 274,169 |
| Residential % of Total Customers | 87.7% |
| Residential MWh per Customer | 9 |
| Commercial | 37,649 |
| Commercial % of Total Customers | 12.0% |
| Commercial MWh per Customer | 76 |
| Industrial | 210 |
| Industrial % of Total Customers | 0.1% |
| Industrial MWh per Customer | 23,098 |
| Street Lighting | 614 |
| Street Lighting % of Total | 0.2% |
| Street Lighting MWh per Customer | 93 |
| **2008 Electric Sales (MWh)** | **10,280,800** |

*Source: FirstEnergy*

# 3.0 CUSTOMER CHARACTERIZATION



**Figure 3.4 – Toledo Edison Electricity Use (MWh)**

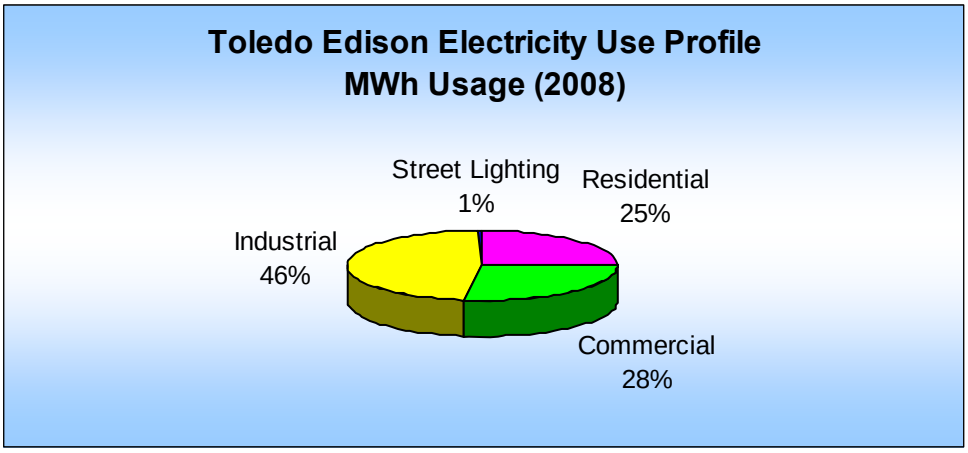



**Table 3.4 – Cleveland Illuminating Operating Information**

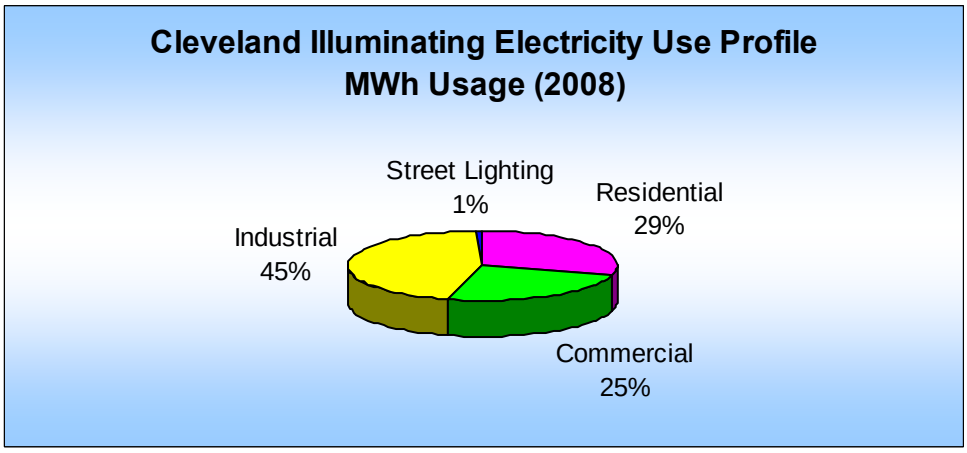
| Cleveland Illuminating Operating Information | |
|---|---|
| **Total Customers (2008 Average)** | **755,807** |
| Residential | 668,403 |
| Residential % of Total Customers | 88.4% |
| Residential MWh per Customer | 8 |
| Commercial | 84,869 |
| Commercial % of Total Customers | 11.2% |
| Commercial MWh per Customer | 57 |
| Industrial | 2,243 |
| Industrial % of Total Customers | 0.3% |
| Industrial MWh per Customer | 3,874 |
| Street Lighting | 292 |
| Street Lighting % of Total | 0.04% |
| Street Lighting MWh per Customer | 573 |
| **2008 Electric Sales (MWh)** | **19,302,333** |

*Source: FirstEnergy*

# 3.0 CUSTOMER CHARACTERIZATION



**Figure 3.5– Cleveland Illuminating Electricity Use (MWh)**

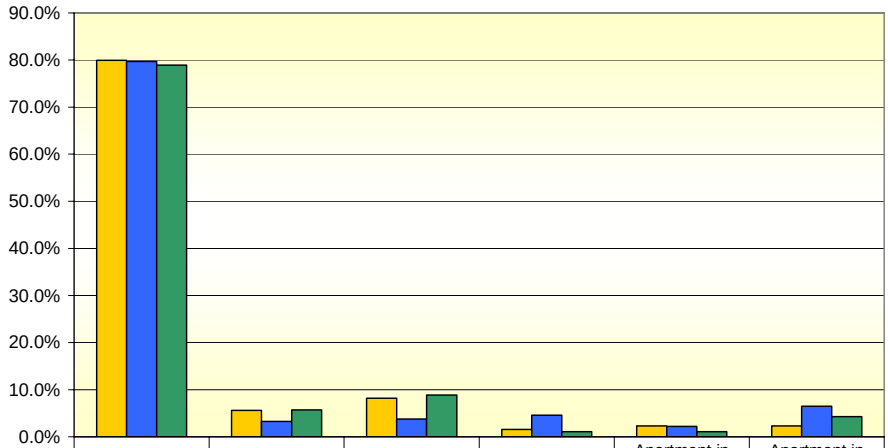



## *Residential Sector Description*

The Residential section of the Market Study begins with a high-level view of residential housing in the Companies' service territories as per the 2009 survey conducted by B&V in August 2009, which included approximately 400 responses from each of the Companies.

According to the survey, on average, 80 % of the homes in the Ohio service territories are single family, with the remaining 20 % distributed among condominiums, mobile homes and apartment buildings (Figure 3.5).

**Figure 3.5 - Type of Housing 2009 Survey Results**



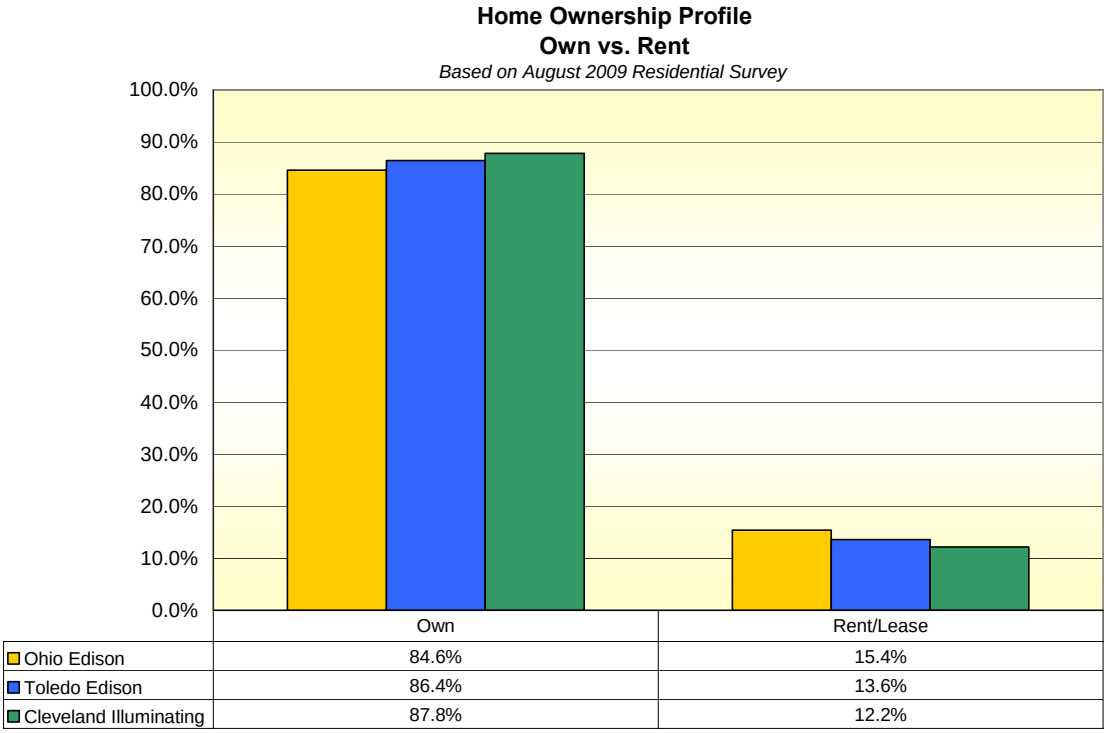

| | Single family home | Duplex or two family home | Condominium | Mobile home | Apartment in building with less than 5 units | Apartment in building with 5 or more units |
|---|---|---|---|---|---|---|
| Ohio Edison | 79.9% | 5.6% | 8.2% | 1.6% | 2.3% | 2.3% |
| Toledo Edison | 79.7% | 3.3% | 3.8% | 4.6% | 2.2% | 6.5% |
| Cleveland Illuminating | 78.9% | 5.7% | 8.9% | 1.1% | 1.1% | 4.3% |

# 3.0 CUSTOMER CHARACTERIZATION



According to the 2009 survey, on average, 86 % of respondents own their home, while the remaining 14 % or so rent a home (Figure 3.6).

**Figure 3.6 Home Ownership 2009 Survey Results**




Natural Gas, according to the 2009 survey results is the primary space heating fuel for these homes, followed by electric heating (Table 3.5).

**Table 3.5 Housing by Heating Fuel 2009 Survey Results**

| Primary Fuel/Energy Used to Heat Residence | | | |
|---|---|---|---|
| | Ohio Edison | Toledo Edison | Cleveland Illuminating |
| **Fuel/Energy** | | | |
| Natural gas | 77.8% | 76.4% | 88.6% |
| Electricity | 14.5% | 12.6% | 10.3% |
| Propane | 3.2% | 10.2% | 1.6% |
| Oil | 3.8% | 0.8% | 0.8% |
| None | 0.2% | 0.0% | 0.3% |

*Note: Totals add to more than 100% due to multiple responses*

# 3.0 CUSTOMER CHARACTERIZATION



The average age of homes (Figure 3.6) in the three service territories are 42, 40 and 45 years respectively for OE, TE and CEI. Given the average age of the homes, there is significant opportunity to improve their overall efficiency.

**Figure 3.6 - Average Home Age 2009 Results**

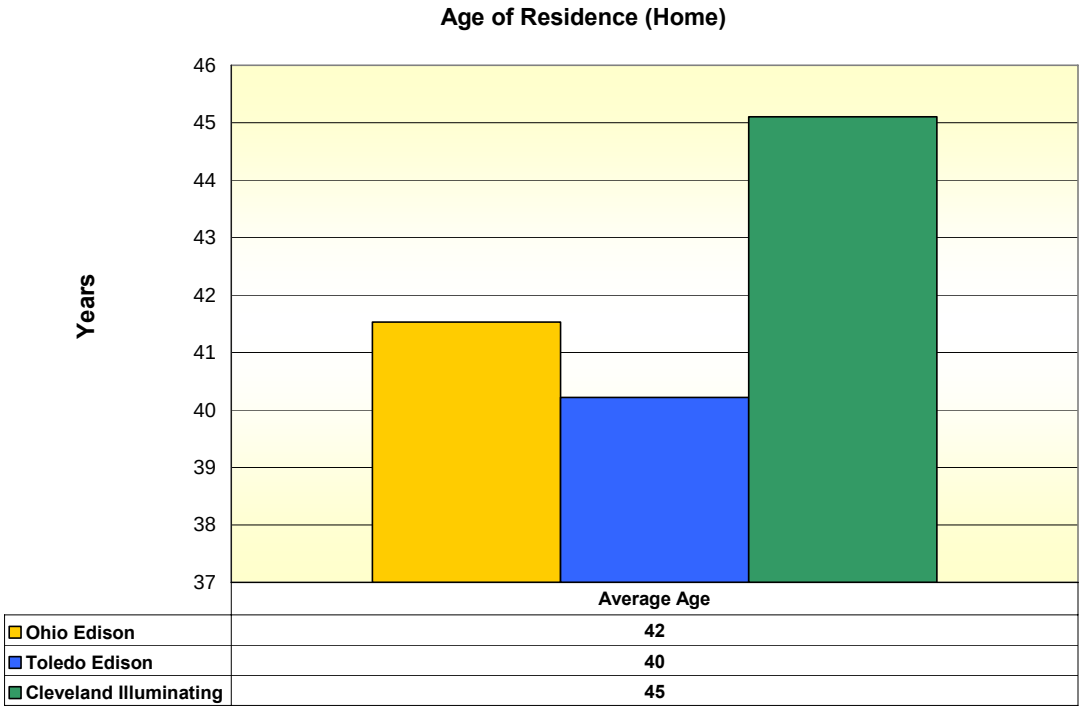



Table 3.6 provides a summary of the residential appliance saturation results for several common household appliance or end-uses.

**Table 3.6 – Appliance and End-Use Rates from 2009 Residential Survey**

| Appliance Saturation 2009 Survey Results | | | |
|---|---|---|---|
| **Appliance Type** | **Ohio Edison** | **Toledo Edison** | **Cleveland Illuminating** |
| Clothes washer (in residence) | 95% | 95% | 94% |
| Dishwasher | 68% | 63% | 70% |
| Dehumidifier | 40% | 36% | 35% |
| Well pump | 27% | 22% | 13% |
| Heated water bed | 3% | 2% | 2% |
| Hot tub/whirlpool tub | 10% | 4% | 6% |
| Heated swimming pool | 2% | 1% | 3% |
| High efficiency air cleaner, whole house | 9% | 7% | 8% |
| Home security system | 13% | 13% | 20% |
| Stereo system / home theater | 40% | 34% | 32% |

# 3.0 CUSTOMER CHARACTERIZATION



| | | | |
|---|---|---|---|
| TiVo / DVR / Hard drive video recorder | 38% | 30% | 37% |
| Large screen (40" or larger) TV – Plasma | 17% | 11% | 16% |
| Large screen (40" or larger) TV – Rear Projector | 11% | 11% | 10% |
| Large screen (40" or larger) TV – LCD | 14% | 14% | 14% |
| Other televisions | 41% | 44% | 47% |
| Satellite dish / Cable TV service | 58% | 55% | 48% |
| Personal computer | 63% | 66% | 59% |

### *Low Income Residential*

Low income households represent an important segment of the residential customer market in that they can experience different barriers to the adoption of efficiency technologies than typical residential customers. While the modeling for the Market Study does not recognize differences in participant characteristics (i.e., a CFL saves the same amount of energy in a low income household as it does in a general residential household), the next phase of the study – program design – will take such information into consideration.

Table 3.7 identifies the Percentage of Income Payment Plan (PIPP) customers by operating company as a proxy for low income. It shows that TE has the largest percentage of low income customers as defined by this metric.

**Table 3.7 – Number of PIPP Customer by Operating Company**

| PIPP (Low-Income) Residential Comparison, 7/2009 | | | |
|---|---|---|---|
| **kWh** | | | |
| | **PIPP** | **Total Res** | **PIPP as % Total** |
| **CEI** | 28,560,542 | 432,770,885 | 6.60% |
| **TE** | 16,144,299 | 203,572,057 | 7.93% |
| **OE** | 50,703,900 | 722,219,395 | 7.02% |
| **№ of Customers** | | | |
| | **PIPP** | **Total Res** | **PIPP as % Total** |
| **CEI** | 47,160 | 666,427 | 7.08% |
| **TE** | 22,156 | 272,301 | 8.14% |
| **OE** | 71,127 | 921,374 | 7.72% |
| **Average kWh / Customer** | | | |
| | **PIPP** | **Total Res** | **PIPP as % Total** |
| **CEI** | 606 | 649 | 93.26% |
| **TE** | 729 | 748 | 97.47% |
| **OE** | 713 | 784 | 90.94% |

# 3.0 CUSTOMER CHARACTERIZATION



### *Commercial and Small Manufacturing Class (<700 kW)*

Table 3.8 shows the types of businesses that responded to the survey by company, in terms of percentages of respondents.

**Table 3.8 – Principal Industry of Survey Respondents**

| Principal Industry of Commercial & Small Manufacturing Class (<700 kW) | | | |
|---|---|---|---|
| | OE % | TE % | CEI % |
| Accommodation and Food Services | 9 | 7 | 7 |
| Administrative and Support and Waste Management and Remediate | 0 | 0 | 2 |
| Agriculture, Forestry, Fishing and Hunting | 0 | 0 | 1 |
| Arts, Entertainment, and Recreation | 5 | 4 | 5 |
| Construction | 5 | 4 | 9 |
| Educational Services | 3 | 2 | 3 |
| Finance and Insurance | 3 | 1 | 1 |
| Health Care and Social Assistance | 5 | 5 | 2 |
| Management of Companies and Enterprises | 12 | 2 | 0 |
| Manufacturing | 1 | 17 | 7 |
| Mining Quarrying and Oil and Gas Extraction | 0 | 0 | 0 |
| Other Services (except Public Administration) | 25 | 21 | 23 |
| Professional, Scientific, and Technical Services | 1 | 2 | 4 |
| Public Administration | 1 | 4 | 4 |
| Real Estate and Rental and Leasing | 6 | 4 | 12 |
| Retail Trade | 20 | 15 | 15 |
| Transportation and Warehousing | 3 | 6 | 0 |
| Utilities | 0 | 0 | 1 |
| Wholesale Trade | 1 | 6 | 4 |
| **Total** | **100** | **100** | **100** |

# 3.0 CUSTOMER CHARACTERIZATION



Table 3.9 shows that the majority of businesses represented in the surveys have fewer than 100 employees, with most having between two and ten.

**Table 3.9 – Number of Employees**

| Number of Employees in Ohio Locations | OE | TE | CEI |
|---|---|---|---|
| 1 | **8** | **8** | **8** |
| 2 - 4 | **32** | **15** | **20** |
| 5 - 9 | **19** | **23** | **28** |
| 10 - 19 | **24** | **25** | **19** |
| 20 - 99 | **14** | **21** | **24** |
| 100 - 499 | **1** | **6** | **1** |
| 500+ | **1** | **2** | **0** |

## *Large Commercial and Industrial Class*

Each of the Companies dedicates a group of individuals to manage accounts that are typically over 700kW of billed peak demand. These individuals are their customers advocate within FirstEnergy and handle a wide range of requests from their customers. Often, they work directly with the customers or arrange for individuals with the necessary technical expertise to assist the customer in troubleshooting and discussing potential EEPD savings. The managed account representatives are viewed by the customer as a trusted source of FirstEnergy's EEPD program information and available rebates. They will be a key element of FirstEnergy's efforts to help the large C&I accounts become more active in investigating and then implementing EEPD measures.

### Cleveland Electric Illuminating - Large Commercial and Industrial Class (Managed Accounts, or over 700kW)

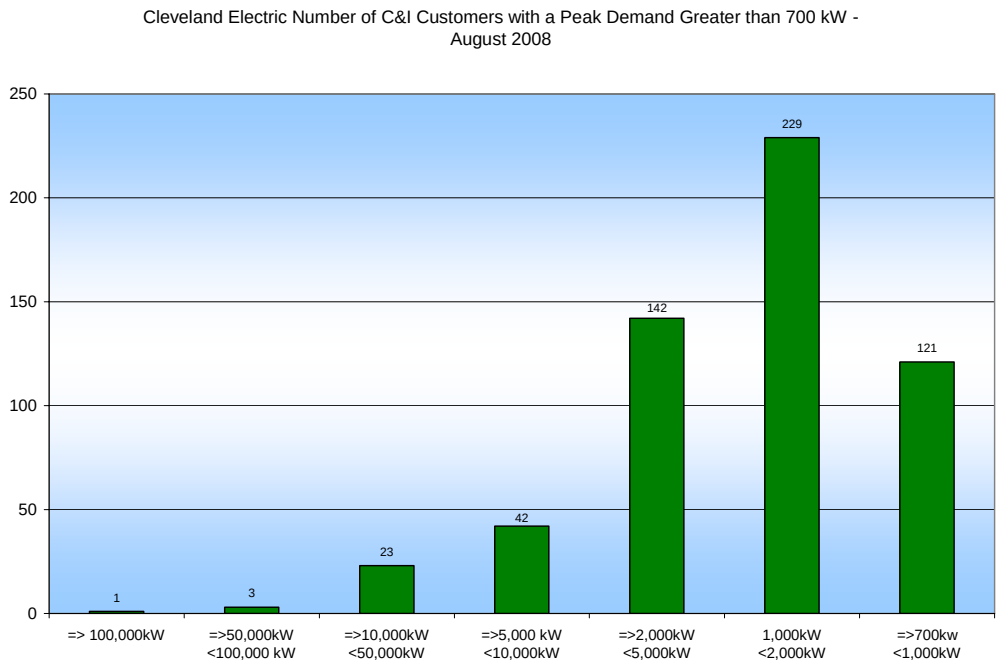
The large commercial and industrial class of customers is characterized by having a billed demand of greater than 700kW (August 2008). There are approximately 560 customer accounts in this class.

Figure 3.7 illustrates the number of large commercial and industrial customers in groupings of kW demand. Of the customers with more than 700kW of demand, 62% have a demand of between 700kW and 2,000kW.

# 3.0 CUSTOMER CHARACTERIZATION

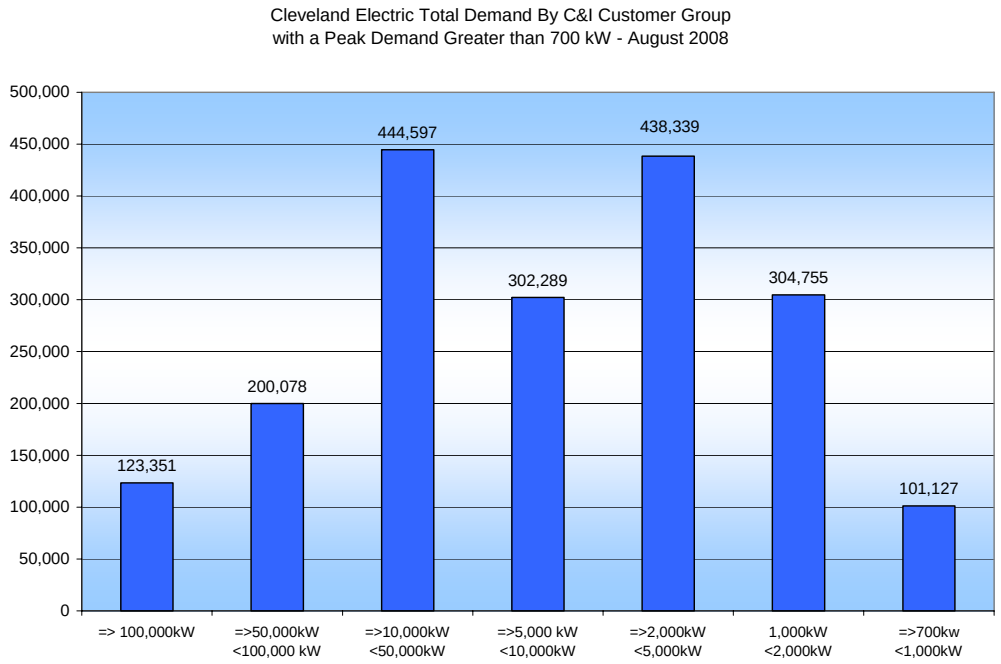


**Figure 3.7 – CEI Large C&I Customers by Peak Demand (>700kW)**




The total demand for each of the demand groupings for August 2008 is illustrated in Figure 3.8. The sum of the total demand (kW) for these customers is 1,591,000kW. The bulk of the demand (62%) is in demand groupings of between 5,000kW and 50,000kW.

**Figure 3.8 - CEI Demand kW by Peak Demand (>700kW)**

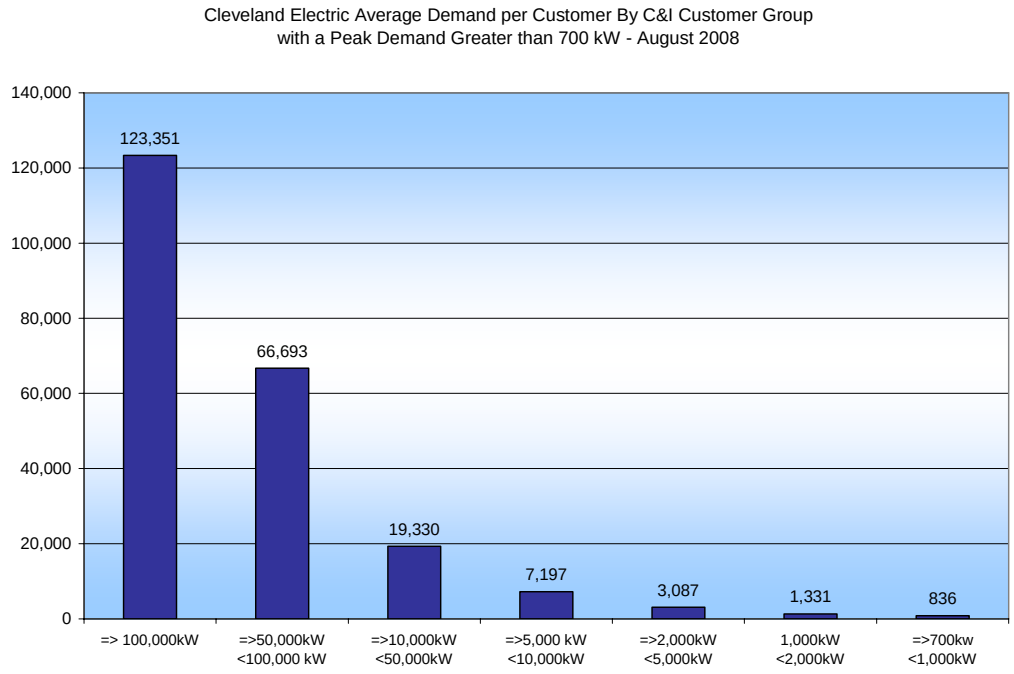


# 3.0 CUSTOMER CHARACTERIZATION



The average usage per customer for each of the demand groupings is illustrated in Figure 3.9. While the weighted average demand for these customers is 3,400kW, one can see that there is a large variance among the demand groupings in the actual average demand for each group. This is due to a relatively small number of very large customers relative to the total number of customers greater than 700kW. Specifically 5% (27) of the customers represent 40% of the total demand of customers with greater than 700kW in demand.

**Figure 3.9 – CEI Average Demand kW per Customer (>700kW)**



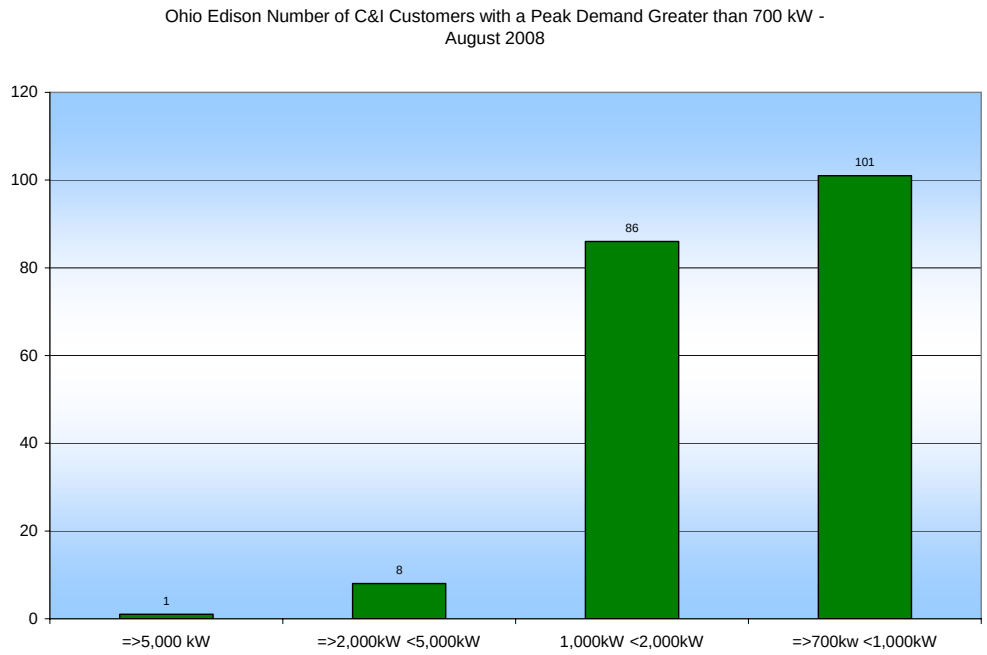

**Ohio Edison - Large Commercial and Industrial Class (Managed Accounts, or over 700kW)**
The large commercial and industrial class of customers is characterized by having a demand of greater than 700kW (August 2008). There are approximately 200 customer accounts in this class.

Figure 3.10 illustrates the number of large commercial & industrial customers in groupings of kW demand. Of the customers with more than 700kW of demand, 95% have a demand of between 700kW and 2,000kW.

# 3.0 CUSTOMER CHARACTERIZATION

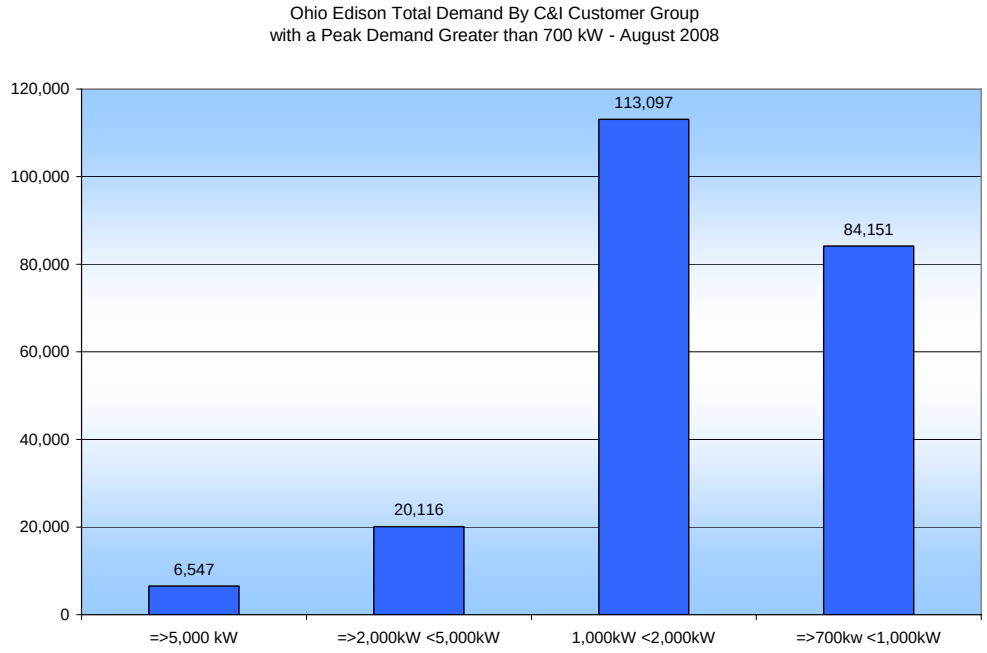


**Figure 3.10 - OE Number of Large C&I Customers by Peak Demand (>700kW)**




The total demand for each of the demand groupings for August 2008 is illustrated in Figure 3.11. The sum of the total demand (kW) for these customers is 223,900kW. The bulk of the demand (88%) is in demand groupings of between 700kW and 2,000kW.

**Figure 3.11 – OE Demand kW by Peak Demand (>700kW)**

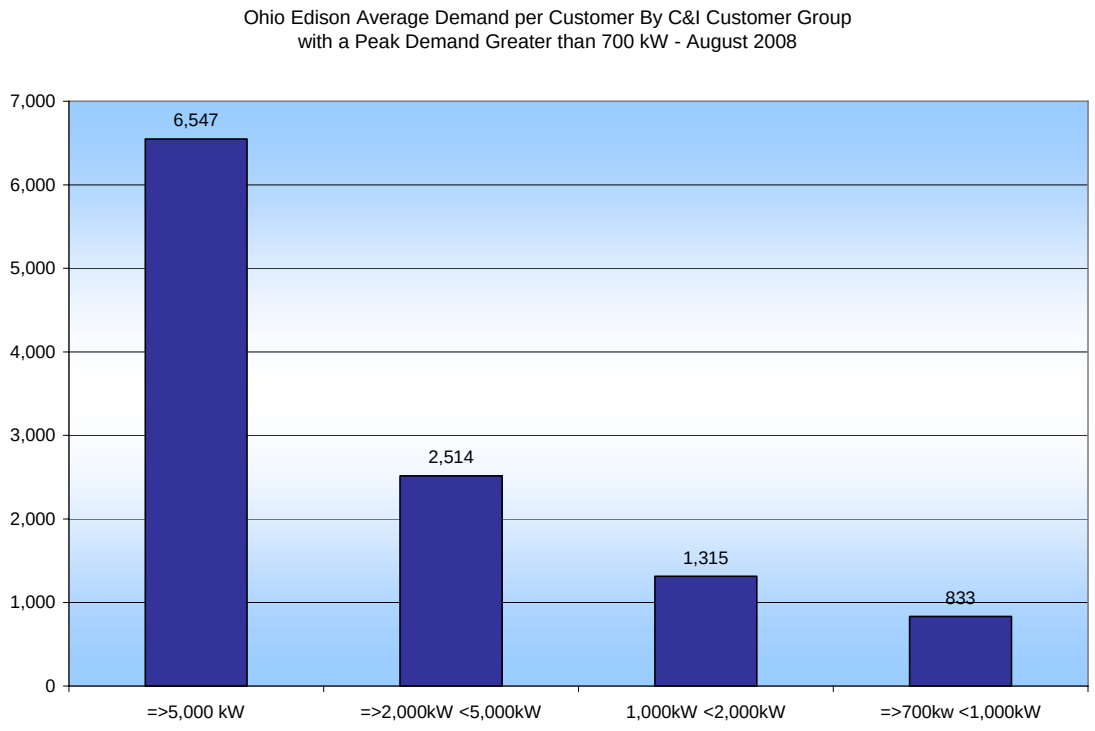


# 3.0 CUSTOMER CHARACTERIZATION



The average usage per customer for each of the demand groupings is illustrated in Figure 3.12. While the weighted average demand for these customers is 1,100kW, one can see that there is a large variance among the demand groupings in the actual average demand for each group. This is due to the two largest large groupings with 5% of the customers represent 10% of the total demand of customers with greater than 700kW in demand.

**Figure 3.12 - OE Average Demand kW per Customer by Demand (>700kW)**




**Toledo Edison - Large Commercial and Industrial Class (Managed Accounts, or over 700kW)**

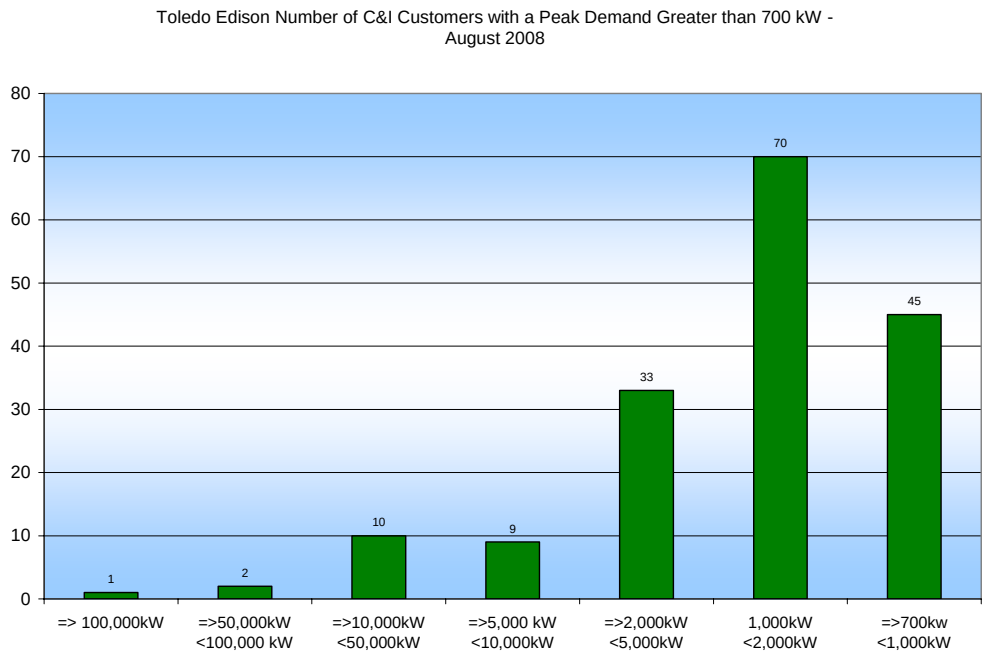
The large commercial and industrial class of customers is characterized by having a demand of greater than 700kW (August 2008). There are approximately 170 customer accounts in this class.

Figure 3.13 illustrates the number of large commercial & industrial customers in groupings of kW demand. Of the customers with more than 700kW of demand, 68% have a demand of between 700kW and 2,000kW.

# 3.0 CUSTOMER CHARACTERIZATION

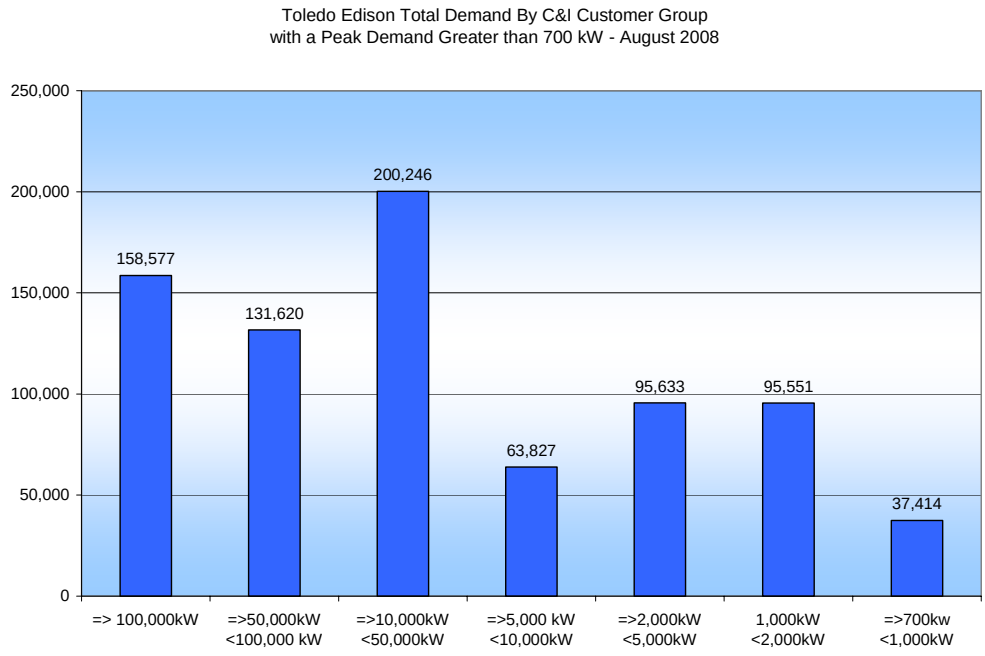


**Figure 3.13 – TE Number of Large C&I Customers by Peak Demand (>700kW)**




The total demand for each of the demand groupings for August 2008 is illustrated in Figure 3.14. The sum of the total demand (kW) for these customers is 782,900kW. The bulk of the demand (63%) is in demand groupings of between 10,000kW and greater than 100,000kW.

**Figure 3.14 – TE Demand kW by Peak Demand (>700kW)**

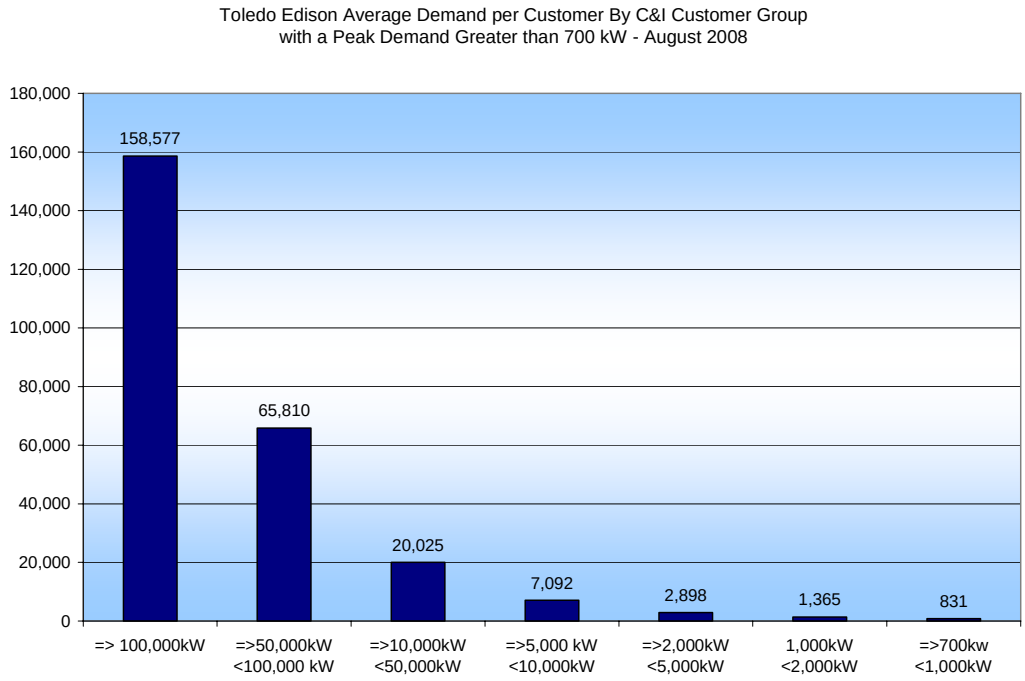


# 3.0 CUSTOMER CHARACTERIZATION



The average usage per customer for each of the demand groupings is illustrated in Figure 3.15. While the weighted average demand for these customers is 4,600kW, one can see that there is a large variance among the demand groupings in the actual average demand for each group. This is due to a relatively small number of very large customers relative to total number of customers greater than 700kW. Specifically 8% (13) of the customers represent 63% of the total demand of customers with greater than 700kW in demand.

**Figure 3.15 – TE Average Demand kW per Customer (>700kW)**




While each of the customers in the over 700kW segment are unique in the products they manufacture or the services that they provide to other businesses or end-use customers, there are a number of common characteristics among them regarding their approach and behavior toward energy efficiency investment decision making.

The top business categories in terms of peak demand are metals fabrication, including automobile manufacturing, primary metals, chemical manufacturing, medical centers, food processing and other manufacturing.

Given the very significant levels of energy usage in these industries, such customers may be very receptive to EEPD initiatives, particularly when factoring in the potential cost savings to the individual companies. However, these companies will often seek relatively short simple payback durations of one to three years. The current economic environment has some companies looking for even shorter pay backs since the capital dollars are competing with other company initiatives to grow or maintain their competitive positions and customers.

The major business categories representing these large C&I customers are listed in Table 3.10.

# 3.0 CUSTOMER CHARACTERIZATION



**Table 3.10 Customer Business Categories**

| Customer Business Categories |
|---|
| Chemical & Allied Prod |
| Education |
| Electronic Mfg |
| Entertainment |
| Food and Kindred Products |
| Health |
| Mining & Oil Gas Extract |
| Paper Mills & Products |
| Primary Metals & Hvy Mfg |
| Refining & Plastics |
| Transport Mfg |

Often these companies do not have a dedicated energy manager, and while cost savings associated with EEPD implemented measures could be significant, we expect that they would be interested in the programs that the Companies would develop related to their industry. This is especially likely given that the Companies account representatives have assisted with such measures in the past, and some initiatives, such as lighting modifications and motor upgrades, could be relatively easy to implement.

Based on our experience, the most common findings among these business categories regarding energy efficiency are:

1. There exists the opportunity for improvements in energy efficiency,
2. There is a need to be better informed about their current energy demand, usage and utility costs through the availability of timely and useable data.
3. There is a need to be better informed as to what their potential energy savings could be if EEPD were implemented.
4. There is a need for financial incentives to help overcome the incremental costs of purchasing higher efficiency equipment than would otherwise be procured and to improve the financial payback on these investments.
5. There is a need that for any proposed EEPD programs to have processes and participation requirements that are simple enough to not frustrate or create a disincentive to those wishing to participate in the program.
6. All of the large commercial and industrial customers are already on time-of-use rates.
7. Utility account managers will be a primary vehicle for introducing new energy efficiency programs to this group of customers.

# 3.0 CUSTOMER CHARACTERIZATION



Appendix B presents a table with additional insight into each of the business categories with regard to the following: 1) the energy efficiency behavior characteristics of each group, 2) the potential opportunities for improvements in energy efficiency, 3) the barriers to investing in energy efficiency improvements and 4) operations.

### *National Accounts*

FirstEnergy's national accounts are managed across the FirstEnergy Companies by a group of national account managers that work across individual utility boundaries. These individuals are the primary, as well as trusted, source of FirstEnergy's EEPD program information for the national accounts.

There are approximately 250 customers that are designated as FirstEnergy national account customers and each is managed by a FirstEnergy national account representative. The commonality among national accounts is that they are businesses that have a national presence and operate under the guidance of a corporate headquarters. National account businesses within FirstEnergy service territory are either owned and operated by corporate headquarters or owned and operated by a franchisee. FirstEnergy national account representatives focus their efforts on EEPD related staff and decision makers at the national account's corporate headquarters.

In cases where the local customer site is owned and operated by corporate headquarters, all energy efficiency related decisions are made for and funded by headquarters. Typically the focus of energy efficiency investments in local sites by corporate headquarters will be targeted on a priority basis to those locations where energy costs are higher and where the utility or State offers energy efficiency improvement programs and financial incentives.

In cases where the local customer site is owned by a franchisee, the corporate headquarters will typically offer the local owner the same energy efficiency information as it does to its corporate sites, however, all decisions and investments will be funded and made by the local owner. It is our opinion that these customers may react favorably to new energy efficiency programs and incentives and will seek to implement energy efficiency measures that will improve their energy efficiency.

As with most C&I accounts, whether they are a location owned by corporate or a franchisee, decisions to invest the capital and time in pursuing and implementing energy efficiency measures will be based on economics - specifically, first costs and reasonable paybacks. In addition, as with other small commercial customers, this group of customers requires that the energy efficiency improvement process be simple enough for business owners to understand and act on while running their businesses. These processes include:

- getting informed about what can be done to improve their energy efficiency
- understanding their energy usage and illustrating their potential savings
- how to get into the utility programs
- how to get improvements implemented and;
- how to obtain their rebates.

# 3.0 CUSTOMER CHARACTERIZATION



FirstEnergy's managed account representatives explain that there are three tiers or levels of awareness and EEPD implementation activity among the national accounts.

The first tier consists of those companies that are the most involved in making their properties as energy efficient as possible. They are believers that EEPD measures will help their bottom line in the long run. These accounts typically have a dedicated energy manager, have budgeted funds for EEPD related capital improvements, perform energy audits and will include the impact on improving the environment in their EEPD decision making process. While they may have already upgraded lighting and HVAC applications, there are still opportunities to upgrade motors and install energy optimizer support tools. These accounts have often chosen to implement EEPD measures even when no utility supported rebate programs were available. The offer of supporting rebates is believed to be a key tool in capturing additional EE savings among these customers. These accounts include combination gas station and convenience stores, high-end grocery stores, large department and box stores.

The second tier national account customers are beginning to further investigate what EEPD measures can do for them. While they may have corporate management backing, they typically don't have the capital funding for EEPD projects. They need to be convinced that each project will provide a quick payback and it needs to be shown in a strong business case. These customers may have implemented some lighting upgrades. Customers in this category include the full range of national account business categories. Opportunities exist for EE savings in motors, HVAC, compressors and energy monitoring applications.

The third tier national account customers are typically not actively pursuing the investigation of the benefits of EEPD measures. Similar to the second tier, customers in this category include the full range of national account business categories. Often these companies may not have funds available to invest in EEPD measures and are focused on the continuation of their businesses. These customers will be a difficult group of customers to convince to invest in EEPD measures. FirstEnergy's program rebates will be an important tool to move some of these companies to consider investing in EE measures. Opportunities exist for EEPD savings in interior and exterior lighting, motors, HVAC, compressors and energy monitoring applications.

### *Regional Governmental Accounts*

Each of the Companies' dedicates a group of area managers to be the primary point of contact for officials representing Counties, Cities, Townships, Boroughs and towns in the service territories for the three utilities. These individuals are also a trusted source of the Companies' EEPD program information for their customers.

There are literally hundreds of governmental entities when you consider the number of Counties, Cities, Townships, Boroughs and towns within the service territories of the Companies and typically they do not have a dedicated individual whose job it is to manage energy efficiency related issues. Rather, EEPD issues are generally the responsibility of a public work director or similar position. Townships, Boroughs and towns often have only a few full time employees and EEPD issues or

# 3.0 CUSTOMER CHARACTERIZATION



initiatives are typically handled by a town supervisor or town manager along with all of the other demands of managing a small government, such as struggling to cover their current costs without raising taxes or reducing the services they provide to their citizens.

Townships, Boroughs and towns may lack the resources (knowledge, staff, and funding) to fully investigate EEPD opportunities. Some have worked with consultants who specialize in EEPD services and may offer a shared savings program. Typically, governmental entities seek to fund EEPD programs through grants. Rebates are less attractive since with rebates, the local government still needs to raise money to make the improvements. Once EEPD opportunities are identified and planned for, the EEPD program needs to then be included in the appropriate government future capital budget cycle.

Townships, Boroughs and towns may differ in their levels of interest and activities regarding EEPD. While some are investigating and pursuing new technologies to reduce energy costs, others may simply not have focused much effort on EEPD initiatives to date.

We believe that typically street lighting represents the biggest element on the local Townships, Boroughs, and Counties' utility electric bill. An exception to this is if the government also operates a water/wastewater treatment facility. Typically the amount of electrical energy utilized in local government buildings is small compared to street lighting and treatment plants. Counties and Cities will have many more governmental buildings and treatment plants, etc. than Townships, Boroughs and towns. At treatment plants and other large governmental facilities, significant EEPD opportunities may exist, but it may also require an EEPD audit to bring them to light.

# 4.0 MARKET CHARACTERIZATION



## 4.0 MARKET CHARACTERIZATION

### *Characterization of the Market for Energy Efficiency*

In addition to understanding the customer base for EEPD initiatives, one must understand the opportunities customers have to obtain energy efficienct products and services. Therefore, an important aspect of determining the potential for energy efficiency in a region is to understand the market for energy efficient products and services as it currently exists. To do this, B&V conducted research of major appliance and lighting retailers in FirstEnergy regional service posing as residential consumers. B&V also conducted Internet research of on-line store sites, and reviewed periodicals and print sources of current energy efficiency messaging to consumers. This included searches and summarization of existing local and national energy efficiency programs, energy audit programs, and other associate resources that a consumer in the specified area may access when looking to conserve energy.

While the Companies' customers have had access to some limited energy efficiency programs to date, the potential market for energy efficient technologies in the Companies territories remains considerable, based on the following conclusions:

1. Customers of the Companies enjoy relatively low electricity prices compared to other areas of the U.S. This tends to dampen interest to more EEPD technology options. This may change when market prices take effect in 2011, and could have the effect of accelerating EEPD technology adoption rates.
2. Barriers to information exist regarding EEPD options at the point of purchase as limited educational materials concerning energy efficiency was in evidence.
3. Customers in the Companies have had access to home energy audits and selected other services through the Home Performance program. However, participation levels were low. These programs have been suspended pending the design of the EEPD plan.
4. Ohio is experiencing relatively high unemployment rates (11%) which are affecting residential as well as business customers and may limit their ability to invest in new equipment prior to end of life.

While these conditions are important to consider, they have more bearing on the design of programs rather than the assessment of potential.

### *Summary of Findings*

The research discussed in this section was conducted in FirstEnergy's Pennsylvania service territory, but is considered representative of current market conditions in the region. The research suggests that consumers in the region have limited access to EEPD information and high-efficiency appliances. For example, while big box stores carry Energy Star appliances, their higher first cost often limits consumer acceptance. Higher levels of acceptance can be expected from the relatively lower cost energy efficient options (e.g., CFL's). Secondly, federal EEPD campaigns such as Energy Star that are available in the area tend to have a national scope, and are not targeted to the Companies' consumers.

# 4.0 MARKET CHARACTERIZATION



Further, in-store customer service representatives are not currently positioned as a ready source of the best and most up-to-date information on energy efficient technology options. Some were unable to relay any information related to energy efficiency programs. At best, they could refer only to Energy Star appliances and sales within their own stores. In addition, none of the stores we spoke with were familiar with such services as energy audits. In fact, many were unaware that such audits existed and did not display much enthusiasm for the concept. Many that we spoke with in the course of our research were unfamiliar with the concept of an energy audit, often needing to put the conversation on hold, ask a peer for clarification, or ask the interviewer to elaborate.

### *Product Availability in Stores*

**Findings Summary:**

- Energy Star seems to have a comprehensive partnership program. Most of the big box stores were offering 10 % off on Energy Star goods. Many of these stores also had Energy Star sections posted on their web sites.
- There were no local energy auditors or EEPD programs currently being marketed (beyond those through Energy Star). This seems like it could be a good opportunity.
- Perhaps not surprisingly, there was a broad range in helpfulness across customer service representatives and the information they were able to share.

The following chart (Figure 4.1) illustrates the 2007 U.S. Department of Energy's estimate of Energy Star appliance market share for Ohio based on sales data received from Energy Star national retail partners[18]. The chart depicts sales of Air Conditioners (AC), Clothes Washers (CW), Dishwashers (DW) and Refrigerator/Freezers (RF).

[18] http://www.Energy Star.gov/index.cfm?c=manuf_res.pt_appliances#asd

# 4.0 MARKET CHARACTERIZATION



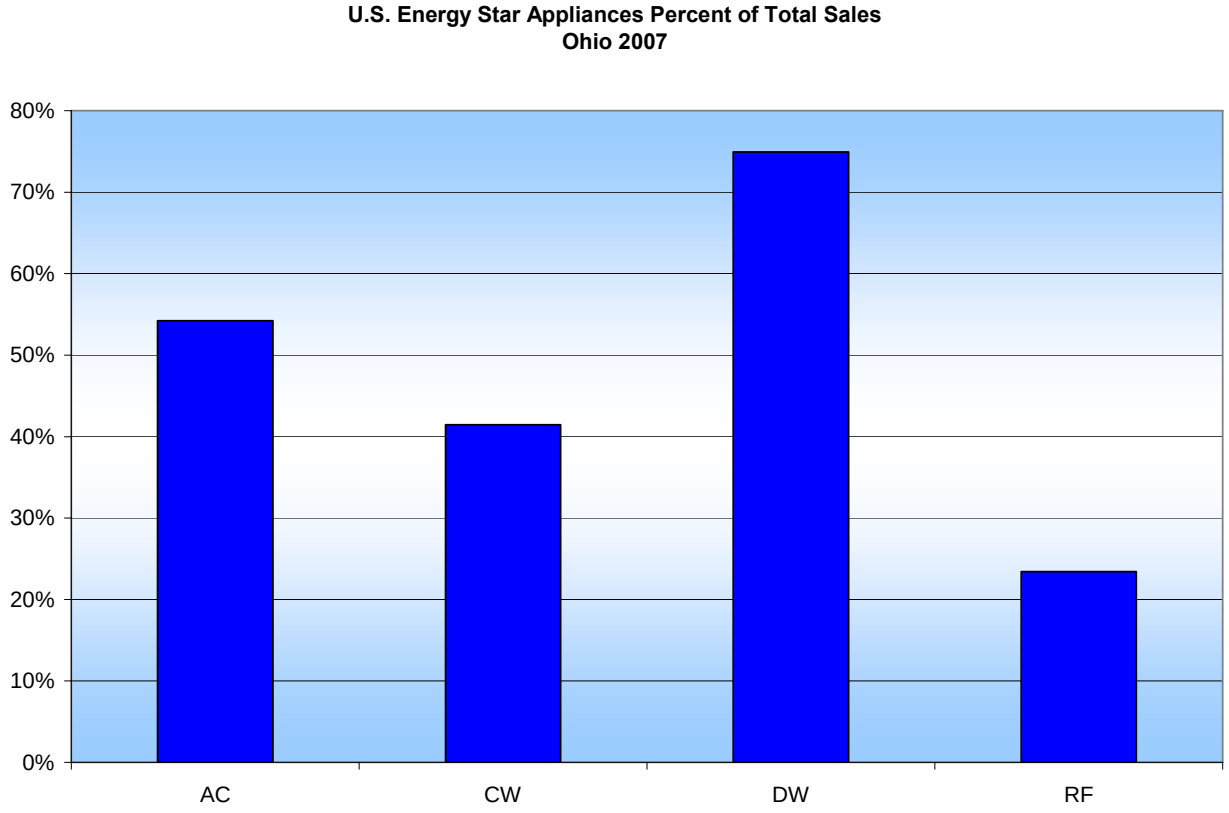



**Figure 4.1 Ohio Energy Star Ohio 2007 Sales as Percentage of Total**

While this U.S. DOE data illustrates that Ohio consumers are already purchasing Energy Star appliances to a varying degree, there is still significant room for many more Ohio consumers to enjoy the benefits of these higher efficiency appliances. It should be noted that these data are for the overall state and are not available specific to the Companies' territory. It is likely that a high percentage of these sales are in Columbus and other areas outside the company's territory.

Taken together, these factors collectively imply that well-designed energy efficiency programs could capture large blocks of economically achievable EEPD savings over the next few years.

### *Availability of EEPD Measures and Services*

FirstEnergy's Ohio customers have had access to home energy audit services through Home Performance with Energy Star. However, the program did not achieve significant activity levels, suggesting the need for reconsideration of the program design. There are no major statewide programs such as those offered to households and businesses in Wisconsin or New York State, and Ohio does not offer a loan program such as the Keystone Loan Program to help finance energy efficiency improvements.

# 4.0 MARKET CHARACTERIZATION



**Lighting**

Since lighting is such a major end use among both residential and commercial customers, it is worth additional consideration. U.S. Department of Energy's "CFL Market Profile | March 2009"[19] reports that "the market for CFL's has grown tremendously, with dramatic increases in shipments[20] and market share in the past three years. CFL availability, varieties, and quality have continued to improve, while prices have continued to fall. With the new ENERGY STAR Criteria V4.0 that took effect December 2, 2008, and upcoming standards on lamp efficiency from the Energy Independence and Security Act of 2007 (EISA 2007), CFL's appear poised to capture even more of the lighting market."

"Despite recent market growth, CFL household saturation is still low throughout the United States, even in regions with successful and long-standing energy efficiency programs. While the commercial and industrial sectors were early adopters of CFL's, vast potential remains in the residential sector. It contains 90 percent of CFL-appropriate sockets, but has only 11 percent CFL saturation. Thirty percent of households still own no CFL's, and 64 percent of households that own CFL's have five or fewer. Overall, there is still plenty of room for the CFL market to grow."

"CFL's remain by far the quickest, cheapest, and easiest technology that utilities can use to improve energy efficiency and generate energy savings. Compared to other energy saving products, CFL's are inexpensive, and offer competitive energy savings and shorter payback periods, making them an easy way to achieve energy savings. Decreasing sales prices and increasing electricity rates have made CFL's more than eight times more cost effective than in 1990."

"CFL shipments have grown tremendously in three years, from 21 million lamps in 2000 to 397 million lamps in 2007. This increase represents a compound annual growth rate of 52 percent. CFL's have captured an increasing share of the market for medium screw-based lamps, growing from 1 percent to 23 percent between 2000 and 2007, or about 3 percentage points a year. Despite increased interest in and demand for energy savings, current data indicates that CFL shipments fell in 2008, suggesting that additional support may be needed to help sustain the market."

"The future market for incandescent lamps is also uncertain. Because each CFL effectively replaces at least five incandescent lamps over its lifetime, incandescent lamp sales have already begun to decline substantially and will continue to fall. In addition, EISA will increase efficiency standards for all lamps over the next six years. While incandescent lamps may improve in efficiency during this time, current ENERGY STAR qualified CFL's already meet the new energy efficiency standards, and the market will likely continue to shift to CFL's."

The following chart (Figure 4.2) illustrates the increase in CFL market share and decrease in incandescent light bulb market share to 2007 and the DOE's projection through 2010.

[19] http://www.Energy Star.gov/ia/products/downloads/CFL_Market_Profile.pdf

[20] This market profile is focused on the general market for medium screw-based CFL's, which DOE considers to provide a reasonable assessment of the market for ENERGY STAR qualified CFL's. The market for pin-based CFL's is not covered because comprehensive data for these types of CFL's are not readily available.

# 4.0 MARKET CHARACTERIZATION



**Figure 4.2 CFL and Incandescent Shipments**

## *Prices of EEPD Measures*

The appliance prices listed in this report are based on both Internet and telephone research. It is important to note that discounts associated with in-store credit card use, on-line sales, and temporary price reductions, were not factored into these totals. As a result, customers in the area might be able to get a different price than the ones listed. However, it made sense to use the directly quoted price as a baseline measurement in terms of both accuracy and a relative average.

Also worth noting is that not every location is home to the same stores. This research was conducted in FirstEnergy's Pennsylvania service territories, with the assumption that demographics and markets are similar in Ohio.

# 4.0 MARKET CHARACTERIZATION



## *Product Availability in Stores*

The following is a summary of Energy Star product availability in stores:

- Energy Star seems to have a comprehensive partnership program. Many of the "big box" stores were offering promotions on Energy Star goods. Many of these stores also have Energy Star sections posted on their web sites.
- Perhaps not surprisingly, there was a broad range in helpfulness across customer service representatives and the information they were able to share. This was particularly true with HVAC contractors, many of whom were reluctant to offer price information without a face-to- face meeting. Slightly more information was provided when a "research for academic project" situation was mentioned.
- The majority of the companies consulted did not have many options for energy efficient appliances in stock at their locations. Most offered to order and deliver Energy Star appliances within two weeks. These stores insisted upon store visits to explore the selection. Air conditioners were a notable exception to this, perhaps because of their seasonality.

**Prices of EEPD Measures**
The appliance prices listed in this report are based on telephone research. It is important to note that discounts associated with in-store credit card use, on-line sales, and temporary price reductions, were not factored into these totals. As a result, customers in the areas of interest might be able to get a different price than the ones listed. However, it made sense to use the directly quoted price as a baseline measurement in terms of both accuracy and a relative average.

Also worth noting is that not every location is home to the same stores. Where possible, our research relied on the store listed nearest the four researched towns, as these areas are where FirstEnergy consumers would look for appliances. The specific details and contact information regarding stores researched are listed in the Appendices of this Report.

**Energy Star Air Conditioners**
Several local Pennsylvania HVAC contractors and some retailers were consulted for cooling/heating options for both a 150 square foot room and a 1,000 square foot residential property. Most HVAC contractors were reluctant to offer price estimates without inspecting the actual place where the work was going to be done. Only three HVAC contractors offered price ranges for the proposed hypothetical spaces.

For the 1,000 square foot residential space, two contractors offered a central system consisting of combination of a 95 % efficient furnace and SEER 16 AC central unit. The third HVAC contractor offered a different solution: a TRANE central heat pump system.

It should be noted that the price and width of the range can vary considerably depending on the information request approach. When no purchase intention was shown, the estimate obtained ($3,500 to $3,600) was half the bottom of the range obtained when an actual sale situation was simulated ($6,000 or $7,000 depending on the solution offered).

# 4.0 MARKET CHARACTERIZATION



Information was volunteered on a tax credit that can be claimed for installation of this equipment since it meets the Advanced Energy Star requirement. A refund of up to $2,000 from the federal government could be claimed on the next tax period due to this requirement. [21] Delivery and installation costs are included in the price estimates shown in the previous figure.

For the 150 square foot Room Solution: The three HVAC contractors mentioned before offered a mini split heat pump system as the best solution for a residential room with these dimensions. Prices ranged from $1,500 to $3,000, including installation charges.

Some local retailers (Lowe's and Sears) were also consulted for single room air conditioning window units. Prices excluding installation fees ranged from $130 to $200 across the stores consulted.

**Energy Star Refrigerators**

In conversation with a Lowe's customer service representative, it was discovered that refrigerator manufacturers will often sell the same refrigerator under a different manufacturer. This makes it difficult for consumers to make direct comparisons of similar products across retailers. Manufacturers do this in order to avoid price wars, where stores are forced to compete on the lowest price.

As such, it was not easy to discern one baseline refrigerator to compare across towns and retailers, and our research instead compared different refrigerators with similar features. All refrigerators compared were Energy Star 25.0 cubic foot side-by-side refrigerator, with a through the door ice and water feature.

Very few of the stores contacted had full size refrigerators in stock. Phrases like "We will have to order that" or "too large to keep in stock" were not uncommon. Because of this, the interviewer accepted prices for the unit even when not in stock. During the call the interviewer requested a GE 25 Cubic Foot Side-by-Side Refrigerator in White with ice and water door dispenser. The unit could not be ordered, so the interviewer accepted Energy Star replacements that offered the same capacity. The most expensive of these offerings was found at Best Buy, which charged $1,299.00 (in stock). On the opposite end of the spectrum was the Home Depot alternative refrigerator at $998.00 (in stock). The average price of this refrigerator was $1,095.00.

**Energy Star Dishwashers**

Very few stores surveyed actually had a stock of dishwashers in the area. Phrases like "very few dishwashers in stock" or "too large to keep in stock" were not uncommon. The price information was collected for any equivalent dishwasher readably available, or for the unit conditioned to delivery. The target unit was a 24 inch white GE Energy Star tall tub with built-in dishwasher. The most economical equivalent unit was found at Home Depot for $219.00 (in stock: Americana), while the most expensive comparable dishwasher retails for $515.00 at Sears (alternative: GE). The average cost of the dishwasher across retailers is $427.19. It should be noted that delivery and installation fees could very well account for 20 % or 40 % of the cost of the unit. Also, a customer

[21] This information is unclear because the current (2009) federal tax credit is limited to $1500 for qualifying energy efficiency upgrades from standard older units.

# 4.0 MARKET CHARACTERIZATION



service representative at Lowe's suggested that when the store makes the installation it is considered home improvement instead of appliance sale. This difference carries some sales-tax benefits.

**Energy Star Clothes Washers**

The clothes washer researched for this project was a GE Energy Star 4.0 cubic foot front load unit. Not many stores had this unit readably available, so the interviewer asked for a customer service representative recommendation of an equivalent Energy Star unit of the same capacity. Some of the alternatives suggested included brands as LG, GE Profile, Samsung, and Maytag. Most stores did have some alternative unit to suggest, with prices ranging from $1,500.00 at Best Buy to $498.00 at Lowe's. The average price for this appliance across retailers is $811.66.

**Compact Florescent Lights (CFL's)**

Not all stores offered the exact same light bulb selection. Our research therefore approached shopping as an average consumer would – making the best of a standardized available option. The suppliers were asked about CFL's to replace indoor incandescent bulbs of 75W, 60W, and 40W. As an example, 13W and 14W compact florescent lights were recommended to replace 60W indoor incandescent lights.

The stores researched had a wide range in terms of CFL offerings. For example, Best Buy does not stock CFL's, and unlike other locations, does not offer to special order them for FirstEnergy's service area. Sam's Club only offered GE CFL's of various wattage, often in bulk packs of 3 or more. Sears didn't offer CFL's in the consulted locations. In contrast, stores with a hardware or do-it-yourself focus, such as Home Depot and Lowe's, had numerous CFL bulbs for area consumers to choose from.

This variance in the market gives some perspective into the market and the possibility for area FirstEnergy program opportunities, either for partnership or further market penetration with new CFL programs. The information that was available indicates that there could be a large difference in terms of potential outreach with energy efficiency programs and local stores. For example, employees at Lowe's and Home Depot are probably more educated, in general, about CFL's as they sell a great deal of them.

# 5.0 CUSTOMER SURVEY RESULTS



## 5.0 CUSTOMER SURVEY RESULTS

This chapter summarizes the highlights of the Residential Mail Survey and the Commercial Telephone Surveys conducted by the B&V team. Both surveys were conducted in August 2009.

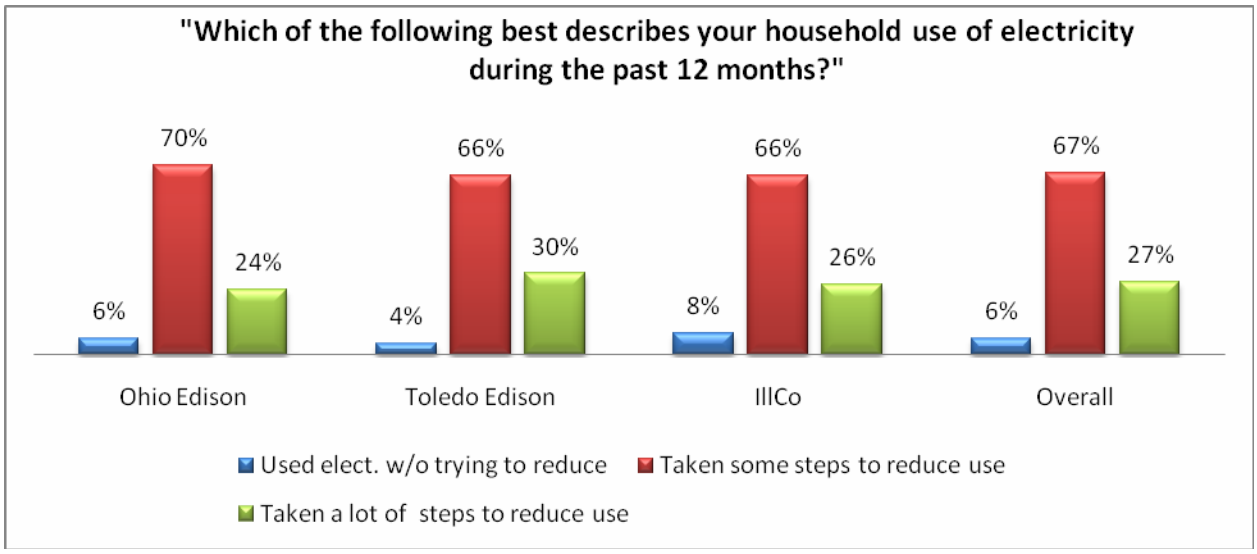
### *Residential Mail Survey Results*

***Baseline estimates of the current level of end-use DSM / EE in the market by customer class, housing stock, business type, etc.***

**Level of Energy Efficiency Actions Taken and Intentions**

Most respondents across all FirstEnergy operating companies have taken steps to conserve energy. Just over two thirds of all the respondents (67%) have taken some steps to reduce usage during the past 12 months and nearly the same percentage (61%) plan to do a little more over the next year.

**Figure 5.1 Residential – Household Electricity Use**



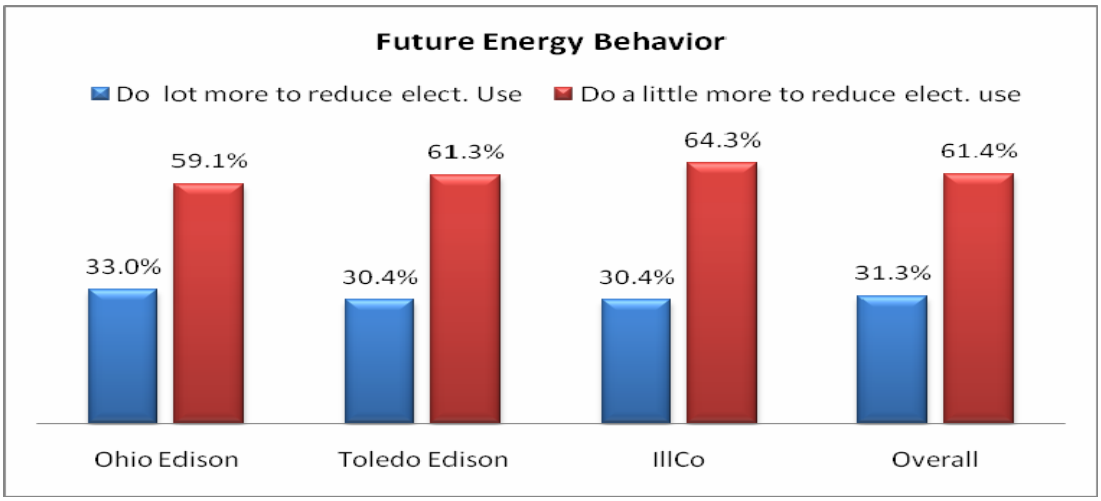

Just over a quarter of the respondents (27%) "Have taken a lot of steps to reduce" their use of electricity in the past 12 months.

Nearly as many of the respondents (31%) reported they would do a lot more to reduce usage over the next year as well.

# 5.0 CUSTOMER SURVEY RESULTS



**Figure 5.2 Residential – Future Energy Behavior**

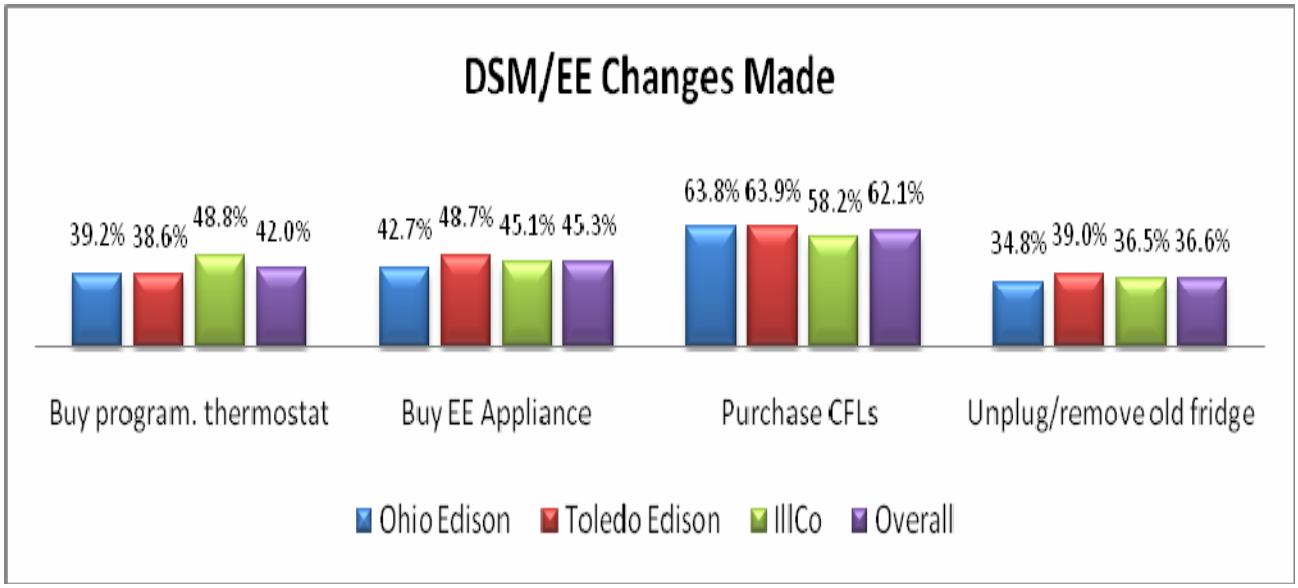



In fact, a combined 93% of respondents plan to do more over the next 12 months to use less electricity. Anxiety about the economy, concerns about the increasing cost of electricity, job stability and other economic factors are provided as reasons for doing so.

The survey explored the specific types of changes, replacements or modifications The Companies customers have already made, plan to make or might consider making in terms of their home energy usage behaviors.

Overall, more respondents reported purchasing CFL bulbs (62%), energy efficient appliances (45%), programmable thermostats (42%), and removing old refrigerators (37%). These measures are included as key components in several utility DSM programs across the country.

**Figure 5.2 Residential – DSM/EE Changes Made**



# 5.0 CUSTOMER SURVEY RESULTS



**Energy Attitudes, Opinions and Behaviors**

Customer perceptions about the cost of electricity have driven "organic" conservation efforts in the absence of any formal utility driven programs. The cost of electricity and the environment are a concern to a majority of the respondents in the sample. Respondents were asked to rate their concerns about the cost of electricity and the environment using a 5 point scale where 1 equaled "Not At All Concerned" and 5 equaled "Very Concerned". A combined 79% expressed some level of concern about the cost of electricity and 68% indicated concern about the environment.

**Figure 5.3 Residential – Concern about Cost of Electricity**

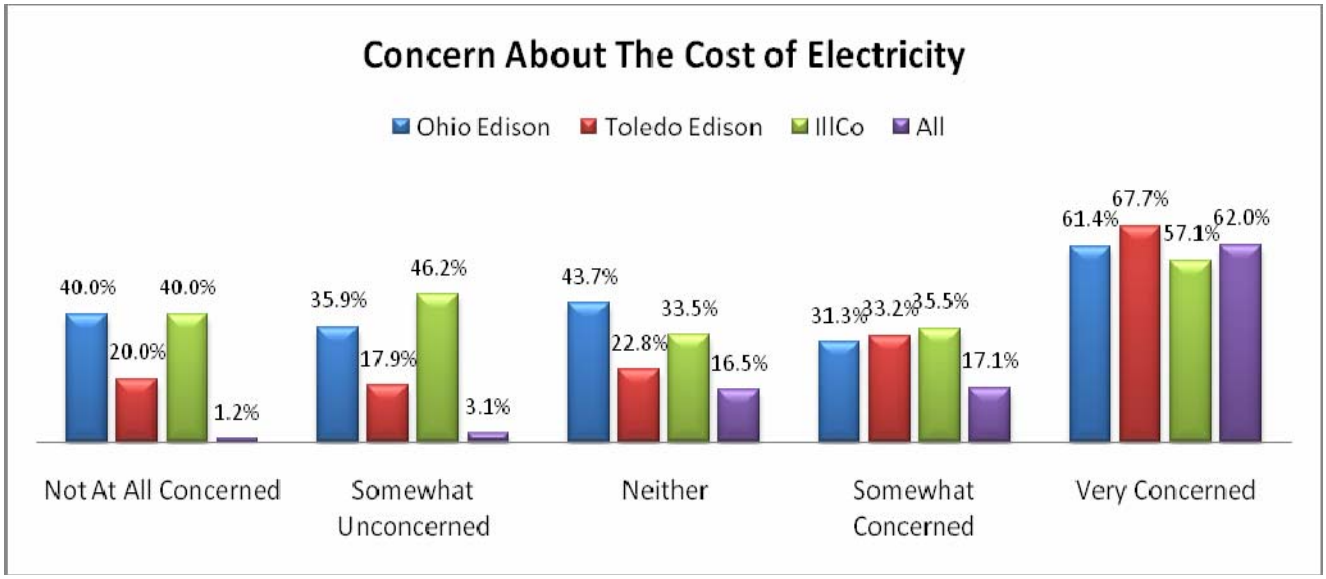
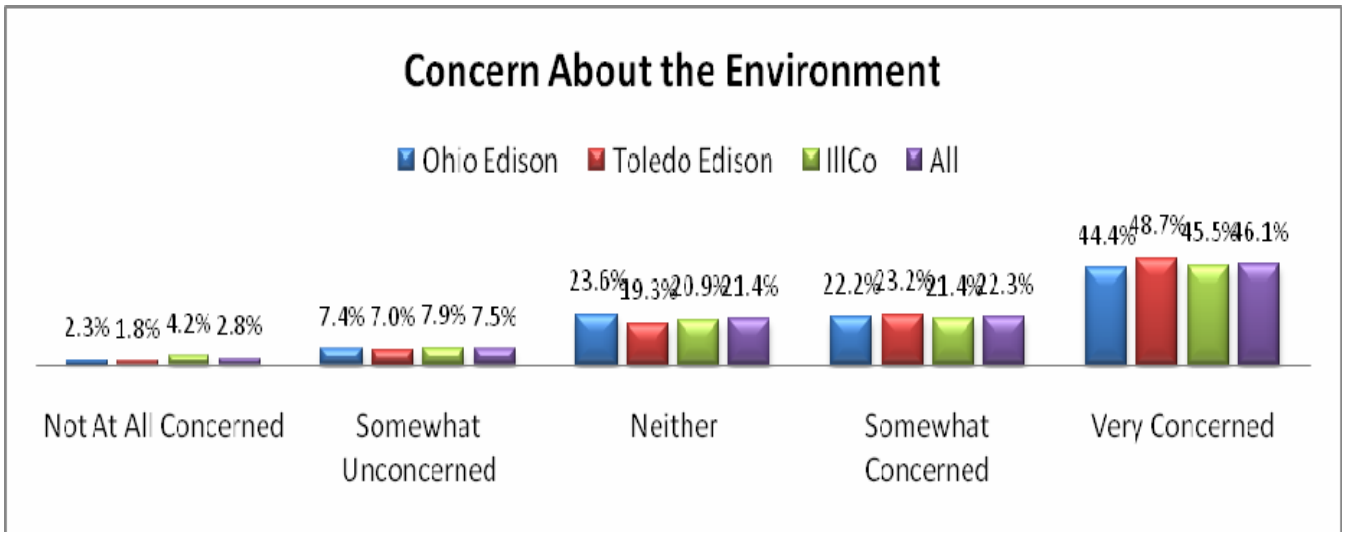



**Figure 5.4 Residential – Concern about the Environment**



# 5.0 CUSTOMER SURVEY RESULTS



The data also suggests that respondent concern about the cost of electricity is causing a change in behavior. Seventy seven percent of the respondents (77%) reported that the cost of electricity caused them to use it differently over the past year.

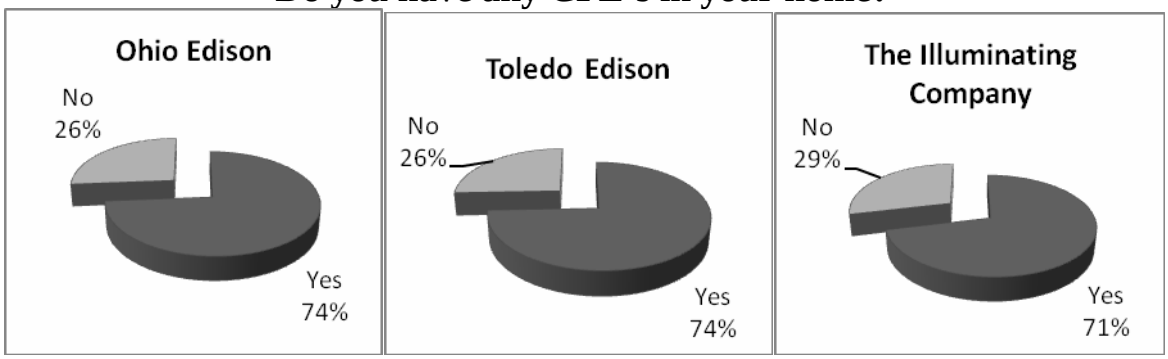
### Appliance and Equipment Holdings and Information on Times of Use

***Indoor and Outdoor/Security Lighting***

Nearly three quarters of the respondents in each operating company have compact fluorescent light (CFL) bulbs installed in their homes. The median number of CFL bulbs installed in respondents' homes is six (6).

**Figure 5.5 Residential – Percentage of CFL's**

**"Do you have any CFL's in your home?"**

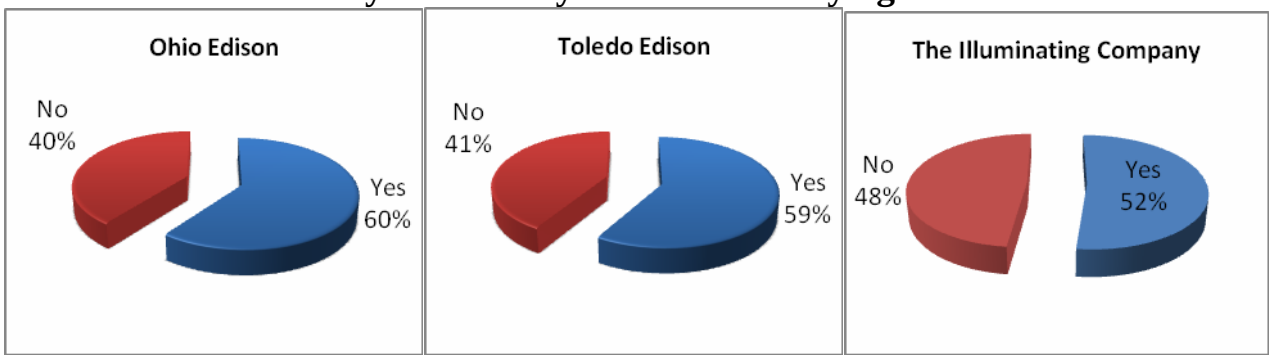



On average, 2.59 lights are on more than 4 hours per day in respondent homes. This suggests a remaining market for compact fluorescent light bulbs.

More than half of the respondents in the operating companies have outdoor/security lights. More respondents (60%) claimed ownership of outdoor security lighting in the Ohio Edison service territory than in Toldeo Edison or the Illuminating Company service areas. (More of these lights are operated by a motion sensor (25%) or a photocell (19%).

**Figure 5.6 Residential – Percentage of Security Lights**

**"Do you have any outdoor security lights?"**



# 5.0 CUSTOMER SURVEY RESULTS



***Refrigerators***

Seventy three percent (73%) of the respondents have a refrigerator that is 10 years old or less. Although most do not own a second one, one third reported that they have a second refrigerator. Seventy seven percent (77%) are used all year, 14% are used part time and 9.4% are unplugged and not in use.

**Figure 5.7 Residential – Age of Primary Refrigerator**

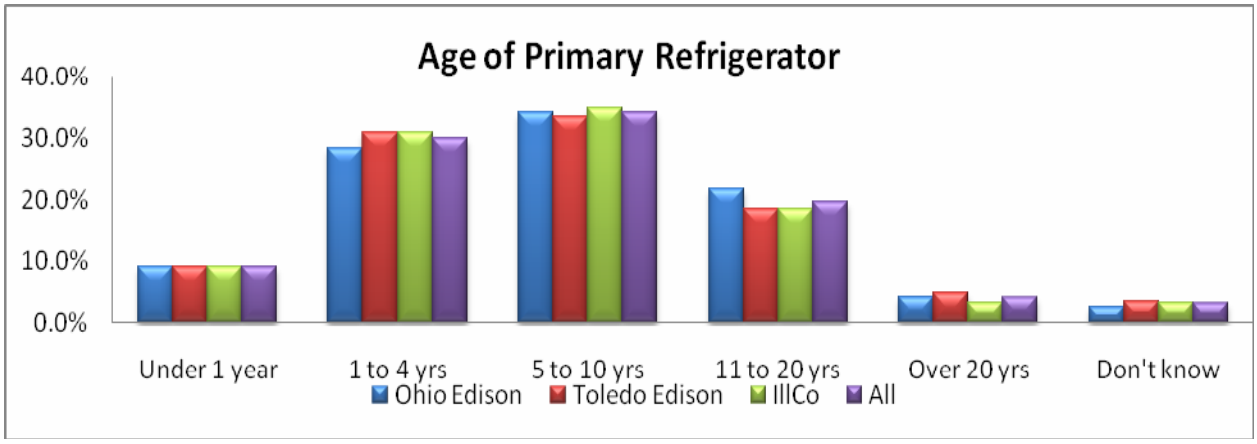
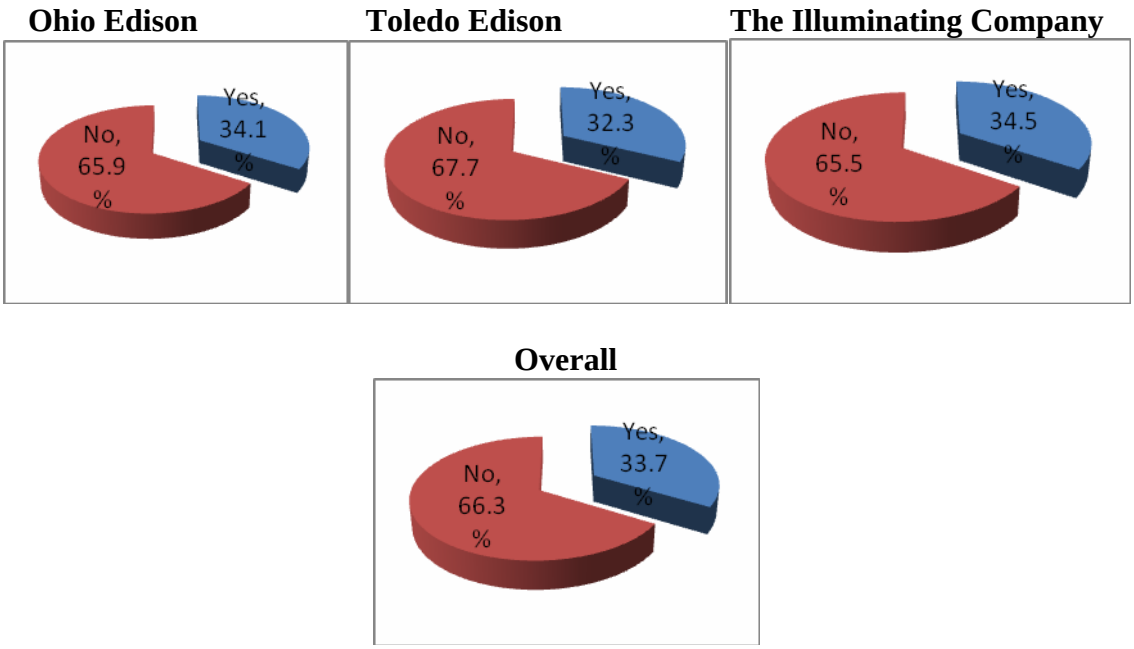



**Figure 5.8 Residential – 2nd Refrigerator Ownership**



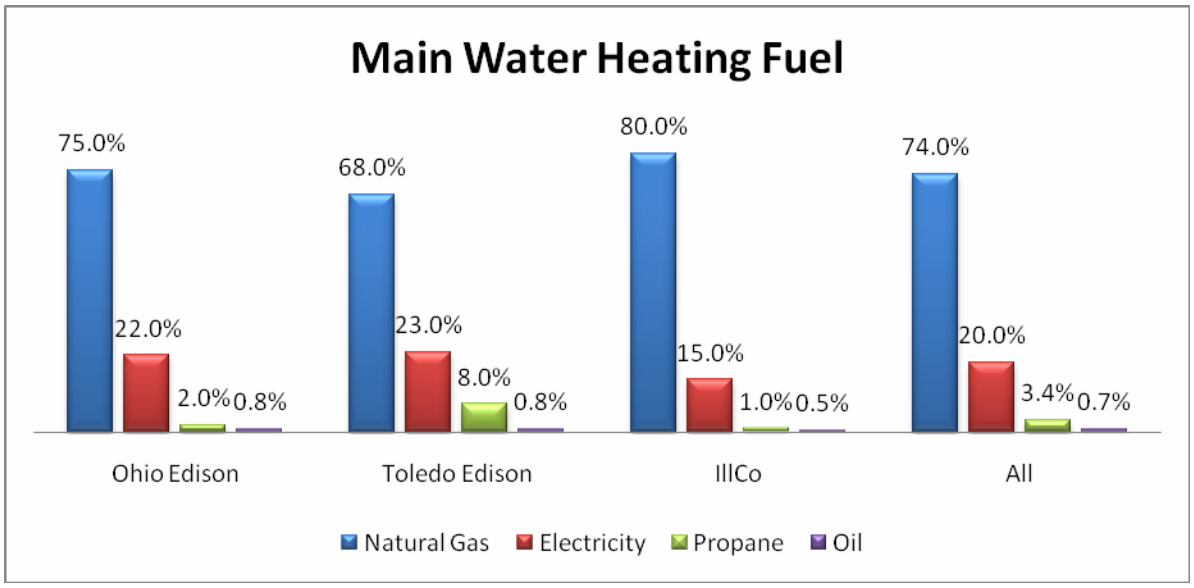
# 5.0 CUSTOMER SURVEY RESULTS



***Water Heating***

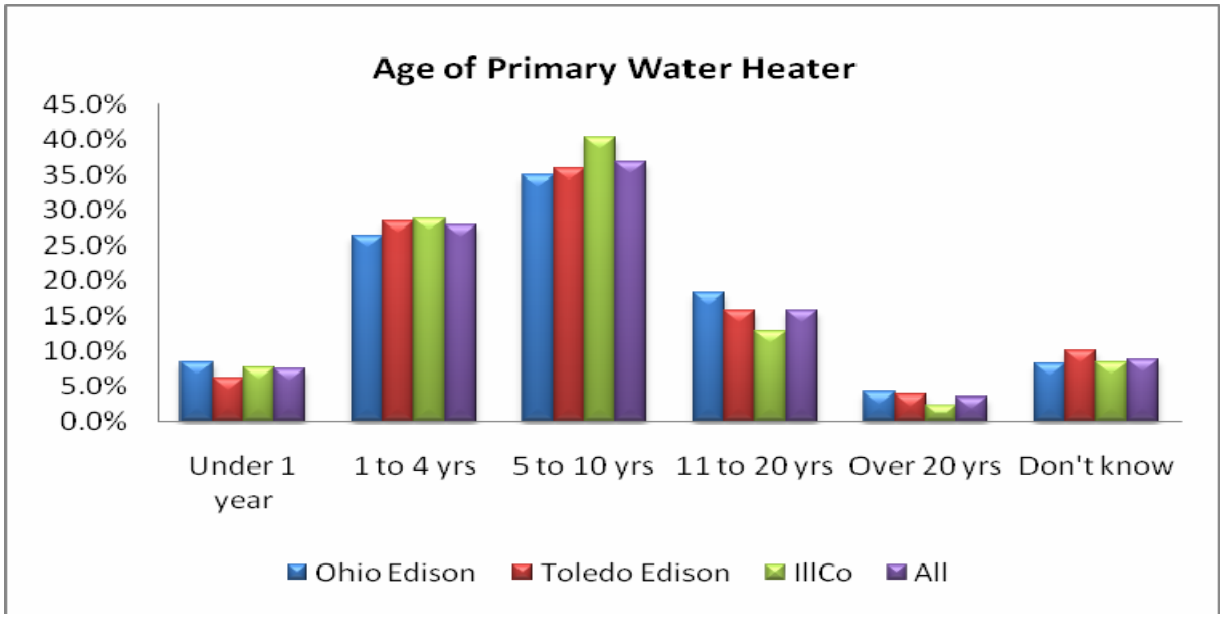
Natural gas and electricity are the two fuels cited most often for water heating. Overall, more respondents (74%) heat their water with natural gas than electricity (20%). Propane is the water heating fuel for 3% of the respondents.

**Figure 5.9 Residential – Main Water Heating Fuel**




Seventy two percent (72%) of the respondents said their water heater was 10 years old or less.

**Figure 5.10 Residential – Age of Primary Water Heater**



# 5.0 CUSTOMER SURVEY RESULTS

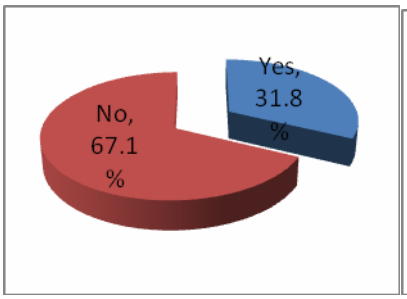


Most of the water heaters owned by the respondent group (68%) are not wrapped with insulation.

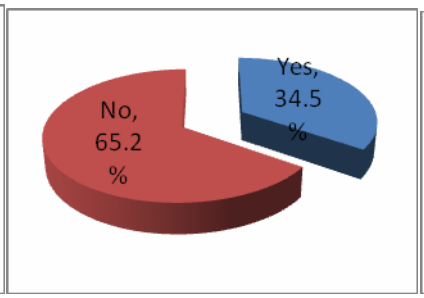
**Figure 5.11 Residential – Percentage of Wrapped Water Heaters**

**"Is your main water heater wrapped with insulation?"**

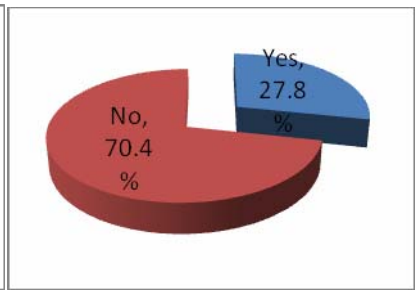
**Ohio Edison**



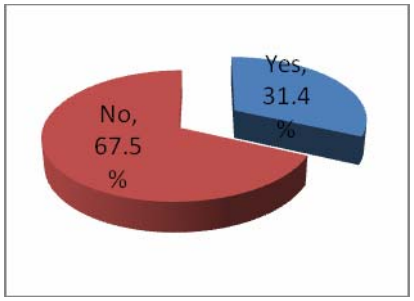

**Toledo Edison**




**The Illuminating Company**



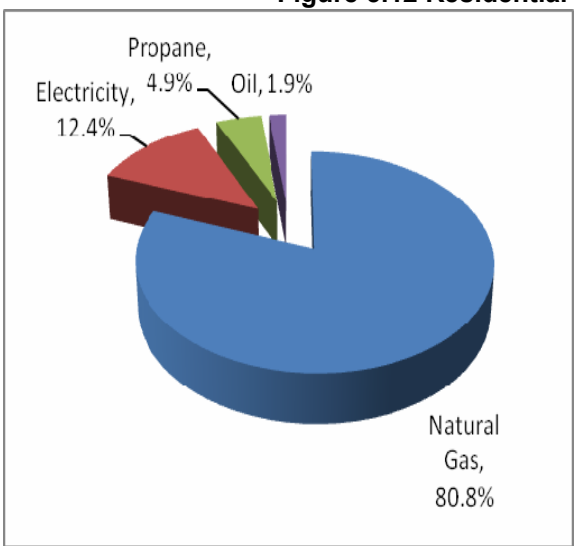

**Overall**

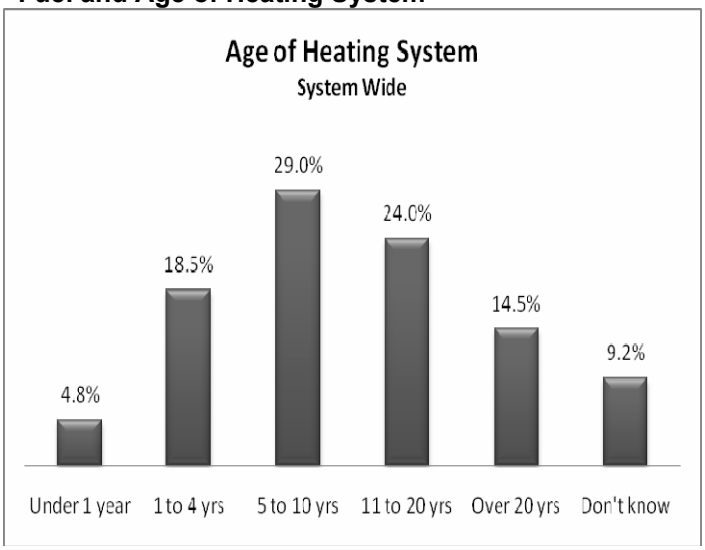



***Heating and Air Conditioning***

System wide, more respondents heat their homes with natural gas (81%) than any other fuel. Just over half of the heating systems (52%) are 10 years old or less. Thirty nine percent (39%) are over 10 years old.

**Figure 5.12 Residential – Fuel and Age of Heating System**



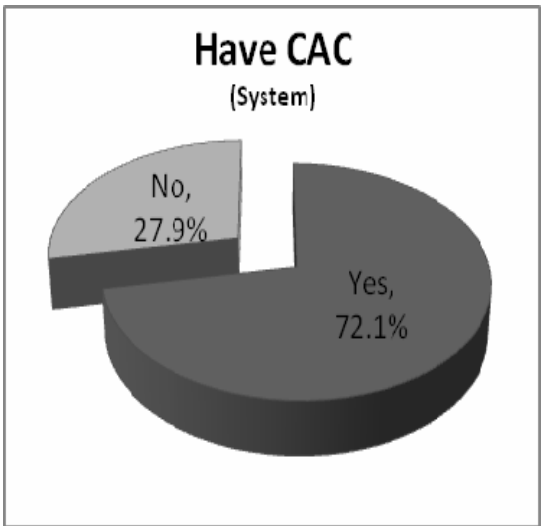



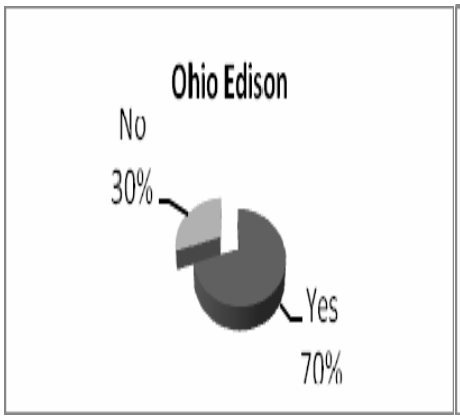
# 5.0 CUSTOMER SURVEY RESULTS

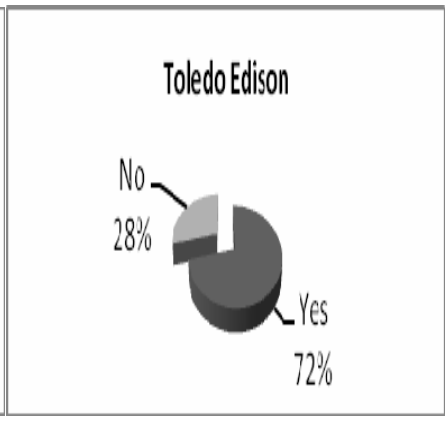


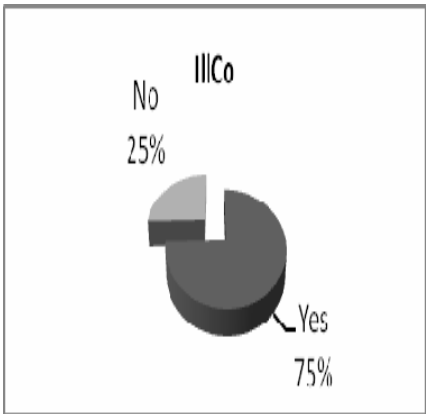
Nearly three quarters of the respondents (72%) have central air conditioning. One third of all respondents CAC units are 5-10 years old and a third are over 10 years old.

**Figure 5.13 Residential – Percentage of CAC**



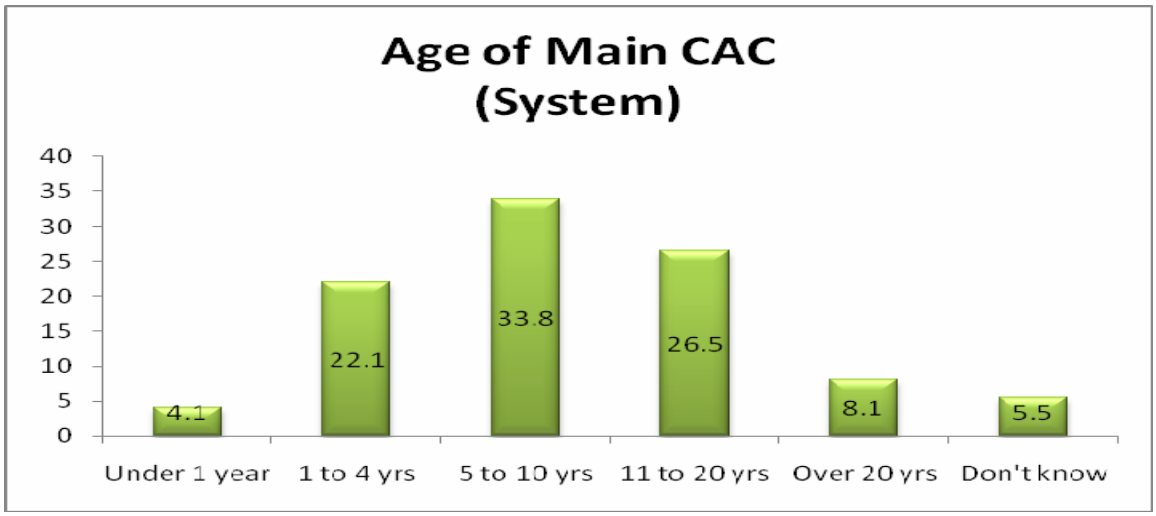



# 5.0 CUSTOMER SURVEY RESULTS

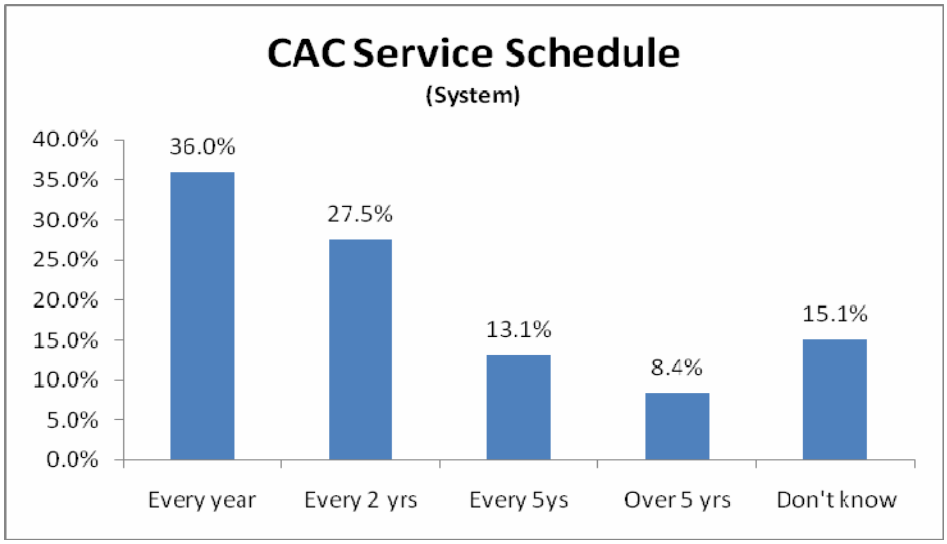


**Figure 5.14 Residential – Age of Main CAC**




Thirty six percent of the respondents with central air conditioning have their units serviced every year.

**Figure 5.15 Residential – CAC Service Schedule**

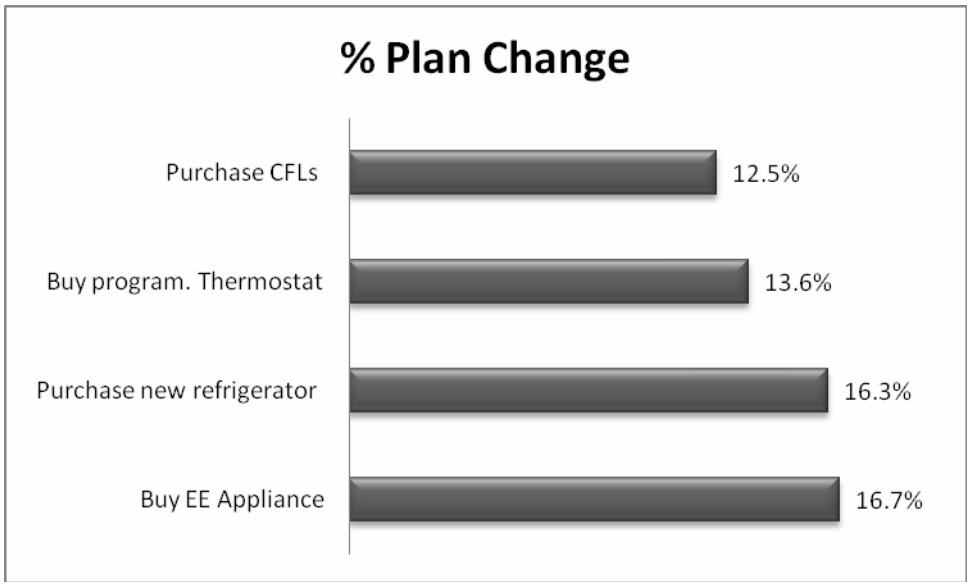


# 5.0 CUSTOMER SURVEY RESULTS



### Intentions to Purchase New Appliances or Equipment in Near Term

**Figure 5.16 Residential – Intentions to Purchase New Appliances**




### Needs and Preferences Regarding Energy Use, Energy Conservation

Respondents demonstrated varying attitudes and opinions about energy conservation and demand side management measures. The survey asked respondents to rate their level of agreement with a series of statements using a 5 point scale where 1 = Completely Disagree and 5 = Completely Agree. Two of the statements were related to respondents' willingness to pay extra to save energy and be environmentally friendly.

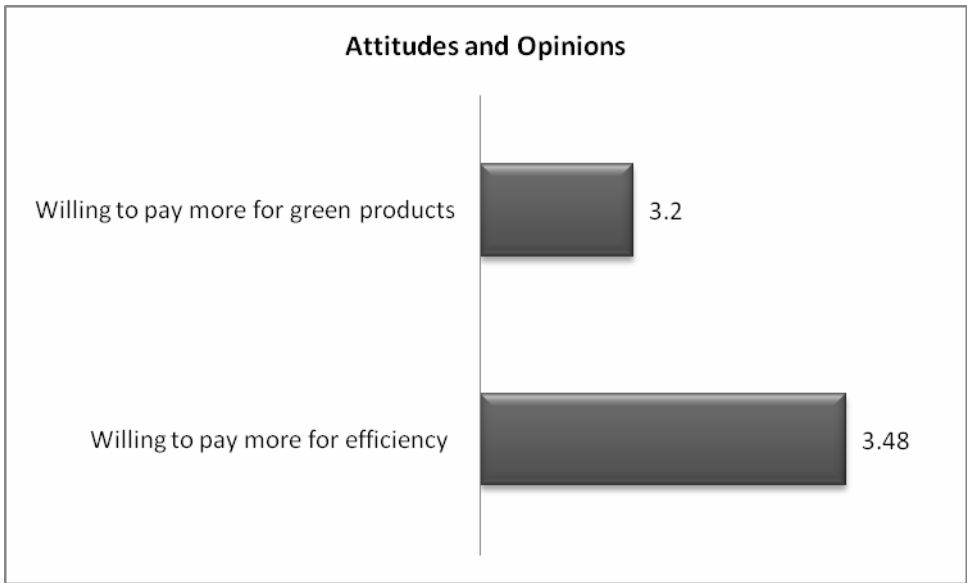
- *"I am willing to pay more for an efficient product in order to save energy and reduce energy costs in the future."*
- *"I am willing to pay extra on products in order to be environmentally friendly."*

Comparing the mean levels of respondent agreement we find that overall, respondents would rather pay more for future energy savings than they are to pay a premium to be environmentally friendly.

# 5.0 CUSTOMER SURVEY RESULTS



**Figure 5.17 Residential – Overall Customer Attitudes and Opinions**




Respondents were presented with statements related to their acceptance of and willingness to adopt several DSM program measures.

- *"I am willing to pay more for an efficient product in order to save energy and reduce energy costs in the future."*
- *"I am willing to pay more for products that are environmentally friendly."*
- *"I would install a programmable thermostat myself if was provided by my utility company."*
- *"I would accept a programmable thermostat if one was provided and installed for me."*
- *"I would buy a higher efficiency water heater or appliance if a rebate was offered."*
- *"I would allow my utility to have limited control of my central AC in times of peak electricity demand in return for a credit on my bill."*
- *"I would be willing to turn in my second refrigerator if my utility offered to pick it up for free."*
- *"I would be willing to turn in my second refrigerator if my utility offered to pick it up and offered me a cash payment."*
- *"I am interested in finding out more about energy efficiency opportunities for my home."*

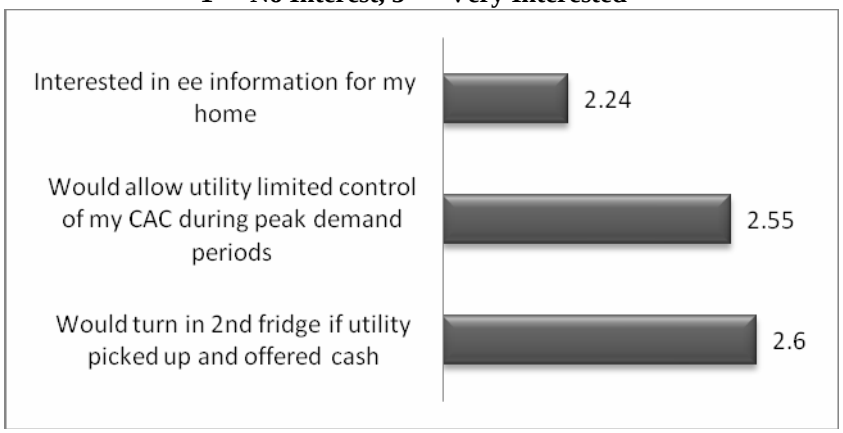
# 5.0 CUSTOMER SURVEY RESULTS



Respondents showed the least agreement about programs for refrigerator pick-up, utility control of their central air conditioners and information.

**Figure 5.18A Residential – Likelihood of Customer Participation**

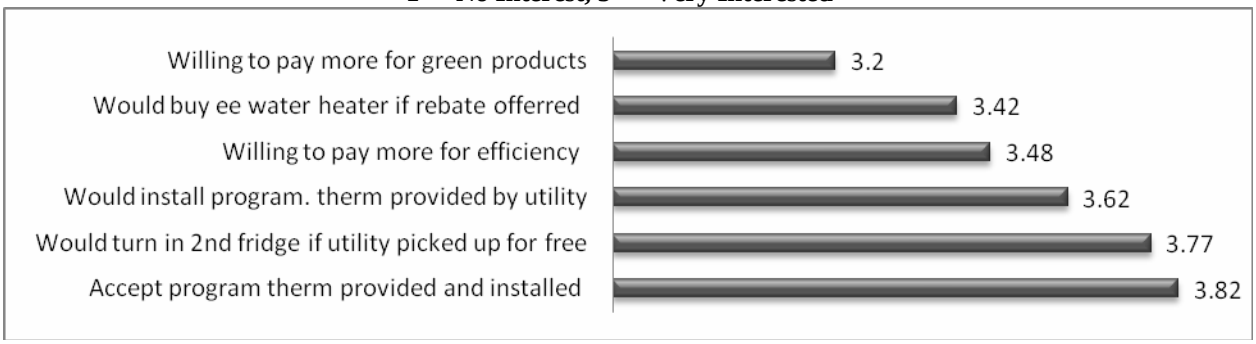
**Please rate each of the following program types in terms of your interest levels**
**1= "No Interest, 5 = "Very Interested"**




On the other hand, program measures related to programmable thermostats and energy efficient water heater rebates, received higher levels of agreement.

**Figure 5.18B Residential – Likelihood of Customer Participation**

**Please rate each of the following program types in terms of your interest levels**
**1= "No Interest, 5 = "Very Interested"**



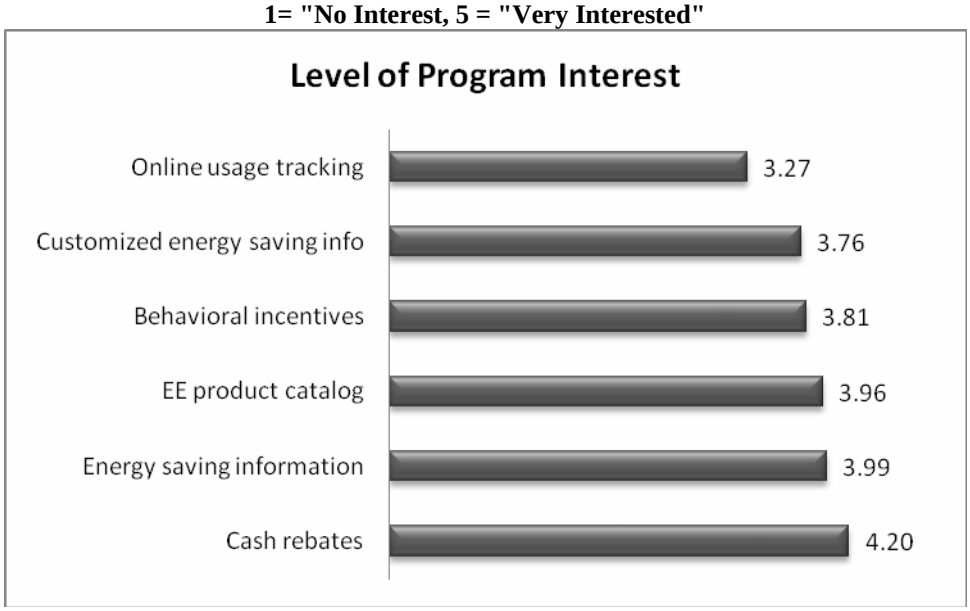
# 5.0 CUSTOMER SURVEY RESULTS



The survey assessed respondents' interest levels in several program delivery methods. Cash rebates or coupons for energy efficient products received the highest mean interest ratings.

**Figure 5.19 Residential – Interest Level of Delivery Methods**

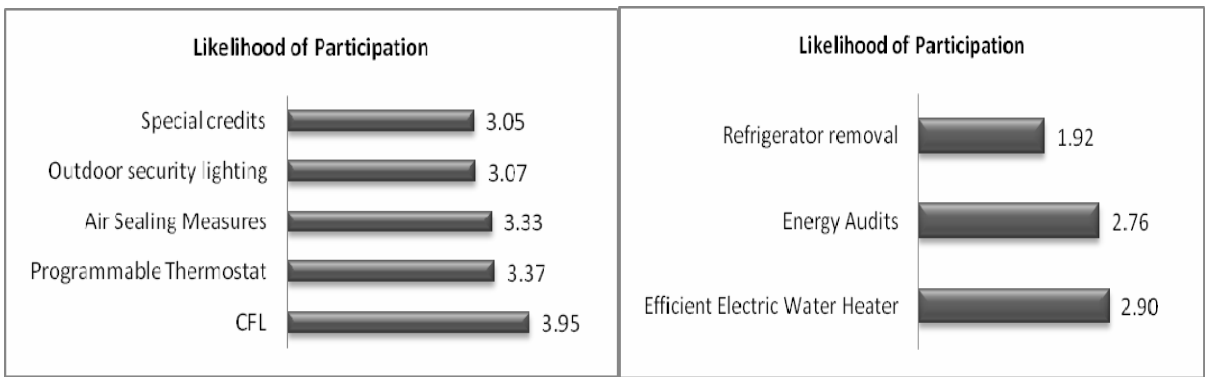
**Please rate each of the following program types in terms of your interest levels**
**1= "No Interest, 5 = "Very Interested"**




## Reactions to Load Management and Rate Concepts

The data suggests that respondents would be more likely to participate in programs that provide CFL light bulbs, programmable thermostats and air sealing measures. Refrigerator removal, energy audits and water heater programs may be less popular, based on this initial respondent feedback.

**Figure 5.20 Residential – Response to Load Management & Rate Concepts**



# 5.0 CUSTOMER SURVEY RESULTS



## *Commercial Customer Survey Results*

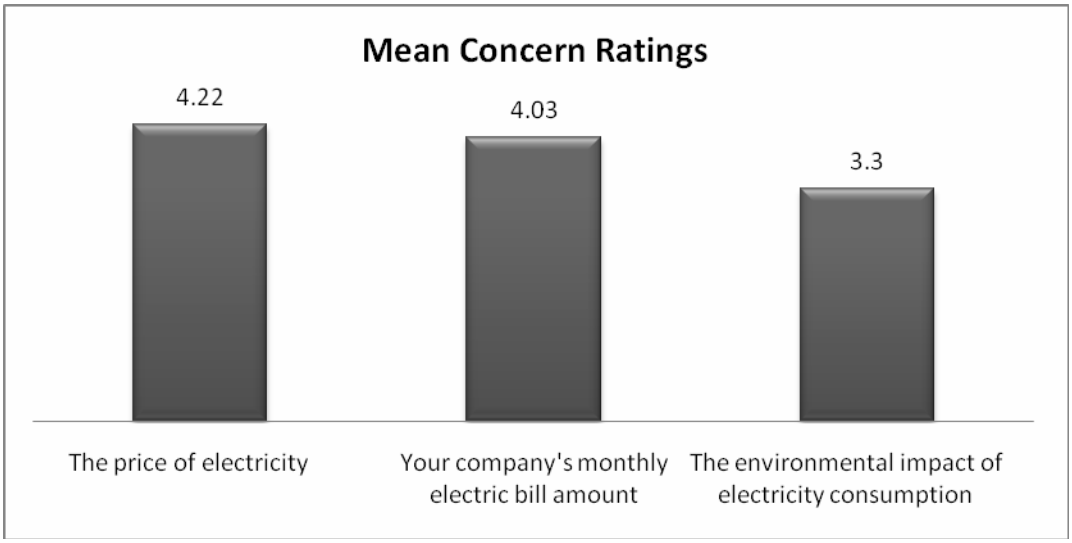
This section covers highlights from the telephone survey of 300 small to medium sized commercial and small manufacturing customers of the three Ohio companies (100 each).

### Findings

*Energy Attitudes, Opinions and Behaviors*

Using a 5 point scale where 1 equaled "Not At All Concerned" and 5 equaled "Very Concerned", respondents were asked to rate their concerns about the cost of electricity, the environmental impact of electricity consumption and their monthly electric bill.

**Figure 5.21 Commercial – Customer Concerns**

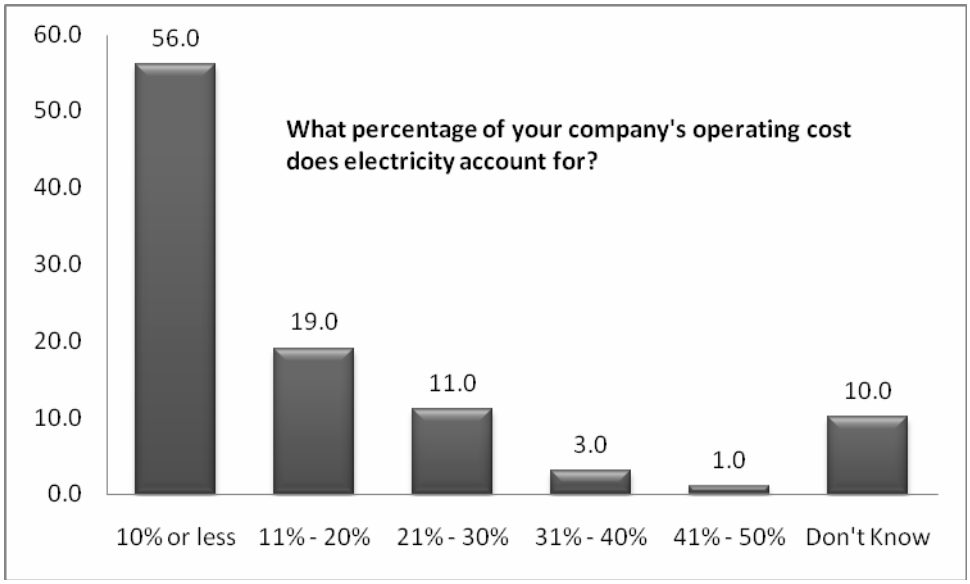



On average, commercial respondents are more concerned with the price of electricity and their monthly electric bill than they seem to be about the environment. Over half of the respondents (56%) indicated that electricity accounts for 10% or less of their operating costs.

# 5.0 CUSTOMER SURVEY RESULTS

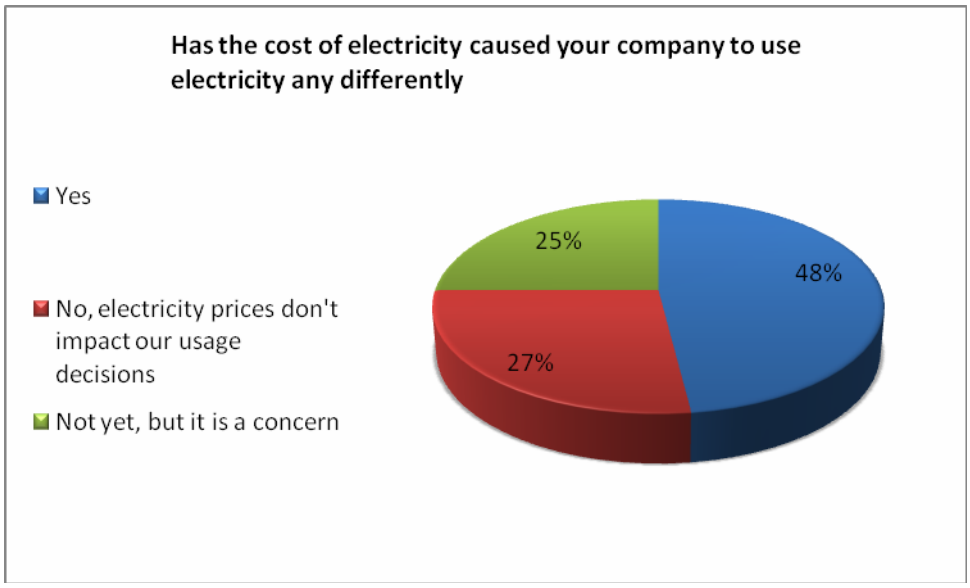


**Figure 5.22 Commercial – Customer Electricity Operating Costs**




Although the highest single percentage of respondents reported that the cost of electricity has caused them to use it differently, a combined half of the respondents said that either they had not yet done anything differently but were concerned (25%) or that electricity prices don't impact their usage decisions (27%).

**Figure 5.23 Commercial – Impact of Electricity Prices on Usage**

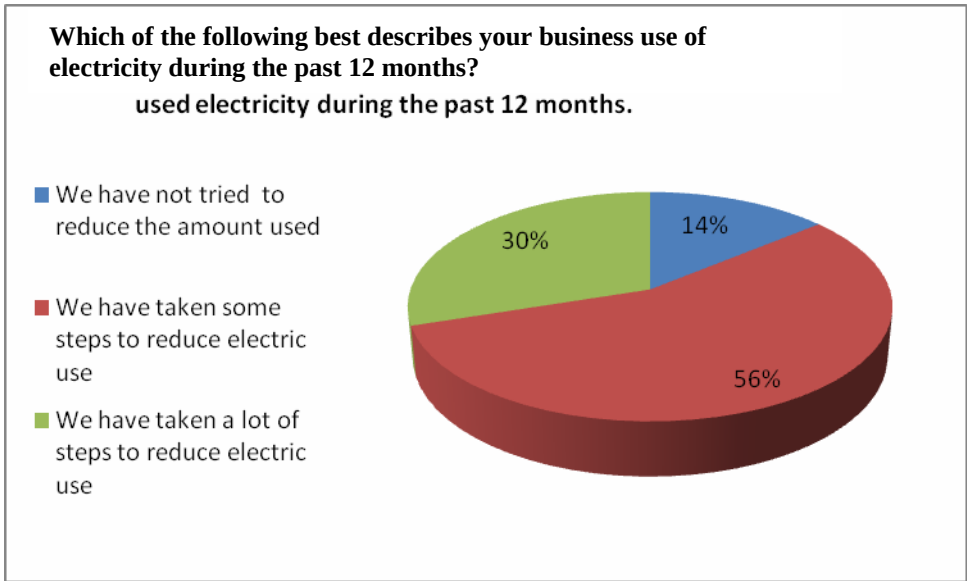



But what have commercial respondents done over the last 12 month? A combined 86% of the respondents have done something to reduce their electric use. Of this group, 56% have taken some steps to reduce their use, while 30% said they have done a lot.

# 5.0 CUSTOMER SURVEY RESULTS

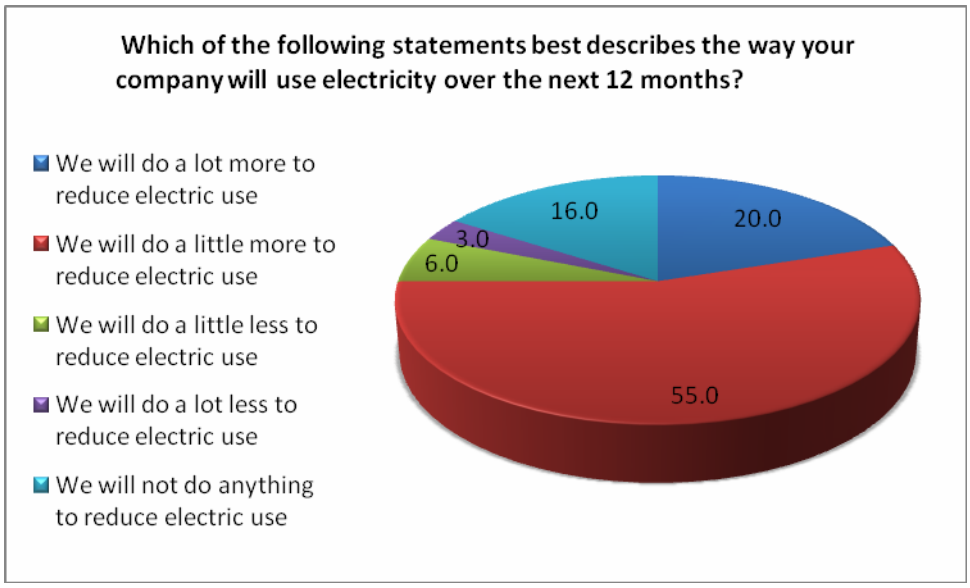


**Figure 5.24 Commercial – Electricity Usage for Past 12 Months**




Going forward, three quarters of the respondents (75%) reported that they would do something to save electricity. Of this group, 55% will do a little more and 20% said they would do a lot more.

**Figure 5.25 Commercial – Electricity Usage for Next 12 Months**

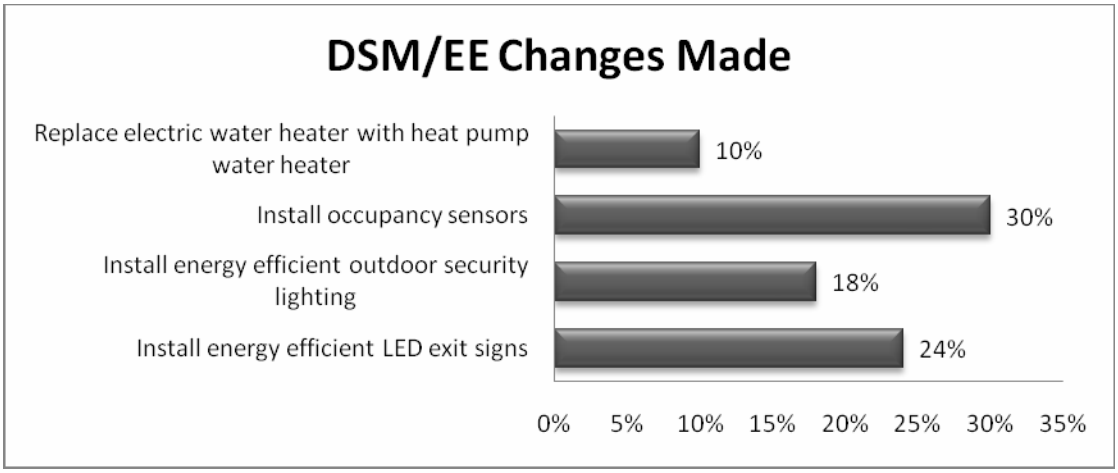



While a majority of the survey respondents have not made any changes to their business, some commercial respondents have already installed energy efficient outdoor security lighting (18%) and energy efficient LED exit signs (24%).

# 5.0 CUSTOMER SURVEY RESULTS



**Figure 5.26 Commercial – DSM/EE Changes Made**

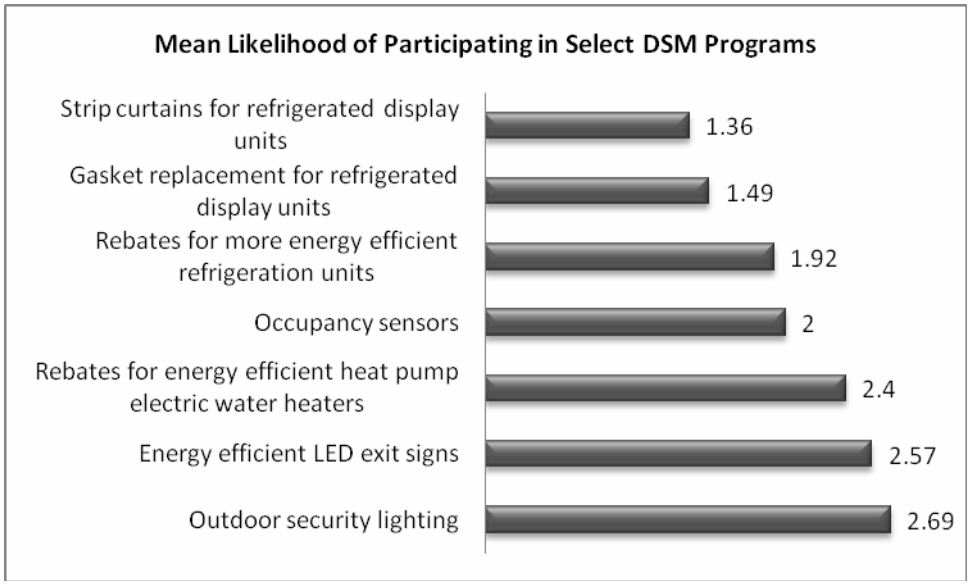



Few respondents plan to make efficiency changes in the future. Just eight percent reported they would install energy efficient outdoor lighting in the next two years. A slightly lower percentage of the commercial respondents (8%) would install energy efficient LED exit signs in their buildings. Only 1% of the respondents would install occupancy sensors or replace their electric water heater with a heat pump water heater.

*Program Participation*

Respondents were asked to rate the likelihood that they would participate in selected energy conservation programs. They were asked to use a five point scale where 1= Not At All Likely and 5=Very Likely. Based on the mean likelihood to participate ratings we find that there is lukewarm receptivity to the programs suggested.

**Figure 5.27 Commercial – Likelihood of Program Participation**



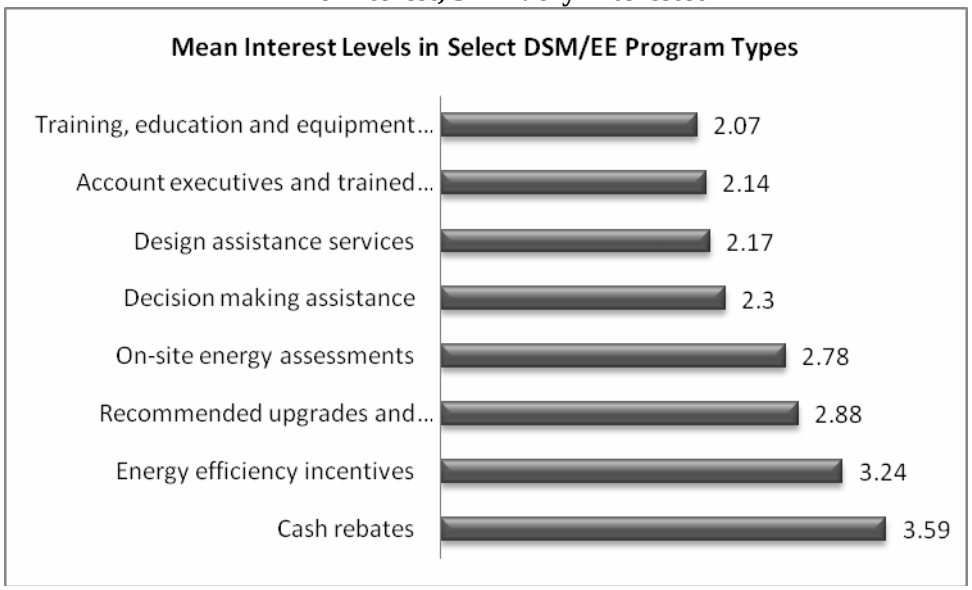
# 5.0 CUSTOMER SURVEY RESULTS



The survey assessed respondents' interest levels in several program delivery methods. Cash rebates received the highest interest ratings.

**Figure 5.28 Commercial – Mean Interest Levels in Select DSM/EE Program Types**

**Please rate each of the following program types in terms of your interest levels**
**1= "No Interest, 5 = "Very Interested"**



# 6.0 ENERGY EFFICIENT TECHNOLOGIES



## 6.0 ENERGY EFFICIENT TECHNOLOGIES

The Market Study started with consideration of a large span of EEPD measures that are applicable to residential and non-residential end users of electricity for reducing consumption. Table 6.1 lists the numbers of technologies by end-use that were initially considered by the study team as the original universe of options.

**Table 6.1 – EEPD Technologies Considered**

| Rate Class | Number Considered | Number Economic* |
|---|---|---|
| Residential | 43 | 28 |
| Commercial | 34 | 28 |
| Industrial | 25 | 21 |

*All Measure Consided in Plan, but not all pass TRC

This list of measures was screened by the study team, a combination of FirstEnergy professionals and senior B&V DSM staff and resulted in an abbreviated list deemed most relevant to the Companies and their customers. The screening process considered commercial availability, contribution to coincident summer peak load reduction, cost per kWh and/or kW saved as the primary considerations. The resultant list of technologies considered in the model is as follows:

**Table 6.2: DSM Technologies - Residential**

| Technology/Measure | Program Category | Market Segment |
|---|---|---|
| DLC-CAC | Therm DLC | Res |
| DLC-Pool Pumps | Res DLC | Res |
| DLC-Water Heat | Res DLC | Res |
| Residential Online Audit | On-Line Audit | Res |
| Residential Online Audit Future | On-Line Audit | Res |
| Schools Children Education | Comprehensive Residential | Res |
| Refrigerator/Freezer recycling | Efficient Appliances | Res |
| Room Air Conditioners recycling | Efficient Appliances | Res |
| ASHP - SEER 15 | Comprehensive Residential | Res |
| CAC - SEER 15 | Comprehensive Residential | Res |
| CAC - Maintenance | Comprehensive Residential | Res |
| EE Ground Source Heat Pump | Comprehensive Residential | Res |
| Solar Water Heating | Comprehensive Residential | Res |
| HP Water Heater | Comprehensive Residential | Res |
| EE Water Heater | Comprehensive Residential | Res |

# 6.0 ENERGY EFFICIENT TECHNOLOGIES



| | | |
|---|---|---|
| Programmable Thermostat Heat | Comprehensive Residential | Res |
| Programmable Thermostat_CAC | Comprehensive Residential | Res |
| LED Lighting Inside | Efficient Appliances | Res |
| CFL bulbs regular - Outside - 15 | Efficient Appliances | Res |
| LED Lighting Outside | Efficient Appliances | Res |
| Clothes Washer Energy Star, Electric Water heater, Electric Dryer | Efficient Appliances | Res |
| Dehumidifiers | Efficient Appliances | Res |
| Freezers Energy Star-Chest Freezer | Efficient Appliances | Res |
| Holiday Lights | Efficient Appliances | Res |
| LED Night Light | Efficient Appliances | Res |
| Pump and Motor Single Speed | Efficient Appliances | Res |
| Refrigerators-Freezers Energy Star - Side by Side | Efficient Appliances | Res |
| Refrigerators-Freezers Energy Star - Top Freezer | Efficient Appliances | Res |
| Room Air Conditioners | Efficient Appliances | Res |
| Smart Strip plug outlet | Efficient Appliances | Res |
| Torchiere Floor Lamps | Efficient Appliances | Res |
| Residential New Construction - 15% | New Homes | Res |
| Residential New Construction - 30% | New Homes | Res |
| Ceiling Fans | Comprehensive Residential | Res |
| Estar Windows | Comprehensive Residential | Res |
| Duct sealing 20 leakage base | Comprehensive Residential | Res |
| Low Flow Showerheads | Comprehensive Residential | Res |
| Kitchen Aerator | Comprehensive Residential | Res |
| Bathroom Aerator | Comprehensive Residential | Res |
| Pipe Wrap | Comprehensive Residential | Res |
| Roof Insulation | Comprehensive Residential | Res |
| Wall Insulation | Comprehensive Residential | Res |
| Whole Building | Comprehensive Residential | Res |

# 6.0 ENERGY EFFICIENT TECHNOLOGIES



Commercial and industrial technologies used in the model are listed in the next table (Table 6.4).

**Table 6.4 - DSM Technologies - Commercial and Industrial**

| Technology/Measure | Program Category | Market Segment |
|---|---|---|
| Commercial New Construction | COMNEW | COMM |
| Commercial CFL Program | COMM Equip | COMM |
| Exterior HID replacement above 175W to 250W HID retrofit | COMM Equip | COMM |
| HPT8 4ft 4 lamp, T12 to HPT8 | COMM Equip | COMM |
| LED Exit Signs Electronic Fixtures (Retrofit Only) | COMM Equip | COMM |
| Occupancy Sensors under 500 W | COMM Equip | COMM |
| LED Auto Traffic Signals | COMM Equip | COMM |
| LED Pedestrian Signals | COMM Equip | COMM |
| Street Lighting - 175 Mercury to 100 HPS | COMM Equip | COMM |
| AC 65,000 - 135,000 | COMM Equip | COMM |
| AC 240,000 - 760,000 | COMM Equip | COMM |
| Clothes Washer CEE Tier1, Electric Water heater, Electric Dryer | COMM Equip | COMM |
| Demand-controlled ventilation (DCV) | COMM Equip | COMM |
| Efficient Refrigeration Condenser | COMM Equip | COMM |
| Energy Star Commercial Solid Door Freezers less than 20ft3 | COMM Equip | COMM |
| Energy Star Commercial Solid Door Freezers 20 to 48 ft3 | COMM Equip | COMM |
| Energy Star Commercial Solid Door Refrigerators less than 20ft3 | COMM Equip | COMM |
| Energy Star Commercial Solid Door Refrigerators 20 to 48 ft3 | COMM Equip | COMM |
| Energy Star Ice Machines less than 500 lbs | COMM Equip | COMM |
| Energy Star Ice Machines 500 to 1000 lbs | COMM Equip | COMM |
| Energy Star Ice Machines more than 1000 lbs | COMM Equip | COMM |
| Energy Star Steam Cookers 3 Pan | COMM Equip | COMM |
| EE Water Heater | COMM Equip | COMM |
| HP Water Heater (Base Usage 22831) | COMM Equip | COMM |
| Plug Load Occupancy Sensors Document Stations | COMM Equip | COMM |
| Commercial Smart Strip plug outlet | COMM Equip | COMM |
| Pre Rinse Sprayers | COMM Equip | COMM |
| Refrigerant charging correction | COMM Equip | COMM |
| Refrigeration Commissioning | COMM Equip | COMM |
| Strip curtains for walk-ins - freezer | COMM Equip | COMM |
| Vending Equipment Controller | COMM Equip | COMM |
| Window Film | COMM Equip | COMM |
| Setback/Setup | COMM Equip | COMM |
| Demand-controlled ventilation (DCV) | IND Equip | IND |
| Exterior HID replacement above 175W to 250W HID retrofit | IND Equip | IND |
| HPT8 4ft 4 lamp, T12 to HPT8 | IND Equip | IND |
| Occupancy Sensors under 500 W | IND Equip | IND |
| Water-Cooled cent Chiller 150 - 300 ton 0.57 kW/ton with 0.46 kW/ton IPLV | IND Equip | IND |
| Water-Cooled Centrifugal Chiller < 150 ton 0.56 kW/ton with 0.53 kW/ton IPLV | IND Equip | IND |
| Window Film | IND Equip | IND |
| Motors 1 HP 1200 | IND MOTOR | IND |

# 6.0 ENERGY EFFICIENT TECHNOLOGIES



| | | |
|---|---|---|
| Motors 5 HP 1200 | IND MOTOR | IND |
| Motors 10 HP 1200 | IND MOTOR | IND |
| Motors 20 HP 1200 | IND MOTOR | IND |
| Motors 1 HP 3600 | IND MOTOR | IND |
| Motors 5 HP 3600 | IND MOTOR | IND |
| Motors 10 HP 3600 | IND MOTOR | IND |
| Motors 20 HP 3600 | IND MOTOR | IND |
| Water Pumps with VFD's | IND MOTOR | IND |
| HVAC Fans with VFD's | IND MOTOR | IND |
| Air Compressors with VFD's | IND MOTOR | IND |
| Water Pumps with VFD's | IND MOTOR | IND |
| HVAC Fans with VFD's | IND MOTOR | IND |
| Air Compressors with VFD's | IND MOTOR | IND |
| Water Pumps with VFD's | IND MOTOR | IND |
| HVAC Fans with VFD's | IND MOTOR | IND |
| Air Compressors with VFD's | IND MOTOR | IND |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



## 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS

This section addresses the following project requirements that appear as outputs to the B&V's program modeling activity:

1. Estimates of demand reduction and energy savings for each year over a 15-year period that is technically achievable in FirstEnergy's Ohio service territory.
2. The results of the standard tests include energy savings and cost-effectiveness of a wide variety of achievable DSM/EE measures. The groups of measures, including a discussion of generally used methodologies for determining cost-effectiveness of individual measures and groups of measures that make up certain programs
3. Estimated costs of implementing all cost-effective demand reduction / energy savings measures.
4. Verifiable technical data based on objective engineering estimates or actual measurement to support estimated energy and demand savings attributed to each customer class.

### *Methodology*

This report provides EEPD evaluation for the three Ohio FirstEnergy service territories, Ohio Edison, Cleveland Electric and Toledo Edison. The following section outlines the common studies performed for all three of these service territories.

The EEPD technologies and measures evaluated for the Companies were based on the various sources listed in Section 2.0[22]. Further, the EEPD technologies and measures were evaluated using the B&V EEPD Model (EE Model)[23]. The EE Model requires inputs to be formatted into unique measures and not in combined programs. Once the results of each measure are calculated, B&V combines these measures evaluated into groups/end-use types, which are then presented as programs. This section also contains the EEPD model outputs and resulting targeted savings and budgets per measure. The next step will be to take these measure results and sum them into B&V subscribed recommendations for programs. B&V created three scenarios: Economically Achievable Scenario (Economic Potential) and two Actual Achievable Scenarios, (e.g., Market Potential Base Case, Market Potential High Case). These three scenarios will be discussed further in this section.

### *Measure Data*

All energy and demand savings are based on the various Databases including: CA DEER, ACEEE OH Report, DSMores MI Database, and PA TRM. All equipment costs and equipment lives are based on publicly available data. The residential and commercial weather sensitive load saving are

[22] The measure savings sources by measures will be included in Appendix C.
[23] The model is license to FirstEnergy and remains the property of Black & Veatch. FirstEnergy has full rights to obtain and utilized this model.

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



based on OH sources such as the ACEEE OH Report or are moved into OH using Cooling Degree Days (CDD).

Customer costs are based on the full incremental costs of a measure. Most measures are assumed to be replacements and not retrofitted; therefore, only the equipment costs are included. The install costs are assumed to be the same for either the base equipment or the more efficient equipment, so the customer is not compensated for the install costs. In cases where the measure is an energy savings addition only, (i.e. pipe wrap) both the equipment costs and the labor to install were included in the full incremental costs. In commercial lighting measure the installation cost where also included in the incremental costs due to the fact that they would be retrofitted into working lights.

The evaluation started with a high-level screening process of B&V's measure database to find the most applicable measures to screen in the EEPD model. This preliminary screening of measures was based on lifetime savings per dollar. The target was measures with lifetime savings per dollar over .08 or about.12 cents a kWh cost. Measures that were not good fits for the Companies or were duplicative of other measures were also eliminated. Therefore, only the measures that were screened had a lifetime savings per dollar above .08 per kWh, were not duplicative of other measures, and were applicable to the Companies.

B&V reviewed different energy efficiency and demand-side management programs for residential, commercial and industrial classes with various end uses for a total of 99 measures. See Table 7.1 for a summary by class. The 99 measures are used for all three service territories.

**Table 7.1 - Programs Evaluated (By Class & Type)**

| Rate Class | Number Considered | Number Economic* |
|---|---|---|
| Residential | 42 | 21 |
| Commercial | 32 | 19 |
| Industrial | 25 | 20 |

*All Measure Considered in Plan, but not all pass TRC

## *Economic Potential*

Economical Achievable will accompany our Maximum Technical presentation as a bottom up confirmation. Economically achievable took our 99 measures and used a premise base on obtaining all savings that are economical achievable for all of the Companies' customers. This scenario has a one year time horizon where all savings are obtainable from all subscribing customers in the first year. The scenario does however take into account the Companies' customers who have already taken energy saving actions.

The number of assumed program recipients (participants) under the Economic Potential scenario is based on survey data, which includes accounts for those who stated they have already made the EEPD change. This approach does not take into account equipment life but rather, simulates that all equipment would be changed in the first year. Budgets are based on a cost per measure item using

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



Base Achievable Case Assumptions.[24] The full results by measure, are presented in Appendix C. For OE, there is a potential to save 5,390 GWh a year and 1,257 MW. For CEI there is a potential to save 3,800 GWh a year and 882 MW. For TE there is a potential to save 1,568 GWh a year and 363 MW.

### *Achievable Potential (Base & High Case)*

These scenarios have study periods from 2009-2025 where the savings are obtainable from all subscribing customers when they either need to replace equipment or have shown interest in installing an energy saving measure such as pipe wrap. These scenarios apply the results of the Companies' mail and phone surveys. The residential achievable numbers were based on mail survey data, including the number of people who have a particular end-use, plus those who have indicated an interest in a particular program. There are two levels of interest based on the program parameters. Program parameters are as follows: Option 1, includes people who responded "I plan to change" or responded "5 out of 5" in interest in a measure when asked on the survey. This option envisions programs that are designed to contribute to all measures, such that all measures have a positive pay back period for the participants and also have incentives that are also reasonable for the utility. Option 2, includes people who responded "I am considering changing" and includes people who responded "4 out of 5"in interest in a measure. In this second option the utility will need to spend more money on both marketing and incentives.

For the commercial measures there are many repetitive programs such as the various types of lights that can be installed in an office building. Only some of the programs are used to evaluate the quantity of kWh and kW savings that a program can produce. These programs where chosen based on their general representation of the amount of savings that each can produce. These representative programs were matched to the survey data to quantify number of items/equipment that could be installed. For example, there are many lighting variations but only one indoor measure and one outdoor measure contains all the participants to calculate savings. This is due to the fact that inventory of lights cannot be known to this level of detail. Light can be calculated based on lumen required but there is no inventory of lights by type. All indoor office building lighting savings, therefore, are associated with one type of lighting; a 4 bulb fixture. The other lighting measures will be offered in programs, but are not specifically evaluated.

[24] This study has two Market Achievable cases, Base and High. In the high case utility budgets for marketing and customer incentives are increased by measure unit to achieve the higher penetration. The Economic Potential study used the base case per measure utility costs.

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



### *Global Assumptions:*

B&V method uses global assumptions in the EEPD Model. There are two types of inputs, for example, one time inputs, such as inflation and annual inputs such as the forecasted number of residential customers.

Some of the global assumptions were as follows:

1. A&G adder was six percent.
2. Inflation was based on a Moody's.com forecast provided by the Company.
3. Number of Residential Customers is forecasted by the Company.
4. Number of Commercial and Industrial Customers are forecasted by the Company.
5. Number of Motors is based the large commercial survey's inventory and input from FirstEnergy based on existing programs in other states.
6. Free Riders and Spill over percentages were set to zero.
7. Line loss Factor = 6.28%
8. Discount Rate = 8.48
9. Average Retail Rate: 10 cents (Supply and Distribution costs for Participant)

### *Survey Data*

The survey results for the residential and commercial classes are presented in Section 5.0. There were specific questions asked in the surveys to identify customer participation in programs. The residential survey was conducted by mail and the small and mid commercial survey was conducted by phone. The two surveys were utilized in both of the achievable scenarios and applied to the appropriate customer groups. Some survey questions were more complex, such as "how many CFL light bulbs do you have in service and how many hours are they on". This information is used to identify how many CFL light bulbs exist in the service territory in order to exclude them from both the economically achievable and achievable scenarios and identify how many CFL lights will be beneficial to install. Beneficial to install is defined as light bulbs on more than four hours.

### *Commercial Square Footage*

Some measures such as lighting required a calculation of current inventory. Some items have no relationship to the number of customers, and therefore the number of these items must be calculated. To calculate the number of 4-foot light bulbs in the Companies' territories, a proxy was needed. B&V used an Energy Information Administration Energy Consumption Series: Lighting in Commercial Buildings Study. The study identifies the proper number of lumens needed to light commercial space. This, along with the number of square feet of commercial space identified by the study, B&V was able to calculate the required number of 4-foot bulbs. Next, a count of T8 and T12 bulbs from the industrial survey was used to estimate the number of T12 bulbs. This became the basis for the number of bulbs that could be replaced in the Economic Potential study. This number

also became the benchmark used to identify the number of bulbs per year that could be replaced in the Market Potential Study.

### Measure Budgets

Budgets were determined for each measure based on implementation, incentive level and administrative and general costs. The Implementation budget has both a first year start-up cost and a per unit cost. The start-up costs range from about $1,000 to $10,000 based on whether a measure is stand alone or part of a collection of measures that will be grouped into a large program. The start-up cost includes one-time program set-up costs such as marketing costs that are not repeated, and program set up such as database development, design and printing of forms, etc. These are one-time costs that do no reoccur. The measure per unit cost is based upon costs such as; utility personnel, supplies, vendor costs, and sales incentives paid to retailers. This number ranges from around 50 cents per CFL or $140 for the refrigerator turn in program. The budget tables are presented in Appendix C on a per measure basis.

### Avoided Costs

Avoided generation costs are derived from the following sources:

For energy costs, the study team used the DOE.EIA 2009 Annual Energy Outlook (AEO). The AEO represents a national average energy price from the reference low oil price. The AEO low oil price case was used to be consistent with a previously preformed study for FirstEnergy Pennsylvania. Next a CIN Hub equivalent price was calculated. The CIN Hub equivalent prices were derived by applying a ratio based on three years of historic national average and CIN Hub prices. The CIN Hub equivalent price was used due to its better representation of the prices that Ohio customers would incur, per the AEO, rather than the national averages.

For capacity, the team has used a combination of market prices for MISO in the early years, and Western PJM prices for years 2011 and beyond. As indicated in a press release July 31, 2009, FE is to convert its transmission assets into PJM. For transmission and distribution, the team is including marginal T&D costs by creating a T&D number the Companies based on a PJM cost of transmission capacity used in the Pennsylvania ACT 129 filing of approximately 15 dollars per kW-year and 5 dollars per kW-yr distribution avoid cost.

### Savings Targets

The study is required to meet various incremental kWh and kW saving per year until 2025. These savings are based on the three previous year's sales and continue to grow until they reach 2 % of the average of the three previous years of sales. This target is incremental, meaning each year another "X"[25] percent of sales are needed. The source of the calculations for the savings was the FirstEnergy Sales and Peak Forecast provided by the Company for each service territory. This was the basis for the EEPD requirement calculations.

[25] "X" indicates the percentage changes by year.

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



## *Economically Achievable Results*

Economically achievable potential takes the programs that passed the Total Resource Test (TRC) and used a one-year time horizon where all savings are obtainable from all participating customers in the first year. The following tables provide the results of the EEPD models by Company.

For the three companies, economic potential ranges between 18% and 24% of peak demand. The largest of the three companies, OE, could reduce its peak demand by 24%, with the smallest company, TE, reaching 18% of its peak load. The energy savings associated with the economic potential programs varied between 16% for TE to 21% for OE and CEI. While these reductions reflect programs that passed the TRC test, it does not reflect customer choice. In other words, while the programs are cost-effective, not all eligible customers will elect to participate.

**Table 7.2.1 - kW and MWh Savings – OE**

| Economically Achievable Results | | |
|---|---|---|
| Electric Impacts/Savings | | |
| | Peak kW | Usage MWh |
| Actual Sales & Peak 2009 | 5,270,000 | 25,589,549 |
| Economically Achievable | 1,257,438 | 5,389,926 |
| % Economically Achievable | 24% | 21% |

**Table 7.2.2 - kW and MWh Savings – CEI**

| Economically Achievable Results | | |
|---|---|---|
| Electric Impacts/Savings | | |
| | Peak kW | Usage MWh |
| Actual Sales & Peak 2009 | 4,113,000 | 18,202,361 |
| Economically Achievable | 881,840 | 3,800,321 |
| % Economically Achievable | 21% | 21% |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



**Table 7.2.3 - kW and MWh Savings – TE**

| Economically Achievable Results | | |
|---|---|---|
| Electric Impacts/Savings | | |
| | Peak kW | Usage MWh |
| Actual Sales & Peak 2009 | 1,998,000 | 9,552,314 |
| Economically Achievable | 362,731 | 1,567,891 |
| % Economically Achievable | 18% | 16% |

While the details of the program measures across the companies varied, the average cost per participant unit was similar ranging from $91.27 for TE to just over $100 for the other two companies. The following tables show the costs by company.

**Table 7.3.1 - Participation and Total Participant Costs - OE**

| Participation and Total Participant Costs | |
|---|---|
| Total Participants Units (Customer - Items) | Total Participant Costs |
| 10,139,249 | $1,019,638,655 |

**Table 7.3.2 - Participation and Total Participant Costs - CEI**

| Participation and Total Participant Costs | |
|---|---|
| Total Participants Units (Customer - Items) | Total Participant Costs |
| 7,085,894 | $713,249,247 |

**Table 7.3.3 - Participation and Total Participant Costs - TE**

| Participation and Total Participant Costs | |
|---|---|
| Total Participants Units (Customer - Items) | Total Participant Costs |
| 3,136,243 | $286,257,773 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



The following tables present the costs associated the programs included in the economic potential estimates for each company. The implementation costs will vary and are a function of the unique programs for each company. Similarly, the incentives reflect the specific measures and the number of participants in the program. Savings costs (program costs divided by savings) are similar for both TE and CEI. However, costs are slightly higher for OE at $0/09/kWh and $386.85/kW.

**Table 7.4.1 - Utility Program Costs - OE**

| Utility Program Costs (Overall Costs) | |
|---|---|
| Category | Total |
| Implementation | $118,197,621 |
| Incentives | $368,237,409 |
| Total | $486,435,030 |
| Total Costs per kW & kWh Saved | Total |
| $/kW | $386.85 |
| $/kWh | $0.090 |

**Table 7.4.2 - Utility Program Costs - CEI**

| Utility Program Costs (Overall Costs) | |
|---|---|
| Category | Total |
| Implementation | $86,908,011 |
| Incentives | $231,702,789 |
| Total | $318,610,800 |
| Total Costs per kW & kWh Saved | Total |
| $/kW | $361.30 |
| $/kWh | $0.084 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



**Table 7.4.3 - Utility Program Costs – TE**

| Utility Program Costs (Overall Costs) | |
|---|---|
| Category | Total |
| Implementation | $34,645,518 |
| Incentives | $95,659,103 |
| Total | $130,304,621 |
| Total Costs per kW & kWh Saved | Total |
| $/kW | $359.23 |
| $/kWh | $0.083 |

The avoided energy costs from the first-year installations are expected to yield over $3.6 billion in avoided energy costs accounting for nearly 71% of total avoided costs of $5.2 billion across the three companies.

**Table 7.5.1 - Avoided Costs – OE**

| Avoided Costs (Cumulative Electric) | | | |
|---|---|---|---|
| | Energy | Capacity | Total Benefits |
| Cumulative Total | $2,151,801,426 | $890,493,950 | $3,042,295,376 |

**Table 7.5.2 - Avoided Costs – CEI**

| Avoided Costs (Cumulative Electric) | | | |
|---|---|---|---|
| | Energy | Capacity | Total Benefits |
| Cumulative Total | $1,523,572,278 | $618,233,750 | $2,141,806,028 |

**Table 7.5.3 - Avoided Costs – TE**

| Avoided Costs (Cumulative Electric) | | | |
|---|---|---|---|
| | Energy | Capacity | Total Benefits |
| Cumulative Total | $614,860,223 | $250,091,656 | $864,951,880 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



On an aggregate basis, all programs solidly pass the TRC requirements with ratios for companies hovering around 2.1. The incentive costs and program cost levels make the programs cost-effective from both the participant and utility perspectives.

**Table 7.6.1 Cost Test Results – OE**

| Cost Test Results | |
|---|---|
| Tests | Total (All Years) |
| Utility Test | 3.60 |
| TRC Test | 2.08 |
| Participant Test | 5.47 |

**Table 7.6.2 Cost Test Results – CEI**

| Cost Test Results | |
|---|---|
| Tests | Total (All Years) |
| Utility Test | 3.90 |
| TRC Test | 2.14 |
| Participant Test | 5.44 |

**Table 7.6.3 Cost Test Results – TE**

| Cost Test Results | |
|---|---|
| Tests | Total (All Years) |
| Utility Test | 3.90 |
| TRC Test | 2.15 |
| Participant Test | 5.44 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



The following tables show the cost-effectiveness of the program included in the economic potential analysis. Any areas in the tables that are grayed out indicate that the information was not applicable and therefore there is no value. The On-line Audit Program has the highest TRC values of all of the residential programs and this result was consistent across the three companies. The lowest TRC values for the residential programs, 1.30 for the Thermostat Direct Load Control Programs, was still clearly cost-effective. Similarly, the cost-benefit analysis for the commercial and industrial programs shows robust results for each program.

**Table 7.7.1 Summary of Measure Tests by Program - OE**

| Summary of Measure Tests by Program | | | | |
|---|---|---|---|---|
| Program Name | Class | Today's Value Utility Test | Today's Value TRC Test | Today's Value Participant Test |
| Comprehensive Residential | Res | 5.04 | 1.52 | 3.36 |
| Thermostat Direct Load Control | Res | 1.30 | 1.30 | |
| On-Line Audit | Res | 5.01 | 5.01 | |
| Efficient Appliances | Res | 3.22 | 2.15 | 13.28 |
| New Homes | Res | 2.38 | 1.78 | 9.24 |
| Efficient Equipment | Comm | 12.26 | 2.75 | 7.09 |
| New Construction | Comm | 6.85 | 3.48 | 18.69 |
| Efficient Equipment | Ind | 7.08 | 1.67 | 2.91 |
| Motors | Ind | 9.47 | 2.70 | 11.46 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



**Table 7.7.2 Summary of Measure Tests by Program – CEI**

| Summary of Measure Tests by Program | | | | |
|---|---|---|---|---|
| Program Name | Class | Today's Value Utility Test | Today's Value TRC Test | Today's Value Participant Test |
| Comprehensive Residential | Res | 5.15 | 1.42 | 2.54 |
| Thermostat Direct Load Control | Res | 1.30 | 1.30 | |
| On-Line Audit | Res | 5.01 | 5.01 | |
| Efficient Appliances | Res | 3.46 | 2.35 | 14.71 |
| New Homes | Res | 2.38 | 1.78 | 9.24 |
| Efficient Equipment | Comm | 12.49 | 2.80 | 7.25 |
| New Construction | Comm | 6.47 | 3.38 | 18.69 |
| Efficient Equipment | Ind | 7.08 | 1.67 | 2.91 |
| Motors | Ind | 9.47 | 2.70 | 11.47 |

**Table 7.7.3 Summary of Measure Tests by Program – TE**

| Summary of Measure Tests by Program | | | | |
|---|---|---|---|---|
| Program Name | Class | Today's Value Utility Test | Today's Value TRC Test | Today's Value Participant Test |
| Comprehensive Residential | Res | 5.08 | 1.41 | 2.57 |
| Thermostat Direct Load Control | Res | 1.30 | 1.30 | |
| On-Line Audit | Res | 5.01 | 5.01 | |
| Efficient Appliances | Res | 3.26 | 2.14 | 12.68 |
| New Homes | Res | 2.38 | 1.78 | 9.24 |
| Efficient Equipment | Comm | 11.89 | 2.89 | 7.68 |
| New Construction | Comm | 6.47 | 3.38 | 18.69 |
| Efficient Equipment | Ind | 7.08 | 1.67 | 2.91 |
| Motors | Ind | 9.47 | 2.70 | 11.45 |

Tables 7.8.1 through 7.83 summarize the measure costs by program.

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



### Table 7.8.1 Summary of Measure Costs by Program - OE

| Summary of Measure Costs by Program | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program Name | Class | Lost Revenue (Electric) | Participant Costs | Program Benefits | Total Avoid Costs Energy Costs | Total Avoid Costs Capacity | Implementation Costs | Incentive Costs |
| Comprehensive Residential | Res | 1,877,259,970 | 559,260,624 | 1,217,147,894 | 807,220,833 | 409,927,061 | 41,261,935 | 200,157,974 |
| Thermostat Direct Load Control | Res | 1,225,895 | 0 | 16,934,972 | 781,223 | 16,153,749 | 6,997,823 | 6,024,878 |
| On-Line Audit | Res | 20,786,814 | 0 | 9,103,130 | 7,358,520 | 1,744,610 | 1,468,935 | 346,477 |
| Efficient Appliances | Res | 601,104,304 | 45,265,276 | 293,306,764 | 245,423,377 | 47,883,387 | 36,938,287 | 54,106,754 |
| New Homes | Res | 44,572,437 | 4,826,463 | 34,107,079 | 13,433,349 | 20,673,730 | 3,097,948 | 11,261,746 |
| Efficient Equipment | Comm | 2,743,359,140 | 386,694,116 | 1,372,890,805 | 1,006,028,758 | 366,862,046 | 27,661,516 | 84,302,730 |
| New Construction | Comm | 119,585,686 | 6,399,846 | 45,170,188 | 28,359,592 | 16,810,597 | 193,824 | 6,399,846 |
| Efficient Equipment | Ind | 20,530,852 | 7,060,426 | 15,452,469 | 6,956,864 | 8,495,605 | 203,043 | 1,979,722 |
| Motors | Ind | 115,984,991 | 10,116,655 | 38,182,075 | 36,238,911 | 1,943,165 | 374,310 | 3,657,281 |

### Table 7.8.2 Summary of Measure Costs by Program – CEI

| Summary of Measure Costs by Program | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program Name | Class | Lost Revenue (Electric) | Participant Costs | Program Benefits | Total Avoid Costs Energy Costs | Total Avoid Costs Capacity | Implementation Costs | Incentive Costs |
| Comprehensive Residential | Res | 879,287,854 | 345,751,512 | 680,641,644 | 445,512,313 | 235,129,331 | 29,240,925 | 102,963,296 |
| Thermostat Direct Load Control | Res | 1,072,680 | 0 | 14,818,512 | 683,584 | 14,134,928 | 6,123,265 | 5,271,899 |
| On-Line Audit | Res | 15,020,143 | 0 | 6,577,743 | 5,317,122 | 1,260,621 | 1,061,423 | 250,366 |
| Efficient Appliances | Res | 411,886,377 | 27,998,381 | 205,172,397 | 168,821,379 | 36,351,018 | 25,834,168 | 33,388,480 |
| New Homes | Res | 32,207,077 | 3,487,497 | 24,645,036 | 9,706,647 | 14,938,389 | 2,238,510 | 8,137,494 |
| Efficient Equipment | Comm | 2,093,849,868 | 288,949,640 | 1,044,063,065 | 765,968,075 | 278,094,990 | 20,552,316 | 63,012,361 |
| New Construction | Comm | 90,029,470 | 4,818,091 | 34,006,145 | 21,350,373 | 12,655,772 | 437,758 | 4,818,091 |
| Efficient Equipment | Ind | 50,484,337 | 17,360,773 | 37,997,263 | 17,106,601 | 20,890,661 | 499,269 | 4,868,033 |
| Motors | Ind | 285,190,133 | 24,868,102 | 93,884,224 | 89,106,183 | 4,778,041 | 920,376 | 8,992,769 |

### Table 7.8.3 Summary of Measure Costs by Program – TE

| Summary of Measure Costs by Program | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Program Name | Class | Lost Revenue (Electric) | Participant Costs | Program Benefits | Total Avoid Costs Energy Costs | Total Avoid Costs Capacity | Implementation Costs | Incentive Costs |
| Comprehensive Residential | Res | 376,174,884 | 146,455,970 | 284,725,636 | 186,960,829 | 97,764,807 | 12,568,613 | 43,525,351 |
| Thermostat Direct Load Control | Res | 316,384 | 0 | 4,371,288 | 201,621 | 4,169,667 | 1,806,290 | 1,555,059 |
| On-Line Audit | Res | 6,155,961 | 0 | 2,695,868 | 2,179,206 | 516,662 | 435,021 | 102,630 |
| Efficient Appliances | Res | 158,825,906 | 12,522,250 | 77,534,870 | 65,080,637 | 12,454,234 | 9,255,148 | 14,516,246 |
| New Homes | Res | 13,199,784 | 1,429,320 | 10,100,549 | 3,978,183 | 6,122,366 | 917,434 | 3,335,080 |
| Efficient Equipment | Comm | 919,883,073 | 119,733,457 | 458,114,289 | 337,049,525 | 121,064,764 | 9,336,310 | 29,194,865 |
| New Construction | Comm | 39,741,626 | 2,126,845 | 15,011,301 | 9,424,675 | 5,586,626 | 193,239 | 2,126,845 |
| Efficient Equipment | Ind | 4,745,239 | 1,632,100 | 3,571,268 | 1,607,909 | 1,963,359 | 46,931 | 457,570 |
| Motors | Ind | 26,813,171 | 2,342,581 | 8,826,809 | 8,377,637 | 449,173 | 86,531 | 845,457 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



For the Company, the economic potential represents energy savings of over 109 GWh and nearly 2.5 GW of capacity savings. Roughly 75% of the total savings are produced by the Comprehensive Residential and the Commercial Efficient Equipment Programs.

**Table 7.9.1 - Summary of Lifetime Measure Savings for Total Economically Achievable by Program - OE**

| Summary of Lifetime Measure Savings for Total Economically Achievable by Program | | | |
|---|---|---|---|
| Program | Class | kW | MWh |
| Comprehensive Residential | Res | 502,695 | 18,772,600 |
| Thermostat Direct Load Control | Res | 20,125 | 12,259 |
| On-Line Audit | Res | 5,289 | 207,868 |
| Efficient Appliances | Res | 80,865 | 6,011,043 |
| New Homes | Res | 20,797 | 445,724 |
| Efficient Equipment | Comm | 592,832 | 27,433,591 |
| New Construction | Comm | 13,632 | 1,195,857 |
| Efficient Equipment | Ind | 8,292 | 205,309 |
| Motors | Ind | 2,188 | 1,159,850 |

**Table 7.9.2 - Summary of Lifetime Measure Savings for Total Economically Achievable by Program - CEI**

| Summary of Lifetime Measure Savings for Total Economically Achievable by Program | | | |
|---|---|---|---|
| Program | Class | kW | MWh |
| Comprehensive Residential | Res | 292,224 | 8,792,879 |
| Thermostat Direct Load Control | Res | 17,610 | 10,727 |
| On-Line Audit | Res | 3,822 | 150,201 |
| Efficient Appliances | Res | 61,858 | 4,118,864 |
| New Homes | Res | 15,028 | 322,071 |
| Efficient Equipment | Comm | 447,266 | 20,938,499 |
| New Construction | Comm | 10,263 | 900,295 |
| Efficient Equipment | Ind | 20,391 | 504,843 |
| Motors | Ind | 5,381 | 2,851,901 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



**Table 7.9.3 - Summary of Lifetime Measure Savings for Total Economically Achievable by Program - TE**

| Summary of Lifetime Measure Savings for Total Economically Achievable by Program | | | |
|---|---|---|---|
| Program | Class | kW | MWh |
| Comprehensive Residential | Res | 121,388 | 3,761,749 |
| Thermostat Direct Load Control | Res | 5,195 | 3,164 |
| On-Line Audit | Res | 1,566 | 61,560 |
| Efficient Appliances | Res | 21,070 | 1,588,259 |
| New Homes | Res | 6,159 | 131,998 |
| Efficient Equipment | Comm | 196,458 | 9,198,831 |
| New Construction | Comm | 4,530 | 397,416 |
| Efficient Equipment | Ind | 1,916 | 47,452 |
| Motors | Ind | 506 | 268,132 |

## *EEPD Achievable Results*

Achievable potential has been estimated by including measures that either passed the TRC or are important to their potential impacts. The following tables present the Base and High Case results of this analysis by Company. The results are calculated on a year-by-year basis. However, the tables below only display the years 2010, 2015, 2020 and 2025.

For the Base Case market potential, defined to include only customers who indicated that they would participate or install equipment, the Residential Efficient Appliance Program accounts for the largest share of residential energy savings. However, for economic potential, the Comprehensive Residential Program generates the most energy savings. Among the commercial and industrial programs, the Commercial Efficient Equipment Program is expected to have the largest savings impact.

**Table 7.10.1 - Base Case Summary of Measure Energy Lifetime Savings by Program - OE**

| Base Case<br>Summary of Measure Energy Lifetime Savings by Program | | | | | |
|---|---|---|---|---|---|
| Program Name | Class | 2010 MWh | 2015 MWh | 2020 MWh | 2025 MWh |
| Comprehensive Residential | Res | 30,961 | 183,127 | 324,116 | 464,592 |
| Thermostat Direct Load Control | Res | 202 | 1,009 | 1,009 | 1,009 |
| On-Line Audit | Res | 6,337 | 37,972 | 64,238 | 89,180 |
| Efficient Appliances | Res | 67,978 | 367,660 | 515,552 | 644,578 |
| New Homes | Res | 691 | 4,163 | 7,661 | 11,195 |
| Efficient Equipment | Comm | 287,078 | 1,451,830 | 1,553,134 | 1,648,300 |
| New Construction | Comm | 2,619 | 15,770 | 29,022 | 42,407 |
| Efficient Equipment | Ind | 28,830 | 144,447 | 146,137 | 147,845 |
| Motors | Ind | 1,453 | 8,707 | 15,943 | 23,179 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



**Table 7.10.2 - Base Case Summary of Measure Energy Lifetime Savings by Program - CEI**

| Base Case<br>Summary of Measure Energy Lifetime Savings by Program | | | | | |
|---|---|---|---|---|---|
| Program Name | Class | 2010 MWh | 2015 MWh | 2020 MWh | 2025 MWh |
| Comprehensive Residential | Res | 22,942 | 135,758 | 240,536 | 344,632 |
| Thermostat Direct Load Control | Res | 177 | 883 | 883 | 883 |
| On-Line Audit | Res | 4,579 | 27,438 | 46,417 | 64,440 |
| Efficient Appliances | Res | 46,168 | 250,009 | 352,117 | 443,363 |
| New Homes | Res | 474 | 2,854 | 5,251 | 7,673 |
| Efficient Equipment | Comm | 217,853 | 1,098,364 | 1,162,897 | 1,221,535 |
| New Construction | Comm | 1,971 | 11,872 | 21,849 | 31,926 |
| Efficient Equipment | Ind | 33,195 | 166,645 | 170,598 | 174,591 |
| Motors | Ind | 2,135 | 12,793 | 23,426 | 34,059 |

**Table 7.10.3 - Base Case Summary of Measure Energy Lifetime Savings by Program – TE**

| Base Case<br>Summary of Measure Energy Lifetime Savings by Program | | | | | |
|---|---|---|---|---|---|
| Program Name | Class | 2010 MWh | 2015 MWh | 2020 MWh | 2025 MWh |
| Comprehensive Residential | Res | 10,232 | 60,871 | 109,270 | 156,688 |
| Thermostat Direct Load Control | Res | 52 | 260 | 260 | 260 |
| On-Line Audit | Res | 1,877 | 11,245 | 19,024 | 26,410 |
| Efficient Appliances | Res | 19,407 | 104,890 | 146,321 | 182,299 |
| New Homes | Res | 159 | 958 | 1,764 | 2,577 |
| Efficient Equipment | Comm | 110,392 | 555,885 | 593,674 | 630,006 |
| New Construction | Comm | 870 | 5,241 | 9,645 | 14,093 |
| Efficient Equipment | Ind | 20,173 | 100,872 | 101,091 | 101,313 |
| Motors | Ind | 972 | 5,824 | 10,665 | 15,506 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



When the market potential for demand savings are analyzed for the residential programs, the Comprehensive Residential Program is expected to produce the greatest level of savings. Again, for the commercial and industrial programs, the Efficient Equipment Program will generate the largest demand savings of the programs in that sector.

**Table 7.11.1 - Base Case Summary of Measure Demand Lifetime Savings by Program – OE**

| Base Case<br>Summary of Measure Demand Lifetime Savings by Program | | | | | |
|---|---|---|---|---|---|
| Program Name | Class | 2010 kW | 2015 kW | 2020 kW | 2025 kW |
| Comprehensive Residential | Res | 11,597 | 69,360 | 125,830 | 182,582 |
| Thermostat Direct Load Control | Res | 4,209 | 21,028 | 21,028 | 21,028 |
| On-Line Audit | Res | 756 | 4,528 | 7,659 | 10,633 |
| Efficient Appliances | Res | 6,548 | 36,686 | 56,860 | 76,846 |
| New Homes | Res | 544 | 3,278 | 6,033 | 8,815 |
| Efficient Equipment | Comm | 24,057 | 125,967 | 153,982 | 180,411 |
| New Construction | Comm | 839 | 5,054 | 9,302 | 13,592 |
| Efficient Equipment | Ind | 6,404 | 32,266 | 33,602 | 34,952 |
| Motors | Ind | 57 | 344 | 630 | 916 |

**Table 7.11.2 - Base Case Summary of Measure Demand Lifetime Savings by Program – CEI**

| Base Case<br>Summary of Measure Demand Lifetime Savings by Program | | | | | |
|---|---|---|---|---|---|
| Program Name | Class | 2010 kW | 2015 kW | 2020 kW | 2025 kW |
| Comprehensive Residential | Res | 9,121 | 54,617 | 99,363 | 144,311 |
| Thermostat Direct Load Control | Res | 3,683 | 18,399 | 18,399 | 18,399 |
| On-Line Audit | Res | 546 | 3,272 | 5,534 | 7,683 |
| Efficient Appliances | Res | 4,661 | 26,124 | 40,517 | 54,805 |
| New Homes | Res | 373 | 2,247 | 4,135 | 6,042 |
| Efficient Equipment | Comm | 19,323 | 100,308 | 118,436 | 135,034 |
| New Construction | Comm | 632 | 3,805 | 7,003 | 10,233 |
| Efficient Equipment | Ind | 8,515 | 43,156 | 46,199 | 49,273 |
| Motors | Ind | 109 | 655 | 1,200 | 1,744 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



**Table 7.11.3 - Base Case Summary of Measure Demand Lifetime Savings by Program – TE**

| Base Case<br>Summary of Measure Demand Lifetime Savings by Program | | | | | |
|---|---|---|---|---|---|
| Program Name | Class | 2010 kW | 2015 kW | 2020 kW | 2025 kW |
| Comprehensive Residential | Res | 4,074 | 24,373 | 44,253 | 64,138 |
| Thermostat Direct Load Control | Res | 1,086 | 5,426 | 5,426 | 5,426 |
| On-Line Audit | Res | 224 | 1,341 | 2,268 | 3,149 |
| Efficient Appliances | Res | 1,806 | 10,108 | 15,629 | 21,106 |
| New Homes | Res | 125 | 755 | 1,389 | 2,029 |
| Efficient Equipment | Comm | 10,644 | 55,345 | 65,877 | 76,033 |
| New Construction | Comm | 279 | 1,680 | 3,091 | 4,517 |
| Efficient Equipment | Ind | 4,437 | 22,201 | 22,359 | 22,519 |
| Motors | Ind | 21 | 125 | 229 | 333 |

The program and participant costs are shown for each company in the tables below. The number of participants represents the total number of customers or the total number of items (i.e. CFL Bulbs, Commercial Lighting Fixtures) in each program. Also customers may participate in multiple programs in the year and will be counted in each program. Participant costs are derived based upon the expected mix of measures installed under the programs. Utility costs are higher in the first five years due to the initial use of direct load control programs to meet peak goals. Also, utility costs are higher in the first-year of the program reflecting the one-time program start-up costs. Tables 7.12.1-3 show the total costs by company. Tables 7.13.1-3 show the breakdown of the utility costs by incentive and program costs.

**Table 7.12.1 – Base Case Achievable Results and Costs - OE**

| Base Case<br>Achievable Results and Costs | | | | | |
|---|---|---|---|---|---|
| YEAR | 2010 | 2015 | 2020 | 2025 | Total of All Years |
| New Participants | 1,322,543 | 295,209 | 214,905 | 214,215 | |
| Participant Costs | 100,524,889 | 30,296,066 | 30,011,131 | 30,235,604 | 848,372,573 |
| Utility Costs | 49,305,189 | 14,646,764 | 14,821,924 | 14,877,648 | 359,400,977 |
| **Total Costs ($)** | **149,830,078** | **44,942,830** | **44,833,054** | **45,113,253** | **1,207,773,551** |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



**Table 7.12.2 – Base Case Achievable Results and Costs – CEI**

| Base Case Achievable Results and Costs | | | | | |
|---|---|---|---|---|---|
| YEAR | 2010 | 2015 | 2020 | 2025 | Total of All Years |
| New Participants | 1,059,988 | 197,577 | 156,090 | 154,933 | |
| Participant Costs | 75,485,132 | 21,364,236 | 21,152,554 | 21,313,320 | 639,173,884 |
| Utility Costs | 42,234,084 | 10,426,359 | 10,593,300 | 10,617,088 | 271,972,188 |
| **Total Costs ($)** | **117,719,216** | **31,790,595** | **31,745,854** | **31,930,408** | **911,146,072** |

**Table 7.12.3 – Base Case Achievable Results and Costs – TE**

| Base Case Achievable Results and Costs | | | | | |
|---|---|---|---|---|---|
| YEAR | 2010 | 2015 | 2020 | 2025 | Total of All Years |
| New Participants | 533,476 | 88,241 | 63,675 | 61,857 | |
| Participant Costs | 46,962,794 | 9,820,964 | 9,752,108 | 9,827,110 | 344,753,253 |
| Utility Costs | 20,015,092 | 4,418,003 | 4,468,488 | 4,449,286 | 134,115,571 |
| **Total Costs ($)** | **66,977,887** | **14,238,966** | **14,220,596** | **14,276,396** | **478,868,824** |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



**Table 7.13.1 – Base Case Utility Program Costs - OE**

| Base Case Utility Program Costs ($) | | | | |
|---|---|---|---|---|
| Utility Program Costs ($) | 2010 | 2015 | 2020 | 2025 |
| Implementation | 13,438,497 | 4,918,488 | 4,840,832 | 4,871,540 |
| Incentives | 35,866,692 | 9,728,277 | 9,981,092 | 10,006,109 |
| **Total** | **49,305,189** | **14,646,764** | **14,821,924** | **14,877,648** |

**Table 7.13.2 – Base Case Utility Program Costs – CEI**

| Base Case Utility Program Costs ($) | | | | |
|---|---|---|---|---|
| Utility Program Costs ($) | 2010 | 2015 | 2020 | 2025 |
| Implementation | 11,209,096 | 3,453,344 | 3,398,631 | 3,417,235 |
| Incentives | 31,024,988 | 6,973,015 | 7,194,669 | 7,199,853 |
| **Total** | **42,234,084** | **10,426,359** | **10,593,300** | **10,617,088** |

**Table 7.13.3 – Base Case Utility Program Costs – TE**

| Base Case Utility Program Costs ($) | | | | |
|---|---|---|---|---|
| Utility Program Costs ($) | 2010 | 2015 | 2020 | 2025 |
| Implementation | 5,662,638 | 1,418,638 | 1,395,573 | 1,397,704 |
| Incentives | 14,352,454 | 2,999,365 | 3,072,915 | 3,051,583 |
| **Total** | **20,015,092** | **4,418,003** | **4,468,488** | **4,449,286** |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



Across the three companies, the savings associated with the market potential programs will result in over $178 million in avoided cost savings with nearly 75% of the savings occurring from avoided energy consumption.

**Table 7.14.1 – Base Case Avoided Costs - OE**

| Base Case Avoided Costs (Cumulative Electric) | | | | |
|---|---|---|---|---|
| Year | 2010 | 2015 | 2020 | 2025 |
| Energy $ | 241,093,995 | 46,320,851 | 57,309,192 | 64,828,501 |
| Capacity $ | 49,014,991 | 19,465,205 | 20,588,678 | 21,324,411 |
| **Total** | **290,108,986** | **65,786,056** | **77,897,870** | **86,152,912** |

**Table 7.14.2 – Base Case Avoided Costs - CEI**

| Base Case Avoided Costs (Cumulative Electric) | | | | |
|---|---|---|---|---|
| Year | 2010 | 2015 | 2020 | 2025 |
| Energy $ | 196,176,973 | 33,355,110 | 41,419,023 | 46,850,591 |
| Capacity $ | 42,789,975 | 14,644,104 | 15,456,609 | 16,008,547 |
| **Total** | **238,966,948** | **47,999,214** | **56,875,632** | **62,859,138** |

**Table 7.14.3 – Base Case Avoided Costs – TE**

| Base Case Avoided Costs (Cumulative Electric) | | | | |
|---|---|---|---|---|
| Year | 2010 | 2015 | 2020 | 2025 |
| Energy $ | 91,100,952 | 15,373,312 | 19,085,720 | 21,492,372 |
| Capacity $ | 20,249,371 | 6,504,462 | 6,904,558 | 7,142,035 |
| **Total** | **111,350,323** | **21,877,774** | **25,990,278** | **28,634,407** |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



The tables below show the results for the cost-benefit analysis for the individual programs. As was the case in the economic potential analysis, all programs for the market potential are clearly cost effective based upon the TRC test. Furthermore, programs are also cost-effective under both the utility and participant tests

**Table 7.15.1 Base Case Summary of Measure Tests by Program - OE**

| Summary of Measure Tests by Program for Base Case Year 2025 | | | | |
|---|---|---|---|---|
| Program Name | Class | Utility Test | TRC Test | Participant Test |
| Comprehensive Residential | Res | 5.20 | 1.36 | 2.39 |
| Thermostat Direct Load Control | Res | 1.30 | 1.30 | |
| On-Line Audit | Res | 6.60 | 6.60 | |
| Efficient Appliances | Res | 2.42 | 1.06 | 2.85 |
| New Homes | Res | 2.60 | 1.98 | 8.87 |
| Efficient Equipment | Comm | 10.45 | 2.08 | 3.56 |
| New Construction | Comm | 7.63 | 3.98 | 18.69 |
| Efficient Equipment | Ind | 7.86 | 1.86 | 2.63 |
| Motors | Ind | 6.21 | 2.41 | 9.07 |

**Table 7.15.2 Base Case Summary of Measure Tests by Program – CEI**

| Summary of Measure Tests by Program for Base Case Year 2025 | | | | |
|---|---|---|---|---|
| Program Name | Class | Utility Test | TRC Test | Participant Test |
| Comprehensive Residential | Res | 5.39 | 1.41 | 2.37 |
| Thermostat Direct Load Control | Res | 1.30 | 1.30 | |
| On-Line Audit | Res | 6.60 | 6.60 | |
| Efficient Appliances | Res | 2.48 | 1.10 | 3.06 |
| New Homes | Res | 2.60 | 1.98 | 8.87 |
| Efficient Equipment | Comm | 10.12 | 2.06 | 3.49 |
| New Construction | Comm | 7.63 | 3.98 | 18.69 |
| Efficient Equipment | Ind | 7.90 | 1.86 | 2.64 |
| Motors | Ind | 4.57 | 2.13 | 9.01 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



**Table 7.15.3 Base Case Summary of Measure Tests by Program – TE**

| Summary of Measure Tests by Program for Base Case Year 2025 | | | | |
|---|---|---|---|---|
| Program Name | Class | Utility Test | TRC Test | Participant Test |
| Comprehensive Residential | Res | 5.17 | 1.36 | 2.34 |
| Thermostat Direct Load Control | Res | 1.28 | 1.28 | |
| On-Line Audit | Res | 6.58 | 6.58 | |
| Efficient Appliances | Res | 2.48 | 1.12 | 3.13 |
| New Homes | Res | 2.59 | 1.97 | 8.87 |
| Efficient Equipment | Comm | 12.00 | 2.13 | 3.56 |
| New Construction | Comm | 7.62 | 3.98 | 18.69 |
| Efficient Equipment | Ind | 7.29 | 1.76 | 2.58 |
| Motors | Ind | 14.98 | 3.07 | 9.17 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



The costs and benefits for the programs are shown below. These were the components used in the cost-effectiveness analysis to calculate the cost-benefit ratios described above.

**Table 7.16.1 – Base Case Summary of Measure Costs & Benefits – OE**

| Base Case<br>Summary of Measure Costs and Benefits by Class and Program | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| RESIDENTIAL PROGRAMS | Year | Lost Revenue (Electric) | Participant Costs | Program Benefits | Total Avoided Energy | Total Avoided Capacity | Total Utility Budget Costs | Incentive Costs |
| Comprehensive Residential | 2010 | 42,252,922 | 16,113,601 | 24,799,215 | 16,914,429 | 7,884,786 | 6,292,795 | 4,974,455 |
| | 2015 | | | 29,483,327 | 19,915,913 | 9,567,414 | 5,667,635 | 4,451,841 |
| | 2020 | | | 35,246,128 | 24,964,110 | 10,282,018 | 5,690,347 | 4,468,748 |
| | 2025 | 38,545,130 | 16,119,757 | 38,504,305 | 27,876,754 | 10,627,551 | 5,680,537 | 4,461,075 |
| FirstEnergy CFL Program | 2010 | 14,567,294 | 0 | 55,203,560 | 51,349,713 | 3,853,848 | 10,624,295 | 9,238,518 |
| | 2015 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2020 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Thermostat Direct Load Control | 2010 | 246,066 | 0 | 3,535,181 | 156,810 | 3,378,371 | 2,714,086 | 1,237,844 |
| | 2015 | | | 0 | 0 | 0 | 0 | 0 |
| | 2020 | | | 0 | 0 | 0 | 0 | 0 |
| | 2025 | | | 0 | 0 | 0 | 0 | 0 |
| On-Line Audit | 2010 | 2,969,673 | 0 | 1,300,503 | 1,051,263 | 249,241 | 269,882 | 49,525 |
| | 2015 | | | 1,713,425 | 1,347,603 | 365,822 | 259,601 | 49,492 |
| | 2020 | | | 1,792,306 | 1,477,436 | 314,870 | 682,412 | 516,305 |
| | 2025 | 2,346,843 | 0 | 2,145,472 | 1,815,413 | 330,059 | 682,412 | 516,305 |
| Efficient Appliances | 2010 | 56,280,360 | 9,521,325 | 23,708,816 | 19,953,108 | 3,755,708 | 8,199,766 | 3,956,689 |
| | 2015 | | | 15,403,952 | 12,319,847 | 3,084,105 | 6,374,207 | 3,367,273 |
| | 2020 | | | 18,612,150 | 15,263,752 | 3,348,399 | 6,168,277 | 3,171,699 |
| | 2025 | 23,163,445 | 8,125,900 | 20,939,627 | 17,455,123 | 3,484,504 | 6,214,214 | 3,188,393 |
| New Homes | 2010 | 1,166,176 | 131,530 | 892,583 | 351,465 | 541,118 | 427,953 | 306,903 |
| | 2015 | | | 1,098,536 | 446,598 | 651,938 | 422,169 | 309,984 |
| | 2020 | | | 1,233,798 | 541,957 | 691,841 | 426,403 | 313,096 |
| | 2025 | 1,201,655 | 135,531 | 1,310,223 | 597,168 | 713,055 | 430,679 | 316,240 |
| COMMERCIAL PROGRAMS | | | | | | | | |
| Efficient Equipment | 2010 | 261,928,990 | 53,536,951 | 104,258,635 | 87,806,597 | 16,452,038 | 15,448,681 | 11,672,958 |
| | 2015 | | | 13,336,091 | 9,139,783 | 4,196,308 | 1,276,152 | 963,834 |
| | 2020 | | | 15,577,590 | 11,312,154 | 4,265,436 | 1,202,436 | 920,760 |
| | 2025 | 17,788,256 | 4,994,249 | 17,429,181 | 12,992,704 | 4,436,476 | 1,212,659 | 928,937 |
| New Construction | 2010 | 7,362,628 | 394,024 | 2,781,029 | 1,746,038 | 1,034,992 | 434,824 | 394,024 |
| | 2015 | | | 3,315,997 | 2,108,923 | 1,207,074 | 434,390 | 397,980 |
| | 2020 | | | 3,744,964 | 2,474,339 | 1,270,625 | 438,749 | 401,976 |
| | 2025 | 7,586,627 | 406,012 | 3,993,094 | 2,687,713 | 1,305,381 | 443,151 | 406,012 |
| INDUSTRIAL PROGRAMS | | | | | | | | |
| Efficient Equipment | 2010 | 39,702,523 | 20,602,268 | 18,210,422 | 12,481,366 | 5,729,056 | 4,709,242 | 3,911,026 |
| | 2015 | | | 544,992 | 214,489 | 330,503 | 69,322 | 63,122 |
| | 2020 | | | 610,520 | 260,521 | 349,999 | 70,012 | 63,756 |
| | 2025 | 602,347 | 228,965 | 647,616 | 287,183 | 360,433 | 70,709 | 64,396 |
| Motors | 2010 | 2,042,622 | 225,189 | 689,213 | 638,207 | 51,006 | 183,663 | 124,750 |
| | 2015 | | | 889,734 | 827,694 | 62,040 | 143,288 | 124,750 |
| | 2020 | | | 1,080,413 | 1,014,923 | 65,490 | 143,288 | 124,750 |
| | 2025 | 2,042,622 | 225,189 | 1,183,394 | 1,116,443 | 66,951 | 143,288 | 124,750 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



**Table 7.16.2 – Base Case Summary of Measure Costs & Benefits – CEI**

| Base Case<br>Summary of Measure Costs and Benefits by Class and Program | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| RESIDENTIAL PROGRAMS | Year | Lost Revenue (Electric) | Participant Costs | Program Benefits | Total Avoided Energy | Total Avoided Capacity | Total Utility Budget Costs | Incentive Costs |
| Comprehensive Residential | 2010 | 30,691,125 | 11,776,031 | 18,618,040 | 12,587,313 | 6,030,727 | 4,571,493 | 3,612,394 |
| | 2015 | | | 22,289,525 | 14,877,293 | 7,412,232 | 4,133,643 | 3,248,860 |
| | 2020 | | | 26,690,192 | 18,713,366 | 7,976,826 | 4,150,143 | 3,261,166 |
| | 2025 | 27,988,220 | 11,800,841 | 29,170,468 | 20,922,697 | 8,247,771 | 4,134,058 | 3,248,846 |
| FirstEnergy CFL Program | 2010 | 10,526,011 | 0 | 39,888,896 | 37,104,189 | 2,784,707 | 10,624,295 | 9,238,518 |
| | 2015 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2020 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Thermostat Direct Load Control | 2010 | 215,310 | 0 | 3,093,311 | 137,210 | 2,956,101 | 2,376,815 | 1,083,123 |
| | 2015 | | | 0 | 0 | 0 | 0 | 0 |
| | 2020 | | | 0 | 0 | 0 | 0 | 0 |
| | 2025 | | | 0 | 0 | 0 | 0 | 0 |
| On-Line Audit | 2010 | 2,145,863 | 0 | 939,734 | 759,634 | 180,099 | 197,936 | 35,795 |
| | 2015 | | | 1,238,084 | 973,749 | 264,335 | 187,655 | 35,762 |
| | 2020 | | | 1,295,082 | 1,067,564 | 227,518 | 493,169 | 373,071 |
| | 2025 | 1,695,778 | 0 | 1,550,272 | 1,311,778 | 238,493 | 493,169 | 373,071 |
| Efficient Appliances | 2010 | 37,856,299 | 6,192,741 | 16,037,469 | 13,382,602 | 2,654,867 | 5,561,920 | 2,624,335 |
| | 2015 | | | 10,479,658 | 8,296,402 | 2,183,256 | 4,231,956 | 2,172,845 |
| | 2020 | | | 12,872,753 | 10,500,981 | 2,371,771 | 4,139,878 | 2,080,316 |
| | 2025 | 16,025,046 | 5,244,716 | 14,485,271 | 12,016,417 | 2,468,854 | 4,165,449 | 2,086,052 |
| New Homes | 2010 | 799,348 | 90,156 | 611,816 | 240,909 | 370,906 | 296,641 | 210,365 |
| | 2015 | | | 752,985 | 306,118 | 446,867 | 289,539 | 212,477 |
| | 2020 | | | 845,699 | 371,481 | 474,218 | 292,440 | 214,610 |
| | 2025 | 823,667 | 92,899 | 898,084 | 409,325 | 488,759 | 295,371 | 216,765 |
| COMMERCIAL PROGRAMS | | | | | | | | |
| Efficient Equipment | 2010 | 198,044,808 | 37,467,343 | 79,498,635 | 66,301,819 | 13,196,816 | 12,370,570 | 9,067,768 |
| | 2015 | | | 8,162,614 | 5,602,270 | 2,560,344 | 806,844 | 603,500 |
| | 2020 | | | 9,339,000 | 6,808,586 | 2,530,414 | 736,090 | 561,479 |
| | 2025 | 10,507,188 | 3,011,942 | 10,497,350 | 7,861,227 | 2,636,123 | 742,554 | 566,592 |
| New Construction | 2010 | 5,542,917 | 296,639 | 2,093,684 | 1,314,496 | 779,188 | 328,591 | 296,639 |
| | 2015 | | | 2,496,431 | 1,587,692 | 908,740 | 327,090 | 299,618 |
| | 2020 | | | 2,819,377 | 1,862,793 | 956,584 | 330,371 | 302,626 |
| | 2025 | 5,711,553 | 305,664 | 3,006,181 | 2,023,431 | 982,750 | 333,686 | 305,664 |
| INDUSTRIAL PROGRAMS | | | | | | | | |
| Efficient Equipment | 2010 | 46,923,242 | 22,276,509 | 22,420,685 | 14,766,034 | 7,654,651 | 5,573,516 | 4,600,249 |
| | 2015 | | | 1,245,634 | 495,391 | 750,243 | 157,699 | 144,152 |
| | 2020 | | | 1,397,570 | 602,947 | 794,623 | 159,276 | 145,599 |
| | 2025 | 1,385,674 | 524,137 | 1,483,601 | 665,239 | 818,362 | 160,869 | 147,061 |
| Motors | 2010 | 3,001,383 | 333,122 | 1,034,851 | 937,767 | 97,085 | 332,307 | 255,803 |
| | 2015 | | | 1,334,282 | 1,216,195 | 118,087 | 291,932 | 255,803 |
| | 2020 | | | 1,615,959 | 1,491,305 | 124,654 | 291,932 | 255,803 |
| | 2025 | 3,001,383 | 333,122 | 1,767,911 | 1,640,477 | 127,435 | 291,932 | 255,803 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



**Table 7.16.3 – Base Case Summary of Measure Costs & Benefits – TE**

| Base Case<br>Summary of Measure Costs and Benefits by Class and Program | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| RESIDENTIAL PROGRAMS | Year | Lost Revenue (Electric) | Participant Costs | Program Benefits | Total Avoided Energy | Total Avoided Capacity | Total Utility Budget Costs | Incentive Costs |
| Comprehensive Residential | 2010 | 13,648,010 | 5,497,568 | 8,275,893 | 5,560,480 | 2,715,413 | 2,112,863 | 1,654,194 |
| | 2015 | | | 10,062,272 | 6,749,784 | 3,312,488 | 1,947,620 | 1,532,962 |
| | 2020 | | | 12,045,969 | 8,483,631 | 3,562,338 | 1,954,527 | 1,538,051 |
| | 2025 | 12,845,323 | 5,497,213 | 13,104,880 | 9,432,174 | 3,672,706 | 1,928,754 | 1,518,442 |
| FirstEnergy CFL Program | 2010 | 4,313,992 | 0 | 16,348,109 | 15,206,822 | 1,141,287 | 3,146,303 | 2,735,916 |
| | 2015 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2020 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Thermostat Direct Load Control | 2010 | 63,491 | 0 | 912,161 | 40,461 | 871,700 | 711,985 | 319,393 |
| | 2015 | | | 0 | 0 | 0 | 0 | 0 |
| | 2020 | | | 0 | 0 | 0 | 0 | 0 |
| | 2025 | | | 0 | 0 | 0 | 0 | 0 |
| On-Line Audit | 2010 | 879,552 | 0 | 385,180 | 311,361 | 73,820 | 87,345 | 14,690 |
| | 2015 | | | 507,418 | 399,082 | 108,335 | 77,064 | 14,657 |
| | 2020 | | | 530,778 | 437,531 | 93,246 | 202,276 | 152,900 |
| | 2025 | 695,000 | 0 | 635,365 | 537,621 | 97,744 | 202,276 | 152,900 |
| Efficient Appliances | 2010 | 15,835,173 | 2,433,648 | 6,575,995 | 5,558,221 | 1,017,773 | 2,194,423 | 1,037,146 |
| | 2015 | | | 4,160,711 | 3,330,975 | 829,736 | 1,674,609 | 867,699 |
| | 2020 | | | 5,007,835 | 4,106,032 | 901,804 | 1,608,383 | 805,858 |
| | 2025 | 6,277,221 | 2,003,727 | 5,610,344 | 4,671,399 | 938,945 | 1,608,538 | 798,799 |
| New Homes | 2010 | 268,458 | 30,279 | 205,476 | 80,908 | 124,567 | 106,599 | 70,650 |
| | 2015 | | | 252,887 | 102,809 | 150,079 | 97,589 | 71,359 |
| | 2020 | | | 284,025 | 124,760 | 159,264 | 98,564 | 72,076 |
| | 2025 | 276,625 | 31,200 | 301,618 | 137,470 | 164,148 | 99,548 | 72,800 |
| COMMERCIAL PROGRAMS | | | | | | | | |
| Efficient Equipment | 2010 | 103,598,332 | 24,375,966 | 42,014,796 | 34,530,514 | 7,484,282 | 8,121,581 | 5,620,978 |
| | 2015 | | | 5,150,593 | 3,509,227 | 1,641,366 | 429,130 | 340,422 |
| | 2020 | | | 6,100,455 | 4,399,682 | 1,700,773 | 411,214 | 330,359 |
| | 2025 | 7,059,862 | 1,982,027 | 6,805,398 | 5,037,352 | 1,768,046 | 415,098 | 333,553 |
| New Construction | 2010 | 2,446,805 | 130,945 | 924,213 | 580,257 | 343,956 | 147,843 | 130,945 |
| | 2015 | | | 1,101,997 | 700,853 | 401,144 | 144,527 | 132,260 |
| | 2020 | | | 1,244,555 | 822,291 | 422,264 | 145,975 | 133,588 |
| | 2025 | 2,521,246 | 134,929 | 1,327,016 | 893,201 | 433,814 | 147,438 | 134,929 |
| INDUSTRIAL PROGRAMS | | | | | | | | |
| Efficient Equipment | 2010 | 27,778,872 | 14,345,319 | 12,657,453 | 8,712,487 | 3,944,966 | 3,307,319 | 2,736,217 |
| | 2015 | | | 65,681 | 26,879 | 38,802 | 9,009 | 7,680 |
| | 2020 | | | 73,944 | 32,839 | 41,105 | 9,093 | 7,757 |
| | 2025 | 74,544 | 28,944 | 78,626 | 36,289 | 42,336 | 9,178 | 7,835 |
| Motors | 2010 | 1,366,451 | 149,070 | 445,449 | 426,941 | 18,508 | 78,831 | 32,325 |
| | 2015 | | | 576,214 | 553,702 | 22,512 | 38,456 | 32,325 |
| | 2020 | | | 702,716 | 678,952 | 23,764 | 38,456 | 32,325 |
| | 2025 | 1,366,451 | 149,070 | 771,161 | 746,866 | 24,294 | 38,456 | 32,325 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



The costs and benefits for each program were aggregated to create an overall cost-effective metric for the utility, TRC and participant tests. Again, given the cost-effectiveness of the underlying programs the portfolio of energy efficiency programs are clearly cost effective.

**Table 7.17.1 – Base Case Comparison of TRC Results – OE**

| Base Case Comparison of TRC Results by Type of Test | |
|---|---|
| Utility Test | 5.9 |
| TRC Test | 1.9 |
| Participant Test | 4.4 |

**Table 7.17.2 – Base Case Comparison of TRC Results – CEI**

| Base Case Comparison of TRC Results by Type of Test | |
|---|---|
| Utility Test | 5.7 |
| TRC Test | 2.0 |
| Participant Test | 4.5 |

**Table 7.17.3 – Base Case Comparison of TRC Results – TE**

| Base Case Comparison of TRC Results by Type of Test | |
|---|---|
| Utility Test | 5.6 |
| TRC Test | 1.7 |
| Participant Test | 3.7 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



The Base Case market potential analysis is repeated for the High Case Scenario. For the High Case Scenario the assumption of participation levels is broadened to also include customers who indicated that they were likely to participate in the program or install the equipment. In addition, the program budgets are increased to reflect greater marketing requirements and higher incentive rates (in order to lure the likely to participate in programs).

Not surprisingly, the higher participation assumptions lead to greater savings than the Base Case and increase of roughly 45-50%. However, the relative magnitude of the program energy savings across programs does not change the Residential Efficient Appliance and the Commercial Efficient Equipment Programs produce the largest savings. The tables below show the energy savings by company.

**Table 7.18.1 – High Case Summary of Measure Energy Lifetime Savings by Program – OE**

| High Case<br>Summary of Measure Energy Lifetime Savings by Program | | | | | |
|---|---|---|---|---|---|
| Program Name | Class | 2010 MWh | 2015 MWh | 2020 MWh | 2025 MWh |
| Comprehensive Residential | Res | 52,524 | 315,658 | 579,725 | 842,974 |
| Thermostat Direct Load Control | Res | 406 | 2,030 | 2,030 | 2,030 |
| On-Line Audit | Res | 8,872 | 53,161 | 97,915 | 142,811 |
| Efficient Appliances | Res | 98,120 | 538,311 | 783,506 | 1,004,754 |
| New Homes | Res | 1,097 | 6,603 | 12,152 | 17,757 |
| Efficient Equipment | Comm | 347,115 | 1,771,896 | 1,973,390 | 2,169,726 |
| New Construction | Comm | 3,928 | 17,079 | 30,331 | 43,716 |
| Efficient Equipment | Ind | 52,311 | 261,921 | 264,133 | 266,368 |
| Motors | Ind | 2,989 | 17,910 | 32,796 | 47,681 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



**Table 7.18.2 – High Case Summary of Measure Energy Lifetime Savings by Program – CEI**

| High Case<br>Summary of Measure Energy Lifetime Savings by Program | | | | | |
|---|---|---|---|---|---|
| Program Name | Class | 2010 MWh | 2015 MWh | 2020 MWh | 2025 MWh |
| Comprehensive Residential | Res | 36,285 | 218,084 | 400,553 | 581,745 |
| Thermostat Direct Load Control | Res | 326 | 1,627 | 1,627 | 1,627 |
| On-Line Audit | Res | 6,411 | 38,413 | 70,751 | 103,192 |
| Efficient Appliances | Res | 66,996 | 367,594 | 535,058 | 687,345 |
| New Homes | Res | 774 | 4,661 | 8,577 | 12,533 |
| Efficient Equipment | Comm | 254,505 | 1,288,322 | 1,386,873 | 1,479,837 |
| New Construction | Comm | 2,957 | 12,858 | 22,835 | 32,911 |
| Efficient Equipment | Ind | 53,664 | 269,492 | 276,324 | 283,224 |
| Motors | Ind | 9,246 | 55,406 | 101,456 | 147,506 |

**Table 7.18.3 – High Case Summary of Measure Energy Lifetime Savings by Program – TE**

| High Case<br>Summary of Measure Energy Lifetime Savings by Program | | | | | |
|---|---|---|---|---|---|
| Program Name | Class | 2010 MWh | 2015 MWh | 2020 MWh | 2025 MWh |
| Comprehensive Residential | Res | 15,498 | 93,123 | 170,992 | 246,903 |
| Thermostat Direct Load Control | Res | 91 | 455 | 455 | 455 |
| On-Line Audit | Res | 2,628 | 15,744 | 28,997 | 42,293 |
| Efficient Appliances | Res | 27,855 | 153,094 | 223,573 | 286,630 |
| New Homes | Res | 298 | 1,792 | 3,298 | 4,819 |
| Efficient Equipment | Comm | 136,908 | 697,832 | 782,846 | 866,866 |
| New Construction | Comm | 1,305 | 5,676 | 10,080 | 14,528 |
| Efficient Equipment | Ind | 35,533 | 177,686 | 178,118 | 178,555 |
| Motors | Ind | 557 | 3,338 | 6,112 | 8,886 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



As with energy savings, the High Case Scenario yield significantly higher demand savings while the relative rank among programs with respect to savings levels does not change from the Base Case.

**Table 7.19.1 – High Case Summary of Measure Demand Lifetime Savings by Program– OE**

| High Case<br>Summary of Measure Demand Lifetime Savings by Program | | | | | |
|---|---|---|---|---|---|
| Program Name | Class | 2010 kW | 2015 kW | 2020 kW | 2025 kW |
| Comprehensive Residential | Res | 20,974 | 126,145 | 231,848 | 338,053 |
| Thermostat Direct Load Control | Res | 8,294 | 41,439 | 41,439 | 41,439 |
| On-Line Audit | Res | 1,058 | 6,339 | 11,675 | 17,028 |
| Efficient Appliances | Res | 9,450 | 53,086 | 82,655 | 112,130 |
| New Homes | Res | 863 | 5,200 | 9,569 | 13,983 |
| Efficient Equipment | Comm | 37,087 | 192,283 | 226,327 | 258,840 |
| New Construction | Comm | 1,259 | 5,474 | 9,722 | 14,012 |
| Efficient Equipment | Ind | 11,523 | 57,922 | 59,661 | 61,417 |
| Motors | Ind | 94 | 562 | 1,030 | 1,497 |

**Table 7.19.2 – High Case Summary of Measure Demand Lifetime Savings by Program– CEI**

| High Case<br>Summary of Measure Demand Lifetime Savings by Program | | | | | |
|---|---|---|---|---|---|
| Program Name | Class | 2010 kW | 2015 kW | 2020 kW | 2025 kW |
| Comprehensive Residential | Res | 15,517 | 93,337 | 171,571 | 250,125 |
| Thermostat Direct Load Control | Res | 6,662 | 33,286 | 33,286 | 33,286 |
| On-Line Audit | Res | 764 | 4,580 | 8,436 | 12,304 |
| Efficient Appliances | Res | 6,705 | 37,725 | 58,985 | 80,210 |
| New Homes | Res | 609 | 3,670 | 6,754 | 9,869 |
| Efficient Equipment | Comm | 28,077 | 145,279 | 169,529 | 192,304 |
| New Construction | Comm | 948 | 4,121 | 7,319 | 10,549 |
| Efficient Equipment | Ind | 13,845 | 70,263 | 75,651 | 81,094 |
| Motors | Ind | 290 | 1,740 | 3,185 | 4,631 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



**Table 7.19.3 – High Case Summary of Measure Demand Lifetime Savings by Program– TE**

| High Case<br>Summary of Measure Demand Lifetime Savings by Program | | | | | |
|---|---|---|---|---|---|
| Program Name | Class | 2010 kW | 2015 kW | 2020 kW | 2025 kW |
| Comprehensive Residential | Res | 6,623 | 39,834 | 73,213 | 106,555 |
| Thermostat Direct Load Control | Res | 1,865 | 9,317 | 9,317 | 9,317 |
| On-Line Audit | Res | 313 | 1,877 | 3,457 | 5,043 |
| Efficient Appliances | Res | 2,590 | 14,611 | 23,010 | 31,395 |
| New Homes | Res | 234 | 1,411 | 2,597 | 3,795 |
| Efficient Equipment | Comm | 16,373 | 84,534 | 97,888 | 110,893 |
| New Construction | Comm | 418 | 1,819 | 3,231 | 4,656 |
| Efficient Equipment | Ind | 7,824 | 39,157 | 39,485 | 39,816 |
| Motors | Ind | 17 | 105 | 192 | 279 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



The program and participant data sheds some light on some inter-utility differences. For both OE and TE, participant and utility costs increased between 83-90% over the Base Case, while for CEI the same costs increased by 68%. This finding indicates that more customers in the OE and TE service territories fall into the "likely to participate" category than CEI customers.

**Table 7.20.1 – High Case Achievable Results and Costs– OE**

| High Case Achievable Results and Costs | | | | | |
|---|---|---|---|---|---|
| YEAR | 2010 | 2015 | 2020 | 2025 | Total of All Years |
| New Participants (Units) | 1,992,978 | 627,047 | 503,487 | 503,007 | |
| Participant Costs | 158,267,402 | 55,968,092 | 56,635,326 | 57,970,112 | 1,443,053,604 |
| Utility Costs | 97,666,125 | 38,560,166 | 39,002,154 | 39,201,080 | 854,200,288 |
| **Total Costs ($)** | **255,933,526** | **94,528,258** | **95,637,481** | **97,171,192** | **2,297,253,892** |

**Table 7.20.2 – High Case Achievable Results and Costs– CEI**

| High Case Achievable Results and Costs | | | | | |
|---|---|---|---|---|---|
| YEAR | 2010 | 2015 | 2020 | 2025 | Total of All Years |
| New Participants (Units) | 1,541,222 | 423,535 | 346,225 | 344,389 | |
| Participant Costs | 110,572,341 | 29,741,991 | 30,388,109 | 31,597,592 | 931,178,480 |
| Utility Costs | 77,037,520 | 25,711,757 | 26,055,089 | 26,148,350 | 601,268,880 |
| **Total Costs ($)** | **187,609,861** | **55,453,747** | **56,443,198** | **57,745,942** | **1,532,447,360** |

**Table 7.20.3 – High Case Achievable Results and Costs– TE**

| High Case Achievable Results and Costs | | | | | |
|---|---|---|---|---|---|
| YEAR | 2010 | 2015 | 2020 | 2025 | Total of All Years |
| New Participants (Units) | 820,374 | 200,985 | 161,829 | 158,618 | |
| Participant Costs | 72,330,145 | 17,936,615 | 18,514,832 | 19,348,493 | 568,413,558 |
| Utility Costs | 38,756,523 | 11,710,166 | 11,832,156 | 11,823,530 | 308,819,356 |
| **Total Costs ($)** | **111,086,668** | **29,646,782** | **30,346,988** | **31,172,023** | **877,232,914** |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



The breakout of the utility costs for the High Case Scenario is shown in the tables below. The increase in program costs reflects the need to provide higher incentive rates to customers in order to capture the likely participants. In addition, the extended marketing campaigns and collateral necessary to reach this customer segment increases program costs.

**Table 7.21.1 – High Case Utility Program Costs– OE**

| High Case Utility Program Costs ($) | | | | |
|---|---|---|---|---|
| Utility Program Costs ($) | 2010 | 2015 | 2020 | 2025 |
| Implementation | 23,436,305 | 8,729,330 | 8,642,989 | 8,695,977 |
| Incentives | 74,229,820 | 29,830,836 | 30,359,166 | 30,505,103 |
| **Total** | **97,666,125** | **38,560,166** | **39,002,154** | **39,201,080** |

**Table 7.21.2 – High Case Utility Program Costs– CEI**

| High Case Utility Program Costs ($) | | | | |
|---|---|---|---|---|
| Utility Program Costs ($) | 2010 | 2015 | 2020 | 2025 |
| Implementation | 18,537,713 | 6,054,594 | 5,996,190 | 6,026,627 |
| Incentives | 58,499,807 | 19,657,162 | 20,058,899 | 20,121,723 |
| **Total** | **77,037,520** | **25,711,757** | **26,055,089** | **26,148,350** |

**Table 7.21.3 – High Case Utility Program Costs– TE**

| High Case Utility Program Costs ($) | | | | |
|---|---|---|---|---|
| Utility Program Costs ($) | 2010 | 2015 | 2020 | 2025 |
| Implementation | 8,995,141 | 2,617,508 | 2,590,373 | 2,592,782 |
| Incentives | 29,761,382 | 9,092,659 | 9,241,783 | 9,230,749 |
| **Total** | **38,756,523** | **11,710,166** | **11,832,156** | **11,823,530** |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



**Table 7.22.1 – High Case Avoided Costs– OE**

| High Case Avoided Costs (Cumulative Electric) | | | | |
|---|---|---|---|---|
| Year | 2010 | 2015 | 2020 | 2025 |
| Energy $ | 297,964,561 | 85,419,864 | 106,665,055 | 120,415,664 |
| Capacity $ | 76,632,132 | 32,307,618 | 34,417,413 | 35,601,151 |
| **Total** | **374,596,693** | **117,727,482** | **141,082,468** | **156,016,816** |

**Table 7.22.2 – High Case Avoided Costs– CEI**

| High Case Avoided Costs (Cumulative Electric) | | | | |
|---|---|---|---|---|
| Year | 2010 | 2015 | 2020 | 2025 |
| Energy $ | 237,806,336 | 59,928,756 | 74,724,322 | 84,222,462 |
| Capacity $ | 63,526,618 | 24,469,959 | 26,034,288 | 26,927,005 |
| **Total** | **301,332,954** | **84,398,715** | **100,758,610** | **111,149,468** |

**Table 7.22.3 – High Case Avoided Costs– TE**

| High Case Avoided Costs (Cumulative Electric) | | | | |
|---|---|---|---|---|
| Year | 2010 | 2015 | 2020 | 2025 |
| Energy $ | 113,593,918 | 27,291,463 | 34,156,858 | 38,398,608 |
| Capacity $ | 30,929,046 | 10,316,531 | 11,011,368 | 11,372,531 |
| **Total** | **144,522,964** | **37,607,994** | **45,168,225** | **49,771,139** |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



Higher program costs drag down the cost-effectiveness of all programs across the utilities. The Residential Efficient Program while producing the largest energy savings within the portfolio of programs, is no longer cost-effective based on the TRC. This is a consistent finding for each of the three companies. The Commercial Efficient Equipment Program, which also produces significant energy and demand savings, is only marginally cost-effective based on the TRC.

**Table 7.23.1 – High Case Summary of Measure Test by Program– OE**

| Summary of Measure Tests by Program for High Case Year 2025 | | | | |
|---|---|---|---|---|
| Program Name | Class | Utility Test | TRC Test | Participant Test |
| Comprehensive Residential | Res | 3.28 | 1.39 | 2.94 |
| Thermostat Direct Load Control | Res | 1.03 | 1.03 | |
| On-Line Audit | Res | 6.60 | 6.60 | |
| Efficient Appliances | Res | 1.74 | 0.93 | 3.02 |
| New Homes | Res | 2.19 | 1.89 | 14.81 |
| Efficient Equipment | Comm | 5.30 | 1.10 | 2.11 |
| New Construction | Comm | 6.73 | 3.98 | 21.80 |
| Efficient Equipment | Ind | 6.58 | 1.88 | 2.84 |
| Motors | Ind | 6.64 | 2.14 | 7.36 |

**Table 7.23.2 – High Case Summary of Measure Test by Program– CEI**

| Summary of Measure Tests by Program for High Case Year 2025 | | | | |
|---|---|---|---|---|
| Program Name | Class | Utility Test | TRC Test | Participant Test |
| Comprehensive Residential | Res | 3.37 | 1.44 | 2.96 |
| Thermostat Direct Load Control | Res | 1.03 | 1.03 | |
| On-Line Audit | Res | 6.60 | 6.60 | |
| Efficient Appliances | Res | 1.80 | 0.97 | 3.15 |
| New Homes | Res | 2.19 | 1.89 | 14.81 |
| Efficient Equipment | Comm | 7.39 | 3.12 | 4.70 |
| New Construction | Comm | 6.73 | 3.98 | 21.80 |
| Efficient Equipment | Ind | 6.62 | 1.89 | 2.87 |
| Motors | Ind | 6.67 | 2.14 | 7.36 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



**Table 7.23.3 – High Case Summary of Measure Test by Program– TE**

| Summary of Measure Tests by Program for High Case Year 2025 | | | | |
|---|---|---|---|---|
| Program Name | Class | Utility Test | TRC Test | Participant Test |
| Comprehensive Residential | Res | 3.29 | 1.38 | 2.78 |
| Thermostat Direct Load Control | Res | 1.02 | 1.02 | |
| On-Line Audit | Res | 6.59 | 6.59 | |
| Efficient Appliances | Res | 1.75 | 0.94 | 3.03 |
| New Homes | Res | 2.19 | 1.89 | 14.81 |
| Efficient Equipment | Comm | 5.48 | 1.20 | 2.26 |
| New Construction | Comm | 6.73 | 3.98 | 21.80 |
| Efficient Equipment | Ind | 6.39 | 1.85 | 2.85 |
| Motors | Ind | 6.42 | 2.12 | 7.36 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



The cost-effectiveness analysis was based upon program level costs and benefits. The data used for the analysis are shown by program in the following tables.

**Table 7.24.1 – High Case Summary of Measure Costs & Benefits– OE**

| High Case<br>Summary of Measure Costs and Benefits by Class and Program | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **RESIDENTIAL PROGRAMS** | **Year** | **Revenue** | **Costs** | **Benefits** | **Avoided** | **Avoided** | **Budget** | **Costs** |
| Comprehensive Residential | 2010 | 71,115,164 | 24,185,108 | 45,621,368 | 30,434,664 | 15,186,705 | 17,648,525 | 14,976,643 |
| | 2015 | | | 58,216,578 | 39,141,473 | 19,075,105 | 17,728,986 | 15,061,803 |
| | 2020 | | | 69,372,319 | 48,933,827 | 20,438,492 | 17,831,519 | 15,147,819 |
| | 2025 | 72,024,689 | 24,514,617 | 75,628,244 | 54,532,818 | 21,095,426 | 17,869,631 | 15,185,198 |
| FirstEnergy CFL Program | 2010 | 14,567,294 | 0 | 55,203,560 | 51,349,713 | 3,853,848 | 10,624,295 | 9,238,518 |
| | 2015 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2020 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Thermostat Direct Load Control | 2010 | 494,940 | 0 | 6,973,039 | 315,409 | 6,657,630 | 6,788,659 | 2,460,941 |
| | 2015 | | | 0 | 0 | 0 | 0 | 0 |
| | 2020 | | | 0 | 0 | 0 | 0 | 0 |
| | 2025 | | | 0 | 0 | 0 | 0 | 0 |
| On-Line Audit | 2010 | 4,157,483 | 0 | 1,820,679 | 1,471,747 | 348,932 | 373,617 | 69,322 |
| | 2015 | | | 2,398,795 | 1,886,645 | 512,151 | 363,336 | 69,289 |
| | 2020 | | | 3,226,151 | 2,659,386 | 566,766 | 1,228,131 | 929,350 |
| | 2025 | 4,224,318 | 0 | 3,861,850 | 3,267,744 | 594,106 | 1,228,131 | 929,350 |
| Efficient Appliances | 2010 | 80,305,337 | 13,419,519 | 34,282,321 | 28,882,877 | 5,399,445 | 16,655,917 | 9,986,276 |
| | 2015 | | | 24,546,436 | 20,070,972 | 4,475,464 | 14,081,847 | 9,337,015 |
| | 2020 | | | 29,686,567 | 24,830,833 | 4,855,734 | 13,583,020 | 8,921,641 |
| | 2025 | 37,117,972 | 12,277,696 | 33,599,964 | 28,544,331 | 5,055,632 | 13,685,932 | 8,980,914 |
| New Homes | 2010 | 1,849,796 | 124,941 | 1,415,821 | 557,496 | 858,326 | 796,213 | 570,504 |
| | 2015 | | | 1,742,506 | 708,397 | 1,034,109 | 794,127 | 576,232 |
| | 2020 | | | 1,957,059 | 859,656 | 1,097,403 | 802,095 | 582,017 |
| | 2025 | 1,906,073 | 128,742 | 2,078,285 | 947,232 | 1,131,053 | 810,143 | 587,861 |
| **COMMERCIAL PROGRAMS** | | | | | | | | |
| Efficient Equipment | 2010 | 329,288,661 | 84,861,511 | 136,110,101 | 109,789,820 | 26,320,281 | 32,116,212 | 26,100,373 |
| | 2015 | | | 24,995,002 | 19,521,734 | 5,473,269 | 4,720,060 | 3,991,885 |
| | 2020 | | | 30,106,878 | 24,479,930 | 5,626,948 | 4,679,565 | 3,978,169 |
| | 2025 | 41,940,192 | 19,854,844 | 33,607,177 | 27,765,026 | 5,842,151 | 4,723,342 | 4,015,998 |
| New Construction | 2010 | 11,043,943 | 506,603 | 4,171,544 | 2,619,057 | 1,552,487 | 735,859 | 675,470 |
| | 2015 | | | 3,315,997 | 2,108,923 | 1,207,074 | 492,381 | 454,835 |
| | 2020 | | | 3,744,964 | 2,474,339 | 1,270,625 | 497,322 | 459,401 |
| | 2025 | 7,586,627 | 348,010 | 3,993,094 | 2,687,713 | 1,305,381 | 502,313 | 464,014 |
| **INDUSTRIAL PROGRAMS** | | | | | | | | |
| Efficient Equipment | 2010 | 71,962,501 | 34,598,798 | 32,872,264 | 22,585,942 | 10,286,322 | 11,614,673 | 9,910,696 |
| | 2015 | | | 708,185 | 279,095 | 429,090 | 107,650 | 98,700 |
| | 2020 | | | 793,768 | 339,315 | 454,453 | 108,725 | 99,691 |
| | 2025 | 782,701 | 275,279 | 842,219 | 374,197 | 468,022 | 109,810 | 100,692 |
| Motors | 2010 | 4,201,821 | 570,922 | 1,396,167 | 1,312,837 | 83,329 | 312,153 | 241,077 |
| | 2015 | | | 1,803,983 | 1,702,627 | 101,356 | 271,778 | 241,077 |
| | 2020 | | | 2,194,762 | 2,087,770 | 106,992 | 271,778 | 241,077 |
| | 2025 | 4,201,821 | 570,922 | 2,405,984 | 2,296,605 | 109,379 | 271,778 | 241,077 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



### Table 7.24.2 – High Case Summary of Measure Costs & Benefits– CEI

| High Case<br>Summary of Measure Costs and Benefits by Class and Program | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| RESIDENTIAL PROGRAMS | Year | Lost Revenue (Electric) | Participant Costs | Program Benefits | Total Avoided Energy | Total Avoided Capacity | Total Utility Budget Costs | Incentive Costs |
| Comprehensive Residential | 2010 | 47,850,107 | 16,151,917 | 31,869,408 | 20,979,064 | 10,890,344 | 12,056,473 | 10,188,541 |
| | 2015 | | | 40,745,882 | 26,999,240 | 13,746,642 | 12,106,327 | 10,247,721 |
| | 2020 | | | 48,639,534 | 33,886,942 | 14,752,592 | 12,177,945 | 10,307,495 |
| | 2025 | 48,400,820 | 16,375,739 | 53,039,405 | 37,807,460 | 15,231,945 | 12,184,833 | 10,318,369 |
| FirstEnergy CFL Program | 2010 | 10,526,011 | 0 | 39,888,896 | 37,104,189 | 2,784,707 | 10,624,295 | 9,238,518 |
| | 2015 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2020 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Thermostat Direct Load Control | 2010 | 396,823 | 0 | 5,600,680 | 252,883 | 5,347,797 | 5,452,000 | 1,975,177 |
| | 2015 | | | 0 | 0 | 0 | 0 | 0 |
| | 2020 | | | 0 | 0 | 0 | 0 | 0 |
| | 2025 | | | 0 | 0 | 0 | 0 | 0 |
| On-Line Audit | 2010 | 3,004,149 | 0 | 1,315,601 | 1,063,467 | 252,134 | 272,893 | 50,100 |
| | 2015 | | | 1,733,318 | 1,363,249 | 370,069 | 262,612 | 50,067 |
| | 2020 | | | 2,331,147 | 1,921,614 | 409,532 | 887,494 | 671,528 |
| | 2025 | 3,052,400 | 0 | 2,790,489 | 2,361,201 | 429,288 | 887,494 | 671,528 |
| Efficient Appliances | 2010 | 54,750,391 | 8,892,586 | 23,563,652 | 19,727,380 | 3,836,272 | 11,235,210 | 6,649,281 |
| | 2015 | | | 16,973,819 | 13,749,681 | 3,224,138 | 9,423,510 | 6,172,234 |
| | 2020 | | | 20,647,469 | 17,148,475 | 3,498,994 | 9,119,501 | 5,917,203 |
| | 2025 | 25,465,549 | 8,096,985 | 23,328,611 | 19,685,646 | 3,642,965 | 9,177,599 | 5,946,311 |
| New Homes | 2010 | 1,305,602 | 88,184 | 999,299 | 393,485 | 605,813 | 565,063 | 402,667 |
| | 2015 | | | 1,229,876 | 499,993 | 729,883 | 560,656 | 406,709 |
| | 2020 | | | 1,381,309 | 606,752 | 774,557 | 566,280 | 410,793 |
| | 2025 | 1,345,323 | 90,867 | 1,466,871 | 668,564 | 798,307 | 571,960 | 414,917 |
| COMMERCIAL PROGRAMS | | | | | | | | |
| Efficient Equipment | 2010 | 239,218,182 | 53,109,074 | 99,648,777 | 79,811,350 | 19,837,427 | 23,163,215 | 18,360,751 |
| | 2015 | | | 13,447,900 | 9,600,008 | 3,847,892 | 1,820,898 | 1,387,878 |
| | 2020 | | | 15,694,835 | 11,791,436 | 3,903,400 | 1,759,082 | 1,352,833 |
| | 2025 | 19,575,198 | 4,163,256 | 17,469,781 | 13,416,088 | 4,053,692 | 1,774,572 | 1,364,992 |
| New Construction | 2010 | 8,314,376 | 381,393 | 3,140,526 | 1,971,743 | 1,168,782 | 555,224 | 508,525 |
| | 2015 | | | 2,496,431 | 1,587,692 | 908,740 | 370,749 | 342,420 |
| | 2020 | | | 2,819,377 | 1,862,793 | 956,584 | 374,468 | 345,858 |
| | 2025 | 5,711,553 | 261,998 | 3,006,181 | 2,023,431 | 982,750 | 378,226 | 349,330 |
| INDUSTRIAL PROGRAMS | | | | | | | | |
| Efficient Equipment | 2010 | 75,899,417 | 33,130,400 | 36,257,128 | 23,796,402 | 12,460,727 | 12,236,454 | 10,380,457 |
| | 2015 | | | 2,190,716 | 861,673 | 1,329,043 | 330,688 | 304,341 |
| | 2020 | | | 2,455,258 | 1,047,618 | 1,407,640 | 334,002 | 307,397 |
| | 2025 | 2,417,054 | 842,550 | 2,605,016 | 1,155,333 | 1,449,683 | 337,349 | 310,483 |
| Motors | 2010 | 12,998,689 | 1,766,197 | 4,319,160 | 4,061,373 | 257,787 | 876,693 | 745,792 |
| | 2015 | | | 5,580,773 | 5,267,220 | 313,552 | 836,318 | 745,792 |
| | 2020 | | | 6,789,681 | 6,458,691 | 330,990 | 836,318 | 745,792 |
| | 2025 | 12,998,689 | 1,766,197 | 7,443,114 | 7,104,740 | 338,374 | 836,318 | 745,792 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



**Table 7.24.3 – High Case Summary of Measure Costs & Benefits– TE**

| High Case<br>Summary of Measure Costs and Benefits by Class and Program | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| RESIDENTIAL PROGRAMS | Year | Lost Revenue (Electric) | Participant Costs | Program Benefits | Total Avoided Energy | Total Avoided Capacity | Total Utility Budget Costs | Incentive Costs |
| Comprehensive Residential | 2010 | 20,221,099 | 7,201,035 | 13,505,713 | 8,842,813 | 4,662,900 | 5,237,395 | 4,406,587 |
| | 2015 | | | 17,258,610 | 11,376,584 | 5,882,026 | 5,245,021 | 4,430,413 |
| | 2020 | | | 20,593,442 | 14,283,842 | 6,309,600 | 5,273,988 | 4,454,478 |
| | 2025 | 20,289,785 | 7,295,048 | 22,332,797 | 15,838,566 | 6,494,231 | 5,237,796 | 4,429,284 |
| FirstEnergy CFL Program | 2010 | 4,313,992 | 0 | 16,348,109 | 15,206,822 | 1,141,287 | 3,146,303 | 2,735,916 |
| | 2015 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2020 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Thermostat Direct Load Control | 2010 | 110,934 | 0 | 1,567,518 | 70,694 | 1,496,824 | 1,536,574 | 552,552 |
| | 2015 | | | 0 | 0 | 0 | 0 | 0 |
| | 2020 | | | 0 | 0 | 0 | 0 | 0 |
| | 2025 | | | 0 | 0 | 0 | 0 | 0 |
| On-Line Audit | 2010 | 1,231,312 | 0 | 539,226 | 435,884 | 103,342 | 118,065 | 20,552 |
| | 2015 | | | 710,385 | 558,715 | 151,669 | 107,784 | 20,519 |
| | 2020 | | | 955,400 | 787,557 | 167,843 | 363,886 | 275,220 |
| | 2025 | 1,250,999 | 0 | 1,143,657 | 967,717 | 175,940 | 363,886 | 275,220 |
| Efficient Appliances | 2010 | 22,743,314 | 3,781,793 | 9,608,083 | 8,133,707 | 1,474,376 | 4,614,273 | 2,768,322 |
| | 2015 | | | 6,949,221 | 5,686,993 | 1,262,228 | 3,960,823 | 2,619,414 |
| | 2020 | | | 8,358,120 | 6,987,991 | 1,370,129 | 3,796,826 | 2,483,668 |
| | 2025 | 10,431,495 | 3,447,933 | 9,399,557 | 7,972,675 | 1,426,882 | 3,801,484 | 2,478,303 |
| New Homes | 2010 | 502,016 | 33,908 | 384,240 | 151,299 | 232,941 | 223,735 | 154,829 |
| | 2015 | | | 472,899 | 192,252 | 280,647 | 215,901 | 156,384 |
| | 2020 | | | 531,126 | 233,302 | 297,824 | 218,063 | 157,954 |
| | 2025 | 517,289 | 34,939 | 564,026 | 257,069 | 306,957 | 220,247 | 159,540 |
| COMMERCIAL PROGRAMS | | | | | | | | |
| Efficient Equipment | 2010 | 133,468,517 | 37,690,331 | 56,022,924 | 44,207,784 | 11,815,140 | 15,616,394 | 12,106,692 |
| | 2015 | | | 10,644,308 | 8,405,038 | 2,239,270 | 1,943,439 | 1,651,063 |
| | 2020 | | | 12,925,637 | 10,587,310 | 2,338,327 | 1,940,348 | 1,653,891 |
| | 2025 | 18,760,204 | 8,295,973 | 14,395,409 | 11,969,084 | 2,426,324 | 1,959,207 | 1,670,105 |
| New Construction | 2010 | 3,670,207 | 168,358 | 1,386,319 | 870,385 | 515,934 | 247,885 | 224,478 |
| | 2015 | | | 1,101,997 | 700,853 | 401,144 | 163,799 | 151,154 |
| | 2020 | | | 1,244,555 | 822,291 | 422,264 | 165,441 | 152,672 |
| | 2025 | 2,521,246 | 115,653 | 1,327,016 | 893,201 | 433,814 | 167,099 | 154,205 |
| INDUSTRIAL PROGRAMS | | | | | | | | |
| Efficient Equipment | 2010 | 48,933,930 | 23,348,318 | 22,295,030 | 15,337,355 | 6,957,674 | 7,923,143 | 6,746,525 |
| | 2015 | | | 134,365 | 53,709 | 80,656 | 21,019 | 18,783 |
| | 2020 | | | 150,906 | 65,466 | 85,440 | 21,223 | 18,971 |
| | 2025 | 149,850 | 52,543 | 160,274 | 72,276 | 87,997 | 21,430 | 19,162 |
| Motors | 2010 | 783,095 | 106,403 | 260,204 | 244,674 | 15,530 | 92,755 | 44,930 |
| | 2015 | | | 336,209 | 317,319 | 18,890 | 52,380 | 44,930 |
| | 2020 | | | 409,039 | 389,099 | 19,940 | 52,380 | 44,930 |
| | 2025 | 783,095 | 106,403 | 448,404 | 428,019 | 20,385 | 52,380 | 44,930 |

# 7.0 TECHNICAL POTENTIAL FOR ENERGY SAVINGS AND DEMAND REDUCTIONS



Finally, the cost-effectiveness analysis is conducted on the portfolio of programs for each company. The detailed program cost and benefit data are aggregated and the utility, TRC and participant test ratios are calculated. Again, given the higher program costs and participation costs due to larger participant rates, the overall cost/benefit ratios for the High Case Scenario are lower than in the Base Case Scenario.

**Table 7.25.1 – High Case Comparison of TRC Results– OE**

| High Case Comparison of TRC Results by Type of Test | |
|---|---|
| Utility Test | 3.8 |
| TRC Test | 1.5 |
| Participant Test | 3.8 |

**Table 7.25.2 – High Case Comparison of TRC Results– CEI**

| High Case Comparison of TRC Results by Type of Test | |
|---|---|
| Utility Test | 3.9 |
| TRC Test | 1.6 |
| Participant Test | 4.1 |

**Table 7.25.3 – High Case Comparison of TRC Results– TE**

| High Case Comparison of TRC Results by Type of Test | |
|---|---|
| Utility Test | 3.7 |
| TRC Test | 1.3 |
| Participant Test | 3.3 |

# 8.0 PROGRAM DESIGN CRITERIA



## 8.0 PROGRAM DESIGN CRITERIA

The State of Ohio has not yet adopted final rules for Energy Efficiency and Peak Demand Reduction. However, as part of Case No. 08-888-EL-ORD, the PUCO's DRAFT Rules as adopted by the Commission indicates that the following criteria shall be used in designing programs to achieve the energy efficiency targets established by the legislation and PUCO directives.

(1) Relative cost-effectiveness.

(2) Benefit to all members of a customer class, including non-participants.

(3) Potential for broad participation within the targeted customer class.

(4) Likely magnitude of aggregate energy savings or peak-demand reduction.

(5) Non-energy benefits.

(6) Equity among customer classes.

(7) Relative advantages or disadvantages of energy efficiency and peak-demand reduction programs for the construction of new facilities, replacement of retiring capital stock, or retrofitting existing capital stock.

(8) Potential to integrate the proposed program with similar programs offered by other utilities, if such integration produces the most cost-effective result and is in the public interest.

(9) The degree to which a program bundles measures so as to avoid lost opportunities to attain energy savings or peak reductions that would not be cost-effective or would be less cost-effective if installed individually.

(10) The degree to which the program design engages the energy efficiency supply chain and leverages partners in program delivery.

(11) The degree to which the program successfully addresses market barriers or market failures.

(12) The degree to which the program leverages knowledge gained from existing program successes and failures.

(13) The degree to which the program promotes market transformation.

# 9.0 CONCLUSION



## 9.0 CONCLUSION

This report has demonstrated that Achievable Potential for EEPD in the 2025 timeframe is as follows for the Companies:

- Using Base Case assumptions:
  - 12.6 % for Ohio Edison
  - 11.9 % for Toledo Edison
  - 13.5 % for Cleveland Electric Illuminating

- Using High Case assumptions:
  - 19.2 % for Ohio Edison
  - 17.9 % for Toledo Edison
  - 19.9 % for Cleveland Electric Illuminating

It should be noted that the potential estimates shown above, even in the High Case scenario do not reach the state goal of 22 % as prescribed in SB221. However, additional savings are expected to be obtained from the Companies' efforts in transmission and distribution efficiency improvements. These improvements are not included in the percentages shown above.

It should also be noted that the measure savings identified in this study do not take into account replacement of appliances or end-uses before the end of their useful lives. If this assumption would be identified in the upcoming Technical Resource Manual, additional savings would accrue.

The next step in the process is the development of the Program Portfolio Plan. As required in the Companies Electric Security Plan Stipulation in Case No. 08-935-EL-SSO.

> *E.6.c The Companies will commence a collaborative process with Signatory Parties and third party administrator(s) to consider the energy efficiency and peak demand reduction opportunities identified in the Market Study and establish priorities which will offer the greatest potential for energy efficiency and peak demand reductions…*
> *… satisfying the requirements of R.C. § 4928.66 in a cost effective (as defined by the Commission's Total Resource Cost Test), or as otherwise deemed appropriate. The Companies will seek approval of such programs they deem most cost effective and necessary to meet the statutory requirements.*

The Companies currently anticipate filing the Program Portfolio Plan prior to January 1, 2010, as required by the PUCO draft rules.

# 10.0 APPENDICES



## 10.0 APPENDICES

### *Appendix A: Collaborative Members Contacted for Input*

Ohio Schools Council (OSC)
Sierra Club
Office of Consumer Counsel (OCC)
Ohio Energy Group
Industrial Energy Users of Ohio (IEU)
Council of Ohio Small Enterprises (COSE)
Sierra Club
Ohio Partners for Affordable Energy
Ohio Manufacturers' Association
Ohio Hospital Association

# 10.0 APPENDICES



## *Appendix B: Attitudes and Decision Making Characteristics of Large Managed Accounts Customers*

| | Large Commercial & Industrial Customer Characteristics (>700kW) | Chemical & Allied Prod | Education | Electronic Mfg | Entertainment | Food and Kindred Products | Health | Mining & Oil Gas Extract | Paper Mills & Products | Primary Metals & Hvy Mfg | Refining & Plastics | Transport Mfg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | These customers may have a dedicated energy manager | | √ | | | √ | √ | | | | | √ |
| 2 | These customers typically do not have the luxury of having a dedicated energy manager and such duties are the responsibility of the facilities or plant manager. In these cases opportunities for energy efficiency improvements are not the primary focus of these individuals. | √ | √ | √ | √ | √ | | √ | √ | √ | √ | |
| 3 | The customers need to have easy and timely access to their energy demand and consumption data in order to better understand the costs associated with various production runs and the timing and use of electrical equipment. | √ | √ | √ | √ | √ | | | √ | √ | √ | √ |
| 4 | Account representatives have frequent contact with all managed accounts and some customers have sought out and implemented some energy efficiency measures in the past. | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| 5 | These customers are in operation 24 hours per day, 7 days a week. | √ | | √ | √ | √ | √ | | √ | √ | √ | √ |
| 6 | These customers are in operation more than 10 hours per day, 5 - 6 days a week. | | √ | | | | | √ | | | | |
| 7 | While these customers have implemented some energy efficiency measures in the past, they would benefit from having an energy audit of their facilities. | √ | √ | √ | √ | √ | √ | | √ | √ | √ | √ |
| 8 | Typically a financial payback of ~ 1year is necessary in order to get the interest of the customer. | √ | | √ | √ | | | √ | | √ | | √ |
| 9 | Typically a financial payback of 2 - 4years is necessary in order to get the interest of the customer. | | √ | | | √ | √ | | √ | | √ | |

# 10.0 APPENDICES



| | Large Commercial & Industrial Customer Characteristics (>700kW) | Chemical & Allied Prod | Education | Electronic Mfg | Entertainment | Food and Kindred Products | Health | Mining & Oil Gas Extract | Paper Mills & Products | Primary Metals & Hvy Mfg | Refining & Plastics | Transport Mfg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | Typically customers need to be further educated in potential energy saving opportunities and measures | √ | √ | √ | | √ | √ | | √ | √ | √ | √ |
| 11 | Typical barriers to investing in energy efficiency improvements are first costs, adequate payback, lack of capital and today's uncertainty regarding general economic conditions. | √ | √ | √ | √ | √ | √ | | √ | √ | √ | √ |
| 12 | Potential leverage points to help encourage the customer's decision to investigate and implement energy efficiency measures include education, energy audits, cost savings (payback), cash incentives, low interest loans, and environmental benefits. | √ | √ | √ | √ | √ | √ | | √ | √ | √ | √ |
| 13 | Major energy efficiency improvement opportunities include interior and exterior lighting improvements. | √ | √ | √ | √ | √ | √ | | √ | √ | √ | √ |
| | Major energy efficiency improvement opportunities include motor improvements. | √ | √ | √ | | √ | √ | √ | √ | √ | √ | √ |
| 14 | Major energy efficiency improvement opportunities include HVAC improvements. | | | √ | √ | √ | √ | | | | | |
| 15 | Major energy efficiency improvement opportunities include a demand / energy management system. | | √ | √ | | √ | | | √ | √ | √ | √ |

# 10.0 APPENDICES



## *Appendix C*

# Appendix C-1 Ohio Edison Detailed Measure Results

# Economic Achievable - OE

| Measure Name | Program | Rate Class | Total Measure TRC Test | **Total Discounted Lifetime Costs ($000)** | **Total Discounted Lifetime Utility Costs ($000)** | **Total Discounted Lifetime Benefits ($000)** | Program Year 2010 Cummultive | | Program Year 2025 Cumm | | Life Time Savings | | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Participants 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MWh Saved | kW Saved | MWh Saved | kW Saved | MWh Saved | kW Saved | Portfolio Budget | Total Incentives | Benefits | Costs | Avoided Capacity | Lost Revene | Participant Costs | Number |
| DLC-CAC | Therm DLC | Res | 1.30 | 13,021,108 | 13,021,108 | 16,932,734 | 1,006 | 20,122 | 1,006 | 20,122 | 12,258 | 20,122 | 13,021,108 | 6,024,208 | 16,932,734 | 13,021,108 | 16,151,574 | 1,225,795 | 0 | 26,192 |
| DLC-Pool Pumps | Therm DLC | Res | 1.62 | 797 | 797 | 1,291 | 0 | 2 | 0 | 2 | 0 | 2 | 797 | 335 | 1,291 | 797 | 1,259 | 50 | 0 | 1 |
| DLC-Water Heat | Therm DLC | Res | 1.19 | 797 | 797 | 948 | 0 | 1 | 0 | 1 | 0 | 1 | 797 | 335 | 948 | 797 | 916 | 50 | 0 | 1 |
| Residential Online Audit | On-Line Audit | Res | 5.01 | 1,815,369 | 1,815,369 | 9,103,064 | 44,359 | 5,289 | 44,359 | 5,289 | 207,867 | 5,289 | 1,815,369 | 346,444 | 9,103,064 | 1,815,369 | 1,744,597 | 20,786,664 | 0 | 138,578 |
| Residential Online Audit Future | On-Line Audit | Res | 1.51 | 44 | 44 | 66 | 0 | 0 | 0 | 0 | 2 | 0 | 44 | 33 | 66 | 44 | 13 | 150 | 0 | 1 |
| Schools Childern Education | Comprehensive Residential | Res | 1.51 | 327,000 | 327,000 | 492,669 | 2,401 | 286 | 2,401 | 286 | 11,250 | 286 | 327,000 | 247,500 | 492,669 | 327,000 | 94,420 | 1,125,000 | 0 | 7,500 |
| Refrigerator/Freezer recycling | Efficient Appliances | Res | 3.09 | 21,268,691 | 21,268,691 | 65,722,223 | 199,790 | 28,391 | 199,790 | 28,391 | 1,497,947 | 28,391 | 21,268,691 | 5,599,381 | 65,722,223 | 21,268,691 | 15,260,479 | 149,794,653 | 0 | 111,988 |
| Room Air Conditioners recycling | Efficient Appliances | Res | 0.43 | 145 | 120 | 62 | 0 | 0 | 0 | 0 | 1 | 0 | 120 | 25 | 62 | 145 | 25 | 52 | 25 | 1 |
| ASHP - SEER 15 | Comprehensive Residential | Res | 2.40 | 30,402,963 | 18,540,707 | 73,025,100 | 119,104 | 12,545 | 119,104 | 12,545 | 2,009,229 | 12,545 | 18,540,707 | 15,816,342 | 73,025,100 | 30,402,963 | 12,470,468 | 200,922,900 | 11,862,256 | 39,541 |
| CAC - SEER 15 | Comprehensive Residential | Res | 1.25 | 360,319,994 | 87,488,096 | 451,267,298 | 302,758 | 144,269 | 302,758 | 144,269 | 5,107,413 | 144,269 | 87,488,096 | 68,207,975 | 451,267,298 | 360,319,994 | 143,410,379 | 510,741,315 | 272,831,899 | 454,720 |
| CAC - Maintenance | Comprehensive Residential | Res | 2.26 | 52,548,614 | 13,795,949 | 118,817,592 | 138,289 | 119,909 | 138,289 | 119,909 | 907,231 | 119,909 | 13,795,949 | 9,688,166 | 118,817,592 | 52,548,614 | 56,785,831 | 90,723,089 | 38,752,665 | 387,527 |
| EE Ground Source Heat Pump | Comprehensive Residential | Res | 0.83 | 1,786 | 706 | 1,485 | 3 | 0 | 3 | 0 | 46 | 0 | 706 | 600 | 1,485 | 1,786 | 113 | 4,554 | 1,080 | 1 |
| Solar Water Heating | Comprehensive Residential | Res | 0.46 | 3,127 | 527 | 1,441 | 2 | 1 | 2 | 1 | 32 | 1 | 527 | 500 | 1,441 | 3,127 | 456 | 3,155 | 2,600 | 1 |
| HP Water Heater | Comprehensive Residential | Res | 1.64 | 221,149,134 | 82,045,426 | 362,177,187 | 563,869 | 128,951 | 563,869 | 128,951 | 7,926,870 | 128,951 | 82,045,426 | 75,386,303 | 362,177,187 | 221,149,134 | 114,506,239 | 792,686,974 | 139,103,707 | 251,288 |
| EE Water Heater | Comprehensive Residential | Res | 0.72 | 277 | 77 | 199 | 0 | 0 | 0 | 0 | 4 | 0 | 77 | 50 | 199 | 277 | 58 | 446 | 200 | 1 |
| Programable Thermostat_Heat | Comprehensive Residential | Res | 2.89 | 2,569,975 | 2,569,975 | 7,438,470 | 16,935 | 0 | 16,935 | 0 | 238,073 | 0 | 2,569,975 | 2,389,568 | 7,438,470 | 2,569,975 | 0 | 23,807,306 | 0 | 34,039 |
| Programable Thermostat_CAC | Comprehensive Residential | Res | 1.36 | 18,777,244 | 10,471,848 | 25,558,062 | 10,733 | 18,164 | 10,733 | 18,164 | 150,887 | 18,164 | 10,471,848 | 7,737,819 | 25,558,062 | 18,777,244 | 16,129,260 | 15,088,747 | 8,305,395 | 257,927 |
| LED Lighting Inside | Efficient Appliances | Res | 0.50 | 7 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 3 | 7 | 0 | 9 | 3 | 1 |
| CFL bulbs regular - Inside - 15 | Efficient Appliances | Res | 3.81 | 6,986,560 | 1,932,990 | 26,651,838 | 88,567 | 3,033 | 88,567 | 3,033 | 747,044 | 3,033 | 1,932,990 | 1,263,392 | 26,651,838 | 6,986,560 | 1,811,485 | 74,704,396 | 5,053,570 | 1,263,392 |
| CFL bulbs regular - Outside - 15 | Efficient Appliances | Res | 6.64 | 4,228,265 | 1,169,846 | 28,062,305 | 100,055 | 0 | 100,055 | 0 | 843,940 | 0 | 1,169,846 | 764,605 | 28,062,305 | 4,228,265 | 0 | 84,394,031 | 3,058,420 | 764,605 |
| LED Lighting Outside | Efficient Appliances | Res | 1.20 | 4,992,870 | 2,699,055 | 6,013,351 | 21,440 | 0 | 21,440 | 0 | 180,844 | 0 | 2,699,055 | 2,293,815 | 6,013,351 | 4,992,870 | 0 | 18,084,435 | 2,293,815 | 764,605 |
| Clothes Washer Energy Star, Electric Water heater, Electric Dryer | Efficient Appliances | Res | 0.79 | 34,823,718 | 24,127,013 | 27,523,957 | 58,843 | 3,728 | 58,843 | 3,728 | 772,064 | 3,728 | 24,127,013 | 17,827,842 | 27,523,957 | 34,823,718 | 3,156,611 | 77,206,441 | 10,696,705 | 237,705 |
| Dehumidifiers | Efficient Appliances | Res | 2.25 | 28,174,357 | 18,967,051 | 63,478,080 | 83,703 | 3,851 | 83,703 | 3,851 | 941,355 | 3,851 | 18,967,051 | 9,207,306 | 63,478,080 | 28,174,357 | 2,911,219 | 94,135,500 | 9,207,306 | 368,292 |
| Freezers Energy Star-Chest Freezer | Efficient Appliances | Res | 0.07 | 389 | 52 | 29 | 0 | 0 | 0 | 0 | 1 | 0 | 52 | 25 | 29 | 389 | 10 | 60 | 337 | 1 |
| Holiday Lights | Efficient Appliances | Res | 0.27 | 77 | 25 | 21 | 0 | 0 | 0 | 0 | 1 | 0 | 25 | 20 | 21 | 77 | 0 | 64 | 52 | 1 |
| LED Night Light | Efficient Appliances | Res | 1.61 | 78,975 | 78,975 | 127,393 | 352 | 0 | 352 | 0 | 3,960 | 0 | 78,975 | 75,000 | 127,393 | 78,975 | 0 | 396,000 | 0 | 7,500 |
| Pump and Motor Single Speed | Efficient Appliances | Res | 7.38 | 1,591,355 | 509,367 | 11,736,267 | 12,326 | 6,341 | 12,326 | 6,341 | 115,523 | 6,341 | 509,367 | 332,920 | 11,736,267 | 1,591,355 | 4,143,178 | 11,552,308 | 1,081,989 | 16,646 |
| Refrigerators-Freezers Energy Star - Side by Side | Efficient Appliances | Res | 0.47 | 120 | 57 | 56 | 0 | 0 | 0 | 0 | 1 | 0 | 57 | 30 | 56 | 120 | 11 | 142 | 63 | 1 |
| Refrigerators-Freezers Energy Star - Top Freezer | Efficient Appliances | Res | 0.36 | 120 | 57 | 43 | 0 | 0 | 0 | 0 | 1 | 0 | 57 | 30 | 43 | 120 | 11 | 103 | 63 | 1 |
| Room Air Conditioners | Efficient Appliances | Res | 2.75 | 15,384,375 | 13,205,285 | 42,289,192 | 39,527 | 27,457 | 39,527 | 27,457 | 370,445 | 27,457 | 13,205,285 | 10,895,450 | 42,289,192 | 15,384,375 | 17,940,602 | 37,044,530 | 2,179,090 | 435,818 |
| Smart Strip plug outlet | Efficient Appliances | Res | 1.16 | 18,780,241 | 7,086,442 | 21,701,904 | 114,792 | 8,063 | 114,792 | 8,063 | 537,915 | 8,063 | 7,086,442 | 5,846,900 | 21,701,904 | 18,780,241 | 2,659,753 | 53,791,476 | 11,693,799 | 584,690 |
| Torchiere Floor Lamps | Efficient Appliances | Res | 0.74 | 52 | 12 | 39 | 0 | 0 | 0 | 0 | 1 | 0 | 12 | 10 | 39 | 52 | 4 | 105 | 40 | 1 |
| Residential New Construction - 15% | New Homes | Res | 1.58 | 7,216,812 | 5,516,460 | 11,369,629 | 8,805 | 6,934 | 8,805 | 6,934 | 148,533 | 6,934 | 5,516,460 | 3,967,486 | 11,369,629 | 7,216,812 | 6,893,119 | 14,853,254 | 1,700,351 | 7,041 |
| Residential New Construction - 30% | New Homes | Res | 1.90 | 11,969,346 | 8,843,235 | 22,737,450 | 17,617 | 13,863 | 17,617 | 13,863 | 297,192 | 13,863 | 8,843,235 | 7,294,260 | 22,737,450 | 11,969,346 | 13,780,611 | 29,719,182 | 3,126,112 | 7,041 |
| Ceiling Fans | Comprehensive Residential | Res | 0.50 | 187 | 80 | 94 | 0 | 0 | 0 | 0 | 2 | 0 | 80 | 75 | 94 | 187 | 14 | 243 | 107 | 1 |
| Estar Windows | Comprehensive Residential | Res | 0.63 | 502 | 127 | 315 | 1 | 0 | 1 | 0 | 9 | 0 | 127 | 100 | 315 | 502 | 36 | 894 | 375 | 1 |
| Duct sealing 20 leakage base | Comprehensive Residential | Res | 1.62 | 76,758,685 | 14,481,838 | 124,092,394 | 79,423 | 61,174 | 79,423 | 61,174 | 1,116,535 | 61,174 | 14,481,838 | 11,862,256 | 124,092,394 | 76,758,685 | 54,321,282 | 111,653,489 | 62,276,846 | 98,852 |
| Low Flow Showerheads | Comprehensive Residential | Res | 0.92 | 105 | 25 | 97 | 0 | 0 | 0 | 0 | 2 | 0 | 25 | 23 | 97 | 105 | 20 | 234 | 80 | 1 |
| Kitchen Aerator | Comprehensive Residential | Res | 6.12 | 1,822,841 | 1,822,841 | 11,149,585 | 27,619 | 5,698 | 27,619 | 5,698 | 232,965 | 5,698 | 1,822,841 | 1,583,112 | 11,149,585 | 1,822,841 | 3,403,155 | 23,296,462 | 0 | 226,159 |
| Bathroom Aerator | Comprehensive Residential | Res | 3.06 | 1,822,841 | 1,822,841 | 5,574,793 | 13,810 | 2,849 | 13,810 | 2,849 | 116,482 | 2,849 | 1,822,841 | 1,583,112 | 5,574,793 | 1,822,841 | 1,701,578 | 11,648,231 | 0 | 226,159 |
| Pipe Wrap | Comprehensive Residential | Res | 1.10 | 34,172,611 | 8,051,257 | 37,549,643 | 78,427 | 8,850 | 78,427 | 8,850 | 955,521 | 8,850 | 8,051,257 | 5,653,973 | 37,549,643 | 34,172,611 | 7,103,496 | 95,552,139 | 26,121,354 | 226,159 |
| Roof Insulation | Comprehensive Residential | Res | 0.80 | 625 | 87 | 499 | 1 | 0 | 1 | 0 | 14 | 0 | 87 | 50 | 499 | 625 | 89 | 1,406 | 538 | 1 |
| Wall Insulation | Comprehensive Residential | Res | 0.61 | 1,597 | 177 | 971 | 1 | 0 | 1 | 0 | 34 | 0 | 177 | 150 | 971 | 1,597 | 168 | 3,387 | 1,421 | 1 |
| Whole Building | Comprehensive Residential | Res | 0.00 | 427 | 327 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 327 | 300 | 0 | 427 | 0 | 0 | 100 | 1 |
| Commercial New Construction | COMNEW | COMM | 3.48 | 12,993,515 | 6,593,669 | 45,170,188 | 42,533 | 13,632 | 42,533 | 13,632 | 1,195,857 | 13,632 | 6,593,669 | 6,399,846 | 45,170,188 | 12,993,515 | 16,810,597 | 119,585,686 | 6,399,846 | 1,829 |
| Commercial CFL Program | COMM Equip | COMM | 19.12 | 14,106,076 | 5,099,802 | 269,716,958 | 933,012 | 13,454 | 933,012 | 13,454 | 7,869,772 | 13,454 | 5,099,802 | 4,503,137 | 269,716,958 | 14,106,076 | 8,035,022 | 786,977,170 | 9,006,273 | 1,125,784 |
| Exterior HID replacement above 175W to 250W HID retrofit | COMM Equip | COMM | 0.31 | 505 | 55 | 158 | 0 | 0 | 0 | 0 | 5 | 0 | 55 | 50 | 158 | 505 | 0 | 491 | 450 | 1 |
| HPT8 4ft 4 lamp, T12 to HPT8 | COMM Equip | COMM | 0.65 | 152 | 30 | 99 | 0 | 0 | 0 | 0 | 2 | 0 | 30 | 25 | 99 | 152 | 33 | 204 | 122 | 1 |
| LED Exit Signs Electronic Fixtures (Retrofit Only) | COMM Equip | COMM | -2.54 | -13,864,518 | -29,071,567 | 35,278,625 | 65,229 | 7,464 | 65,229 | 7,464 | 916,985 | 7,464 | 4,653,357 | 3,041,410 | 35,278,625 | -13,864,518 | 6,627,900 | 91,698,507 | -18,517,875 | 304,141 |
| Occupancy Sensors under 500 W | COMM Equip | COMM | 1.89 | 50,342,141 | 14,485,915 | 95,373,959 | 202,517 | 50,502 | 202,517 | 50,502 | 1,897,990 | 50,502 | 14,485,915 | 11,952,075 | 95,373,959 | 50,342,141 | 32,998,529 | 189,798,955 | 35,856,226 | 478,083 |
| LED Auto Traffic Signals | COMM Equip | COMM | 1.22 | 4,307,645 | -4,212,355 | 5,241,767 | 13,700 | 1,564 | 13,700 | 1,564 | 128,400 | 1,564 | 1,207,200 | 1,080,000 | 5,241,767 | 4,307,645 | 1,022,036 | 12,840,000 | 3,100,445 | 24,000 |
| LED Pedestrian Signals | COMM Equip | COMM | 4.83 | 480,170 | -269,830 | 2,317,142 | 6,056 | 691 | 6,056 | 691 | 56,760 | 691 | 181,800 | 150,000 | 2,317,142 | 480,170 | 451,784 | 5,676,000 | 298,370 | 6,000 |
| Street Lighting - 175 Mercury to 100 HPS | COMM Equip | COMM | 0.59 | 184 | 184 | 108 | 0 | 0 | 0 | 0 | 3 | 0 | 184 | 50 | 108 | 184 | 0 | 329 | 0 | 1 |
| AC 65,000 - 135,000 | COMM Equip | COMM | 2.58 | 61,422,784 | 27,289,008 | 158,182,234 | 102,825 | 76,413 | 102,825 | 76,413 | 1,445,507 | 76,413 | 27,289,008 | 22,515,683 | 158,182,234 | 61,422,784 | 67,854,004 | 144,550,687 | 34,133,776 | 90,063 |
| AC 240,000 - 760,000 | COMM Equip | COMM | 3.92 | 33,053,023 | 9,073,820 | 129,616,707 | 80,986 | 65,849 | 80,986 | 65,849 | 1,138,506 | 65,849 | 9,073,820 | 7,880,489 | 129,616,707 | 33,053,023 | 58,472,674 | 113,850,553 | 23,979,203 | 22,516 |
| Clothes Washer CEE Tier1, Electric Water heater, Electric Dryer | COMM Equip | COMM | 0.68 | 374 | 77 | 254 | 1 | 0 | 1 | 0 | 6 | 0 | 77 | 50 | 254 | 374 | 46 | 633 | 297 | 1 |
| Demand-controlled ventilation (DCV) | COMM Equip | COMM | 1.97 | 4,003,288 | 682,225 | 7,896,978 | 7,688 | 1,288 | 7,688 | 1,288 | 108,075 | 1,288 | 682,225 | 562,892 | 7,896,978 | 4,003,288 | 1,143,466 | 10,807,528 | 3,321,063 | 1,126 |
| Efficient Refrigeration Condenser | COMM Equip | COMM | 4.17 | 952,751 | 361,714 | 3,972,795 | 3,027 | 2,977 | 3,027 | 2,977 | 42,555 | 2,977 | 361,714 | 236,415 | 3,972,795 | 952,751 | 2,643,198 | 4,255,464 | 591,037 | 23,641 |
| ENERGY STAR Commercial Solid Door Freezers less than 20ft3 | COMM Equip | COMM | 1.29 | 4,404,218 | 2,115,123 | 5,684,514 | 12,701 | 1,441 | 12,701 | 1,441 | 142,839 | 1,441 | 2,115,123 | 1,144,547 | 5,684,514 | 4,404,218 | 1,089,361 | 14,283,950 | 2,289,094 | 22,891 |

# Economic Achievable - OE

| Measure Name | Program | Rate Class | Total Measure TRC Test | **Total Discounted Lifetime Costs ($000)** | **Total Discounted Lifetime Utility Costs ($000)** | **Total Discounted Lifetime Benefits ($000)** | Program Year 2010 Cummultive | | Program Year 2025 Cumm | | Life Time Savings | | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Participants 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MWh Saved | kW Saved | MWh Saved | kW Saved | MWh Saved | kW Saved | Portfolio Budget | Total Incentives | Benefits | Costs | Avoided Capacity | Lost Revene | Participant Costs | Number |
| ENERGY STAR Commercial Solid Door Freezers 20 to 48 ft3 | COMM Equip | COMM | 0.55 | 442 | 92 | 243 | 1 | 0 | 1 | 0 | 6 | 0 | 92 | 50 | 243 | 442 | 47 | 608 | 350 | 1 |
| ENERGY STAR Commercial Solid Door Refrigerators less than 20ft3 | COMM Equip | COMM | 1.48 | 13,825,530 | 4,368,943 | 20,447,320 | 45,658 | 5,196 | 45,658 | 5,196 | 513,493 | 5,196 | 4,368,943 | 2,364,147 | 20,447,320 | 13,825,530 | 3,928,239 | 51,349,267 | 9,456,587 | 47,283 |
| ENERGY STAR Commercial Solid Door Refrigerators 20 to 48 ft3 | COMM Equip | COMM | 0.94 | 542 | 92 | 511 | 1 | 0 | 1 | 0 | 13 | 0 | 92 | 50 | 511 | 542 | 98 | 1,283 | 450 | 1 |
| ENERGY STAR Ice Machines less than 500 lbs | COMM Equip | COMM | 1.23 | 2,892,815 | 416,090 | 3,556,861 | 7,938 | 906 | 7,938 | 906 | 89,270 | 906 | 416,090 | 225,157 | 3,556,861 | 2,892,815 | 685,036 | 8,927,018 | 2,476,725 | 4,503 |
| ENERGY STAR Ice Machines 500 to 1000 lbs | COMM Equip | COMM | 0.84 | 1,542 | 192 | 1,289 | 3 | 0 | 3 | 0 | 32 | 0 | 192 | 150 | 1,289 | 1,542 | 248 | 3,234 | 1,350 | 1 |
| ENERGY STAR Ice Machines more than 1000 lbs | COMM Equip | COMM | 1.42 | 2,042 | 242 | 2,892 | 6 | 1 | 6 | 1 | 73 | 1 | 242 | 200 | 2,892 | 2,042 | 557 | 7,258 | 1,800 | 1 |
| ENERGY STAR Steam Cookers 3 Pan | COMM Equip | COMM | 1.52 | 4,192 | 442 | 6,376 | 12 | 3 | 12 | 3 | 134 | 3 | 442 | 400 | 6,376 | 4,192 | 2,057 | 13,426 | 3,750 | 1 |
| EE Water Heater | COMM Equip | COMM | 0.72 | 277 | 77 | 199 | 0 | 0 | 0 | 0 | 4 | 0 | 77 | 50 | 199 | 277 | 58 | 446 | 200 | 1 |
| HP Water Heater (Base Usage 22831) | COMM Equip | COMM | 2.25 | 211,405,380 | 15,502,048 | 475,411,134 | 767,580 | 155,704 | 767,580 | 155,704 | 10,790,641 | 155,704 | 15,502,048 | 10,132,058 | 475,411,134 | 211,405,380 | 138,263,125 | 1,079,064,124 | 195,903,332 | 50,660 |
| Plug Load Occupancy Sensors Document Stations | COMM Equip | COMM | 1.04 | 3,496,686 | 907,382 | 3,636,018 | 19,292 | 1,321 | 19,292 | 1,321 | 90,400 | 1,321 | 907,382 | 788,049 | 3,636,018 | 3,496,686 | 435,847 | 9,040,047 | 2,589,304 | 22,516 |
| Commercial Smart Strip plug outlet | COMM Equip | COMM | 1.16 | 10,848,056 | 4,093,351 | 12,535,700 | 66,307 | 4,658 | 66,307 | 4,658 | 310,716 | 4,658 | 4,093,351 | 3,377,353 | 12,535,700 | 10,848,056 | 1,536,357 | 31,071,643 | 6,754,705 | 337,735 |
| Pre Rinse Sprayers | COMM Equip | COMM | 5.35 | 424,128 | 292,524 | 2,268,937 | 11,738 | 975 | 11,738 | 975 | 55,006 | 975 | 292,524 | 275,817 | 2,268,937 | 424,128 | 321,734 | 5,500,581 | 131,604 | 7,880 |
| Refrigerant charging correction | COMM Equip | COMM | 1.64 | 56,942,163 | 12,023,375 | 93,216,868 | 332,820 | 151,973 | 332,820 | 151,973 | 935,756 | 151,973 | 12,023,375 | 8,443,381 | 93,216,868 | 56,942,163 | 24,709,053 | 93,575,630 | 44,918,788 | 337,735 |
| Refrigeration Commissioning | COMM Equip | COMM | 0.39 | 124 | 36 | 49 | 0 | 0 | 0 | 0 | 1 | 0 | 36 | 25 | 49 | 124 | 7 | 113 | 88 | 1 |
| Strip curtains for walk-ins - freezer | COMM Equip | COMM | 0.51 | 211 | 61 | 107 | 1 | 0 | 1 | 0 | 2 | 0 | 61 | 50 | 107 | 211 | 19 | 245 | 150 | 1 |
| Vending Equipment Controller | COMM Equip | COMM | 1.23 | 39,605,087 | 9,208,914 | 48,523,568 | 192,195 | 50,451 | 192,195 | 50,451 | 900,627 | 50,451 | 9,208,914 | 5,628,921 | 48,523,568 | 39,605,087 | 16,641,413 | 90,062,733 | 30,396,173 | 225,157 |
| Window Film | COMM Equip | COMM | 1.17 | 159 | 30 | 187 | 0 | 0 | 0 | 0 | 3 | 0 | 30 | 25 | 187 | 159 | 102 | 256 | 129 | 1 |
| Setback/Setup | COMM Equip | COMM | 1.30 | 191 | 41 | 247 | 1 | 0 | 1 | 0 | 8 | 0 | 41 | 25 | 247 | 191 | -5 | 758 | 150 | 1 |
| Demand-controlled ventilation (DCV) | IND Equip | IND | 1.97 | 1,073,138 | 182,880 | 2,116,897 | 2,061 | 345 | 2,061 | 345 | 28,971 | 345 | 182,880 | 150,891 | 2,116,897 | 1,073,138 | 306,522 | 2,897,111 | 890,258 | 302 |
| Exterior HID replacement above 175W to 250W HID retrofit | IND Equip | IND | 0.31 | 505 | 55 | 158 | 0 | 0 | 0 | 0 | 5 | 0 | 55 | 50 | 158 | 505 | 0 | 491 | 450 | 1 |
| HPT8 4ft 4 lamp, T12 to HPT8 | IND Equip | IND | 0.78 | 152 | 30 | 119 | 0 | 0 | 0 | 0 | 3 | 0 | 30 | 25 | 119 | 152 | 39 | 254 | 122 | 1 |
| Occupancy Sensors under 500 W | IND Equip | IND | 1.89 | 480,519 | 138,269 | 910,351 | 1,933 | 482 | 1,933 | 482 | 18,116 | 482 | 138,269 | 114,083 | 910,351 | 480,519 | 314,973 | 1,811,643 | 342,250 | 4,563 |
| Water-Cooled cent Chiller 150 - 300 ton 0.57 kW/ton with 0.46 kW/ton IPLV | IND Equip | IND | 1.13 | 3,694,090 | 758,571 | 4,189,397 | 2,312 | 2,510 | 2,312 | 2,510 | 49,844 | 2,510 | 758,571 | 685,869 | 4,189,397 | 3,694,090 | 2,817,402 | 4,984,391 | 2,935,519 | 274 |
| Water-Cooled Centrifugal Chiller < 150 ton 0.56 kW/ton with 0.53 kW/ton IPLV | IND Equip | IND | 2.49 | 1,883,396 | 758,571 | 4,680,342 | 2,583 | 2,805 | 2,583 | 2,805 | 55,685 | 2,805 | 758,571 | 685,869 | 4,680,342 | 1,883,396 | 3,147,566 | 5,568,499 | 1,124,825 | 274 |
| Window Film | IND Equip | IND | 1.68 | 2,111,390 | 344,389 | 3,555,207 | 3,748 | 2,150 | 3,748 | 2,150 | 52,685 | 2,150 | 344,389 | 342,935 | 3,555,207 | 2,111,390 | 1,909,103 | 5,268,462 | 1,767,001 | 274 |
| Motors 1 HP 1200 | IND MOTOR | IND | 0.87 | 60 | 25 | 53 | 0 | 0 | 0 | 0 | 1 | 0 | 25 | 20 | 53 | 60 | 7 | 146 | 35 | 1 |
| Motors 5 HP 1200 | IND MOTOR | IND | 2.60 | 1,246,703 | 1,082,423 | 3,243,938 | 6,401 | 487 | 6,401 | 487 | 89,983 | 487 | 1,082,423 | 985,680 | 3,243,938 | 1,246,703 | 432,466 | 8,998,296 | 164,280 | 18,253 |
| Motors 10 HP 1200 | IND MOTOR | IND | 1.85 | 621,982 | 343,619 | 1,151,752 | 2,273 | 173 | 2,273 | 173 | 31,948 | 173 | 343,619 | 319,433 | 1,151,752 | 621,982 | 153,546 | 3,194,823 | 278,363 | 4,563 |
| Motors 20 HP 1200 | IND MOTOR | IND | 2.50 | 211,396 | 134,961 | 528,723 | 1,043 | 79 | 1,043 | 79 | 14,666 | 79 | 134,961 | 128,914 | 528,723 | 211,396 | 70,487 | 1,466,615 | 76,436 | 1,141 |
| Motors 1 HP 3600 | IND MOTOR | IND | 0.60 | 60 | 25 | 36 | 0 | 0 | 0 | 0 | 1 | 0 | 25 | 20 | 36 | 60 | 5 | 100 | 35 | 1 |
| Motors 5 HP 3600 | IND MOTOR | IND | 1.38 | 623,351 | 541,211 | 858,739 | 1,694 | 129 | 1,694 | 129 | 23,820 | 129 | 541,211 | 492,840 | 858,739 | 623,351 | 114,483 | 2,382,041 | 82,140 | 9,127 |
| Motors 10 HP 3600 | IND MOTOR | IND | 1.29 | 310,991 | 171,810 | 400,910 | 791 | 60 | 791 | 60 | 11,121 | 60 | 171,810 | 159,717 | 400,910 | 310,991 | 53,447 | 1,112,078 | 139,182 | 2,282 |
| Motors 20 HP 3600 | IND MOTOR | IND | 1.46 | 105,698 | 67,480 | 154,748 | 305 | 23 | 305 | 23 | 4,293 | 23 | 67,480 | 64,457 | 154,748 | 105,698 | 20,630 | 429,253 | 38,218 | 570 |
| Water Pumps with VFD's | IND MOTOR | IND | 5.07 | 594,602 | 161,086 | 3,012,495 | 6,622 | 117 | 6,622 | 117 | 93,092 | 117 | 161,086 | 136,900 | 3,012,495 | 594,602 | 103,884 | 9,309,200 | 433,517 | 4,563 |
| HVAC Fans with VFD's | IND MOTOR | IND | 6.16 | 594,602 | 161,086 | 3,661,511 | 8,049 | 142 | 8,049 | 142 | 113,148 | 142 | 161,086 | 136,900 | 3,661,511 | 594,602 | 126,265 | 11,314,785 | 433,517 | 4,563 |
| Air Compressors with VFD's | IND MOTOR | IND | 2.88 | 594,602 | 161,086 | 1,714,464 | 3,769 | 67 | 3,769 | 67 | 52,980 | 67 | 161,086 | 136,900 | 1,714,464 | 594,602 | 59,122 | 5,298,030 | 433,517 | 4,563 |
| Water Pumps with VFD's | IND MOTOR | IND | 5.15 | 1,169,856 | 302,823 | 6,024,991 | 13,244 | 234 | 13,244 | 234 | 186,184 | 234 | 302,823 | 273,800 | 6,024,991 | 1,169,856 | 207,768 | 18,618,400 | 867,033 | 1,825 |
| HVAC Fans with VFD's | IND MOTOR | IND | 6.26 | 1,169,856 | 302,823 | 7,323,022 | 16,097 | 284 | 16,097 | 284 | 226,296 | 284 | 302,823 | 273,800 | 7,323,022 | 1,169,856 | 252,530 | 22,629,570 | 867,033 | 1,825 |
| Air Compressors with VFD's | IND MOTOR | IND | 2.93 | 1,169,856 | 302,823 | 3,428,929 | 7,537 | 133 | 7,537 | 133 | 105,961 | 133 | 302,823 | 273,800 | 3,428,929 | 1,169,856 | 118,245 | 10,596,060 | 867,033 | 1,825 |
| Water Pumps with VFD's | IND MOTOR | IND | 1.05 | 2,864,176 | 148,993 | 3,012,495 | 6,622 | 117 | 6,622 | 117 | 93,092 | 117 | 148,993 | 136,900 | 3,012,495 | 2,864,176 | 103,884 | 9,309,200 | 2,715,183 | 456 |
| HVAC Fans with VFD's | IND MOTOR | IND | 1.28 | 2,864,176 | 148,993 | 3,661,511 | 8,049 | 142 | 8,049 | 142 | 113,148 | 142 | 148,993 | 136,900 | 3,661,511 | 2,864,176 | 126,265 | 11,314,785 | 2,715,183 | 456 |
| Air Compressors with VFD's | IND MOTOR | IND | 0.60 | 6,277 | 327 | 3,757 | 8 | 0 | 8 | 0 | 116 | 0 | 327 | 300 | 3,757 | 6,277 | 130 | 11,610 | 5,950 | 1 |

# Market Achievable BASE CASE - OE

| Measure Name | Program | Rate Class | Total Measure TRC Test | **Total Discounted Lifetime Costs ($000)** | **Total Discounted Lifetime Utility Costs ($000)** | **Total Discounted Lifetime Benefits ($000)** | Program Year 2010 Cummultive | | Program Year 2025 Cumm | | Life Time Savings | | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Participants 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MWh Saved | kW Saved | MWh Saved | kW Saved | MWh Saved | kW Saved | Portfolio Budget | Total Incentives | Benefits | Costs | Avoided Capacity | Lost Revene | Participant Costs | Number |
| DLC-CAC | Therm DLC | Res | 1.54 | 11,781,053 | 11,781,053 | 18,123,341 | 189 | 3,783 | 945 | 18,900 | 11,513 | 18,900 | 2,453,218 | 1,132,551 | 3,183,354 | 2,453,218 | 3,036,496 | 230,450 | 0 | 4,924 |
| DLC-Pool Pumps | Therm DLC | Res | 1.92 | 602,534 | 602,534 | 1,155,094 | 6 | 246 | 32 | 1,232 | 390 | 1,232 | 130,434 | 52,646 | 202,833 | 130,434 | 197,857 | 7,808 | 0 | 157 |
| DLC-Water Heat | Therm DLC | Res | 1.41 | 602,534 | 602,534 | 848,393 | 6 | 179 | 32 | 896 | 390 | 896 | 130,434 | 52,646 | 148,994 | 130,434 | 144,018 | 7,808 | 0 | 157 |
| Residential Online Audit | On-Line Audit | Res | 6.00 | 1,822,194 | 1,822,194 | 10,931,688 | 6,337 | 756 | 44,284 | 5,280 | 207,515 | 5,280 | 264,588 | 49,492 | 1,300,438 | 264,588 | 249,228 | 2,969,523 | 0 | 19,797 |
| Residential Online Audit Future | On-Line Audit | Res | 2.73 | 6,146,998 | 6,146,998 | 16,779,756 | 0 | 0 | 44,896 | 5,353 | 210,384 | 5,353 | 5,294 | 33 | 66 | 5,294 | 13 | 150 | 0 | 1 |
| Schools Childern Education | Comprehensive Residential | Res | 2.02 | 361,200 | 361,200 | 730,409 | 240 | 29 | 2,634 | 314 | 12,344 | 314 | 33,700 | 24,750 | 49,267 | 33,700 | 9,442 | 112,500 | 0 | 750 |
| Refrigerator/Freezer recycling | Efficient Appliances | Res | 4.41 | 32,138,002 | 32,138,002 | 141,839,752 | 27,005 | 3,838 | 301,042 | 42,780 | 2,257,091 | 42,780 | 2,880,039 | 756,842 | 8,883,365 | 2,880,039 | 2,062,687 | 20,247,041 | 0 | 15,137 |
| Room Air Conditioners recycling | Efficient Appliances | Res | 0.63 | 4,928,659 | 4,082,807 | 3,086,672 | 336 | 234 | 3,749 | 2,604 | 17,569 | 2,604 | 369,745 | 75,684 | 188,643 | 445,429 | 77,061 | 157,602 | 75,684 | 3,027 |
| ASHP - SEER 15 | Comprehensive Residential | Res | 3.22 | 2,529,007 | 1,543,317 | 8,142,740 | 609 | 64 | 9,867 | 1,039 | 166,460 | 1,039 | 96,387 | 80,916 | 373,593 | 157,074 | 63,798 | 1,027,912 | 60,687 | 202 |
| CAC - SEER 15 | Comprehensive Residential | Res | 1.65 | 59,173,931 | 14,369,857 | 97,647,134 | 3,061 | 1,459 | 49,571 | 23,621 | 836,241 | 23,621 | 886,089 | 689,622 | 4,562,574 | 3,644,578 | 1,449,962 | 5,163,891 | 2,758,489 | 4,597 |
| CAC - Maintenance | Comprehensive Residential | Res | 3.33 | 45,039,589 | 11,826,532 | 149,788,365 | 7,297 | 6,327 | 118,169 | 102,463 | 775,235 | 102,463 | 729,502 | 511,214 | 6,269,627 | 2,774,357 | 2,996,408 | 4,787,169 | 2,044,855 | 20,449 |
| EE Ground Source Heat Pump | Comprehensive Residential | Res | 1.13 | 2,670,020 | 1,057,074 | 3,011,639 | 248 | 10 | 4,020 | 169 | 67,811 | 169 | 66,450 | 55,170 | 136,585 | 165,756 | 10,384 | 418,739 | 99,306 | 92 |
| Solar Water Heating | Comprehensive Residential | Res | 0.63 | 1,118,317 | 189,239 | 702,714 | 49 | 11 | 799 | 183 | 11,239 | 183 | 12,212 | 11,000 | 31,709 | 69,414 | 10,025 | 69,401 | 57,201 | 22 |
| HP Water Heater | Comprehensive Residential | Res | 2.23 | 3,145,899 | 1,167,808 | 7,027,137 | 494 | 113 | 7,995 | 1,828 | 112,387 | 1,828 | 72,461 | 66,001 | 317,090 | 194,247 | 100,251 | 694,006 | 121,787 | 220 |
| EE Water Heater | Comprehensive Residential | Res | 1.00 | 21,468,482 | 5,940,539 | 21,439,876 | 1,624 | 330 | 26,307 | 5,336 | 345,167 | 5,336 | 366,307 | 239,005 | 951,704 | 1,322,329 | 278,991 | 2,131,450 | 956,021 | 4,780 |
| Programable Thermostat_Heat | Comprehensive Residential | Res | 3.27 | 2,074,568 | 2,074,568 | 6,773,686 | 2,662 | 0 | 13,652 | 0 | 191,913 | 0 | 404,653 | 375,662 | 1,169,397 | 404,653 | 0 | 3,742,730 | 0 | 5,351 |
| Programable Thermostat_CAC | Comprehensive Residential | Res | 1.57 | 2,456,221 | 1,370,293 | 3,857,390 | 247 | 418 | 1,402 | 2,372 | 19,706 | 2,372 | 241,493 | 177,978 | 587,863 | 432,526 | 370,990 | 347,057 | 191,033 | 5,933 |
| LED Lighting Inside | Efficient Appliances | Res | 0.77 | 6,796,938 | 3,674,648 | 5,240,159 | 0 | 0 | 11,305 | 387 | 95,352 | 387 | 633 | 3 | 3 | 636 | 0 | 9 | 3 | 1 |
| CFL bulbs regular - Inside - 15 | Efficient Appliances | Res | 4.29 | 6,987,315 | 1,933,745 | 29,944,447 | 17,713 | 607 | 88,497 | 3,031 | 746,455 | 3,031 | 387,227 | 252,678 | 5,330,368 | 1,397,941 | 362,297 | 14,940,879 | 1,010,714 | 252,678 |
| CFL bulbs regular - Outside - 15 | Efficient Appliances | Res | 7.43 | 2,080,003 | 576,026 | 15,456,564 | 9,801 | 0 | 49,163 | 0 | 414,679 | 0 | 115,224 | 74,899 | 2,748,908 | 414,819 | 0 | 8,267,014 | 299,595 | 74,899 |
| LED Lighting Outside | Efficient Appliances | Res | 1.81 | 2,480,686 | 1,341,375 | 4,491,210 | 0 | 0 | 10,607 | 0 | 89,469 | 0 | 633 | 3 | 8 | 636 | 0 | 24 | 3 | 1 |
| Clothes Washer Energy Star, Electric Water heater, Electric Dryer | Efficient Appliances | Res | 1.13 | 11,243,947 | 7,790,513 | 12,652,178 | 1,170 | 74 | 18,941 | 1,200 | 248,521 | 1,200 | 480,206 | 354,367 | 547,099 | 692,826 | 62,745 | 1,534,646 | 212,620 | 4,725 |
| Dehumidifiers | Efficient Appliances | Res | 3.33 | 10,613,215 | 7,145,204 | 35,361,522 | 1,941 | 89 | 31,434 | 1,446 | 353,517 | 1,446 | 440,476 | 213,518 | 1,472,060 | 653,994 | 67,511 | 2,183,006 | 213,518 | 8,541 |
| Freezers Energy Star-Chest Freezer | Efficient Appliances | Res | 0.10 | 73,733,734 | 9,775,182 | 7,613,124 | 574 | 141 | 9,288 | 2,282 | 113,156 | 2,282 | 602,398 | 292,121 | 335,733 | 4,540,186 | 113,087 | 698,753 | 3,937,788 | 11,685 |
| Holiday Lights | Efficient Appliances | Res | 0.41 | 40,642,181 | 13,302,774 | 16,754,046 | 2,197 | 0 | 35,573 | 0 | 333,389 | 0 | 819,584 | 647,395 | 676,576 | 2,502,811 | 0 | 2,058,717 | 1,683,227 | 32,370 |
| LED Night Light | Efficient Appliances | Res | 2.14 | 174,689 | 174,689 | 374,310 | 70 | 0 | 773 | 0 | 8,690 | 0 | 16,424 | 15,000 | 25,479 | 16,424 | 0 | 79,200 | 0 | 1,500 |
| Pump and Motor Single Speed | Efficient Appliances | Res | 10.64 | 882,636 | 283,266 | 9,393,272 | 420 | 216 | 6,808 | 3,502 | 63,804 | 3,502 | 18,001 | 11,354 | 400,273 | 54,903 | 141,306 | 393,999 | 36,902 | 568 |
| Refrigerators-Freezers Energy Star - Side by Side | Efficient Appliances | Res | 0.67 | 25,804,440 | 12,201,006 | 17,215,582 | 1,546 | 177 | 25,039 | 2,871 | 305,061 | 2,871 | 751,750 | 398,826 | 742,563 | 1,589,284 | 142,325 | 1,883,786 | 837,534 | 13,294 |
| Refrigerators-Freezers Energy Star - Top Freezer | Efficient Appliances | Res | 0.51 | 25,804,440 | 12,201,006 | 13,274,739 | 1,121 | 177 | 18,147 | 2,871 | 221,099 | 2,871 | 751,750 | 398,826 | 577,360 | 1,589,284 | 142,325 | 1,365,313 | 837,534 | 13,294 |
| Room Air Conditioners | Efficient Appliances | Res | 3.93 | 7,179,210 | 6,162,481 | 28,190,927 | 1,135 | 789 | 18,388 | 12,773 | 172,331 | 12,773 | 379,972 | 312,989 | 1,214,824 | 442,569 | 515,372 | 1,064,163 | 62,598 | 12,520 |
| Smart Strip plug outlet | Efficient Appliances | Res | 1.32 | 2,454,928 | 927,016 | 3,249,411 | 2,897 | 204 | 14,985 | 1,053 | 70,222 | 1,053 | 179,477 | 147,565 | 547,715 | 474,607 | 67,127 | 1,357,594 | 295,129 | 14,756 |
| Torchiere Floor Lamps | Efficient Appliances | Res | 1.11 | 392,142 | 92,034 | 434,967 | 52 | 3 | 840 | 46 | 7,873 | 46 | 6,228 | 4,619 | 17,842 | 24,705 | 1,865 | 48,615 | 18,477 | 462 |
| Residential New Construction - 15% | New Homes | Res | 2.00 | 7,538,410 | 5,764,452 | 15,065,274 | 566 | 445 | 9,159 | 7,213 | 154,502 | 7,213 | 359,589 | 254,844 | 730,306 | 468,808 | 442,766 | 954,070 | 109,219 | 452 |
| Residential New Construction - 30% | New Homes | Res | 2.40 | 1,396,687 | 1,034,304 | 3,347,659 | 126 | 99 | 2,036 | 1,602 | 34,348 | 1,602 | 68,364 | 52,059 | 162,277 | 90,675 | 98,352 | 212,106 | 22,311 | 50 |
| Ceiling Fans | Comprehensive Residential | Res | 0.74 | 10,535,947 | 4,518,201 | 7,835,508 | 911 | 74 | 14,539 | 1,177 | 136,260 | 1,177 | 283,446 | 263,628 | 328,938 | 659,555 | 48,229 | 854,154 | 376,109 | 3,515 |
| Estar Windows | Comprehensive Residential | Res | 0.88 | 18,805,193 | 4,745,038 | 16,568,462 | 1,490 | 95 | 23,773 | 1,508 | 334,203 | 1,508 | 297,623 | 234,336 | 738,516 | 1,176,383 | 83,955 | 2,094,963 | 878,760 | 2,343 |
| Duct sealing 20 leakage base | Comprehensive Residential | Res | 2.16 | 29,115,973 | 5,494,913 | 63,020,409 | 1,883 | 1,450 | 30,036 | 23,134 | 422,239 | 23,134 | 344,490 | 281,203 | 2,941,697 | 1,820,806 | 1,287,724 | 2,646,824 | 1,476,316 | 2,343 |
| Low Flow Showerheads | Comprehensive Residential | Res | 1.36 | 5,914,093 | 1,414,843 | 8,016,425 | 878 | 106 | 14,001 | 1,688 | 131,214 | 1,688 | 89,486 | 80,846 | 339,446 | 370,689 | 69,134 | 822,519 | 281,203 | 3,515 |
| Kitchen Aerator | Comprehensive Residential | Res | 8.95 | 505,745 | 505,745 | 4,527,005 | 477 | 98 | 7,609 | 1,570 | 64,180 | 1,570 | 32,667 | 27,339 | 192,545 | 32,667 | 58,770 | 402,313 | 0 | 3,906 |
| Bathroom Aerator | Comprehensive Residential | Res | 4.48 | 505,745 | 505,745 | 2,263,503 | 238 | 49 | 3,804 | 785 | 32,090 | 785 | 32,667 | 27,339 | 96,273 | 32,667 | 29,385 | 201,156 | 0 | 3,906 |
| Pipe Wrap | Comprehensive Residential | Res | 1.57 | 6,538,970 | 1,542,207 | 10,240,938 | 938 | 106 | 14,958 | 1,688 | 182,241 | 1,688 | 97,446 | 67,597 | 448,930 | 409,744 | 84,927 | 1,142,388 | 312,298 | 2,704 |
| Roof Insulation | Comprehensive Residential | Res | 1.05 | 82,632,891 | 11,524,823 | 86,852,411 | 6,202 | 700 | 98,941 | 11,164 | 1,854,542 | 11,164 | 721,360 | 413,416 | 4,125,940 | 5,165,614 | 736,006 | 11,625,272 | 4,444,254 | 8,268 |
| Wall Insulation | Comprehensive Residential | Res | 0.77 | 29,946,460 | 3,310,902 | 22,933,083 | 1,411 | 159 | 22,517 | 2,541 | 633,078 | 2,541 | 207,989 | 175,752 | 1,137,522 | 1,872,712 | 196,403 | 3,968,479 | 1,664,722 | 1,172 |
| Whole Building | Comprehensive Residential | Res | 0.00 | 26,653,884 | 20,404,926 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,276,366 | 1,171,680 | 0 | 1,666,926 | 0 | 0 | 390,560 | 3,906 |
| Commercial New Construction | COMNEW | COMM | 4.18 | 13,389,913 | 6,990,067 | 55,923,031 | 2,619 | 839 | 42,407 | 13,592 | 1,192,306 | 13,592 | 434,824 | 394,024 | 2,781,029 | 828,849 | 1,034,992 | 7,362,628 | 394,024 | 113 |
| Commercial CFL Program | COMM Equip | COMM | 21.56 | 14,273,127 | 5,165,783 | 307,671,368 | 186,602 | 2,691 | 942,705 | 13,593 | 7,951,532 | 13,593 | 1,024,960 | 900,627 | 53,943,392 | 2,826,215 | 1,607,004 | 157,395,434 | 1,801,255 | 225,157 |
| Exterior HID replacement above 175W to 250W HID retrofit | COMM Equip | COMM | 0.36 | 47,146,734 | 5,167,528 | 17,119,722 | 7,535 | 0 | 40,670 | 0 | 457,388 | 0 | 959,786 | 863,279 | 2,726,072 | 8,729,295 | 0 | 8,473,945 | 7,769,509 | 17,266 |
| HPT8 4ft 4 lamp, T12 to HPT8 | COMM Equip | COMM | 0.74 | 235,673,890 | 46,873,531 | 173,263,558 | 56,000 | 13,696 | 279,780 | 68,424 | 3,146,513 | 68,424 | 9,378,506 | 7,733,916 | 30,613,805 | 47,138,578 | 10,353,135 | 62,979,929 | 37,760,072 | 309,357 |
| LED Exit Signs Electronic Fixtures (Retrofit Only) | COMM Equip | COMM | -4.60 | -1,814,230 | -4,907,602 | 8,348,001 | 2,353 | 269 | 13,254 | 1,517 | 186,318 | 1,517 | 173,356 | 109,710 | 1,272,571 | -494,621 | 239,082 | 3,307,749 | -667,977 | 10,971 |
| Occupancy Sensors under 500 W | COMM Equip | COMM | 2.15 | 4,537,393 | 1,310,332 | 9,753,574 | 3,645 | 909 | 18,212 | 4,542 | 170,684 | 4,542 | 266,246 | 215,137 | 1,716,731 | 911,659 | 593,974 | 3,416,381 | 645,412 | 8,605 |
| LED Auto Traffic Signals | COMM Equip | COMM | 1.13 | 2,623,427 | -1,636,573 | 2,961,969 | 1,370 | 156 | 6,845 | 781 | 64,149 | 781 | 126,220 | 108,000 | 524,177 | 436,264 | 102,204 | 1,284,000 | 310,044 | 2,400 |
| LED Pedestrian Signals | COMM Equip | COMM | 4.59 | 285,269 | -89,731 | 1,309,349 | 606 | 69 | 3,026 | 345 | 28,358 | 345 | 23,680 | 15,000 | 231,714 | 53,517 | 45,178 | 567,600 | 29,837 | 600 |
| Street Lighting - 175 Mercury to 100 HPS | COMM Equip | COMM | 0.70 | 6,754,878 | 6,754,878 | 4,708,897 | 3,505 | 0 | 14,020 | 0 | 131,400 | 0 | 1,846,425 | 500,000 | 1,079,581 | 1,846,425 | 0 | 3,285,000 | 0 | 10,000 |
| AC 65,000 - 135,000 | COMM Equip | COMM | 3.45 | 10,505,843 | 4,672,901 | 36,282,140 | 1,082 | 804 | 17,519 | 13,019 | 246,282 | 13,019 | 292,608 | 236,888 | 1,664,235 | 651,729 | 713,892 | 1,520,818 | 359,121 | 948 |
| AC 240,000 - 760,000 | COMM Equip | COMM | 5.23 | 2,519,962 | 698,771 | 13,170,479 | 379 | 308 | 6,133 | 4,986 | 86,211 | 4,986 | 47,929 | 36,849 | 606,088 | 160,056 | 273,418 | 532,365 | 112,127 | 105 |
| Clothes Washer CEE Tier1, Electric Water heater, Electric Dryer | COMM Equip | COMM | 1.01 | 4,102,105 | 843,669 | 4,141,493 | 456 | 48 | 7,388 | 778 | 69,241 | 778 | 54,173 | 33,774 | 171,897 | 254,788 | 31,379 | 427,573 | 200,615 | 675 |
| Demand-controlled ventilation (DCV) | COMM Equip | COMM | 2.21 | 4,022,334 | 687,960 | 8,881,305 | 1,538 | 258 | 7,713 | 1,292 | 108,423 | 1,292 | 138,945 | 112,578 | 1,579,396 | 803,158 | 228,693 | 2,161,506 | 664,213 | 225 |
| Efficient Refrigeration Condenser | COMM Equip | COMM | 5.32 | 309,255 | 120,124 | 1,645,747 | 61 | 60 | 966 | 950 | 13,577 | 950 | 9,734 | 4,728 | 79,456 | 21,555 | 52,864 | 85,109 | 11,821 | 473 |
| ENERGY STAR Commercial Solid Door Freezers less than 20ft3 | COMM Equip | COMM | 1.86 | 1,134,110 | 546,930 | 2,105,878 | 204 | 23 | 3,248 | 369 | 36,532 | 369 | 36,410 | 18,349 | 91,134 | 73,108 | 17,465 | 229,000 | 36,699 | 367 |

# Market Achievable BASE CASE - OE

| Measure Name | Program | Rate Class | Total Measure TRC Test | **Total Discounted Lifetime Costs ($000)** | **Total Discounted Lifetime Utility Costs ($000)** | **Total Discounted Lifetime Benefits ($000)** | Program Year 2010 Cummultive | | Program Year 2025 Cumm | | Life Time Savings | | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Participants 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MWh Saved | kW Saved | MWh Saved | kW Saved | MWh Saved | kW Saved | Portfolio Budget | Total Incentives | Benefits | Costs | Avoided Capacity | Lost Revene | Participant Costs | Number |
| ENERGY STAR Commercial Solid Door Freezers 20 to 48 ft3 | COMM Equip | COMM | 0.78 | 302,470 | 66,635 | 235,943 | 23 | 3 | 363 | 42 | 4,087 | 42 | 6,391 | 2,106 | 10,213 | 21,131 | 1,970 | 25,622 | 14,740 | 42 |
| ENERGY STAR Commercial Solid Door Refrigerators less than 20ft3 | COMM Equip | COMM | 2.13 | 3,543,711 | 1,122,824 | 7,559,216 | 731 | 83 | 11,654 | 1,326 | 131,065 | 1,326 | 72,403 | 37,826 | 327,157 | 223,708 | 62,852 | 821,588 | 151,305 | 757 |
| ENERGY STAR Commercial Solid Door Refrigerators 20 to 48 ft3 | COMM Equip | COMM | 1.36 | 1,645,736 | 283,987 | 2,233,300 | 216 | 25 | 3,441 | 393 | 38,704 | 393 | 19,976 | 9,457 | 96,662 | 105,085 | 18,611 | 242,618 | 85,109 | 189 |
| ENERGY STAR Ice Machines less than 500 lbs | COMM Equip | COMM | 1.76 | 569,333 | 85,636 | 1,004,672 | 95 | 11 | 1,546 | 176 | 17,382 | 176 | 7,503 | 2,707 | 42,768 | 37,283 | 8,237 | 107,338 | 29,780 | 54 |
| ENERGY STAR Ice Machines 500 to 1000 lbs | COMM Equip | COMM | 1.20 | 682,606 | 88,978 | 819,501 | 78 | 9 | 1,261 | 144 | 14,178 | 144 | 7,709 | 4,061 | 34,885 | 44,257 | 6,719 | 87,554 | 36,548 | 27 |
| ENERGY STAR Ice Machines more than 1000 lbs | COMM Equip | COMM | 2.02 | 303,739 | 39,905 | 613,010 | 58 | 7 | 943 | 108 | 10,606 | 108 | 4,687 | 1,805 | 26,095 | 20,931 | 5,025 | 65,495 | 16,244 | 9 |
| ENERGY STAR Steam Cookers 3 Pan | COMM Equip | COMM | 2.16 | 38,410,624 | 4,057,167 | 82,787,155 | 6,733 | 1,535 | 109,035 | 24,852 | 1,226,256 | 24,852 | 252,022 | 225,607 | 3,596,089 | 2,367,089 | 1,160,084 | 7,572,278 | 2,115,067 | 564 |
| EE Water Heater | COMM Equip | COMM | 1.00 | 3,081,964 | 855,860 | 3,073,646 | 233 | 47 | 3,771 | 765 | 49,484 | 765 | 54,924 | 34,264 | 136,437 | 191,980 | 39,996 | 305,567 | 137,056 | 685 |
| HP Water Heater (Base Usage 22831) | COMM Equip | COMM | 3.08 | 5,165,226 | 382,813 | 15,893,043 | 1,154 | 234 | 18,683 | 3,790 | 262,640 | 3,790 | 25,800 | 15,228 | 714,543 | 320,242 | 207,809 | 1,621,833 | 294,443 | 76 |
| Plug Load Occupancy Sensors Document Stations | COMM Equip | COMM | 1.36 | 626,275 | 165,757 | 854,604 | 470 | 32 | 3,425 | 235 | 16,049 | 235 | 24,593 | 19,188 | 88,532 | 87,639 | 10,612 | 220,112 | 63,046 | 548 |
| Commercial Smart Strip plug outlet | COMM Equip | COMM | 1.52 | 1,978,371 | 749,233 | 3,014,970 | 1,652 | 116 | 12,044 | 846 | 56,439 | 846 | 104,473 | 84,136 | 312,286 | 272,744 | 38,273 | 774,049 | 168,272 | 8,414 |
| Pre Rinse Sprayers | COMM Equip | COMM | 6.01 | 427,976 | 296,109 | 2,570,498 | 2,352 | 195 | 11,753 | 977 | 55,072 | 977 | 61,122 | 55,274 | 454,695 | 87,495 | 64,475 | 1,102,317 | 26,373 | 1,579 |
| Refrigerant charging correction | COMM Equip | COMM | 2.71 | 10,301,251 | 2,178,567 | 27,890,460 | 3,705 | 1,692 | 60,005 | 27,400 | 168,711 | 27,400 | 136,360 | 94,003 | 1,037,814 | 636,456 | 275,094 | 1,041,809 | 500,096 | 3,760 |
| Refrigeration Commissioning | COMM Equip | COMM | 0.63 | 2,683,548 | 776,046 | 1,697,513 | 542 | 62 | 8,648 | 987 | 24,314 | 987 | 50,729 | 33,869 | 65,852 | 169,948 | 10,061 | 152,410 | 119,219 | 1,355 |
| Strip curtains for walk-ins - freezer | COMM Equip | COMM | 0.58 | 1,309,604 | 378,974 | 763,933 | 812 | 93 | 4,055 | 463 | 15,201 | 463 | 77,695 | 62,042 | 132,805 | 263,821 | 23,095 | 304,254 | 186,126 | 1,241 |
| Vending Equipment Controller | COMM Equip | COMM | 1.62 | 3,600,335 | 839,926 | 5,847,681 | 1,730 | 454 | 17,413 | 4,571 | 81,596 | 4,571 | 85,380 | 50,660 | 436,712 | 358,946 | 149,773 | 810,565 | 273,566 | 2,026 |
| Window Film | COMM Equip | COMM | 1.64 | 2,919,651 | 559,527 | 4,787,163 | 308 | 177 | 4,991 | 2,863 | 46,773 | 2,863 | 36,679 | 28,201 | 210,443 | 181,987 | 115,522 | 288,831 | 145,308 | 1,128 |
| Setback/Setup | COMM Equip | COMM | 2.00 | 2,938,710 | 633,840 | 5,876,332 | 852 | -7 | 13,791 | -121 | 116,328 | -121 | 41,255 | 23,689 | 234,399 | 183,161 | -4,460 | 718,341 | 141,906 | 948 |
| Demand-controlled ventilation (DCV) | IND Equip | IND | 2.19 | 328,193 | 58,418 | 718,414 | 125 | 21 | 624 | 105 | 8,772 | 105 | 13,584 | 9,145 | 128,297 | 67,539 | 18,577 | 175,582 | 53,955 | 18 |
| Exterior HID replacement above 175W to 250W HID retrofit | IND Equip | IND | 0.35 | 19,779,504 | 2,168,564 | 6,985,163 | 3,367 | 0 | 17,065 | 0 | 191,918 | 0 | 429,097 | 385,711 | 1,218,004 | 3,900,500 | 0 | 3,786,144 | 3,471,403 | 7,714 |
| HPT8 4ft 4 lamp, T12 to HPT8 | IND Equip | IND | 0.87 | 105,298,999 | 20,943,331 | 92,092,385 | 25,021 | 6,119 | 125,005 | 30,572 | 1,757,320 | 30,572 | 4,190,566 | 3,455,500 | 16,423,740 | 21,061,700 | 5,433,758 | 35,174,152 | 16,871,134 | 138,220 |
| Occupancy Sensors under 500 W | IND Equip | IND | 2.58 | 74,758 | 24,628 | 192,867 | 17 | 4 | 282 | 70 | 2,646 | 70 | 3,747 | 1,029 | 8,210 | 6,833 | 2,840 | 16,337 | 3,086 | 41 |
| Water-Cooled cent Chiller 150 - 300 ton 0.57 kW/ton with 0.46 kW/ton IPLV | IND Equip | IND | 1.39 | 2,091,344 | 432,928 | 2,900,895 | 80 | 87 | 1,302 | 1,414 | 28,076 | 1,414 | 28,885 | 23,856 | 145,718 | 130,990 | 97,997 | 173,370 | 102,105 | 10 |
| Water-Cooled Centrifugal Chiller < 150 ton 0.56 kW/ton with 0.53 kW/ton IPLV | IND Equip | IND | 3.03 | 1,068,396 | 432,928 | 3,240,844 | 90 | 98 | 1,455 | 1,580 | 31,366 | 1,580 | 28,885 | 23,856 | 162,794 | 68,009 | 109,481 | 193,687 | 39,124 | 10 |
| Window Film | IND Equip | IND | 2.22 | 1,197,200 | 198,937 | 2,653,245 | 130 | 75 | 2,111 | 1,211 | 29,676 | 1,211 | 14,479 | 11,928 | 123,659 | 75,940 | 66,404 | 183,251 | 61,461 | 10 |
| Motors 1 HP 1200 | IND MOTOR | IND | 1.21 | 708,808 | 299,933 | 861,180 | 76 | 6 | 1,212 | 92 | 17,033 | 92 | 20,972 | 14,603 | 38,491 | 46,527 | 5,131 | 106,770 | 25,555 | 730 |
| Motors 5 HP 1200 | IND MOTOR | IND | 3.60 | 403,320 | 350,750 | 1,451,566 | 128 | 10 | 2,042 | 155 | 28,709 | 155 | 24,148 | 19,714 | 64,879 | 27,434 | 8,649 | 179,966 | 3,286 | 365 |
| Motors 10 HP 1200 | IND MOTOR | IND | 2.56 | 402,444 | 224,291 | 1,030,750 | 91 | 7 | 1,450 | 110 | 20,386 | 110 | 16,245 | 12,777 | 46,070 | 27,379 | 6,142 | 127,793 | 11,135 | 183 |
| Motors 20 HP 1200 | IND MOTOR | IND | 3.39 | 139,669 | 90,750 | 473,176 | 42 | 3 | 666 | 51 | 9,359 | 51 | 7,898 | 5,157 | 21,149 | 10,956 | 2,819 | 58,665 | 3,057 | 46 |
| Motors 1 HP 3600 | IND MOTOR | IND | 0.83 | 708,808 | 299,933 | 586,613 | 52 | 4 | 825 | 63 | 11,602 | 63 | 20,972 | 14,603 | 26,219 | 46,527 | 3,495 | 72,729 | 25,555 | 730 |
| Motors 5 HP 3600 | IND MOTOR | IND | 1.91 | 403,320 | 350,750 | 768,521 | 68 | 5 | 1,081 | 82 | 15,200 | 82 | 24,148 | 19,714 | 34,350 | 27,434 | 4,579 | 95,282 | 3,286 | 365 |
| Motors 10 HP 3600 | IND MOTOR | IND | 1.78 | 402,444 | 224,291 | 717,582 | 63 | 5 | 1,010 | 77 | 14,192 | 77 | 16,245 | 12,777 | 32,073 | 27,379 | 4,276 | 88,966 | 11,135 | 183 |
| Motors 20 HP 3600 | IND MOTOR | IND | 1.98 | 139,669 | 90,750 | 276,981 | 24 | 2 | 390 | 30 | 5,478 | 30 | 7,898 | 5,157 | 12,380 | 10,956 | 1,650 | 34,340 | 3,057 | 46 |
| Water Pumps with VFD's | IND MOTOR | IND | 6.89 | 108,615 | 32,615 | 748,680 | 73 | 1 | 1,157 | 20 | 16,272 | 20 | 4,265 | 1,500 | 33,008 | 9,015 | 1,138 | 102,000 | 4,750 | 50 |
| HVAC Fans with VFD's | IND MOTOR | IND | 8.38 | 108,615 | 32,615 | 909,977 | 88 | 2 | 1,407 | 25 | 19,777 | 25 | 4,265 | 1,500 | 40,119 | 9,015 | 1,383 | 123,975 | 4,750 | 50 |
| Air Compressors with VFD's | IND MOTOR | IND | 3.92 | 108,615 | 32,615 | 426,087 | 41 | 1 | 659 | 12 | 9,261 | 12 | 4,265 | 1,500 | 18,785 | 9,015 | 648 | 58,050 | 4,750 | 50 |
| Water Pumps with VFD's | IND MOTOR | IND | 7.18 | 260,735 | 70,735 | 1,871,701 | 181 | 3 | 2,894 | 51 | 40,679 | 51 | 6,648 | 3,750 | 82,519 | 18,523 | 2,846 | 255,000 | 11,875 | 25 |
| HVAC Fans with VFD's | IND MOTOR | IND | 8.73 | 260,735 | 70,735 | 2,274,943 | 220 | 4 | 3,517 | 62 | 49,443 | 62 | 6,648 | 3,750 | 100,297 | 18,523 | 3,459 | 309,938 | 11,875 | 25 |
| Air Compressors with VFD's | IND MOTOR | IND | 4.09 | 260,735 | 70,735 | 1,065,218 | 103 | 2 | 1,647 | 29 | 23,151 | 29 | 6,648 | 3,750 | 46,963 | 18,523 | 1,619 | 145,125 | 11,875 | 25 |
| Water Pumps with VFD's | IND MOTOR | IND | 1.48 | 506,495 | 30,495 | 748,680 | 73 | 1 | 1,157 | 20 | 16,272 | 20 | 4,133 | 1,500 | 33,008 | 33,883 | 1,138 | 102,000 | 29,750 | 5 |
| HVAC Fans with VFD's | IND MOTOR | IND | 1.80 | 506,495 | 30,495 | 909,977 | 88 | 2 | 1,407 | 25 | 19,777 | 25 | 4,133 | 1,500 | 40,119 | 33,883 | 1,383 | 123,975 | 29,750 | 5 |
| Air Compressors with VFD's | IND MOTOR | IND | 0.84 | 506,495 | 30,495 | 426,087 | 41 | 1 | 659 | 12 | 9,261 | 12 | 4,133 | 1,500 | 18,785 | 33,883 | 648 | 58,050 | 29,750 | 5 |

# Market Achievable HIGH CASE - OE

| Measure Name | Program | Rate Class | Total Measure TRC Test | **Total Discounted Lifetime Costs ($000)** | **Total Discounted Lifetime Utility Costs ($000)** | **Total Discounted Lifetime Benefits ($000)** | Program Year 2010 Cummultive | | Program Year 2025 Cumm | | Life Time Savings | | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Participants 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MWh Saved | kW Saved | MWh Saved | kW Saved | MWh Saved | kW Saved | Portfolio Budget | Total Incentives | Benefits | Costs | Avoided Capacity | Lost Revene | Participant Costs | Number |
| DLC-CAC | Therm DLC | Res | 1.23 | 30,664,738 | 30,664,738 | 37,695,615 | 393 | 7,868 | 1,966 | 39,311 | 23,947 | 39,311 | 6,485,187 | 2,355,648 | 6,621,212 | 6,485,187 | 6,315,755 | 479,323 | 0 | 10,242 |
| DLC-Pool Pumps | Therm DLC | Res | 1.66 | 697,170 | 697,170 | 1,155,094 | 6 | 246 | 32 | 1,232 | 390 | 1,232 | 151,736 | 52,646 | 202,833 | 151,736 | 197,857 | 7,808 | 0 | 157 |
| DLC-Water Heat | Therm DLC | Res | 1.22 | 697,170 | 697,170 | 848,393 | 6 | 179 | 32 | 896 | 390 | 896 | 151,736 | 52,646 | 148,994 | 151,736 | 144,018 | 7,808 | 0 | 157 |
| Residential Online Audit | On-Line Audit | Res | 6.01 | 2,548,341 | 2,548,341 | 15,304,363 | 8,872 | 1,058 | 61,998 | 7,392 | 290,521 | 7,392 | 368,324 | 69,289 | 1,820,613 | 368,324 | 348,919 | 4,157,333 | 0 | 27,716 |
| Residential Online Audit Future | On-Line Audit | Res | 2.73 | 11,058,471 | 11,058,471 | 30,203,509 | 0 | 0 | 80,813 | 9,636 | 378,691 | 9,636 | 5,294 | 33 | 66 | 5,294 | 13 | 150 | 0 | 1 |
| Schools Childern Education | Comprehensive Residential | Res | 2.03 | 720,900 | 720,900 | 1,460,818 | 480 | 57 | 5,268 | 628 | 24,688 | 628 | 66,400 | 49,500 | 98,534 | 66,400 | 18,884 | 225,000 | 0 | 1,500 |
| Refrigerator/Freezer recycling | Efficient Appliances | Res | 4.09 | 38,461,579 | 38,461,579 | 157,252,629 | 35,271 | 5,012 | 342,343 | 48,649 | 2,566,750 | 48,649 | 3,957,782 | 1,186,234 | 11,602,762 | 3,957,782 | 2,694,122 | 26,445,114 | 0 | 19,771 |
| Room Air Conditioners recycling | Efficient Appliances | Res | 0.52 | 6,564,097 | 5,602,402 | 3,427,769 | 439 | 305 | 4,264 | 2,962 | 19,979 | 2,962 | 580,178 | 197,706 | 246,391 | 679,031 | 100,651 | 205,847 | 98,853 | 3,954 |
| ASHP - SEER 15 | Comprehensive Residential | Res | 3.22 | 6,820,294 | 4,160,283 | 21,974,243 | 1,644 | 173 | 26,629 | 2,805 | 449,215 | 2,805 | 257,508 | 218,361 | 1,008,189 | 421,279 | 172,168 | 2,773,955 | 163,771 | 546 |
| CAC - SEER 15 | Comprehensive Residential | Res | 1.65 | 159,683,992 | 69,001,776 | 263,513,498 | 8,261 | 3,936 | 133,774 | 63,745 | 2,256,707 | 63,745 | 4,249,657 | 3,722,070 | 12,312,699 | 9,832,762 | 3,912,911 | 13,935,431 | 5,583,105 | 12,407 |
| CAC - Maintenance | Comprehensive Residential | Res | 3.33 | 65,055,990 | 29,075,180 | 216,360,972 | 10,540 | 9,139 | 170,688 | 148,002 | 1,119,784 | 148,002 | 1,791,464 | 1,476,840 | 9,056,128 | 4,006,723 | 4,328,145 | 6,914,800 | 2,215,260 | 29,537 |
| EE Ground Source Heat Pump | Comprehensive Residential | Res | 1.13 | 7,200,837 | 2,848,091 | 8,127,301 | 670 | 28 | 10,848 | 457 | 182,996 | 457 | 176,719 | 148,883 | 368,591 | 444,708 | 28,023 | 1,130,020 | 267,989 | 248 |
| Solar Water Heating | Comprehensive Residential | Res | 0.63 | 1,767,639 | 298,584 | 1,111,129 | 78 | 18 | 1,264 | 289 | 17,771 | 289 | 18,944 | 17,394 | 50,138 | 109,391 | 15,852 | 109,736 | 90,446 | 35 |
| HP Water Heater | Comprehensive Residential | Res | 2.23 | 4,973,645 | 4,670,999 | 11,111,285 | 781 | 179 | 12,641 | 2,891 | 177,707 | 2,891 | 288,144 | 278,297 | 501,381 | 306,778 | 158,517 | 1,097,359 | 18,633 | 348 |
| EE Water Heater | Comprehensive Residential | Res | 1.00 | 33,945,251 | 12,461,611 | 33,900,658 | 2,569 | 521 | 41,596 | 8,438 | 545,778 | 8,438 | 767,795 | 566,872 | 1,504,831 | 2,090,496 | 441,140 | 3,370,241 | 1,322,701 | 7,558 |
| Programable Thermostat_Heat | Comprehensive Residential | Res | 3.87 | 8,902,413 | 8,902,413 | 34,471,488 | 3,387 | 0 | 54,849 | 0 | 771,072 | 0 | 548,663 | 477,914 | 1,487,694 | 548,663 | 0 | 4,761,461 | 0 | 6,808 |
| Programable Thermostat_CAC | Comprehensive Residential | Res | 1.56 | 25,533,265 | 18,687,566 | 39,798,189 | 790 | 1,337 | 12,794 | 21,651 | 179,853 | 21,651 | 1,151,114 | 759,396 | 1,881,217 | 1,572,588 | 1,187,204 | 1,110,616 | 421,475 | 18,985 |
| LED Lighting Inside | Efficient Appliances | Res | 0.72 | 7,317,319 | 5,235,793 | 5,240,159 | 0 | 0 | 11,305 | 387 | 95,352 | 387 | 634 | 4 | 3 | 636 | 0 | 9 | 2 | 1 |
| CFL bulbs regular - Inside - 15 | Efficient Appliances | Res | 4.29 | 6,987,315 | 1,933,745 | 29,944,447 | 17,713 | 607 | 88,497 | 3,031 | 746,455 | 3,031 | 387,227 | 252,678 | 5,330,368 | 1,397,941 | 362,297 | 14,940,879 | 1,010,714 | 252,678 |
| CFL bulbs regular - Outside - 15 | Efficient Appliances | Res | 6.82 | 3,775,163 | 1,584,379 | 25,731,391 | 16,316 | 0 | 81,844 | 0 | 690,338 | 0 | 316,089 | 187,032 | 4,576,259 | 752,497 | 0 | 13,762,552 | 436,408 | 124,688 |
| LED Lighting Outside | Efficient Appliances | Res | 1.68 | 4,445,319 | 3,180,872 | 7,476,760 | 0 | 0 | 17,658 | 0 | 148,944 | 0 | 634 | 4 | 8 | 636 | 0 | 24 | 2 | 1 |
| Clothes Washer Energy Star, Electric Water heater, Electric Dryer | Efficient Appliances | Res | 1.10 | 20,615,325 | 17,857,569 | 22,732,774 | 2,102 | 133 | 34,032 | 2,156 | 446,530 | 2,156 | 1,100,013 | 848,945 | 982,998 | 1,269,802 | 112,736 | 2,757,373 | 169,789 | 8,489 |
| Dehumidifiers | Efficient Appliances | Res | 3.21 | 19,816,133 | 16,077,448 | 63,535,743 | 3,488 | 160 | 56,479 | 2,599 | 635,180 | 2,599 | 990,414 | 537,093 | 2,644,920 | 1,220,597 | 121,301 | 3,922,312 | 230,183 | 15,346 |
| Freezers Energy Star-Chest Freezer | Efficient Appliances | Res | 0.10 | 117,859,441 | 31,460,096 | 12,075,991 | 910 | 223 | 14,732 | 3,619 | 179,489 | 3,619 | 1,937,490 | 1,390,092 | 532,542 | 7,256,909 | 179,379 | 1,108,367 | 5,319,418 | 18,535 |
| Holiday Lights | Efficient Appliances | Res | 0.41 | 92,894,998 | 42,422,247 | 38,294,961 | 5,021 | 0 | 81,309 | 0 | 762,032 | 0 | 2,612,406 | 2,219,640 | 1,546,458 | 5,719,903 | 0 | 4,705,638 | 3,107,497 | 73,988 |
| LED Night Light | Efficient Appliances | Res | 2.05 | 364,934 | 364,934 | 748,620 | 141 | 0 | 1,545 | 0 | 17,380 | 0 | 33,719 | 30,000 | 50,957 | 33,719 | 0 | 158,400 | 0 | 3,000 |
| Pump and Motor Single Speed | Efficient Appliances | Res | 10.32 | 1,443,278 | 638,818 | 14,899,673 | 667 | 343 | 10,799 | 5,555 | 101,207 | 5,555 | 39,892 | 27,016 | 634,916 | 89,421 | 224,140 | 624,964 | 49,529 | 901 |
| Refrigerators-Freezers Energy Star - Side by Side | Efficient Appliances | Res | 0.65 | 41,958,052 | 23,805,249 | 27,307,475 | 2,453 | 281 | 39,716 | 4,555 | 483,889 | 4,555 | 1,466,198 | 843,493 | 1,177,859 | 2,583,827 | 225,757 | 2,988,074 | 1,117,628 | 21,087 |
| Refrigerators-Freezers Energy Star - Top Freezer | Efficient Appliances | Res | 0.50 | 41,958,052 | 23,805,249 | 21,056,482 | 1,778 | 281 | 28,785 | 4,555 | 350,709 | 4,555 | 1,466,198 | 843,493 | 915,813 | 2,583,827 | 225,757 | 2,165,668 | 1,117,628 | 21,087 |
| Room Air Conditioners | Efficient Appliances | Res | 3.62 | 13,994,438 | 13,994,438 | 50,651,992 | 2,040 | 1,417 | 33,038 | 22,950 | 309,635 | 22,950 | 862,168 | 674,835 | 2,182,732 | 862,168 | 925,994 | 1,912,032 | 0 | 22,494 |
| Smart Strip plug outlet | Efficient Appliances | Res | 1.74 | 26,661,275 | 14,586,921 | 46,415,632 | 9,730 | 683 | 157,567 | 11,068 | 738,361 | 11,068 | 898,646 | 743,392 | 1,839,495 | 1,642,037 | 225,446 | 4,559,468 | 743,392 | 49,559 |
| Torchiere Floor Lamps | Efficient Appliances | Res | 1.11 | 392,142 | 92,034 | 434,967 | 52 | 3 | 840 | 46 | 7,873 | 46 | 6,228 | 4,619 | 17,842 | 24,705 | 1,865 | 48,615 | 18,477 | 462 |
| Residential New Construction - 15% | New Homes | Res | 1.91 | 12,534,674 | 10,885,970 | 23,896,642 | 897 | 707 | 14,527 | 11,441 | 245,073 | 11,441 | 674,910 | 475,971 | 1,158,416 | 776,417 | 702,318 | 1,513,352 | 101,507 | 717 |
| Residential New Construction - 30% | New Homes | Res | 2.33 | 2,274,779 | 1,894,160 | 5,310,080 | 199 | 157 | 3,230 | 2,542 | 54,484 | 2,542 | 121,304 | 94,533 | 257,405 | 144,738 | 156,007 | 336,444 | 23,434 | 80 |
| Ceiling Fans | Comprehensive Residential | Res | 0.74 | 26,272,276 | 14,134,692 | 19,472,031 | 2,227 | 180 | 36,066 | 2,921 | 338,009 | 2,921 | 871,302 | 816,000 | 803,805 | 1,618,586 | 117,855 | 2,087,243 | 747,284 | 8,589 |
| Estar Windows | Comprehensive Residential | Res | 0.88 | 46,224,916 | 16,448,063 | 40,487,297 | 3,642 | 231 | 58,093 | 3,686 | 816,670 | 3,686 | 1,029,062 | 858,948 | 1,804,664 | 2,890,115 | 205,156 | 5,119,328 | 1,861,053 | 5,726 |
| Duct sealing 20 leakage base | Comprehensive Residential | Res | 2.16 | 71,420,714 | 18,280,485 | 153,998,963 | 4,601 | 3,544 | 73,396 | 56,531 | 1,031,799 | 56,531 | 1,143,588 | 973,474 | 7,188,438 | 4,464,853 | 3,146,729 | 6,467,876 | 3,321,264 | 5,726 |
| Low Flow Showerheads | Comprehensive Residential | Res | 1.35 | 14,517,607 | 4,897,393 | 19,589,229 | 2,145 | 259 | 34,212 | 4,125 | 320,639 | 4,125 | 307,145 | 283,453 | 829,483 | 908,409 | 168,938 | 2,009,938 | 601,263 | 8,589 |
| Kitchen Aerator | Comprehensive Residential | Res | 8.45 | 1,309,206 | 1,309,206 | 11,062,355 | 1,166 | 240 | 18,593 | 3,836 | 156,832 | 3,836 | 82,883 | 66,807 | 470,510 | 82,883 | 143,613 | 983,106 | 0 | 9,544 |
| Bathroom Aerator | Comprehensive Residential | Res | 4.22 | 1,309,206 | 1,309,206 | 5,531,177 | 583 | 120 | 9,297 | 1,918 | 78,416 | 1,918 | 82,883 | 66,807 | 235,255 | 82,883 | 71,806 | 491,553 | 0 | 9,544 |
| Pipe Wrap | Comprehensive Residential | Res | 1.56 | 16,081,579 | 6,514,224 | 25,025,128 | 2,291 | 259 | 36,552 | 4,125 | 445,332 | 4,125 | 408,197 | 330,364 | 1,097,022 | 1,006,157 | 207,530 | 2,791,580 | 597,960 | 6,607 |
| Roof Insulation | Comprehensive Residential | Res | 1.05 | 43,128,347 | 9,629,164 | 45,112,904 | 3,222 | 364 | 51,392 | 5,799 | 963,287 | 5,799 | 602,881 | 429,474 | 2,143,097 | 2,696,580 | 382,297 | 6,038,402 | 2,093,699 | 4,295 |
| Wall Insulation | Comprehensive Residential | Res | 0.76 | 73,312,689 | 10,515,598 | 56,040,114 | 3,449 | 389 | 55,023 | 6,209 | 1,547,014 | 6,209 | 658,283 | 572,632 | 2,779,691 | 4,583,101 | 479,937 | 9,697,519 | 3,924,818 | 2,863 |
| Whole Building | Comprehensive Residential | Res | 0.00 | 65,587,505 | 50,317,324 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3,145,891 | 2,863,159 | 0 | 4,100,277 | 0 | 0 | 954,386 | 9,544 |
| Commercial New Construction | COMNEW | COMM | 4.15 | 13,820,685 | 8,166,236 | 57,313,546 | 3,928 | 1,259 | 43,716 | 14,012 | 1,229,119 | 14,012 | 735,859 | 675,470 | 4,171,544 | 1,242,462 | 1,552,487 | 11,043,943 | 506,603 | 169 |
| Commercial CFL Program | COMM Equip | COMM | 21.56 | 14,301,339 | 5,175,983 | 308,276,319 | 186,976 | 2,696 | 944,570 | 13,620 | 7,967,259 | 13,620 | 1,027,000 | 902,429 | 54,051,278 | 2,831,858 | 1,610,218 | 157,710,225 | 1,804,857 | 225,607 |
| Exterior HID replacement above 175W to 250W HID retrofit | COMM Equip | COMM | 0.46 | 258,918,305 | 39,026,722 | 120,238,224 | 13,740 | 0 | 222,505 | 0 | 2,502,379 | 0 | 2,407,251 | 2,203,900 | 4,971,072 | 15,945,494 | 0 | 15,452,487 | 13,538,243 | 31,484 |
| HPT8 4ft 4 lamp, T12 to HPT8 | COMM Equip | COMM | 0.73 | 432,573,934 | 116,496,973 | 315,951,195 | 102,118 | 24,974 | 510,186 | 124,774 | 5,737,758 | 124,774 | 23,303,195 | 19,744,233 | 55,825,174 | 86,518,587 | 18,879,246 | 114,845,753 | 63,215,392 | 564,121 |
| LED Exit Signs Electronic Fixtures (Retrofit Only) | COMM Equip | COMM | 28.22 | 1,809,749 | -10,861,778 | 51,063,599 | 4,183 | 479 | 67,739 | 7,751 | 952,280 | 7,751 | 518,454 | 390,079 | 2,262,348 | -864,100 | 425,034 | 5,880,442 | -1,382,554 | 19,504 |
| Occupancy Sensors under 500 W | COMM Equip | COMM | 2.13 | 8,646,038 | 3,363,221 | 18,423,418 | 6,886 | 1,717 | 34,401 | 8,579 | 322,404 | 8,579 | 676,824 | 568,919 | 3,242,715 | 1,733,388 | 1,121,950 | 6,453,164 | 1,056,563 | 16,255 |
| LED Auto Traffic Signals | COMM Equip | COMM | 1.13 | 2,623,427 | -1,636,573 | 2,961,969 | 1,370 | 156 | 6,845 | 781 | 64,149 | 781 | 126,220 | 108,000 | 524,177 | 436,264 | 102,204 | 1,284,000 | 310,044 | 2,400 |
| LED Pedestrian Signals | COMM Equip | COMM | 4.59 | 285,269 | -89,731 | 1,309,349 | 606 | 69 | 3,026 | 345 | 28,358 | 345 | 23,680 | 15,000 | 231,714 | 53,517 | 45,178 | 567,600 | 29,837 | 600 |
| Street Lighting - 175 Mercury to 100 HPS | COMM Equip | COMM | 0.70 | 6,754,878 | 6,754,878 | 4,708,897 | 3,505 | 0 | 14,020 | 0 | 131,400 | 0 | 1,846,425 | 500,000 | 1,079,581 | 1,846,425 | 0 | 3,285,000 | 0 | 10,000 |
| AC 65,000 - 135,000 | COMM Equip | COMM | 3.43 | 15,869,379 | 8,274,242 | 54,423,211 | 1,623 | 1,206 | 26,278 | 19,529 | 369,422 | 19,529 | 514,334 | 426,398 | 2,496,353 | 981,950 | 1,070,838 | 2,281,227 | 467,616 | 1,421 |
| AC 240,000 - 760,000 | COMM Equip | COMM | 5.22 | 3,787,956 | 1,184,422 | 19,755,718 | 568 | 462 | 9,199 | 7,479 | 129,317 | 7,479 | 77,830 | 63,170 | 909,132 | 238,124 | 410,127 | 798,548 | 160,294 | 158 |
| Clothes Washer CEE Tier1, Electric Water heater, Electric Dryer | COMM Equip | COMM | 1.00 | 5,339,789 | 1,485,254 | 5,349,428 | 589 | 62 | 9,543 | 1,005 | 89,437 | 1,005 | 93,674 | 65,436 | 222,033 | 330,990 | 40,532 | 552,282 | 237,315 | 872 |
| Demand-controlled ventilation (DCV) | COMM Equip | COMM | 2.21 | 4,022,334 | 687,960 | 8,881,305 | 1,538 | 258 | 7,713 | 1,292 | 108,423 | 1,292 | 138,945 | 112,578 | 1,579,396 | 803,158 | 228,693 | 2,161,506 | 664,213 | 225 |
| Efficient Refrigeration Condenser | COMM Equip | COMM | 5.21 | 407,951 | 212,514 | 2,125,756 | 78 | 77 | 1,247 | 1,227 | 17,537 | 1,227 | 15,509 | 9,161 | 102,631 | 27,723 | 68,283 | 109,933 | 12,215 | 611 |
| ENERGY STAR Commercial Solid Door Freezers less than 20ft3 | COMM Equip | COMM | 1.83 | 1,486,369 | 917,538 | 2,720,092 | 263 | 30 | 4,196 | 476 | 47,187 | 476 | 59,573 | 35,552 | 117,715 | 95,125 | 22,558 | 295,792 | 35,552 | 474 |

# Market Achievable HIGH CASE - OE

| Measure Name | Program | Rate Class | Total Measure TRC Test | **Total Discounted Lifetime Costs ($000)** | **Total Discounted Lifetime Utility Costs ($000)** | **Total Discounted Lifetime Benefits ($000)** | Program Year 2010 Cummultive | | Program Year 2025 Cumm | | Life Time Savings | | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Participants 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MWh Saved | kW Saved | MWh Saved | kW Saved | MWh Saved | kW Saved | Portfolio Budget | Total Incentives | Benefits | Costs | Avoided Capacity | Lost Revene | Participant Costs | Number |
| ENERGY STAR Commercial Solid Door Freezers 20 to 48 ft3 | COMM Equip | COMM | 0.78 | 392,025 | 109,164 | 304,760 | 29 | 3 | 469 | 54 | 5,279 | 54 | 9,049 | 4,080 | 13,191 | 26,728 | 2,545 | 33,095 | 17,679 | 54 |
| ENERGY STAR Commercial Solid Door Refrigerators less than 20ft3 | COMM Equip | COMM | 2.11 | 4,622,922 | 1,886,816 | 9,763,988 | 944 | 107 | 15,053 | 1,713 | 169,293 | 1,713 | 120,153 | 73,289 | 422,578 | 291,159 | 81,184 | 1,061,218 | 171,007 | 977 |
| ENERGY STAR Commercial Solid Door Refrigerators 20 to 48 ft3 | COMM Equip | COMM | 1.35 | 2,136,192 | 474,985 | 2,884,680 | 279 | 32 | 4,445 | 507 | 49,993 | 507 | 31,913 | 18,322 | 124,855 | 135,739 | 24,040 | 313,382 | 103,825 | 244 |
| ENERGY STAR Ice Machines less than 500 lbs | COMM Equip | COMM | 1.76 | 737,520 | 141,144 | 1,297,702 | 123 | 14 | 1,996 | 228 | 22,452 | 228 | 10,921 | 5,245 | 55,242 | 47,638 | 10,639 | 138,646 | 36,718 | 70 |
| ENERGY STAR Ice Machines 500 to 1000 lbs | COMM Equip | COMM | 1.20 | 882,127 | 143,757 | 1,058,522 | 101 | 11 | 1,628 | 186 | 18,314 | 186 | 11,081 | 6,994 | 45,060 | 56,541 | 8,679 | 113,090 | 45,460 | 35 |
| ENERGY STAR Ice Machines more than 1000 lbs | COMM Equip | COMM | 2.02 | 391,622 | 69,768 | 791,805 | 75 | 9 | 1,218 | 139 | 13,700 | 139 | 6,526 | 3,497 | 33,706 | 26,342 | 6,491 | 84,597 | 19,816 | 12 |
| ENERGY STAR Steam Cookers 3 Pan | COMM Equip | COMM | 2.16 | 38,410,624 | 4,057,167 | 82,787,155 | 6,733 | 1,535 | 109,035 | 24,852 | 1,226,256 | 24,852 | 252,022 | 225,607 | 3,596,089 | 2,367,089 | 1,160,084 | 7,572,278 | 2,115,067 | 564 |
| EE Water Heater | COMM Equip | COMM | 0.99 | 4,004,207 | 1,499,840 | 3,951,830 | 299 | 61 | 4,849 | 984 | 63,622 | 984 | 94,572 | 66,081 | 175,420 | 248,761 | 51,424 | 392,872 | 154,188 | 881 |
| HP Water Heater (Base Usage 22831) | COMM Equip | COMM | 3.07 | 6,647,705 | 816,903 | 20,433,912 | 1,483 | 301 | 24,020 | 4,873 | 337,680 | 4,873 | 52,526 | 39,159 | 918,698 | 411,515 | 267,184 | 2,085,214 | 358,990 | 98 |
| Plug Load Occupancy Sensors Document Stations | COMM Equip | COMM | 1.36 | 626,275 | 165,757 | 854,604 | 470 | 32 | 3,425 | 235 | 16,049 | 235 | 24,593 | 19,188 | 88,532 | 87,639 | 10,612 | 220,112 | 63,046 | 548 |
| Commercial Smart Strip plug outlet | COMM Equip | COMM | 1.52 | 1,978,371 | 749,233 | 3,014,970 | 1,652 | 116 | 12,044 | 846 | 56,439 | 846 | 104,473 | 84,136 | 312,286 | 272,744 | 38,273 | 774,049 | 168,272 | 8,414 |
| Pre Rinse Sprayers | COMM Equip | COMM | 6.01 | 427,976 | 296,109 | 2,570,498 | 2,352 | 195 | 11,753 | 977 | 55,072 | 977 | 61,122 | 55,274 | 454,695 | 87,495 | 64,475 | 1,102,317 | 26,373 | 1,579 |
| Refrigerant charging correction | COMM Equip | COMM | 2.71 | 10,301,251 | 2,178,567 | 27,890,460 | 3,705 | 1,692 | 60,005 | 27,400 | 168,711 | 27,400 | 136,360 | 94,003 | 1,037,814 | 636,456 | 275,094 | 1,041,809 | 500,096 | 3,760 |
| Refrigeration Commissioning | COMM Equip | COMM | 0.62 | 3,520,970 | 1,477,089 | 2,192,621 | 700 | 80 | 11,170 | 1,275 | 31,405 | 1,275 | 94,545 | 69,996 | 85,059 | 222,287 | 12,996 | 196,864 | 127,743 | 1,750 |
| Strip curtains for walk-ins - freezer | COMM Equip | COMM | 0.58 | 1,309,604 | 378,974 | 763,933 | 812 | 93 | 4,055 | 463 | 15,201 | 463 | 77,695 | 62,042 | 132,805 | 263,821 | 23,095 | 304,254 | 186,126 | 1,241 |
| Vending Equipment Controller | COMM Equip | COMM | 1.62 | 3,600,335 | 839,926 | 5,847,681 | 1,730 | 454 | 17,413 | 4,571 | 81,596 | 4,571 | 85,380 | 50,660 | 436,712 | 358,946 | 149,773 | 810,565 | 273,566 | 2,026 |
| Window Film | COMM Equip | COMM | 1.64 | 2,919,651 | 559,527 | 4,787,163 | 308 | 177 | 4,991 | 2,863 | 46,773 | 2,863 | 36,679 | 28,201 | 210,443 | 181,987 | 115,522 | 288,831 | 145,308 | 1,128 |
| Setback/Setup | COMM Equip | COMM | 1.98 | 4,452,048 | 1,225,599 | 8,814,498 | 1,277 | -11 | 20,687 | -181 | 174,492 | -181 | 77,688 | 49,746 | 351,599 | 276,333 | -6,690 | 1,077,511 | 198,645 | 1,421 |
| Demand-controlled ventilation (DCV) | IND Equip | IND | 2.19 | 328,193 | 58,418 | 718,414 | 125 | 21 | 624 | 105 | 8,772 | 105 | 13,584 | 9,145 | 128,297 | 67,539 | 18,577 | 175,582 | 53,955 | 18 |
| Exterior HID replacement above 175W to 250W HID retrofit | IND Equip | IND | 0.35 | 35,965,450 | 5,423,751 | 12,649,642 | 6,139 | 0 | 30,972 | 0 | 348,319 | 0 | 1,075,822 | 984,699 | 2,221,066 | 7,124,684 | 0 | 6,904,144 | 6,048,863 | 14,067 |
| HPT8 4ft 4 lamp, T12 to HPT8 | IND Equip | IND | 0.87 | 193,273,592 | 52,050,962 | 167,933,173 | 45,626 | 11,159 | 227,950 | 55,749 | 3,204,525 | 55,749 | 10,412,092 | 8,821,688 | 29,949,172 | 38,656,618 | 9,908,617 | 64,141,100 | 28,244,526 | 252,048 |
| Occupancy Sensors under 500 W | IND Equip | IND | 2.63 | 138,583 | 56,518 | 364,304 | 33 | 8 | 533 | 133 | 4,997 | 133 | 5,710 | 2,721 | 15,507 | 10,763 | 5,365 | 30,860 | 5,053 | 78 |
| Water-Cooled cent Chiller 150 - 300 ton 0.57 kW/ton with 0.46 kW/ton IPLV | IND Equip | IND | 1.38 | 2,707,050 | 665,029 | 3,746,989 | 104 | 113 | 1,682 | 1,827 | 36,264 | 1,827 | 43,175 | 36,977 | 188,219 | 168,898 | 126,579 | 223,936 | 125,723 | 12 |
| Water-Cooled Centrifugal Chiller < 150 ton 0.56 kW/ton with 0.53 kW/ton IPLV | IND Equip | IND | 3.02 | 1,385,742 | 665,029 | 4,186,090 | 116 | 126 | 1,880 | 2,041 | 40,514 | 2,041 | 43,175 | 36,977 | 210,276 | 87,548 | 141,412 | 250,179 | 44,373 | 12 |
| Window Film | IND Equip | IND | 2.22 | 1,546,109 | 306,734 | 3,427,108 | 168 | 97 | 2,727 | 1,564 | 38,331 | 1,564 | 21,116 | 18,489 | 159,727 | 97,421 | 85,771 | 236,699 | 76,306 | 12 |
| Motors 1 HP 1200 | IND MOTOR | IND | 1.20 | 929,357 | 476,674 | 1,112,358 | 98 | 7 | 1,565 | 119 | 22,000 | 119 | 32,019 | 23,577 | 49,718 | 60,311 | 6,628 | 137,911 | 28,293 | 943 |
| Motors 5 HP 1200 | IND MOTOR | IND | 3.56 | 527,223 | 534,768 | 1,874,939 | 165 | 13 | 2,638 | 201 | 37,083 | 201 | 35,650 | 30,179 | 83,802 | 35,178 | 11,172 | 232,456 | -472 | 472 |
| Motors 10 HP 1200 | IND MOTOR | IND | 2.55 | 522,319 | 348,791 | 1,331,385 | 117 | 9 | 1,873 | 143 | 26,332 | 143 | 24,026 | 20,041 | 59,507 | 34,872 | 7,933 | 165,066 | 10,846 | 236 |
| Motors 20 HP 1200 | IND MOTOR | IND | 3.39 | 180,072 | 135,747 | 611,185 | 54 | 4 | 860 | 65 | 12,088 | 65 | 10,711 | 7,839 | 27,317 | 13,481 | 3,642 | 75,775 | 2,770 | 59 |
| Motors 1 HP 3600 | IND MOTOR | IND | 0.82 | 929,357 | 476,674 | 757,708 | 67 | 5 | 1,066 | 81 | 14,986 | 81 | 32,019 | 23,577 | 33,866 | 60,311 | 4,515 | 93,941 | 28,293 | 943 |
| Motors 5 HP 3600 | IND MOTOR | IND | 1.88 | 527,223 | 534,768 | 992,673 | 88 | 7 | 1,397 | 106 | 19,633 | 106 | 35,650 | 30,179 | 44,368 | 35,178 | 5,915 | 123,072 | -472 | 472 |
| Motors 10 HP 3600 | IND MOTOR | IND | 1.77 | 522,319 | 348,791 | 926,877 | 82 | 6 | 1,304 | 99 | 18,332 | 99 | 24,026 | 20,041 | 41,427 | 34,872 | 5,523 | 114,915 | 10,846 | 236 |
| Motors 20 HP 3600 | IND MOTOR | IND | 1.99 | 180,072 | 135,747 | 357,767 | 32 | 2 | 503 | 38 | 7,076 | 38 | 10,711 | 7,839 | 15,991 | 13,481 | 2,132 | 44,356 | 2,770 | 59 |
| Water Pumps with VFD's | IND MOTOR | IND | 6.97 | 202,499 | 89,328 | 1,412,144 | 137 | 2 | 2,183 | 39 | 30,691 | 39 | 7,810 | 4,715 | 62,258 | 14,883 | 2,147 | 192,390 | 7,073 | 94 |
| HVAC Fans with VFD's | IND MOTOR | IND | 8.48 | 202,499 | 89,328 | 1,716,378 | 166 | 3 | 2,654 | 47 | 37,304 | 47 | 7,810 | 4,715 | 75,671 | 14,883 | 2,609 | 233,839 | 7,073 | 94 |
| Air Compressors with VFD's | IND MOTOR | IND | 3.97 | 202,499 | 89,328 | 803,676 | 78 | 1 | 1,242 | 22 | 17,467 | 22 | 7,810 | 4,715 | 35,432 | 14,883 | 1,222 | 109,493 | 7,073 | 94 |
| Water Pumps with VFD's | IND MOTOR | IND | 7.19 | 490,933 | 170,283 | 3,530,361 | 342 | 6 | 5,458 | 96 | 76,728 | 96 | 12,869 | 9,431 | 155,646 | 32,910 | 5,367 | 480,975 | 20,041 | 47 |
| HVAC Fans with VFD's | IND MOTOR | IND | 8.74 | 490,933 | 170,283 | 4,290,946 | 416 | 7 | 6,634 | 117 | 93,259 | 117 | 12,869 | 9,431 | 189,178 | 32,910 | 6,524 | 584,597 | 20,041 | 47 |
| Air Compressors with VFD's | IND MOTOR | IND | 4.09 | 490,933 | 170,283 | 2,009,191 | 195 | 3 | 3,106 | 55 | 43,668 | 55 | 12,869 | 9,431 | 88,581 | 32,910 | 3,055 | 273,732 | 20,041 | 47 |
| Water Pumps with VFD's | IND MOTOR | IND | 1.49 | 2,375,112 | 206,007 | 3,530,361 | 342 | 6 | 5,458 | 96 | 76,728 | 96 | 15,102 | 11,789 | 155,646 | 150,671 | 5,367 | 480,975 | 135,569 | 24 |
| HVAC Fans with VFD's | IND MOTOR | IND | 1.81 | 2,375,112 | 206,007 | 4,290,946 | 416 | 7 | 6,634 | 117 | 93,259 | 117 | 15,102 | 11,789 | 189,178 | 150,671 | 6,524 | 584,597 | 135,569 | 24 |
| Air Compressors with VFD's | IND MOTOR | IND | 0.85 | 2,375,112 | 206,007 | 2,009,191 | 195 | 3 | 3,106 | 55 | 43,668 | 55 | 15,102 | 11,789 | 88,581 | 150,671 | 3,055 | 273,732 | 135,569 | 24 |

# 10.0 APPENDICES



## Appendix C-2 Cleveland Electric Illuminating Detailed Measure Results

# Economic Achievable - CEI

| Measure Name | Program | Rate Class | Total Measure TRC Test | Total Discounted Lifetime Costs ($000) | Total Discounted Lifetime Utility Costs ($000) | Total Discounted Lifetime Benefits ($000) | Program Year 2010 Cummultive | | Program Year 2025 Cumm | | Life Time Savings | | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Participants 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MWh Saved | kW Saved | MWh Saved | kW Saved | MWh Saved | kW Saved | Portfolio Budget | Total Incentives | Benefits | Costs | Avoided Capacity | Lost Revene | Participant Costs | Number |
| DLC-CAC | Therm DLC | Res | 1.30 | 11,393,570 | 11,393,570 | 14,816,273 | 880 | 17,607 | 880 | 17,607 | 10,726 | 17,607 | 11,393,570 | 5,271,229 | 14,816,273 | 11,393,570 | 14,132,752 | 1,072,580 | 0 | 22,918 |
| DLC-Pool Pumps | Therm DLC | Res | 1.62 | 797 | 797 | 1,291 | 0 | 2 | 0 | 2 | 0 | 2 | 797 | 335 | 1,291 | 797 | 1,259 | 50 | 0 | 1 |
| DLC-Water Heat | Therm DLC | Res | 1.19 | 797 | 797 | 948 | 0 | 1 | 0 | 1 | 0 | 1 | 797 | 335 | 948 | 797 | 916 | 50 | 0 | 1 |
| Residential Online Audit | On-Line Audit | Res | 5.01 | 1,311,746 | 1,311,746 | 6,577,677 | 32,053 | 3,822 | 32,053 | 3,822 | 150,200 | 3,822 | 1,311,746 | 250,333 | 6,577,677 | 1,311,746 | 1,260,608 | 15,019,993 | 0 | 100,133 |
| Residential Online Audit Future | On-Line Audit | Res | 1.51 | 44 | 44 | 66 | 0 | 0 | 0 | 0 | 2 | 0 | 44 | 33 | 66 | 44 | 13 | 150 | 0 | 1 |
| Schools Childern Education | Comprehensive Residential | Res | 1.51 | 327,000 | 327,000 | 492,669 | 2,401 | 286 | 2,401 | 286 | 11,250 | 286 | 327,000 | 247,500 | 492,669 | 327,000 | 94,420 | 1,125,000 | 0 | 7,500 |
| Refrigerator/Freezer recycling | Efficient Appliances | Res | 3.09 | 17,913,920 | 17,913,920 | 55,355,672 | 168,277 | 23,913 | 168,277 | 23,913 | 1,261,671 | 23,913 | 17,913,920 | 4,716,175 | 55,355,672 | 17,913,920 | 12,853,401 | 126,167,122 | 0 | 94,324 |
| Room Air Conditioners recycling | Efficient Appliances | Res | 0.43 | 145 | 120 | 62 | 0 | 0 | 0 | 0 | 1 | 0 | 120 | 25 | 62 | 145 | 25 | 52 | 25 | 1 |
| ASHP - SEER 15 | Comprehensive Residential | Res | 2.40 | 23,857,405 | 14,549,014 | 57,303,275 | 93,461 | 9,844 | 93,461 | 9,844 | 1,576,655 | 9,844 | 14,549,014 | 12,411,187 | 57,303,275 | 23,857,405 | 9,785,658 | 157,665,517 | 9,308,390 | 31,028 |
| CAC - SEER 15 | Comprehensive Residential | Res | 1.25 | 282,745,461 | 68,652,482 | 354,112,407 | 237,577 | 113,209 | 237,577 | 113,209 | 4,007,821 | 113,209 | 68,652,482 | 53,523,245 | 354,112,407 | 282,745,461 | 112,535,064 | 400,782,057 | 214,092,979 | 356,822 |
| CAC - Maintenance | Comprehensive Residential | Res | 2.26 | 37,539,456 | 9,855,491 | 84,880,407 | 98,790 | 85,660 | 98,790 | 85,660 | 648,104 | 85,660 | 9,855,491 | 6,920,991 | 84,880,407 | 37,539,456 | 40,566,421 | 64,810,375 | 27,683,964 | 276,840 |
| EE Ground Source Heat Pump | Comprehensive Residential | Res | 0.83 | 1,786 | 706 | 1,485 | 3 | 0 | 3 | 0 | 46 | 0 | 706 | 600 | 1,485 | 1,786 | 113 | 4,554 | 1,080 | 1 |
| Solar Water Heating | Comprehensive Residential | Res | 0.46 | 3,127 | 527 | 1,441 | 2 | 1 | 2 | 1 | 32 | 1 | 527 | 500 | 1,441 | 3,127 | 456 | 3,155 | 2,600 | 1 |
| HP Water Heater | Comprehensive Residential | Res | 1.64 | 7,848,881 | 2,911,903 | 12,854,156 | 20,012 | 4,577 | 20,012 | 4,577 | 281,335 | 4,577 | 2,911,903 | 2,675,561 | 12,854,156 | 7,848,881 | 4,063,981 | 28,133,529 | 4,936,978 | 8,919 |
| EE Water Heater | Comprehensive Residential | Res | 0.72 | 30,824,697 | 8,528,352 | 22,195,657 | 37,886 | 7,685 | 37,886 | 7,685 | 497,097 | 7,685 | 8,528,352 | 5,574,086 | 22,195,657 | 30,824,697 | 6,506,635 | 49,709,702 | 22,296,345 | 111,482 |
| Programable Thermostat_Heat | Comprehensive Residential | Res | 2.89 | 2,037,851 | 2,037,851 | 5,898,302 | 13,429 | 0 | 13,429 | 0 | 188,779 | 0 | 2,037,851 | 1,894,797 | 5,898,302 | 2,037,851 | 0 | 18,877,898 | 0 | 26,991 |
| Programable Thermostat_CAC | Comprehensive Residential | Res | 1.36 | 15,755,808 | 8,786,829 | 21,445,528 | 9,006 | 15,241 | 9,006 | 15,241 | 126,608 | 15,241 | 8,786,829 | 6,492,731 | 21,445,528 | 15,755,808 | 13,533,910 | 12,660,825 | 6,968,979 | 216,424 |
| LED Lighting Inside | Efficient Appliances | Res | 0.50 | 7 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 3 | 7 | 0 | 9 | 3 | 1 |
| CFL bulbs regular - Inside - 15 | Efficient Appliances | Res | 3.81 | 5,002,313 | 1,384,003 | 19,082,470 | 63,413 | 2,172 | 63,413 | 2,172 | 534,877 | 2,172 | 1,384,003 | 904,577 | 19,082,470 | 5,002,313 | 1,297,007 | 53,487,659 | 3,618,309 | 904,577 |
| CFL bulbs regular - Outside - 15 | Efficient Appliances | Res | 6.64 | 2,618,296 | 724,411 | 17,377,203 | 61,957 | 0 | 61,957 | 0 | 522,599 | 0 | 724,411 | 473,471 | 17,377,203 | 2,618,296 | 0 | 52,259,864 | 1,893,885 | 473,471 |
| LED Lighting Outside | Efficient Appliances | Res | 1.20 | 3,091,767 | 1,671,354 | 3,723,686 | 13,277 | 0 | 13,277 | 0 | 111,985 | 0 | 1,671,354 | 1,420,414 | 3,723,686 | 3,091,767 | 0 | 11,198,542 | 1,420,414 | 473,471 |
| Clothes Washer Energy Star, Electric Water heater, Electric Dryer | Efficient Appliances | Res | 0.79 | 15,363,935 | 10,644,637 | 12,143,341 | 25,961 | 1,645 | 25,961 | 1,645 | 340,628 | 1,645 | 10,644,637 | 7,865,496 | 12,143,341 | 15,363,935 | 1,392,670 | 34,062,839 | 4,719,297 | 104,873 |
| Dehumidifiers | Efficient Appliances | Res | 2.25 | 17,900,116 | 12,050,405 | 40,329,756 | 53,179 | 2,447 | 53,179 | 2,447 | 598,074 | 2,447 | 12,050,405 | 5,849,711 | 40,329,756 | 17,900,116 | 1,849,595 | 59,807,445 | 5,849,711 | 233,988 |
| Freezers Energy Star-Chest Freezer | Efficient Appliances | Res | 0.07 | 389 | 52 | 29 | 0 | 0 | 0 | 0 | 1 | 0 | 52 | 25 | 29 | 389 | 10 | 60 | 337 | 1 |
| Holiday Lights | Efficient Appliances | Res | 0.27 | 77 | 25 | 21 | 0 | 0 | 0 | 0 | 1 | 0 | 25 | 20 | 21 | 77 | 0 | 64 | 52 | 1 |
| LED Night Light | Efficient Appliances | Res | 1.61 | 78,975 | 78,975 | 127,393 | 352 | 0 | 352 | 0 | 3,960 | 0 | 78,975 | 75,000 | 127,393 | 78,975 | 0 | 396,000 | 0 | 7,500 |
| Pump and Motor Single Speed | Efficient Appliances | Res | 7.38 | 1,644,801 | 526,474 | 12,130,430 | 12,740 | 6,554 | 12,740 | 6,554 | 119,403 | 6,554 | 526,474 | 344,101 | 12,130,430 | 1,644,801 | 4,282,327 | 11,940,292 | 1,118,327 | 17,205 |
| Refrigerators-Freezers Energy Star - Side by Side | Efficient Appliances | Res | 0.47 | 120 | 57 | 56 | 0 | 0 | 0 | 0 | 1 | 0 | 57 | 30 | 56 | 120 | 11 | 142 | 63 | 1 |
| Refrigerators-Freezers Energy Star - Top Freezer | Efficient Appliances | Res | 0.36 | 120 | 57 | 43 | 0 | 0 | 0 | 0 | 1 | 0 | 57 | 30 | 43 | 120 | 11 | 103 | 63 | 1 |
| Room Air Conditioners | Efficient Appliances | Res | 2.75 | 11,061,396 | 9,494,626 | 30,406,012 | 28,420 | 19,741 | 28,420 | 19,741 | 266,351 | 19,741 | 9,494,626 | 7,833,850 | 30,406,012 | 11,061,396 | 12,899,328 | 26,635,090 | 1,566,770 | 313,354 |
| Smart Strip plug outlet | Efficient Appliances | Res | 1.16 | 12,544,602 | 4,733,517 | 14,496,179 | 76,677 | 5,386 | 76,677 | 5,386 | 359,310 | 5,386 | 4,733,517 | 3,905,542 | 14,496,179 | 12,544,602 | 1,776,630 | 35,930,989 | 7,811,085 | 390,554 |
| Torchiere Floor Lamps | Efficient Appliances | Res | 0.74 | 52 | 12 | 39 | 0 | 0 | 0 | 0 | 1 | 0 | 12 | 10 | 39 | 52 | 4 | 105 | 40 | 1 |
| Residential New Construction - 15% | New Homes | Res | 1.58 | 5,214,712 | 3,986,075 | 8,215,447 | 6,362 | 5,011 | 6,362 | 5,011 | 107,326 | 5,011 | 3,986,075 | 2,866,820 | 8,215,447 | 5,214,712 | 4,980,818 | 10,732,640 | 1,228,637 | 5,088 |
| Residential New Construction - 30% | New Homes | Res | 1.90 | 8,648,790 | 6,389,930 | 16,429,589 | 12,730 | 10,017 | 12,730 | 10,017 | 214,744 | 10,017 | 6,389,930 | 5,270,674 | 16,429,589 | 8,648,790 | 9,957,571 | 21,474,437 | 2,258,860 | 5,088 |
| Ceiling Fans | Comprehensive Residential | Res | 0.50 | 187 | 80 | 94 | 0 | 0 | 0 | 0 | 2 | 0 | 80 | 75 | 94 | 187 | 14 | 243 | 107 | 1 |
| Estar Windows | Comprehensive Residential | Res | 0.63 | 502 | 127 | 315 | 1 | 0 | 1 | 0 | 9 | 0 | 127 | 100 | 315 | 502 | 36 | 894 | 375 | 1 |
| Duct sealing 20 leakage base | Comprehensive Residential | Res | 1.62 | 60,233,043 | 11,363,993 | 97,376,115 | 62,324 | 48,003 | 62,324 | 48,003 | 876,152 | 48,003 | 11,363,993 | 9,308,390 | 97,376,115 | 60,233,043 | 42,626,266 | 87,615,225 | 48,869,050 | 77,570 |
| Low Flow Showerheads | Comprehensive Residential | Res | 0.92 | 105 | 25 | 97 | 0 | 0 | 0 | 0 | 2 | 0 | 25 | 23 | 97 | 105 | 20 | 234 | 80 | 1 |
| Kitchen Aerator | Comprehensive Residential | Res | 6.12 | 808,688 | 808,688 | 4,946,422 | 12,253 | 2,528 | 12,253 | 2,528 | 103,353 | 2,528 | 808,688 | 702,335 | 4,946,422 | 808,688 | 1,509,782 | 10,335,285 | 0 | 100,334 |
| Bathroom Aerator | Comprehensive Residential | Res | 3.06 | 808,688 | 808,688 | 2,473,211 | 6,127 | 1,264 | 6,127 | 1,264 | 51,676 | 1,264 | 808,688 | 702,335 | 2,473,211 | 808,688 | 754,891 | 5,167,643 | 0 | 100,334 |
| Pipe Wrap | Comprehensive Residential | Res | 1.10 | 15,160,400 | 3,571,875 | 16,658,593 | 34,793 | 3,926 | 34,793 | 3,926 | 423,909 | 3,926 | 3,571,875 | 2,508,339 | 16,658,593 | 15,160,400 | 3,151,408 | 42,390,927 | 11,588,525 | 100,334 |
| Roof Insulation | Comprehensive Residential | Res | 0.80 | 625 | 87 | 499 | 1 | 0 | 1 | 0 | 14 | 0 | 87 | 50 | 499 | 625 | 89 | 1,406 | 538 | 1 |
| Wall Insulation | Comprehensive Residential | Res | 0.61 | 1,597 | 177 | 971 | 1 | 0 | 1 | 0 | 34 | 0 | 177 | 150 | 971 | 1,597 | 168 | 3,387 | 1,421 | 1 |
| Whole Building | Comprehensive Residential | Res | 0.00 | 427 | 327 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 327 | 300 | 0 | 427 | 0 | 0 | 100 | 1 |
| Commercial New Construction | COMNEW | COMM | 3.38 | 10,073,940 | 5,255,849 | 34,006,145 | 32,021 | 10,263 | 32,021 | 10,263 | 900,295 | 10,263 | 5,255,849 | 4,818,091 | 34,006,145 | 10,073,940 | 12,655,772 | 90,029,470 | 4,818,091 | 1,377 |
| Commercial CFL Program | COMM Equip | COMM | 19.12 | 10,619,687 | 3,839,360 | 203,055,028 | 702,413 | 10,129 | 702,413 | 10,129 | 5,924,717 | 10,129 | 3,839,360 | 3,390,163 | 203,055,028 | 10,619,687 | 6,049,125 | 592,471,724 | 6,780,327 | 847,541 |
| Exterior HID replacement above 175W to 250W HID retrofit | COMM Equip | COMM | 0.31 | 505 | 55 | 158 | 0 | 0 | 0 | 0 | 5 | 0 | 55 | 50 | 158 | 505 | 0 | 491 | 450 | 1 |
| HPT8 4ft 4 lamp, T12 to HPT8 | COMM Equip | COMM | 0.65 | 152 | 30 | 99 | 0 | 0 | 0 | 0 | 2 | 0 | 30 | 25 | 99 | 152 | 33 | 204 | 122 | 1 |
| LED Exit Signs Electronic Fixtures (Retrofit Only) | COMM Equip | COMM | -2.54 | -13,344,030 | -27,980,193 | 33,954,232 | 62,780 | 7,184 | 62,780 | 7,184 | 882,561 | 7,184 | 4,478,666 | 2,927,232 | 33,954,232 | -13,344,030 | 6,379,083 | 88,256,058 | -17,822,696 | 292,723 |
| Occupancy Sensors under 500 W | COMM Equip | COMM | 1.89 | 33,937,839 | 9,765,589 | 64,295,757 | 136,526 | 34,045 | 136,526 | 34,045 | 1,279,518 | 34,045 | 9,765,589 | 8,057,417 | 64,295,757 | 33,937,839 | 22,245,751 | 127,951,776 | 24,172,250 | 322,297 |
| LED Auto Traffic Signals | COMM Equip | COMM | 1.22 | 4,307,645 | -4,212,355 | 5,241,767 | 13,700 | 1,564 | 13,700 | 1,564 | 128,400 | 1,564 | 1,207,200 | 1,080,000 | 5,241,767 | 4,307,645 | 1,022,036 | 12,840,000 | 3,100,445 | 24,000 |
| LED Pedestrian Signals | COMM Equip | COMM | 4.83 | 480,170 | -269,830 | 2,317,142 | 6,056 | 691 | 6,056 | 691 | 56,760 | 691 | 181,800 | 150,000 | 2,317,142 | 480,170 | 451,784 | 5,676,000 | 298,370 | 6,000 |
| Street Lighting - 175 Mercury to 100 HPS | COMM Equip | COMM | 0.59 | 184 | 184 | 108 | 0 | 0 | 0 | 0 | 3 | 0 | 184 | 50 | 108 | 184 | 0 | 329 | 0 | 1 |
| AC 65,000 - 135,000 | COMM Equip | COMM | 2.58 | 46,241,828 | 20,544,390 | 119,086,683 | 77,411 | 57,528 | 77,411 | 57,528 | 1,088,242 | 57,528 | 20,544,390 | 16,950,817 | 119,086,683 | 46,241,828 | 51,083,539 | 108,824,243 | 25,697,438 | 67,803 |
| AC 240,000 - 760,000 | COMM Equip | COMM | 3.92 | 24,883,799 | 6,831,179 | 97,581,273 | 60,970 | 49,574 | 60,970 | 49,574 | 857,118 | 49,574 | 6,831,179 | 5,932,786 | 97,581,273 | 24,883,799 | 44,020,852 | 85,711,804 | 18,052,620 | 16,951 |
| Clothes Washer CEE Tier1, Electric Water heater, Electric Dryer | COMM Equip | COMM | 0.68 | 374 | 77 | 254 | 1 | 0 | 1 | 0 | 6 | 0 | 77 | 50 | 254 | 374 | 46 | 633 | 297 | 1 |
| Demand-controlled ventilation (DCV) | COMM Equip | COMM | 1.97 | 3,013,855 | 513,610 | 5,945,199 | 5,788 | 969 | 5,788 | 969 | 81,364 | 969 | 513,610 | 423,770 | 5,945,199 | 3,013,855 | 860,852 | 8,136,392 | 2,500,245 | 848 |
| Efficient Refrigeration Condenser | COMM Equip | COMM | 4.17 | 457,689 | 173,763 | 1,908,478 | 1,454 | 1,430 | 1,454 | 1,430 | 20,443 | 1,430 | 173,763 | 113,570 | 1,908,478 | 457,689 | 1,269,757 | 2,044,268 | 283,926 | 11,357 |
| ENERGY STAR Commercial Solid Door Freezers less than 20ft3 | COMM Equip | COMM | 1.29 | 3,098,270 | 1,487,943 | 3,998,931 | 8,935 | 1,014 | 8,935 | 1,014 | 100,484 | 1,014 | 1,487,943 | 805,164 | 3,998,931 | 3,098,270 | 766,342 | 10,048,444 | 1,610,328 | 16,103 |

# Economic Achievable - CEI

| Measure Name | Program | Rate Class | Total Measure TRC Test | **Total Discounted Lifetime Costs ($000)** | **Total Discounted Lifetime Utility Costs ($000)** | **Total Discounted Lifetime Benefits ($000)** | Program Year 2010 Cummultive | | Program Year 2025 Cumm | | Life Time Savings | | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Participants 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MWh Saved | kW Saved | MWh Saved | kW Saved | MWh Saved | kW Saved | Portfolio Budget | Total Incentives | Benefits | Costs | Avoided Capacity | Lost Revene | Participant Costs | Number |
| ENERGY STAR Commercial Solid Door Freezers 20 to 48 ft3 | COMM Equip | COMM | 0.55 | 442 | 92 | 243 | 1 | 0 | 1 | 0 | 6 | 0 | 92 | 50 | 243 | 442 | 47 | 608 | 350 | 1 |
| ENERGY STAR Commercial Solid Door Refrigerators less than 20ft3 | COMM Equip | COMM | 1.48 | 6,641,601 | 2,098,782 | 9,822,621 | 21,934 | 2,496 | 21,934 | 2,496 | 246,675 | 2,496 | 2,098,782 | 1,135,705 | 9,822,621 | 6,641,601 | 1,887,074 | 24,667,506 | 4,542,819 | 22,714 |
| ENERGY STAR Commercial Solid Door Refrigerators 20 to 48 ft3 | COMM Equip | COMM | 0.94 | 542 | 92 | 511 | 1 | 0 | 1 | 0 | 13 | 0 | 92 | 50 | 511 | 542 | 98 | 1,283 | 450 | 1 |
| ENERGY STAR Ice Machines less than 500 lbs | COMM Equip | COMM | 1.23 | 2,177,841 | 313,251 | 2,677,765 | 5,976 | 682 | 5,976 | 682 | 67,207 | 682 | 313,251 | 169,508 | 2,677,765 | 2,177,841 | 515,725 | 6,720,660 | 1,864,590 | 3,390 |
| ENERGY STAR Ice Machines 500 to 1000 lbs | COMM Equip | COMM | 0.84 | 1,542 | 192 | 1,289 | 3 | 0 | 3 | 0 | 32 | 0 | 192 | 150 | 1,289 | 1,542 | 248 | 3,234 | 1,350 | 1 |
| ENERGY STAR Ice Machines more than 1000 lbs | COMM Equip | COMM | 1.42 | 2,042 | 242 | 2,892 | 6 | 1 | 6 | 1 | 73 | 1 | 242 | 200 | 2,892 | 2,042 | 557 | 7,258 | 1,800 | 1 |
| ENERGY STAR Steam Cookers 3 Pan | COMM Equip | COMM | 1.52 | 4,192 | 442 | 6,376 | 12 | 3 | 12 | 3 | 134 | 3 | 442 | 400 | 6,376 | 4,192 | 2,057 | 13,426 | 3,750 | 1 |
| EE Water Heater | COMM Equip | COMM | 0.72 | 277 | 77 | 199 | 0 | 0 | 0 | 0 | 4 | 0 | 77 | 50 | 199 | 277 | 58 | 446 | 200 | 1 |
| HP Water Heater (Base Usage 22831) | COMM Equip | COMM | 2.25 | 166,229,031 | 12,189,332 | 373,817,981 | 603,552 | 122,431 | 603,552 | 122,431 | 8,484,731 | 122,431 | 12,189,332 | 7,966,884 | 373,817,981 | 166,229,031 | 108,716,937 | 848,473,128 | 154,039,699 | 39,834 |
| Plug Load Occupancy Sensors Document Stations | COMM Equip | COMM | 1.04 | 2,632,462 | 683,118 | 2,737,357 | 14,524 | 995 | 14,524 | 995 | 68,058 | 995 | 683,118 | 593,279 | 2,737,357 | 2,632,462 | 328,125 | 6,805,753 | 1,949,344 | 16,951 |
| Commercial Smart Strip plug outlet | COMM Equip | COMM | 1.16 | 8,166,903 | 3,081,658 | 9,437,437 | 49,919 | 3,507 | 49,919 | 3,507 | 233,921 | 3,507 | 3,081,658 | 2,542,623 | 9,437,437 | 8,166,903 | 1,156,638 | 23,392,127 | 5,085,245 | 254,262 |
| Pre Rinse Sprayers | COMM Equip | COMM | 5.35 | 273,688 | 188,764 | 1,464,135 | 7,575 | 629 | 7,575 | 629 | 35,495 | 629 | 188,764 | 177,984 | 1,464,135 | 273,688 | 207,614 | 3,549,501 | 84,924 | 5,085 |
| Refrigerant charging correction | COMM Equip | COMM | 1.64 | 42,868,615 | 9,051,736 | 70,177,841 | 250,562 | 114,412 | 250,562 | 114,412 | 704,479 | 114,412 | 9,051,736 | 6,356,556 | 70,177,841 | 42,868,615 | 18,602,084 | 70,447,933 | 33,816,879 | 254,262 |
| Refrigeration Commissioning | COMM Equip | COMM | 0.39 | 124 | 36 | 49 | 0 | 0 | 0 | 0 | 1 | 0 | 36 | 25 | 49 | 124 | 7 | 113 | 88 | 1 |
| Strip curtains for walk-ins - freezer | COMM Equip | COMM | 0.51 | 211 | 61 | 107 | 1 | 0 | 1 | 0 | 2 | 0 | 61 | 50 | 107 | 211 | 19 | 245 | 150 | 1 |
| Vending Equipment Controller | COMM Equip | COMM | 1.23 | 29,816,487 | 6,932,884 | 36,530,720 | 144,693 | 37,982 | 144,693 | 37,982 | 678,033 | 37,982 | 6,932,884 | 4,237,704 | 36,530,720 | 29,816,487 | 12,528,403 | 67,803,267 | 22,883,603 | 169,508 |
| Window Film | COMM Equip | COMM | 1.17 | 159 | 30 | 187 | 0 | 0 | 0 | 0 | 3 | 0 | 30 | 25 | 187 | 159 | 102 | 256 | 129 | 1 |
| Setback/Setup | COMM Equip | COMM | 1.30 | 191 | 41 | 247 | 1 | 0 | 1 | 0 | 8 | 0 | 41 | 25 | 247 | 191 | -5 | 758 | 150 | 1 |
| Demand-controlled ventilation (DCV) | IND Equip | IND | 1.97 | 2,638,850 | 449,703 | 5,205,455 | 5,068 | 849 | 5,068 | 849 | 71,240 | 849 | 449,703 | 371,042 | 5,205,455 | 2,638,850 | 753,739 | 7,124,004 | 2,189,147 | 742 |
| Exterior HID replacement above 175W to 250W HID retrofit | IND Equip | IND | 0.31 | 505 | 55 | 158 | 0 | 0 | 0 | 0 | 5 | 0 | 55 | 50 | 158 | 505 | 0 | 491 | 450 | 1 |
| HPT8 4ft 4 lamp, T12 to HPT8 | IND Equip | IND | 0.78 | 152 | 30 | 119 | 0 | 0 | 0 | 0 | 3 | 0 | 30 | 25 | 119 | 152 | 39 | 254 | 122 | 1 |
| Occupancy Sensors under 500 W | IND Equip | IND | 1.89 | 1,181,598 | 340,004 | 2,238,555 | 4,753 | 1,185 | 4,753 | 1,185 | 44,548 | 1,185 | 340,004 | 280,531 | 2,238,555 | 1,181,598 | 774,520 | 4,454,836 | 841,594 | 11,221 |
| Water-Cooled cent Chiller 150 - 300 ton 0.57 kW/ton with 0.46 kW/ton IPLV | IND Equip | IND | 1.13 | 9,083,779 | 1,865,329 | 10,301,739 | 5,686 | 6,173 | 5,686 | 6,173 | 122,566 | 6,173 | 1,865,329 | 1,686,554 | 10,301,739 | 9,083,779 | 6,928,000 | 12,256,632 | 7,218,451 | 675 |
| Water-Cooled Centrifugal Chiller < 150 ton 0.56 kW/ton with 0.53 kW/ton IPLV | IND Equip | IND | 2.49 | 4,631,277 | 1,865,329 | 11,508,974 | 6,352 | 6,897 | 6,352 | 6,897 | 136,930 | 6,897 | 1,865,329 | 1,686,554 | 11,508,974 | 4,631,277 | 7,739,874 | 13,692,956 | 2,765,948 | 675 |
| Window Film | IND Equip | IND | 1.68 | 5,191,914 | 846,852 | 8,742,263 | 9,216 | 5,287 | 9,216 | 5,287 | 129,552 | 5,287 | 846,852 | 843,277 | 8,742,263 | 5,191,914 | 4,694,489 | 12,955,164 | 4,345,062 | 675 |
| Motors 1 HP 1200 | IND MOTOR | IND | 0.87 | 60 | 25 | 53 | 0 | 0 | 0 | 0 | 1 | 0 | 25 | 20 | 53 | 60 | 7 | 146 | 35 | 1 |
| Motors 5 HP 1200 | IND MOTOR | IND | 2.60 | 3,065,646 | 2,661,681 | 7,976,852 | 15,740 | 1,198 | 15,740 | 1,198 | 221,268 | 1,198 | 2,661,681 | 2,423,790 | 7,976,852 | 3,065,646 | 1,063,436 | 22,126,836 | 403,965 | 44,885 |
| Motors 10 HP 1200 | IND MOTOR | IND | 1.85 | 1,529,456 | 844,960 | 2,832,161 | 5,588 | 425 | 5,588 | 425 | 78,561 | 425 | 844,960 | 785,488 | 2,832,161 | 1,529,456 | 377,570 | 7,856,078 | 684,496 | 11,221 |
| Motors 20 HP 1200 | IND MOTOR | IND | 2.50 | 519,824 | 331,868 | 1,300,132 | 2,565 | 195 | 2,565 | 195 | 36,064 | 195 | 331,868 | 317,000 | 1,300,132 | 519,824 | 173,327 | 3,606,410 | 187,956 | 2,805 |
| Motors 1 HP 3600 | IND MOTOR | IND | 0.60 | 60 | 25 | 36 | 0 | 0 | 0 | 0 | 1 | 0 | 25 | 20 | 36 | 60 | 5 | 100 | 35 | 1 |
| Motors 5 HP 3600 | IND MOTOR | IND | 1.38 | 1,532,823 | 1,330,840 | 2,111,643 | 4,167 | 317 | 4,167 | 317 | 58,574 | 317 | 1,330,840 | 1,211,895 | 2,111,643 | 1,532,823 | 281,514 | 5,857,445 | 201,983 | 22,443 |
| Motors 10 HP 3600 | IND MOTOR | IND | 1.29 | 764,728 | 422,480 | 985,840 | 1,945 | 148 | 1,945 | 148 | 27,346 | 148 | 422,480 | 392,744 | 985,840 | 764,728 | 131,428 | 2,734,602 | 342,248 | 5,611 |
| Motors 20 HP 3600 | IND MOTOR | IND | 1.46 | 259,912 | 165,934 | 380,526 | 751 | 57 | 751 | 57 | 10,555 | 57 | 165,934 | 158,500 | 380,526 | 259,912 | 50,730 | 1,055,535 | 93,978 | 1,403 |
| Water Pumps with VFD's | IND MOTOR | IND | 5.07 | 1,462,129 | 396,110 | 7,407,735 | 16,284 | 288 | 16,284 | 288 | 228,914 | 288 | 396,110 | 336,638 | 7,407,735 | 1,462,129 | 255,451 | 22,891,350 | 1,066,019 | 11,221 |
| HVAC Fans with VFD's | IND MOTOR | IND | 6.16 | 1,462,129 | 396,110 | 9,003,666 | 19,792 | 350 | 19,792 | 350 | 278,231 | 350 | 396,110 | 336,638 | 9,003,666 | 1,462,129 | 310,486 | 27,823,089 | 1,066,019 | 11,221 |
| Air Compressors with VFD's | IND MOTOR | IND | 2.88 | 1,462,129 | 396,110 | 4,215,873 | 9,267 | 164 | 9,267 | 164 | 130,279 | 164 | 396,110 | 336,638 | 4,215,873 | 1,462,129 | 145,382 | 13,027,871 | 1,066,019 | 11,221 |
| Water Pumps with VFD's | IND MOTOR | IND | 5.15 | 2,876,680 | 744,642 | 14,815,470 | 32,567 | 575 | 32,567 | 575 | 457,827 | 575 | 744,642 | 673,275 | 14,815,470 | 2,876,680 | 510,902 | 45,782,700 | 2,132,038 | 4,489 |
| HVAC Fans with VFD's | IND MOTOR | IND | 6.26 | 2,876,680 | 744,642 | 18,007,333 | 39,583 | 699 | 39,583 | 699 | 556,462 | 699 | 744,642 | 673,275 | 18,007,333 | 2,876,680 | 620,972 | 55,646,179 | 2,132,038 | 4,489 |
| Air Compressors with VFD's | IND MOTOR | IND | 2.93 | 2,876,680 | 744,642 | 8,431,746 | 18,534 | 327 | 18,534 | 327 | 260,557 | 327 | 744,642 | 673,275 | 8,431,746 | 2,876,680 | 290,764 | 26,055,743 | 2,132,038 | 4,489 |
| Water Pumps with VFD's | IND MOTOR | IND | 1.05 | 7,043,018 | 366,374 | 7,407,735 | 16,284 | 288 | 16,284 | 288 | 228,914 | 288 | 366,374 | 336,638 | 7,407,735 | 7,043,018 | 255,451 | 22,891,350 | 6,676,644 | 1,122 |
| HVAC Fans with VFD's | IND MOTOR | IND | 1.28 | 7,043,018 | 366,374 | 9,003,666 | 19,792 | 350 | 19,792 | 350 | 278,231 | 350 | 366,374 | 336,638 | 9,003,666 | 7,043,018 | 310,486 | 27,823,089 | 6,676,644 | 1,122 |
| Air Compressors with VFD's | IND MOTOR | IND | 0.60 | 6,277 | 327 | 3,757 | 8 | 0 | 8 | 0 | 116 | 0 | 327 | 300 | 3,757 | 6,277 | 130 | 11,610 | 5,950 | 1 |

# Market Achievable BASE CASE - CEI

| Measure Name | Program | Rate Class | Total Measure TRC Test | **Total Discounted Lifetime Costs ($000)** | **Total Discounted Lifetime Utility Costs ($000)** | **Total Discounted Lifetime Benefits ($000)** | Program Year 2010 Cummultive | | Program Year 2025 Cumm | | Life Time Savings | | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Participants 2010 | Participants 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MWh Saved | kW Saved | MWh Saved | kW Saved | MWh Saved | kW Saved | Portfolio Budget | Total Incentives | Benefits | Costs | Avoided Capacity | Lost Revene | Participant Costs | Number |
| DLC-CAC | Therm DLC | Res | 1.54 | 10,309,300 | 10,309,300 | 15,858,064 | 166 | 3,310 | 827 | 16,537 | 10,074 | 16,537 | 2,147,241 | 990,991 | 2,785,459 | 2,147,241 | 2,656,957 | 201,645 | 0 | 4,309 |
| DLC-Pool Pumps | Therm DLC | Res | 1.91 | 528,009 | 528,009 | 1,010,716 | 6 | 216 | 28 | 1,078 | 341 | 1,078 | 114,787 | 46,066 | 177,480 | 114,787 | 173,126 | 6,832 | 0 | 138 |
| DLC-Water Heat | Therm DLC | Res | 1.41 | 528,009 | 528,009 | 742,350 | 6 | 157 | 28 | 784 | 341 | 784 | 114,787 | 46,066 | 130,371 | 114,787 | 126,017 | 6,832 | 0 | 138 |
| Residential Online Audit | On-Line Audit | Res | 5.99 | 1,318,571 | 1,318,571 | 7,899,001 | 4,579 | 546 | 31,999 | 3,815 | 149,946 | 3,815 | 192,642 | 35,762 | 939,668 | 192,642 | 180,087 | 2,145,713 | 0 | 14,305 |
| Residential Online Audit Future | On-Line Audit | Res | 2.73 | 4,443,811 | 4,443,811 | 12,124,707 | 0 | 0 | 32,441 | 3,868 | 152,020 | 3,868 | 5,294 | 33 | 66 | 5,294 | 13 | 150 | 0 | 1 |
| Schools Childern Education | Comprehensive Residential | Res | 2.02 | 361,200 | 361,200 | 730,409 | 240 | 29 | 2,634 | 314 | 12,344 | 314 | 33,700 | 24,750 | 49,267 | 33,700 | 9,442 | 112,500 | 0 | 750 |
| Refrigerator/Freezer recycling | Efficient Appliances | Res | 4.42 | 23,804,202 | 23,804,202 | 105,316,521 | 19,695 | 2,799 | 222,951 | 31,682 | 1,671,595 | 31,682 | 2,101,855 | 551,970 | 6,478,702 | 2,101,855 | 1,504,333 | 14,766,313 | 0 | 11,039 |
| Room Air Conditioners recycling | Efficient Appliances | Res | 0.63 | 3,652,611 | 3,026,163 | 2,291,485 | 245 | 170 | 2,777 | 1,929 | 13,012 | 1,929 | 271,079 | 55,197 | 137,579 | 326,276 | 56,201 | 114,940 | 55,197 | 2,208 |
| ASHP - SEER 15 | Comprehensive Residential | Res | 3.22 | 1,675,175 | 1,022,623 | 5,390,704 | 403 | 42 | 6,533 | 688 | 110,201 | 688 | 64,329 | 53,568 | 247,328 | 104,506 | 42,236 | 680,504 | 40,176 | 134 |
| CAC - SEER 15 | Comprehensive Residential | Res | 1.65 | 46,586,668 | 11,313,586 | 76,875,049 | 2,410 | 1,148 | 39,026 | 18,596 | 658,351 | 18,596 | 697,921 | 542,922 | 3,591,996 | 2,869,608 | 1,141,517 | 4,065,397 | 2,171,686 | 3,619 |
| CAC - Maintenance | Comprehensive Residential | Res | 3.33 | 38,287,020 | 10,053,734 | 127,329,980 | 6,203 | 5,379 | 100,451 | 87,100 | 659,001 | 87,100 | 620,355 | 434,565 | 5,329,596 | 2,358,617 | 2,547,144 | 4,069,409 | 1,738,262 | 17,383 |
| EE Ground Source Heat Pump | Comprehensive Residential | Res | 1.13 | 2,102,609 | 832,778 | 2,370,985 | 195 | 8 | 3,165 | 133 | 53,386 | 133 | 52,641 | 43,434 | 107,529 | 130,822 | 8,175 | 329,662 | 78,181 | 72 |
| Solar Water Heating | Comprehensive Residential | Res | 0.63 | 395,051 | 67,442 | 247,790 | 17 | 4 | 282 | 64 | 3,963 | 64 | 4,713 | 3,879 | 11,181 | 24,884 | 3,535 | 24,472 | 20,170 | 8 |
| HP Water Heater | Comprehensive Residential | Res | 2.23 | 1,110,014 | 412,503 | 2,477,896 | 174 | 40 | 2,819 | 645 | 39,630 | 645 | 25,958 | 23,273 | 111,812 | 68,902 | 35,350 | 244,719 | 42,944 | 78 |
| EE Water Heater | Comprehensive Residential | Res | 1.00 | 9,068,924 | 2,509,920 | 9,056,204 | 686 | 139 | 11,112 | 2,254 | 145,799 | 2,254 | 155,091 | 100,956 | 402,000 | 558,915 | 117,846 | 900,324 | 403,823 | 2,019 |
| Programable Thermostat_Heat | Comprehensive Residential | Res | 3.26 | 1,512,899 | 1,512,899 | 4,938,802 | 1,941 | 0 | 9,954 | 0 | 139,927 | 0 | 295,209 | 273,901 | 852,626 | 295,209 | 0 | 2,728,884 | 0 | 3,902 |
| Programable Thermostat_CAC | Comprehensive Residential | Res | 1.58 | 1,597,891 | 891,612 | 2,521,682 | 156 | 265 | 912 | 1,543 | 12,815 | 1,543 | 153,217 | 112,749 | 372,412 | 274,236 | 235,023 | 219,861 | 121,020 | 3,758 |
| LED Lighting Inside | Efficient Appliances | Res | 0.77 | 4,321,506 | 2,336,475 | 3,331,490 | 0 | 0 | 7,187 | 246 | 60,621 | 246 | 633 | 3 | 3 | 636 | 0 | 9 | 3 | 1 |
| CFL bulbs regular - Inside - 15 | Efficient Appliances | Res | 4.29 | 5,003,068 | 1,384,758 | 21,439,948 | 12,683 | 434 | 63,363 | 2,170 | 534,455 | 2,170 | 277,430 | 180,915 | 3,816,494 | 1,001,092 | 259,401 | 10,697,532 | 723,662 | 180,915 |
| CFL bulbs regular - Outside - 15 | Efficient Appliances | Res | 7.43 | 1,036,561 | 287,334 | 7,699,899 | 4,883 | 0 | 24,491 | 0 | 206,578 | 0 | 57,716 | 37,312 | 1,369,406 | 206,963 | 0 | 4,118,326 | 149,247 | 37,312 |
| LED Lighting Outside | Efficient Appliances | Res | 1.81 | 1,236,186 | 668,621 | 2,237,362 | 0 | 0 | 5,284 | 0 | 44,570 | 0 | 633 | 3 | 8 | 636 | 0 | 24 | 3 | 1 |
| Clothes Washer Energy Star, Electric Water heater, Electric Dryer | Efficient Appliances | Res | 1.13 | 4,365,381 | 3,024,817 | 4,911,358 | 454 | 29 | 7,353 | 466 | 96,472 | 466 | 186,793 | 137,559 | 212,374 | 269,328 | 24,356 | 595,723 | 82,536 | 1,834 |
| Dehumidifiers | Efficient Appliances | Res | 3.33 | 5,933,260 | 3,994,646 | 19,767,048 | 1,085 | 50 | 17,571 | 808 | 197,615 | 808 | 246,503 | 119,356 | 822,879 | 365,859 | 37,739 | 1,220,298 | 119,356 | 4,774 |
| Freezers Energy Star-Chest Freezer | Efficient Appliances | Res | 0.10 | 43,731,287 | 5,798,024 | 4,515,278 | 340 | 84 | 5,508 | 1,353 | 67,112 | 1,353 | 357,533 | 173,254 | 199,120 | 2,693,001 | 67,071 | 414,424 | 2,335,468 | 6,930 |
| Holiday Lights | Efficient Appliances | Res | 0.41 | 30,666,142 | 10,037,654 | 12,641,482 | 1,657 | 0 | 26,841 | 0 | 251,553 | 0 | 618,558 | 488,481 | 510,499 | 1,888,608 | 0 | 1,553,370 | 1,270,051 | 24,424 |
| LED Night Light | Efficient Appliances | Res | 2.14 | 174,689 | 174,689 | 374,310 | 70 | 0 | 773 | 0 | 8,690 | 0 | 16,424 | 15,000 | 25,479 | 16,424 | 0 | 79,200 | 0 | 1,500 |
| Pump and Motor Single Speed | Efficient Appliances | Res | 10.64 | 876,372 | 281,261 | 9,326,525 | 417 | 215 | 6,760 | 3,477 | 63,351 | 3,477 | 17,878 | 11,274 | 397,429 | 54,518 | 140,302 | 391,199 | 36,640 | 564 |
| Refrigerators-Freezers Energy Star - Side by Side | Efficient Appliances | Res | 0.67 | 17,863,028 | 8,446,280 | 11,917,197 | 1,070 | 123 | 17,333 | 1,988 | 211,173 | 1,988 | 520,580 | 276,080 | 514,027 | 1,100,349 | 98,522 | 1,304,019 | 579,769 | 9,203 |
| Refrigerators-Freezers Energy Star - Top Freezer | Efficient Appliances | Res | 0.51 | 17,863,028 | 8,446,280 | 9,189,215 | 776 | 123 | 12,562 | 1,988 | 153,052 | 1,988 | 520,580 | 276,080 | 399,668 | 1,100,349 | 98,522 | 945,115 | 579,769 | 9,203 |
| Room Air Conditioners | Efficient Appliances | Res | 3.93 | 4,451,986 | 3,821,549 | 17,480,173 | 704 | 489 | 11,402 | 7,920 | 106,856 | 7,920 | 235,846 | 194,073 | 753,268 | 274,660 | 319,564 | 659,849 | 38,815 | 7,763 |
| Smart Strip plug outlet | Efficient Appliances | Res | 1.32 | 1,737,019 | 656,124 | 2,298,214 | 2,050 | 144 | 10,601 | 745 | 49,677 | 745 | 127,208 | 104,438 | 387,642 | 336,084 | 47,509 | 960,829 | 208,876 | 10,444 |
| Torchiere Floor Lamps | Efficient Appliances | Res | 1.11 | 283,659 | 66,807 | 314,298 | 37 | 2 | 607 | 33 | 5,689 | 33 | 4,674 | 3,338 | 12,892 | 18,025 | 1,347 | 35,128 | 13,351 | 334 |
| Residential New Construction - 15% | New Homes | Res | 2.00 | 5,170,048 | 3,954,099 | 10,326,401 | 388 | 305 | 6,278 | 4,944 | 105,903 | 4,944 | 248,130 | 174,681 | 500,584 | 322,993 | 303,491 | 653,961 | 74,863 | 310 |
| Residential New Construction - 30% | New Homes | Res | 2.39 | 960,240 | 711,848 | 2,294,633 | 86 | 68 | 1,396 | 1,098 | 23,544 | 1,098 | 48,511 | 35,684 | 111,232 | 63,804 | 67,415 | 145,387 | 15,293 | 34 |
| Ceiling Fans | Comprehensive Residential | Res | 0.74 | 7,674,616 | 3,291,480 | 5,707,137 | 664 | 54 | 10,590 | 858 | 99,248 | 858 | 206,776 | 192,018 | 239,588 | 480,722 | 35,129 | 622,139 | 273,946 | 2,560 |
| Estar Windows | Comprehensive Residential | Res | 0.88 | 13,697,674 | 3,456,701 | 12,067,945 | 1,085 | 69 | 17,316 | 1,099 | 243,423 | 1,099 | 217,102 | 170,683 | 537,912 | 857,163 | 61,150 | 1,525,905 | 640,061 | 1,707 |
| Duct sealing 20 leakage base | Comprehensive Residential | Res | 2.16 | 21,207,720 | 4,002,886 | 45,902,076 | 1,371 | 1,056 | 21,877 | 16,850 | 307,546 | 16,850 | 251,238 | 204,819 | 2,142,639 | 1,326,541 | 937,938 | 1,927,863 | 1,075,302 | 1,707 |
| Low Flow Showerheads | Comprehensive Residential | Res | 1.36 | 4,308,203 | 1,031,092 | 5,838,911 | 639 | 77 | 10,198 | 1,229 | 95,572 | 1,229 | 65,501 | 58,886 | 247,242 | 270,321 | 50,355 | 599,097 | 204,819 | 2,560 |
| Kitchen Aerator | Comprehensive Residential | Res | 8.94 | 368,933 | 368,933 | 3,297,328 | 347 | 72 | 5,542 | 1,143 | 46,746 | 1,143 | 24,116 | 19,913 | 140,244 | 24,116 | 42,806 | 293,032 | 0 | 2,845 |
| Bathroom Aerator | Comprehensive Residential | Res | 4.47 | 368,933 | 368,933 | 1,648,664 | 174 | 36 | 2,771 | 572 | 23,373 | 572 | 24,116 | 19,913 | 70,122 | 24,116 | 21,403 | 146,516 | 0 | 2,845 |
| Pipe Wrap | Comprehensive Residential | Res | 1.57 | 4,763,344 | 1,123,859 | 7,459,176 | 683 | 77 | 10,895 | 1,229 | 132,739 | 1,229 | 71,299 | 49,235 | 326,987 | 298,767 | 61,858 | 832,079 | 227,468 | 1,969 |
| Roof Insulation | Comprehensive Residential | Res | 1.05 | 60,264,267 | 8,405,552 | 63,340,976 | 4,523 | 510 | 72,157 | 8,142 | 1,352,507 | 8,142 | 526,405 | 301,502 | 3,009,025 | 3,767,575 | 536,765 | 8,478,246 | 3,241,170 | 6,030 |
| Wall Insulation | Comprehensive Residential | Res | 0.77 | 21,812,621 | 2,412,121 | 16,703,733 | 1,028 | 116 | 16,400 | 1,851 | 461,114 | 1,851 | 151,816 | 128,012 | 828,535 | 1,364,347 | 143,054 | 2,890,515 | 1,212,531 | 853 |
| Whole Building | Comprehensive Residential | Res | 0.00 | 19,414,412 | 14,862,869 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 929,987 | 853,414 | 0 | 1,214,459 | 0 | 0 | 284,471 | 2,845 |
| Commercial New Construction | COMNEW | COMM | 4.18 | 10,082,690 | 5,264,599 | 42,101,367 | 1,971 | 632 | 31,926 | 10,233 | 897,621 | 10,233 | 328,591 | 296,639 | 2,093,684 | 625,230 | 779,188 | 5,542,917 | 296,639 | 85 |
| Commercial CFL Program | COMM Equip | COMM | 21.55 | 10,747,613 | 3,891,196 | 231,628,811 | 140,483 | 2,026 | 709,711 | 10,234 | 5,986,270 | 10,234 | 772,872 | 678,033 | 40,611,006 | 2,128,937 | 1,209,825 | 118,494,345 | 1,356,065 | 169,508 |
| Exterior HID replacement above 175W to 250W HID retrofit | COMM Equip | COMM | 0.52 | 3,107,349 | 342,517 | 1,602,703 | 0 | 0 | 2,671 | 0 | 30,036 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HPT8 4ft 4 lamp, T12 to HPT8 | COMM Equip | COMM | 0.74 | 199,823,850 | 39,743,995 | 146,906,529 | 47,481 | 11,612 | 237,219 | 58,016 | 2,667,862 | 58,016 | 7,952,599 | 6,557,425 | 25,956,802 | 39,968,570 | 8,778,206 | 53,399,358 | 32,015,971 | 262,297 |
| LED Exit Signs Electronic Fixtures (Retrofit Only) | COMM Equip | COMM | -4.38 | -2,124,910 | -5,598,300 | 9,306,968 | 2,705 | 310 | 14,883 | 1,703 | 209,221 | 1,703 | 198,468 | 126,123 | 1,462,952 | -569,441 | 274,849 | 3,802,601 | -767,909 | 12,612 |
| Occupancy Sensors under 500 W | COMM Equip | COMM | 2.15 | 4,588,208 | 1,324,955 | 9,862,966 | 3,686 | 919 | 18,416 | 4,593 | 172,599 | 4,593 | 269,171 | 217,550 | 1,735,985 | 921,822 | 600,635 | 3,454,698 | 652,651 | 8,702 |
| LED Auto Traffic Signals | COMM Equip | COMM | 1.13 | 2,623,427 | -1,636,573 | 2,961,969 | 1,370 | 156 | 6,845 | 781 | 64,149 | 781 | 126,220 | 108,000 | 524,177 | 436,264 | 102,204 | 1,284,000 | 310,044 | 2,400 |
| LED Pedestrian Signals | COMM Equip | COMM | 4.59 | 285,269 | -89,731 | 1,309,349 | 606 | 69 | 3,026 | 345 | 28,358 | 345 | 23,680 | 15,000 | 231,714 | 53,517 | 45,178 | 567,600 | 29,837 | 600 |
| Street Lighting - 175 Mercury to 100 HPS | COMM Equip | COMM | 0.70 | 6,754,878 | 6,754,878 | 4,708,897 | 3,505 | 0 | 14,020 | 0 | 131,400 | 0 | 1,846,425 | 500,000 | 1,079,581 | 1,846,425 | 0 | 3,285,000 | 0 | 10,000 |
| AC 65,000 - 135,000 | COMM Equip | COMM | 3.45 | 6,218,358 | 2,768,050 | 21,461,647 | 640 | 476 | 10,363 | 7,701 | 145,681 | 7,701 | 175,330 | 140,124 | 984,430 | 387,758 | 422,282 | 899,596 | 212,428 | 560 |
| AC 240,000 - 760,000 | COMM Equip | COMM | 5.21 | 1,494,542 | 417,269 | 7,790,614 | 224 | 182 | 3,628 | 2,949 | 50,996 | 2,949 | 30,598 | 21,797 | 358,514 | 96,923 | 161,733 | 314,905 | 66,325 | 62 |
| Clothes Washer CEE Tier1, Electric Water heater, Electric Dryer | COMM Equip | COMM | 1.01 | 2,832,250 | 583,578 | 2,858,077 | 315 | 33 | 5,099 | 537 | 47,784 | 537 | 38,160 | 23,307 | 118,627 | 176,606 | 21,655 | 295,071 | 138,446 | 466 |
| Demand-controlled ventilation (DCV) | COMM Equip | COMM | 2.21 | 3,028,935 | 518,668 | 6,686,245 | 1,158 | 194 | 5,806 | 973 | 81,625 | 973 | 105,222 | 84,754 | 1,189,040 | 605,271 | 172,170 | 1,627,278 | 500,049 | 170 |
| Efficient Refrigeration Condenser | COMM Equip | COMM | 5.23 | 138,630 | 55,345 | 724,712 | 27 | 26 | 425 | 418 | 5,979 | 418 | 5,686 | 2,082 | 34,989 | 10,891 | 23,279 | 37,478 | 5,205 | 208 |
| ENERGY STAR Commercial Solid Door Freezers less than 20ft3 | COMM Equip | COMM | 1.85 | 732,890 | 354,244 | 1,357,986 | 131 | 15 | 2,095 | 238 | 23,558 | 238 | 24,367 | 11,833 | 58,768 | 48,032 | 11,262 | 147,672 | 23,665 | 237 |

# Market Achievable BASE CASE - CEI

| Measure Name | Program | Rate Class | Total Measure TRC Test | **Total Discounted Lifetime Costs ($000)** | **Total Discounted Lifetime Utility Costs ($000)** | **Total Discounted Lifetime Benefits ($000)** | Program Year 2010 Cummultive | | Program Year 2025 Cumm | | Life Time Savings | | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Participants 2010 | Participants 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MWh Saved | kW Saved | MWh Saved | kW Saved | MWh Saved | kW Saved | Portfolio Budget | Total Incentives | Benefits | Costs | Avoided Capacity | Lost Revene | Participant Costs | Number |
| ENERGY STAR Commercial Solid Door Freezers 20 to 48 ft3 | COMM Equip | COMM | 0.76 | 114,581 | 27,393 | 87,228 | 8 | 1 | 134 | 15 | 1,511 | 15 | 3,939 | 778 | 3,776 | 9,388 | 728 | 9,472 | 5,449 | 16 |
| ENERGY STAR Commercial Solid Door Refrigerators less than 20ft3 | COMM Equip | COMM | 2.13 | 1,562,937 | 496,889 | 3,328,735 | 322 | 37 | 5,132 | 584 | 57,715 | 584 | 33,282 | 16,657 | 144,065 | 99,910 | 27,677 | 361,790 | 66,628 | 333 |
| ENERGY STAR Commercial Solid Door Refrigerators 20 to 48 ft3 | COMM Equip | COMM | 1.35 | 727,156 | 127,504 | 983,444 | 95 | 11 | 1,515 | 173 | 17,044 | 173 | 10,196 | 4,164 | 42,565 | 47,674 | 8,196 | 106,838 | 37,478 | 83 |
| ENERGY STAR Ice Machines less than 500 lbs | COMM Equip | COMM | 1.76 | 394,257 | 60,454 | 693,332 | 66 | 8 | 1,067 | 122 | 11,996 | 122 | 5,953 | 1,868 | 29,514 | 26,504 | 5,684 | 74,075 | 20,552 | 37 |
| ENERGY STAR Ice Machines 500 to 1000 lbs | COMM Equip | COMM | 1.20 | 472,427 | 62,760 | 565,544 | 54 | 6 | 870 | 99 | 9,785 | 99 | 6,095 | 2,802 | 24,075 | 31,317 | 4,637 | 60,421 | 25,222 | 19 |
| ENERGY STAR Ice Machines more than 1000 lbs | COMM Equip | COMM | 2.01 | 210,969 | 28,894 | 423,043 | 40 | 5 | 651 | 74 | 7,319 | 74 | 4,010 | 1,246 | 18,008 | 15,220 | 3,468 | 45,198 | 11,210 | 6 |
| ENERGY STAR Steam Cookers 3 Pan | COMM Equip | COMM | 2.16 | 19,280,340 | 2,038,457 | 41,550,590 | 3,379 | 770 | 54,725 | 12,473 | 615,454 | 12,473 | 127,734 | 113,231 | 1,804,865 | 1,189,279 | 582,242 | 3,800,501 | 1,061,545 | 283 |
| EE Water Heater | COMM Equip | COMM | 1.00 | 2,193,829 | 610,137 | 2,186,648 | 166 | 34 | 2,683 | 544 | 35,204 | 544 | 39,795 | 24,376 | 97,064 | 137,300 | 28,454 | 217,386 | 97,504 | 488 |
| HP Water Heater (Base Usage 22831) | COMM Equip | COMM | 3.08 | 3,675,900 | 273,603 | 11,306,605 | 821 | 166 | 13,291 | 2,696 | 186,847 | 2,696 | 19,076 | 10,834 | 508,339 | 228,548 | 147,840 | 1,153,802 | 209,472 | 54 |
| Plug Load Occupancy Sensors Document Stations | COMM Equip | COMM | 1.30 | 688,863 | 181,998 | 896,743 | 592 | 41 | 3,771 | 258 | 17,670 | 258 | 30,359 | 24,195 | 111,633 | 109,855 | 13,381 | 277,548 | 79,497 | 691 |
| Commercial Smart Strip plug outlet | COMM Equip | COMM | 1.45 | 2,403,111 | 909,502 | 3,493,129 | 2,300 | 162 | 14,640 | 1,028 | 68,605 | 1,028 | 144,461 | 117,129 | 434,748 | 378,719 | 53,282 | 1,077,590 | 234,259 | 11,713 |
| Pre Rinse Sprayers | COMM Equip | COMM | 5.98 | 277,235 | 192,142 | 1,658,731 | 1,518 | 126 | 7,584 | 630 | 35,538 | 630 | 40,328 | 35,668 | 293,413 | 57,347 | 41,606 | 711,320 | 17,019 | 1,019 |
| Refrigerant charging correction | COMM Equip | COMM | 2.71 | 7,756,325 | 1,641,204 | 20,997,190 | 2,790 | 1,274 | 45,175 | 20,628 | 127,013 | 20,628 | 103,276 | 70,770 | 781,313 | 479,771 | 207,103 | 784,320 | 376,495 | 2,831 |
| Refrigeration Commissioning | COMM Equip | COMM | 0.63 | 1,326,694 | 385,237 | 837,816 | 268 | 31 | 4,268 | 487 | 12,000 | 487 | 26,304 | 16,716 | 32,502 | 85,145 | 4,966 | 75,223 | 58,841 | 669 |
| Strip curtains for walk-ins - freezer | COMM Equip | COMM | 0.58 | 1,254,944 | 363,246 | 731,975 | 778 | 89 | 3,885 | 444 | 14,565 | 444 | 74,549 | 59,447 | 127,250 | 252,889 | 22,129 | 291,526 | 178,340 | 1,189 |
| Vending Equipment Controller | COMM Equip | COMM | 1.62 | 3,313,115 | 773,143 | 5,380,707 | 1,592 | 418 | 16,022 | 4,206 | 75,080 | 4,206 | 78,762 | 46,615 | 401,838 | 330,481 | 137,812 | 745,836 | 251,720 | 1,865 |
| Window Film | COMM Equip | COMM | 1.64 | 2,199,126 | 422,318 | 3,603,991 | 232 | 133 | 3,757 | 2,155 | 35,213 | 2,155 | 28,232 | 21,231 | 158,431 | 137,626 | 86,970 | 217,445 | 109,394 | 849 |
| Setback/Setup | COMM Equip | COMM | 2.00 | 1,740,096 | 376,717 | 3,475,974 | 504 | -4 | 8,158 | -72 | 68,811 | -72 | 25,424 | 14,012 | 138,652 | 109,365 | -2,638 | 424,914 | 83,940 | 560 |
| Demand-controlled ventilation (DCV) | IND Equip | IND | 2.20 | 802,651 | 139,274 | 1,766,582 | 307 | 51 | 1,534 | 257 | 21,571 | 257 | 29,755 | 22,487 | 315,482 | 162,430 | 45,681 | 431,758 | 132,676 | 45 |
| Exterior HID replacement above 175W to 250W HID retrofit | IND Equip | IND | 0.51 | 510,423 | 57,085 | 262,789 | 0 | 0 | 438 | 0 | 4,925 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HPT8 4ft 4 lamp, T12 to HPT8 | IND Equip | IND | 0.87 | 135,284,402 | 26,906,561 | 118,317,762 | 32,146 | 7,862 | 160,603 | 39,278 | 2,257,757 | 39,278 | 5,383,212 | 4,439,531 | 21,100,769 | 27,058,780 | 6,981,142 | 45,190,782 | 21,675,568 | 177,581 |
| Occupancy Sensors under 500 W | IND Equip | IND | 2.69 | 263,983 | 79,077 | 711,390 | 64 | 16 | 1,041 | 260 | 9,759 | 260 | 7,099 | 3,795 | 30,281 | 18,483 | 10,477 | 60,261 | 11,384 | 152 |
| Water-Cooled cent Chiller 150 - 300 ton 0.57 kW/ton with 0.46 kW/ton IPLV | IND Equip | IND | 1.39 | 4,708,583 | 970,371 | 6,538,867 | 181 | 197 | 2,936 | 3,187 | 63,285 | 3,187 | 61,974 | 53,774 | 328,461 | 292,128 | 220,893 | 390,791 | 230,153 | 22 |
| Water-Cooled Centrifugal Chiller < 150 ton 0.56 kW/ton with 0.53 kW/ton IPLV | IND Equip | IND | 3.04 | 2,402,770 | 970,371 | 7,305,140 | 203 | 220 | 3,280 | 3,561 | 70,701 | 3,561 | 61,974 | 53,774 | 366,953 | 150,164 | 246,779 | 436,587 | 88,190 | 22 |
| Window Film | IND Equip | IND | 2.22 | 2,693,106 | 442,934 | 5,980,641 | 294 | 169 | 4,758 | 2,730 | 66,892 | 2,730 | 29,501 | 26,887 | 278,739 | 168,039 | 149,679 | 413,063 | 138,538 | 22 |
| Motors 1 HP 1200 | IND MOTOR | IND | 1.22 | 1,592,227 | 670,588 | 1,941,174 | 171 | 13 | 2,731 | 208 | 38,393 | 208 | 44,138 | 32,916 | 86,762 | 101,741 | 11,567 | 240,668 | 57,602 | 1,646 |
| Motors 5 HP 1200 | IND MOTOR | IND | 3.62 | 903,631 | 785,135 | 3,271,955 | 289 | 22 | 4,603 | 350 | 64,713 | 350 | 51,297 | 44,436 | 146,242 | 58,704 | 19,496 | 405,659 | 7,406 | 823 |
| Motors 10 HP 1200 | IND MOTOR | IND | 2.58 | 901,656 | 500,085 | 2,323,399 | 205 | 16 | 3,269 | 249 | 45,953 | 249 | 33,482 | 28,801 | 103,846 | 58,580 | 13,844 | 288,056 | 25,098 | 411 |
| Motors 20 HP 1200 | IND MOTOR | IND | 3.45 | 309,339 | 199,071 | 1,066,579 | 94 | 7 | 1,501 | 114 | 21,095 | 114 | 14,669 | 11,623 | 47,671 | 21,560 | 6,355 | 132,235 | 6,892 | 103 |
| Motors 1 HP 3600 | IND MOTOR | IND | 0.83 | 1,592,227 | 670,588 | 1,322,275 | 117 | 9 | 1,860 | 142 | 26,152 | 142 | 44,138 | 32,916 | 59,100 | 101,741 | 7,879 | 163,936 | 57,602 | 1,646 |
| Motors 5 HP 3600 | IND MOTOR | IND | 1.92 | 903,631 | 785,135 | 1,732,312 | 153 | 12 | 2,437 | 185 | 34,262 | 185 | 51,297 | 44,436 | 77,427 | 58,704 | 10,322 | 214,773 | 7,406 | 823 |
| Motors 10 HP 3600 | IND MOTOR | IND | 1.79 | 901,656 | 500,085 | 1,617,492 | 143 | 11 | 2,276 | 173 | 31,991 | 173 | 33,482 | 28,801 | 72,295 | 58,580 | 9,638 | 200,537 | 25,098 | 411 |
| Motors 20 HP 3600 | IND MOTOR | IND | 2.02 | 309,339 | 199,071 | 624,339 | 55 | 4 | 878 | 67 | 12,348 | 67 | 14,669 | 11,623 | 27,905 | 21,560 | 3,720 | 77,406 | 6,892 | 103 |
| Water Pumps with VFD's | IND MOTOR | IND | 6.89 | 108,615 | 32,615 | 748,680 | 73 | 1 | 1,157 | 20 | 16,272 | 20 | 4,265 | 1,500 | 33,008 | 9,015 | 1,138 | 102,000 | 4,750 | 50 |
| HVAC Fans with VFD's | IND MOTOR | IND | 8.38 | 108,615 | 32,615 | 909,977 | 88 | 2 | 1,407 | 25 | 19,777 | 25 | 4,265 | 1,500 | 40,119 | 9,015 | 1,383 | 123,975 | 4,750 | 50 |
| Air Compressors with VFD's | IND MOTOR | IND | 3.92 | 108,615 | 32,615 | 426,087 | 41 | 1 | 659 | 12 | 9,261 | 12 | 4,265 | 1,500 | 18,785 | 9,015 | 648 | 58,050 | 4,750 | 50 |
| Water Pumps with VFD's | IND MOTOR | IND | 7.18 | 260,735 | 70,735 | 1,871,701 | 181 | 3 | 2,894 | 51 | 40,679 | 51 | 6,648 | 3,750 | 82,519 | 18,523 | 2,846 | 255,000 | 11,875 | 25 |
| HVAC Fans with VFD's | IND MOTOR | IND | 8.73 | 260,735 | 70,735 | 2,274,943 | 220 | 4 | 3,517 | 62 | 49,443 | 62 | 6,648 | 3,750 | 100,297 | 18,523 | 3,459 | 309,938 | 11,875 | 25 |
| Air Compressors with VFD's | IND MOTOR | IND | 4.09 | 260,735 | 70,735 | 1,065,218 | 103 | 2 | 1,647 | 29 | 23,151 | 29 | 6,648 | 3,750 | 46,963 | 18,523 | 1,619 | 145,125 | 11,875 | 25 |
| Water Pumps with VFD's | IND MOTOR | IND | 1.48 | 506,495 | 30,495 | 748,680 | 73 | 1 | 1,157 | 20 | 16,272 | 20 | 4,133 | 1,500 | 33,008 | 33,883 | 1,138 | 102,000 | 29,750 | 5 |
| HVAC Fans with VFD's | IND MOTOR | IND | 1.80 | 506,495 | 30,495 | 909,977 | 88 | 2 | 1,407 | 25 | 19,777 | 25 | 4,133 | 1,500 | 40,119 | 33,883 | 1,383 | 123,975 | 29,750 | 5 |
| Air Compressors with VFD's | IND MOTOR | IND | 0.84 | 506,495 | 30,495 | 426,087 | 41 | 1 | 659 | 12 | 9,261 | 12 | 4,133 | 1,500 | 18,785 | 33,883 | 648 | 58,050 | 29,750 | 5 |

# Market Achievable HIGH CASE - CEI

| Measure Name | Program | Rate Class | Total Measure TRC Test | **Total Discounted Lifetime Costs ($000)** | **Total Discounted Lifetime Utility Costs ($000)** | **Total Discounted Lifetime Benefits ($000)** | Program Year 2010 Cummultive | | Program Year 2025 Cumm | | Life Time Savings | | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Participants 2010 | Participants 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MWh Saved | kW Saved | MWh Saved | kW Saved | MWh Saved | kW Saved | Portfolio Budget | Total Incentives | Benefits | Costs | Avoided Capacity | Lost Revene | Participant Costs | Number |
| DLC-CAC | Therm DLC | Res | 1.23 | 24,513,877 | 24,513,877 | 30,132,917 | 314 | 6,290 | 1,571 | 31,424 | 19,143 | 31,424 | 5,185,147 | 1,883,045 | 5,292,829 | 5,185,147 | 5,048,654 | 383,159 | 0 | 8,187 |
| DLC-Pool Pumps | Therm DLC | Res | 1.65 | 610,816 | 610,816 | 1,010,716 | 6 | 216 | 28 | 1,078 | 341 | 1,078 | 133,426 | 46,066 | 177,480 | 133,426 | 173,126 | 6,832 | 0 | 138 |
| DLC-Water Heat | Therm DLC | Res | 1.22 | 610,816 | 610,816 | 742,350 | 6 | 157 | 28 | 784 | 341 | 784 | 133,426 | 46,066 | 130,371 | 133,426 | 126,017 | 6,832 | 0 | 138 |
| Residential Online Audit | On-Line Audit | Res | 6.00 | 1,843,269 | 1,843,269 | 11,058,601 | 6,411 | 764 | 44,798 | 5,341 | 209,924 | 5,341 | 267,599 | 50,067 | 1,315,535 | 267,599 | 252,122 | 3,003,999 | 0 | 20,027 |
| Residential Online Audit Future | On-Line Audit | Res | 2.73 | 7,992,736 | 7,992,736 | 21,824,419 | 0 | 0 | 58,394 | 6,962 | 273,634 | 6,962 | 5,294 | 33 | 66 | 5,294 | 13 | 150 | 0 | 1 |
| Schools Childern Education | Comprehensive Residential | Res | 2.03 | 720,900 | 720,900 | 1,460,818 | 480 | 57 | 5,268 | 628 | 24,688 | 628 | 66,400 | 49,500 | 98,534 | 66,400 | 18,884 | 225,000 | 0 | 1,500 |
| Refrigerator/Freezer recycling | Efficient Appliances | Res | 4.11 | 28,136,631 | 28,136,631 | 115,563,878 | 25,191 | 3,580 | 250,410 | 35,585 | 1,877,474 | 35,585 | 2,828,155 | 847,210 | 8,286,712 | 2,828,155 | 1,924,147 | 18,887,145 | 0 | 14,120 |
| Room Air Conditioners recycling | Efficient Appliances | Res | 0.52 | 4,804,022 | 4,100,554 | 2,518,266 | 314 | 218 | 3,119 | 2,166 | 14,614 | 2,166 | 415,865 | 141,202 | 175,973 | 486,466 | 71,885 | 147,016 | 70,601 | 2,824 |
| ASHP - SEER 15 | Comprehensive Residential | Res | 3.22 | 3,948,718 | 2,409,103 | 12,718,693 | 952 | 100 | 15,413 | 1,623 | 260,006 | 1,623 | 149,692 | 126,388 | 583,540 | 244,483 | 99,651 | 1,605,565 | 94,791 | 316 |
| CAC - SEER 15 | Comprehensive Residential | Res | 1.65 | 109,911,770 | 47,494,950 | 181,377,069 | 5,686 | 2,709 | 92,077 | 43,876 | 1,553,297 | 43,876 | 2,925,529 | 2,561,911 | 8,474,865 | 6,768,395 | 2,693,268 | 9,591,795 | 3,842,867 | 8,540 |
| CAC - Maintenance | Comprehensive Residential | Res | 3.33 | 53,669,120 | 23,986,357 | 178,489,347 | 8,695 | 7,540 | 140,811 | 122,096 | 923,778 | 122,096 | 1,478,156 | 1,218,335 | 7,470,951 | 3,305,659 | 3,570,550 | 5,704,440 | 1,827,503 | 24,367 |
| EE Ground Source Heat Pump | Comprehensive Residential | Res | 1.13 | 4,957,193 | 1,961,186 | 5,594,044 | 461 | 19 | 7,466 | 314 | 125,956 | 314 | 122,115 | 102,476 | 253,702 | 306,572 | 19,288 | 777,796 | 184,458 | 171 |
| Solar Water Heating | Comprehensive Residential | Res | 0.63 | 579,454 | 98,495 | 363,776 | 26 | 6 | 414 | 95 | 5,818 | 95 | 6,625 | 5,695 | 16,415 | 36,237 | 5,190 | 35,927 | 29,612 | 11 |
| HP Water Heater | Comprehensive Residential | Res | 2.23 | 1,629,079 | 1,529,995 | 3,637,762 | 256 | 58 | 4,139 | 946 | 58,180 | 946 | 94,760 | 91,113 | 164,149 | 100,860 | 51,897 | 359,268 | 6,100 | 114 |
| EE Water Heater | Comprehensive Residential | Res | 1.00 | 13,313,436 | 4,887,908 | 13,295,279 | 1,007 | 204 | 16,313 | 3,309 | 214,045 | 3,309 | 301,499 | 222,318 | 590,170 | 820,240 | 173,008 | 1,321,753 | 518,741 | 2,964 |
| Programable Thermostat_Heat | Comprehensive Residential | Res | 3.87 | 7,059,357 | 7,059,357 | 27,334,013 | 2,686 | 0 | 43,493 | 0 | 611,418 | 0 | 435,190 | 378,959 | 1,179,660 | 435,190 | 0 | 3,775,580 | 0 | 5,398 |
| Programable Thermostat_CAC | Comprehensive Residential | Res | 1.56 | 21,847,386 | 15,989,947 | 34,052,835 | 676 | 1,144 | 10,947 | 18,525 | 153,889 | 18,525 | 985,027 | 649,768 | 1,609,640 | 1,345,657 | 1,015,817 | 950,285 | 360,630 | 16,244 |
| LED Lighting Inside | Efficient Appliances | Res | 0.72 | 4,652,344 | 3,328,990 | 3,331,490 | 0 | 0 | 7,187 | 246 | 60,621 | 246 | 634 | 4 | 3 | 636 | 0 | 9 | 2 | 1 |
| CFL bulbs regular - Inside - 15 | Efficient Appliances | Res | 4.29 | 5,003,068 | 1,384,758 | 21,439,948 | 12,683 | 434 | 63,363 | 2,170 | 534,455 | 2,170 | 277,430 | 180,915 | 3,816,494 | 1,001,092 | 259,401 | 10,697,532 | 723,662 | 180,915 |
| CFL bulbs regular - Outside - 15 | Efficient Appliances | Res | 6.82 | 2,350,030 | 986,438 | 16,015,790 | 10,156 | 0 | 50,942 | 0 | 429,682 | 0 | 196,979 | 116,413 | 2,848,365 | 468,608 | 0 | 8,566,119 | 271,630 | 77,609 |
| LED Lighting Outside | Efficient Appliances | Res | 1.68 | 2,767,165 | 1,980,144 | 4,653,704 | 0 | 0 | 10,991 | 0 | 92,706 | 0 | 634 | 4 | 8 | 636 | 0 | 24 | 2 | 1 |
| Clothes Washer Energy Star, Electric Water heater, Electric Dryer | Efficient Appliances | Res | 1.10 | 9,095,925 | 7,879,226 | 10,029,511 | 927 | 59 | 15,015 | 951 | 197,005 | 951 | 485,668 | 374,547 | 433,691 | 560,577 | 49,738 | 1,216,530 | 74,909 | 3,745 |
| Dehumidifiers | Efficient Appliances | Res | 3.21 | 12,590,256 | 10,214,944 | 40,366,392 | 2,216 | 102 | 35,883 | 1,651 | 403,551 | 1,651 | 629,473 | 341,233 | 1,680,407 | 775,716 | 77,066 | 2,491,977 | 146,243 | 9,750 |
| Freezers Energy Star-Chest Freezer | Efficient Appliances | Res | 0.10 | 71,978,623 | 19,213,492 | 7,374,954 | 556 | 136 | 8,997 | 2,210 | 109,616 | 2,210 | 1,183,494 | 848,946 | 325,230 | 4,432,127 | 109,549 | 676,893 | 3,248,633 | 11,319 |
| Holiday Lights | Efficient Appliances | Res | 0.41 | 66,945,909 | 30,572,275 | 27,597,602 | 3,618 | 0 | 58,596 | 0 | 549,165 | 0 | 1,882,829 | 1,599,604 | 1,114,469 | 4,122,274 | 0 | 3,391,159 | 2,239,445 | 53,320 |
| LED Night Light | Efficient Appliances | Res | 2.05 | 364,934 | 364,934 | 748,620 | 141 | 0 | 1,545 | 0 | 17,380 | 0 | 33,719 | 30,000 | 50,957 | 33,719 | 0 | 158,400 | 0 | 3,000 |
| Pump and Motor Single Speed | Efficient Appliances | Res | 10.32 | 1,475,572 | 653,098 | 15,233,325 | 682 | 351 | 11,041 | 5,679 | 103,473 | 5,679 | 40,771 | 27,621 | 649,133 | 91,409 | 229,159 | 638,959 | 50,638 | 921 |
| Refrigerators-Freezers Energy Star - Side by Side | Efficient Appliances | Res | 0.65 | 29,907,995 | 16,968,686 | 19,464,755 | 1,748 | 200 | 28,310 | 3,247 | 344,916 | 3,247 | 1,045,286 | 601,241 | 839,577 | 1,841,931 | 160,920 | 2,129,898 | 796,645 | 15,031 |
| Refrigerators-Freezers Energy Star - Top Freezer | Efficient Appliances | Res | 0.50 | 29,907,995 | 16,968,686 | 15,009,050 | 1,267 | 200 | 20,518 | 3,247 | 249,985 | 3,247 | 1,045,286 | 601,241 | 652,791 | 1,841,931 | 160,920 | 1,543,687 | 796,645 | 15,031 |
| Room Air Conditioners | Efficient Appliances | Res | 3.62 | 9,862,729 | 9,862,729 | 35,696,353 | 1,438 | 999 | 23,283 | 16,173 | 218,211 | 16,173 | 607,788 | 475,581 | 1,538,253 | 607,788 | 652,582 | 1,347,480 | 0 | 15,853 |
| Smart Strip plug outlet | Efficient Appliances | Res | 1.74 | 16,504,471 | 9,030,119 | 28,732,534 | 6,023 | 423 | 97,539 | 6,852 | 457,066 | 6,852 | 556,526 | 460,179 | 1,138,697 | 1,016,705 | 139,557 | 2,822,434 | 460,179 | 30,679 |
| Torchiere Floor Lamps | Efficient Appliances | Res | 1.11 | 283,659 | 66,807 | 314,298 | 37 | 2 | 607 | 33 | 5,689 | 33 | 4,674 | 3,338 | 12,892 | 18,025 | 1,347 | 35,128 | 13,351 | 334 |
| Residential New Construction - 15% | New Homes | Res | 1.91 | 8,849,783 | 7,686,114 | 16,866,454 | 633 | 499 | 10,254 | 8,075 | 172,974 | 8,075 | 477,902 | 335,945 | 817,620 | 549,546 | 495,702 | 1,068,137 | 71,645 | 506 |
| Residential New Construction - 30% | New Homes | Res | 2.33 | 1,608,262 | 1,339,617 | 3,747,900 | 141 | 111 | 2,280 | 1,794 | 38,455 | 1,794 | 87,162 | 66,722 | 181,679 | 103,701 | 110,111 | 237,465 | 16,540 | 56 |
| Ceiling Fans | Comprehensive Residential | Res | 0.74 | 17,303,292 | 9,309,635 | 12,824,029 | 1,467 | 119 | 23,752 | 1,924 | 222,608 | 1,924 | 574,234 | 537,407 | 529,376 | 1,066,386 | 77,618 | 1,374,631 | 492,152 | 5,657 |
| Estar Windows | Comprehensive Residential | Res | 0.88 | 30,443,843 | 10,833,192 | 26,664,411 | 2,398 | 152 | 38,259 | 2,427 | 537,848 | 2,427 | 678,133 | 565,692 | 1,188,528 | 1,903,798 | 135,113 | 3,371,523 | 1,225,666 | 3,771 |
| Duct sealing 20 leakage base | Comprehensive Residential | Res | 2.16 | 47,037,470 | 12,040,001 | 101,421,730 | 3,030 | 2,334 | 48,338 | 37,231 | 679,530 | 37,231 | 753,558 | 641,117 | 4,734,213 | 2,940,900 | 2,072,395 | 4,259,660 | 2,187,342 | 3,771 |
| Low Flow Showerheads | Comprehensive Residential | Res | 1.35 | 9,561,819 | 3,226,070 | 12,901,213 | 1,412 | 170 | 22,532 | 2,716 | 211,169 | 2,716 | 202,687 | 186,678 | 546,287 | 598,672 | 111,260 | 1,323,719 | 395,984 | 5,657 |
| Kitchen Aerator | Comprehensive Residential | Res | 8.44 | 862,936 | 862,936 | 7,285,524 | 768 | 158 | 12,245 | 2,526 | 103,287 | 2,526 | 54,992 | 43,998 | 309,872 | 54,992 | 94,581 | 647,461 | 0 | 6,285 |
| Bathroom Aerator | Comprehensive Residential | Res | 4.22 | 862,936 | 862,936 | 3,642,762 | 384 | 79 | 6,123 | 1,263 | 51,644 | 1,263 | 54,992 | 43,998 | 154,936 | 54,992 | 47,291 | 323,731 | 0 | 6,285 |
| Pipe Wrap | Comprehensive Residential | Res | 1.56 | 10,591,830 | 4,290,893 | 16,481,226 | 1,509 | 170 | 24,072 | 2,716 | 293,290 | 2,716 | 269,239 | 217,574 | 722,485 | 663,047 | 136,677 | 1,838,498 | 393,809 | 4,351 |
| Roof Insulation | Comprehensive Residential | Res | 1.05 | 28,404,482 | 6,342,353 | 29,710,777 | 2,122 | 239 | 33,846 | 3,819 | 634,408 | 3,819 | 397,455 | 282,846 | 1,411,416 | 1,776,338 | 251,776 | 3,976,814 | 1,378,883 | 2,828 |
| Wall Insulation | Comprehensive Residential | Res | 0.76 | 48,283,501 | 6,926,147 | 36,907,296 | 2,272 | 256 | 36,237 | 4,089 | 1,018,843 | 4,089 | 433,942 | 377,128 | 1,830,669 | 3,018,777 | 316,080 | 6,386,661 | 2,584,835 | 1,886 |
| Whole Building | Comprehensive Residential | Res | 0.00 | 43,195,794 | 33,139,050 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,072,249 | 1,885,639 | 0 | 2,700,795 | 0 | 0 | 628,546 | 6,285 |
| Commercial New Construction | COMNEW | COMM | 4.15 | 10,406,995 | 6,150,071 | 43,148,209 | 2,957 | 948 | 32,911 | 10,549 | 925,336 | 10,549 | 555,224 | 508,525 | 3,140,526 | 936,617 | 1,168,782 | 8,314,376 | 381,393 | 127 |
| Commercial CFL Program | COMM Equip | COMM | 21.55 | 10,768,852 | 3,898,875 | 232,084,245 | 140,764 | 2,030 | 711,115 | 10,254 | 5,998,110 | 10,254 | 774,408 | 679,389 | 40,692,228 | 2,133,185 | 1,212,245 | 118,731,334 | 1,358,777 | 169,847 |
| Exterior HID replacement above 175W to 250W HID retrofit | COMM Equip | COMM | #DIV/0! | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HPT8 4ft 4 lamp, T12 to HPT8 | COMM Equip | COMM | 0.73 | 325,643,971 | 87,700,628 | 237,848,666 | 76,874 | 18,801 | 384,069 | 93,930 | 4,319,395 | 93,930 | 17,543,926 | 14,863,496 | 42,025,298 | 65,132,594 | 14,212,333 | 86,456,103 | 47,588,669 | 424,671 |
| LED Exit Signs Electronic Fixtures (Retrofit Only) | COMM Equip | COMM | 28.23 | 2,012,880 | -12,088,543 | 56,825,783 | 4,655 | 533 | 75,383 | 8,626 | 1,059,738 | 8,626 | 576,337 | 434,097 | 2,517,638 | -962,228 | 472,996 | 6,544,010 | -1,538,566 | 21,705 |
| Occupancy Sensors under 500 W | COMM Equip | COMM | 2.13 | 7,886,431 | 3,068,096 | 16,803,572 | 6,280 | 1,566 | 31,376 | 7,824 | 294,057 | 7,824 | 617,799 | 518,898 | 2,957,605 | 1,581,466 | 1,023,305 | 5,885,782 | 963,667 | 14,826 |
| LED Auto Traffic Signals | COMM Equip | COMM | 1.13 | 2,623,427 | -1,636,573 | 2,961,969 | 1,370 | 156 | 6,845 | 781 | 64,149 | 781 | 126,220 | 108,000 | 524,177 | 436,264 | 102,204 | 1,284,000 | 310,044 | 2,400 |
| LED Pedestrian Signals | COMM Equip | COMM | 4.59 | 285,269 | -89,731 | 1,309,349 | 606 | 69 | 3,026 | 345 | 28,358 | 345 | 23,680 | 15,000 | 231,714 | 53,517 | 45,178 | 567,600 | 29,837 | 600 |
| Street Lighting - 175 Mercury to 100 HPS | COMM Equip | COMM | 0.70 | 6,754,878 | 6,754,878 | 4,708,897 | 3,505 | 0 | 14,020 | 0 | 131,400 | 0 | 1,846,425 | 500,000 | 1,079,581 | 1,846,425 | 0 | 3,285,000 | 0 | 10,000 |
| AC 65,000 - 135,000 | COMM Equip | COMM | 3.43 | 10,812,423 | 5,639,031 | 37,070,117 | 1,105 | 821 | 17,899 | 13,302 | 251,630 | 13,302 | 352,090 | 290,439 | 1,700,379 | 670,605 | 729,396 | 1,553,847 | 318,514 | 968 |
| AC 240,000 - 760,000 | COMM Equip | COMM | 5.21 | 2,583,217 | 809,832 | 13,456,516 | 387 | 315 | 6,266 | 5,095 | 88,084 | 5,095 | 54,767 | 43,028 | 619,251 | 163,950 | 279,356 | 543,927 | 109,183 | 108 |
| Clothes Washer CEE Tier1, Electric Water heater, Electric Dryer | COMM Equip | COMM | 1.00 | 5,057,692 | 1,406,956 | 5,066,590 | 558 | 59 | 9,038 | 951 | 84,708 | 951 | 88,854 | 61,976 | 210,294 | 313,622 | 38,389 | 523,081 | 224,768 | 826 |
| Demand-controlled ventilation (DCV) | COMM Equip | COMM | 2.21 | 3,028,935 | 518,668 | 6,686,245 | 1,158 | 194 | 5,806 | 973 | 81,625 | 973 | 105,222 | 84,754 | 1,189,040 | 605,271 | 172,170 | 1,627,278 | 500,049 | 170 |
| Efficient Refrigeration Condenser | COMM Equip | COMM | 5.17 | 248,279 | 130,166 | 1,284,717 | 47 | 46 | 754 | 741 | 10,599 | 741 | 10,362 | 5,537 | 62,026 | 17,744 | 41,267 | 66,439 | 7,382 | 369 |
| ENERGY STAR Commercial Solid Door Freezers less than 20ft3 | COMM Equip | COMM | 1.83 | 1,315,970 | 812,543 | 2,407,338 | 233 | 26 | 3,713 | 421 | 41,761 | 421 | 53,011 | 31,464 | 104,180 | 84,475 | 19,965 | 261,782 | 31,464 | 420 |

# Market Achievable HIGH CASE - CEI

| Measure Name | Program | Rate Class | Total Measure TRC Test | **Total Discounted Lifetime Costs ($000)** | **Total Discounted Lifetime Utility Costs ($000)** | **Total Discounted Lifetime Benefits ($000)** | Program Year 2010 Cummultive | | Program Year 2025 Cumm | | Life Time Savings | | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Participants 2010 | Participants 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MWh Saved | kW Saved | MWh Saved | kW Saved | MWh Saved | kW Saved | Portfolio Budget | Total Incentives | Benefits | Costs | Avoided Capacity | Lost Revene | Participant Costs | Number |
| ENERGY STAR Commercial Solid Door Freezers 20 to 48 ft3 | COMM Equip | COMM | 0.77 | 201,065 | 57,544 | 154,632 | 15 | 2 | 238 | 27 | 2,679 | 27 | 5,823 | 2,070 | 6,693 | 14,793 | 1,291 | 16,792 | 8,970 | 28 |
| ENERGY STAR Commercial Solid Door Refrigerators less than 20ft3 | COMM Equip | COMM | 2.11 | 2,795,628 | 1,142,042 | 5,900,939 | 570 | 65 | 9,097 | 1,035 | 102,313 | 1,035 | 73,604 | 44,292 | 255,388 | 176,953 | 49,064 | 641,355 | 103,349 | 591 |
| ENERGY STAR Commercial Solid Door Refrigerators 20 to 48 ft3 | COMM Equip | COMM | 1.35 | 1,292,755 | 288,792 | 1,743,378 | 168 | 19 | 2,687 | 307 | 30,214 | 307 | 20,276 | 11,073 | 75,457 | 83,024 | 14,529 | 189,395 | 62,748 | 148 |
| ENERGY STAR Ice Machines less than 500 lbs | COMM Equip | COMM | 1.76 | 698,757 | 133,913 | 1,229,089 | 117 | 13 | 1,891 | 216 | 21,265 | 216 | 10,475 | 4,968 | 52,321 | 45,252 | 10,077 | 131,315 | 34,776 | 66 |
| ENERGY STAR Ice Machines 500 to 1000 lbs | COMM Equip | COMM | 1.20 | 835,718 | 136,387 | 1,002,555 | 95 | 11 | 1,542 | 176 | 17,346 | 176 | 10,628 | 6,624 | 42,678 | 53,684 | 8,220 | 107,111 | 43,056 | 33 |
| ENERGY STAR Ice Machines more than 1000 lbs | COMM Equip | COMM | 2.02 | 371,147 | 66,311 | 749,940 | 71 | 8 | 1,154 | 132 | 12,975 | 132 | 6,313 | 3,312 | 31,924 | 25,081 | 6,148 | 80,124 | 18,768 | 11 |
| ENERGY STAR Steam Cookers 3 Pan | COMM Equip | COMM | 2.16 | 19,280,340 | 2,038,457 | 41,550,590 | 3,379 | 770 | 54,725 | 12,473 | 615,454 | 12,473 | 127,734 | 113,231 | 1,804,865 | 1,189,279 | 582,242 | 3,800,501 | 1,061,545 | 283 |
| EE Water Heater | COMM Equip | COMM | 0.99 | 3,149,461 | 1,180,266 | 3,107,342 | 235 | 48 | 3,813 | 773 | 50,026 | 773 | 74,897 | 51,960 | 137,933 | 196,136 | 40,435 | 308,917 | 121,239 | 693 |
| HP Water Heater (Base Usage 22831) | COMM Equip | COMM | 3.07 | 5,228,057 | 643,270 | 16,067,280 | 1,166 | 237 | 18,887 | 3,831 | 265,519 | 3,831 | 41,835 | 30,791 | 722,377 | 324,111 | 210,088 | 1,639,614 | 282,275 | 77 |
| Plug Load Occupancy Sensors Document Stations | COMM Equip | COMM | 1.30 | 688,863 | 181,998 | 896,743 | 592 | 41 | 3,771 | 258 | 17,670 | 258 | 30,359 | 24,195 | 111,633 | 109,855 | 13,381 | 277,548 | 79,497 | 691 |
| Commercial Smart Strip plug outlet | COMM Equip | COMM | 1.45 | 2,403,111 | 909,502 | 3,493,129 | 2,300 | 162 | 14,640 | 1,028 | 68,605 | 1,028 | 144,461 | 117,129 | 434,748 | 378,719 | 53,282 | 1,077,590 | 234,259 | 11,713 |
| Pre Rinse Sprayers | COMM Equip | COMM | 5.98 | 277,235 | 192,142 | 1,658,731 | 1,518 | 126 | 7,584 | 630 | 35,538 | 630 | 40,328 | 35,668 | 293,413 | 57,347 | 41,606 | 711,320 | 17,019 | 1,019 |
| Refrigerant charging correction | COMM Equip | COMM | 2.71 | 7,756,325 | 1,641,204 | 20,997,190 | 2,790 | 1,274 | 45,175 | 20,628 | 127,013 | 20,628 | 103,276 | 70,770 | 781,313 | 479,771 | 207,103 | 784,320 | 376,495 | 2,831 |
| Refrigeration Commissioning | COMM Equip | COMM | 0.62 | 2,386,416 | 1,001,949 | 1,485,219 | 474 | 54 | 7,566 | 864 | 21,273 | 864 | 64,848 | 47,413 | 57,616 | 151,378 | 8,803 | 133,350 | 86,529 | 1,185 |
| Strip curtains for walk-ins - freezer | COMM Equip | COMM | 0.58 | 1,254,944 | 363,246 | 731,975 | 778 | 89 | 3,885 | 444 | 14,565 | 444 | 74,549 | 59,447 | 127,250 | 252,889 | 22,129 | 291,526 | 178,340 | 1,189 |
| Vending Equipment Controller | COMM Equip | COMM | 1.62 | 3,313,115 | 773,143 | 5,380,707 | 1,592 | 418 | 16,022 | 4,206 | 75,080 | 4,206 | 78,762 | 46,615 | 401,838 | 330,481 | 137,812 | 745,836 | 251,720 | 1,865 |
| Window Film | COMM Equip | COMM | 1.64 | 2,199,126 | 422,318 | 3,603,991 | 232 | 133 | 3,757 | 2,155 | 35,213 | 2,155 | 28,232 | 21,231 | 158,431 | 137,626 | 86,970 | 217,445 | 109,394 | 849 |
| Setback/Setup | COMM Equip | COMM | 1.98 | 3,033,887 | 836,206 | 6,003,954 | 870 | -8 | 14,091 | -124 | 118,855 | -124 | 53,714 | 33,885 | 239,490 | 189,020 | -4,557 | 733,942 | 135,306 | 968 |
| Demand-controlled ventilation (DCV) | IND Equip | IND | 2.20 | 802,651 | 139,274 | 1,766,582 | 307 | 51 | 1,534 | 257 | 21,571 | 257 | 29,755 | 22,487 | 315,482 | 162,430 | 45,681 | 431,758 | 132,676 | 45 |
| Exterior HID replacement above 175W to 250W HID retrofit | IND Equip | IND | 0.51 | 511,431 | 78,241 | 262,789 | 0 | 0 | 438 | 0 | 4,925 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HPT8 4ft 4 lamp, T12 to HPT8 | IND Equip | IND | 0.87 | 220,467,594 | 59,374,334 | 191,562,092 | 52,046 | 12,729 | 260,024 | 63,593 | 3,655,416 | 63,593 | 11,876,767 | 10,062,938 | 34,163,149 | 44,095,419 | 11,302,802 | 73,166,029 | 32,218,652 | 287,513 |
| Occupancy Sensors under 500 W | IND Equip | IND | 2.69 | 450,870 | 177,849 | 1,211,997 | 110 | 27 | 1,774 | 442 | 16,626 | 442 | 13,180 | 9,051 | 51,590 | 29,990 | 17,850 | 102,666 | 16,809 | 259 |
| Water-Cooled cent Chiller 150 - 300 ton 0.57 kW/ton with 0.46 kW/ton IPLV | IND Equip | IND | 1.39 | 8,365,329 | 2,048,164 | 11,591,627 | 321 | 349 | 5,205 | 5,650 | 112,187 | 5,650 | 128,332 | 114,392 | 582,272 | 517,266 | 391,583 | 692,766 | 388,934 | 38 |
| Water-Cooled Centrifugal Chiller < 150 ton 0.56 kW/ton with 0.53 kW/ton IPLV | IND Equip | IND | 3.03 | 4,277,751 | 2,048,164 | 12,950,021 | 359 | 390 | 5,814 | 6,313 | 125,334 | 6,313 | 128,332 | 114,392 | 650,507 | 265,602 | 437,471 | 773,950 | 137,271 | 38 |
| Window Film | IND Equip | IND | 2.22 | 4,773,859 | 939,749 | 10,602,046 | 521 | 299 | 8,435 | 4,839 | 118,580 | 4,839 | 60,089 | 57,196 | 494,128 | 296,147 | 265,341 | 732,248 | 236,058 | 38 |
| Motors 1 HP 1200 | IND MOTOR | IND | 1.20 | 2,865,884 | 1,465,472 | 3,441,172 | 303 | 23 | 4,841 | 368 | 68,060 | 368 | 93,819 | 72,938 | 153,806 | 181,344 | 20,505 | 426,638 | 87,526 | 2,918 |
| Motors 5 HP 1200 | IND MOTOR | IND | 3.58 | 1,621,851 | 1,645,191 | 5,800,283 | 512 | 39 | 8,160 | 621 | 114,719 | 621 | 105,051 | 93,361 | 259,248 | 103,592 | 34,562 | 719,122 | -1,459 | 1,459 |
| Motors 10 HP 1200 | IND MOTOR | IND | 2.56 | 1,606,680 | 1,069,855 | 4,118,752 | 363 | 28 | 5,795 | 441 | 81,462 | 441 | 69,093 | 61,997 | 184,090 | 102,644 | 24,542 | 510,645 | 33,552 | 729 |
| Motors 20 HP 1200 | IND MOTOR | IND | 3.45 | 547,910 | 410,786 | 1,890,754 | 167 | 13 | 2,660 | 202 | 37,396 | 202 | 27,901 | 24,252 | 84,509 | 36,471 | 11,266 | 234,417 | 8,570 | 182 |
| Motors 1 HP 3600 | IND MOTOR | IND | 0.82 | 2,865,884 | 1,465,472 | 2,344,034 | 207 | 16 | 3,298 | 251 | 46,361 | 251 | 93,819 | 72,938 | 104,768 | 181,344 | 13,967 | 290,615 | 87,526 | 2,918 |
| Motors 5 HP 3600 | IND MOTOR | IND | 1.89 | 1,621,851 | 1,645,191 | 3,070,917 | 271 | 21 | 4,320 | 329 | 60,737 | 329 | 105,051 | 93,361 | 137,257 | 103,592 | 18,298 | 380,734 | -1,459 | 1,459 |
| Motors 10 HP 3600 | IND MOTOR | IND | 1.78 | 1,606,680 | 1,069,855 | 2,867,372 | 253 | 19 | 4,034 | 307 | 56,711 | 307 | 69,093 | 61,997 | 128,159 | 102,644 | 17,086 | 355,498 | 33,552 | 729 |
| Motors 20 HP 3600 | IND MOTOR | IND | 2.02 | 547,910 | 410,786 | 1,106,783 | 98 | 7 | 1,557 | 118 | 21,890 | 118 | 27,901 | 24,252 | 49,468 | 36,471 | 6,595 | 137,220 | 8,570 | 182 |
| Water Pumps with VFD's | IND MOTOR | IND | 7.08 | 617,289 | 267,186 | 4,368,588 | 423 | 7 | 6,754 | 119 | 94,946 | 119 | 18,926 | 14,588 | 192,601 | 40,807 | 6,642 | 595,175 | 21,881 | 292 |
| HVAC Fans with VFD's | IND MOTOR | IND | 8.60 | 617,289 | 267,186 | 5,309,761 | 515 | 9 | 8,209 | 145 | 115,402 | 145 | 18,926 | 14,588 | 234,095 | 40,807 | 8,073 | 723,400 | 21,881 | 292 |
| Air Compressors with VFD's | IND MOTOR | IND | 4.03 | 617,289 | 267,186 | 2,486,240 | 241 | 4 | 3,844 | 68 | 54,036 | 68 | 18,926 | 14,588 | 109,613 | 40,807 | 3,780 | 338,725 | 21,881 | 292 |
| Water Pumps with VFD's | IND MOTOR | IND | 7.23 | 1,509,584 | 517,626 | 10,921,469 | 1,058 | 19 | 16,885 | 298 | 237,366 | 298 | 34,578 | 29,175 | 481,503 | 96,576 | 16,604 | 1,487,938 | 61,997 | 146 |
| HVAC Fans with VFD's | IND MOTOR | IND | 8.79 | 1,509,584 | 517,626 | 13,274,403 | 1,286 | 23 | 20,522 | 363 | 288,504 | 363 | 34,578 | 29,175 | 585,238 | 96,576 | 20,182 | 1,808,501 | 61,997 | 146 |
| Air Compressors with VFD's | IND MOTOR | IND | 4.12 | 1,509,584 | 517,626 | 6,215,601 | 602 | 11 | 9,609 | 170 | 135,089 | 170 | 34,578 | 29,175 | 274,032 | 96,576 | 9,450 | 846,812 | 61,997 | 146 |
| Water Pumps with VFD's | IND MOTOR | IND | 1.49 | 7,338,449 | 628,142 | 10,921,469 | 1,058 | 19 | 16,885 | 298 | 237,366 | 298 | 41,485 | 36,469 | 481,503 | 460,880 | 16,604 | 1,487,938 | 419,394 | 73 |
| HVAC Fans with VFD's | IND MOTOR | IND | 1.81 | 7,338,449 | 628,142 | 13,274,403 | 1,286 | 23 | 20,522 | 363 | 288,504 | 363 | 41,485 | 36,469 | 585,238 | 460,880 | 20,182 | 1,808,501 | 419,394 | 73 |
| Air Compressors with VFD's | IND MOTOR | IND | 0.85 | 7,338,449 | 628,142 | 6,215,601 | 602 | 11 | 9,609 | 170 | 135,089 | 170 | 41,485 | 36,469 | 274,032 | 460,880 | 9,450 | 846,812 | 419,394 | 73 |

# 10.0 APPENDICES



## Appendix C-3 Toledo Edison Detailed Measure Results

# Economic Achievable - TE

| Measure Name | Program | Rate Class | Total Measure TRC Test | **Total Discounted Lifetime Costs ($000)** | **Total Discounted Lifetime Utility Costs ($000)** | **Total Discounted Lifetime Benefits ($000)** | Program Year 2010 Cummultive | | Program Year 2025 Cumm | | Life Time Savings | | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Participants 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MWh Saved | kW Saved | MWh Saved | kW Saved | MWh Saved | kW Saved | Portfolio Budget | Total Incentives | Benefits | Costs | Avoided Capacity | Lost Revene | Participant Costs | Number |
| DLC-CAC | Therm DLC | Res | 1.30 | 3,359,757 | 3,359,757 | 4,369,049 | 260 | 5,192 | 260 | 5,192 | 3,163 | 5,192 | 3,359,757 | 1,554,389 | 4,369,049 | 3,359,757 | 4,167,492 | 316,284 | 0 | 6,758 |
| DLC-Pool Pumps | Therm DLC | Res | 1.62 | 797 | 797 | 1,291 | 0 | 2 | 0 | 2 | 0 | 2 | 797 | 335 | 1,291 | 797 | 1,259 | 50 | 0 | 1 |
| DLC-Water Heat | Therm DLC | Res | 1.19 | 797 | 797 | 948 | 0 | 1 | 0 | 1 | 0 | 1 | 797 | 335 | 948 | 797 | 916 | 50 | 0 | 1 |
| Residential Online Audit | On-Line Audit | Res | 5.01 | 537,607 | 537,607 | 2,695,802 | 13,137 | 1,566 | 13,137 | 1,566 | 61,558 | 1,566 | 537,607 | 102,597 | 2,695,802 | 537,607 | 516,649 | 6,155,811 | 0 | 41,039 |
| Residential Online Audit Future | On-Line Audit | Res | 1.51 | 44 | 44 | 66 | 0 | 0 | 0 | 0 | 2 | 0 | 44 | 33 | 66 | 44 | 13 | 150 | 0 | 1 |
| Schools Childern Education | Comprehensive Residential | Res | 1.51 | 327,000 | 327,000 | 492,669 | 2,401 | 286 | 2,401 | 286 | 11,250 | 286 | 327,000 | 247,500 | 492,669 | 327,000 | 94,420 | 1,125,000 | 0 | 7,500 |
| Refrigerator/Freezer recycling | Efficient Appliances | Res | 3.09 | 4,843,487 | 4,843,487 | 14,966,823 | 45,498 | 6,465 | 45,498 | 6,465 | 341,125 | 6,465 | 4,843,487 | 1,275,139 | 14,966,823 | 4,843,487 | 3,475,246 | 34,112,512 | 0 | 25,503 |
| Room Air Conditioners recycling | Efficient Appliances | Res | 0.43 | 145 | 120 | 62 | 0 | 0 | 0 | 0 | 1 | 0 | 120 | 25 | 62 | 145 | 25 | 52 | 25 | 1 |
| ASHP - SEER 15 | Comprehensive Residential | Res | 2.40 | 9,710,428 | 5,921,732 | 23,323,549 | 38,041 | 4,007 | 38,041 | 4,007 | 641,729 | 4,007 | 5,921,732 | 5,051,595 | 23,323,549 | 9,710,428 | 3,982,953 | 64,172,937 | 3,788,696 | 12,629 |
| CAC - SEER 15 | Comprehensive Residential | Res | 1.25 | 115,082,911 | 27,942,898 | 144,130,649 | 96,698 | 46,078 | 96,698 | 46,078 | 1,631,261 | 46,078 | 27,942,898 | 21,785,003 | 144,130,649 | 115,082,911 | 45,803,964 | 163,126,106 | 87,140,014 | 145,233 |
| CAC - Maintenance | Comprehensive Residential | Res | 2.26 | 15,007,990 | 3,940,151 | 33,934,545 | 39,496 | 34,246 | 39,496 | 34,246 | 259,107 | 34,246 | 3,940,151 | 2,766,960 | 33,934,545 | 15,007,990 | 16,218,148 | 25,910,698 | 11,067,840 | 110,678 |
| EE Ground Source Heat Pump | Comprehensive Residential | Res | 0.83 | 1,786 | 706 | 1,485 | 3 | 0 | 3 | 0 | 46 | 0 | 706 | 600 | 1,485 | 1,786 | 113 | 4,554 | 1,080 | 1 |
| Solar Water Heating | Comprehensive Residential | Res | 0.46 | 3,127 | 527 | 1,441 | 2 | 1 | 2 | 1 | 32 | 1 | 527 | 500 | 1,441 | 3,127 | 456 | 3,155 | 2,600 | 1 |
| HP Water Heater | Comprehensive Residential | Res | 1.64 | 4,411,053 | 1,636,483 | 7,224,006 | 11,247 | 2,572 | 11,247 | 2,572 | 158,110 | 2,572 | 1,636,483 | 1,503,659 | 7,224,006 | 4,411,053 | 2,283,948 | 15,810,978 | 2,774,570 | 5,012 |
| EE Water Heater | Comprehensive Residential | Res | 0.72 | 17,323,409 | 4,792,914 | 12,473,908 | 21,292 | 4,319 | 21,292 | 4,319 | 279,367 | 4,319 | 4,792,914 | 3,132,624 | 12,473,908 | 17,323,409 | 3,656,714 | 27,936,738 | 12,530,495 | 62,652 |
| Programable Thermostat_Heat | Comprehensive Residential | Res | 2.89 | 528,397 | 528,397 | 1,529,379 | 3,482 | 0 | 3,482 | 0 | 48,949 | 0 | 528,397 | 491,305 | 1,529,379 | 528,397 | 0 | 4,894,878 | 0 | 6,999 |
| Programable Thermostat_CAC | Comprehensive Residential | Res | 1.36 | 6,205,296 | 3,460,621 | 8,446,146 | 3,547 | 6,003 | 3,547 | 6,003 | 49,864 | 6,003 | 3,460,621 | 2,557,109 | 8,446,146 | 6,205,296 | 5,330,220 | 4,986,363 | 2,744,675 | 85,237 |
| LED Lighting Inside | Efficient Appliances | Res | 0.50 | 7 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 3 | 7 | 0 | 9 | 3 | 1 |
| CFL bulbs regular - Inside - 15 | Efficient Appliances | Res | 3.81 | 1,952,246 | 540,133 | 7,447,291 | 24,748 | 848 | 24,748 | 848 | 208,746 | 848 | 540,133 | 353,028 | 7,447,291 | 1,952,246 | 506,181 | 20,874,558 | 1,412,113 | 353,028 |
| CFL bulbs regular - Outside - 15 | Efficient Appliances | Res | 6.64 | 1,211,071 | 335,070 | 8,037,681 | 28,658 | 0 | 28,658 | 0 | 241,724 | 0 | 335,070 | 219,000 | 8,037,681 | 1,211,071 | 0 | 24,172,365 | 876,001 | 219,000 |
| LED Lighting Outside | Efficient Appliances | Res | 1.20 | 1,430,071 | 773,071 | 1,722,360 | 6,141 | 0 | 6,141 | 0 | 51,798 | 0 | 773,071 | 657,001 | 1,722,360 | 1,430,071 | 0 | 5,179,793 | 657,001 | 219,000 |
| Clothes Washer Energy Star, Electric Water heater, Electric Dryer | Efficient Appliances | Res | 0.79 | 8,684,356 | 6,016,806 | 6,863,938 | 14,674 | 930 | 14,674 | 930 | 192,538 | 930 | 6,016,806 | 4,445,916 | 6,863,938 | 8,684,356 | 787,197 | 19,253,780 | 2,667,550 | 59,279 |
| Dehumidifiers | Efficient Appliances | Res | 2.25 | 7,513,246 | 5,057,937 | 16,927,677 | 22,321 | 1,027 | 22,321 | 1,027 | 251,031 | 1,027 | 5,057,937 | 2,455,309 | 16,927,677 | 7,513,246 | 776,334 | 25,103,080 | 2,455,309 | 98,212 |
| Freezers Energy Star-Chest Freezer | Efficient Appliances | Res | 0.07 | 389 | 52 | 29 | 0 | 0 | 0 | 0 | 1 | 0 | 52 | 25 | 29 | 389 | 10 | 60 | 337 | 1 |
| Holiday Lights | Efficient Appliances | Res | 0.27 | 77 | 25 | 21 | 0 | 0 | 0 | 0 | 1 | 0 | 25 | 20 | 21 | 77 | 0 | 64 | 52 | 1 |
| LED Night Light | Efficient Appliances | Res | 1.61 | 78,975 | 78,975 | 127,393 | 352 | 0 | 352 | 0 | 3,960 | 0 | 78,975 | 75,000 | 127,393 | 78,975 | 0 | 396,000 | 0 | 7,500 |
| Pump and Motor Single Speed | Efficient Appliances | Res | 7.38 | 335,325 | 107,332 | 2,473,027 | 2,597 | 1,336 | 2,597 | 1,336 | 24,343 | 1,336 | 107,332 | 70,152 | 2,473,027 | 335,325 | 873,037 | 2,434,264 | 227,993 | 3,508 |
| Refrigerators-Freezers Energy Star - Side by Side | Efficient Appliances | Res | 0.47 | 120 | 57 | 56 | 0 | 0 | 0 | 0 | 1 | 0 | 57 | 30 | 56 | 120 | 11 | 142 | 63 | 1 |
| Refrigerators-Freezers Energy Star - Top Freezer | Efficient Appliances | Res | 0.36 | 120 | 57 | 43 | 0 | 0 | 0 | 0 | 1 | 0 | 57 | 30 | 43 | 120 | 11 | 103 | 63 | 1 |
| Room Air Conditioners | Efficient Appliances | Res | 2.75 | 4,475,581 | 3,841,646 | 12,302,658 | 11,499 | 7,988 | 11,499 | 7,988 | 107,769 | 7,988 | 3,841,646 | 3,169,675 | 12,302,658 | 4,475,581 | 5,219,232 | 10,776,895 | 633,935 | 126,787 |
| Smart Strip plug outlet | Efficient Appliances | Res | 1.16 | 5,768,377 | 2,176,610 | 6,665,770 | 35,258 | 2,477 | 35,258 | 2,477 | 165,221 | 2,477 | 2,176,610 | 1,795,883 | 6,665,770 | 5,768,377 | 816,947 | 16,522,126 | 3,591,766 | 179,588 |
| Torchiere Floor Lamps | Efficient Appliances | Res | 0.74 | 52 | 12 | 39 | 0 | 0 | 0 | 0 | 1 | 0 | 12 | 10 | 39 | 52 | 4 | 105 | 40 | 1 |
| Residential New Construction - 15% | New Homes | Res | 1.58 | 2,137,203 | 1,633,657 | 3,367,028 | 2,607 | 2,054 | 2,607 | 2,054 | 43,987 | 2,054 | 1,633,657 | 1,174,940 | 3,367,028 | 2,137,203 | 2,041,344 | 4,398,677 | 503,546 | 2,085 |
| Residential New Construction - 30% | New Homes | Res | 1.90 | 3,544,630 | 2,618,856 | 6,733,521 | 5,217 | 4,105 | 5,217 | 4,105 | 88,011 | 4,105 | 2,618,856 | 2,160,139 | 6,733,521 | 3,544,630 | 4,081,022 | 8,801,107 | 925,774 | 2,085 |
| Ceiling Fans | Comprehensive Residential | Res | 0.50 | 187 | 80 | 94 | 0 | 0 | 0 | 0 | 2 | 0 | 80 | 75 | 94 | 187 | 14 | 243 | 107 | 1 |
| Estar Windows | Comprehensive Residential | Res | 0.63 | 502 | 127 | 315 | 1 | 0 | 1 | 0 | 9 | 0 | 127 | 100 | 315 | 502 | 36 | 894 | 375 | 1 |
| Duct sealing 20 leakage base | Comprehensive Residential | Res | 1.62 | 24,516,022 | 4,625,367 | 39,633,976 | 25,367 | 19,538 | 25,367 | 19,538 | 356,611 | 19,538 | 4,625,367 | 3,788,696 | 39,633,976 | 24,516,022 | 17,349,721 | 35,661,103 | 19,890,655 | 31,572 |
| Low Flow Showerheads | Comprehensive Residential | Res | 0.92 | 105 | 25 | 97 | 0 | 0 | 0 | 0 | 2 | 0 | 25 | 23 | 97 | 105 | 20 | 234 | 80 | 1 |
| Kitchen Aerator | Comprehensive Residential | Res | 6.12 | 454,481 | 454,481 | 2,779,878 | 6,886 | 1,421 | 6,886 | 1,421 | 58,084 | 1,421 | 454,481 | 394,711 | 2,779,878 | 454,481 | 848,494 | 5,808,406 | 0 | 56,387 |
| Bathroom Aerator | Comprehensive Residential | Res | 3.06 | 454,481 | 454,481 | 1,389,939 | 3,443 | 710 | 3,443 | 710 | 29,042 | 710 | 454,481 | 394,711 | 1,389,939 | 454,481 | 424,247 | 2,904,203 | 0 | 56,387 |
| Pipe Wrap | Comprehensive Residential | Res | 1.10 | 8,520,110 | 2,007,385 | 9,362,090 | 19,554 | 2,206 | 19,554 | 2,206 | 238,236 | 2,206 | 2,007,385 | 1,409,681 | 9,362,090 | 8,520,110 | 1,771,084 | 23,823,603 | 6,512,725 | 56,387 |
| Roof Insulation | Comprehensive Residential | Res | 0.80 | 625 | 87 | 499 | 1 | 0 | 1 | 0 | 14 | 0 | 87 | 50 | 499 | 625 | 89 | 1,406 | 538 | 1 |
| Wall Insulation | Comprehensive Residential | Res | 0.61 | 1,597 | 177 | 971 | 1 | 0 | 1 | 0 | 34 | 0 | 177 | 150 | 971 | 1,597 | 168 | 3,387 | 1,421 | 1 |
| Whole Building | Comprehensive Residential | Res | 0.00 | 427 | 327 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 327 | 300 | 0 | 427 | 0 | 0 | 100 | 1 |
| Commercial New Construction | COMNEW | COMM | 3.38 | 4,446,930 | 2,320,085 | 15,011,301 | 14,135 | 4,530 | 14,135 | 4,530 | 397,416 | 4,530 | 2,320,085 | 2,126,845 | 15,011,301 | 4,446,930 | 5,586,626 | 39,741,626 | 2,126,845 | 608 |
| Commercial CFL Program | COMM Equip | COMM | 19.12 | 4,687,838 | 1,694,805 | 89,634,393 | 310,066 | 4,471 | 310,066 | 4,471 | 2,615,342 | 4,471 | 1,694,805 | 1,496,517 | 89,634,393 | 4,687,838 | 2,670,260 | 261,534,246 | 2,993,033 | 374,129 |
| Exterior HID replacement above 175W to 250W HID retrofit | COMM Equip | COMM | 0.31 | 505 | 55 | 158 | 0 | 0 | 0 | 0 | 5 | 0 | 55 | 50 | 158 | 505 | 0 | 491 | 450 | 1 |
| HPT8 4ft 4 lamp, T12 to HPT8 | COMM Equip | COMM | 0.65 | 152 | 30 | 99 | 0 | 0 | 0 | 0 | 2 | 0 | 30 | 25 | 99 | 152 | 33 | 204 | 122 | 1 |
| LED Exit Signs Electronic Fixtures (Retrofit Only) | COMM Equip | COMM | -2.54 | -8,631,263 | 2,896,916 | 21,962,473 | 40,608 | 4,647 | 40,608 | 4,647 | 570,863 | 4,647 | 2,896,916 | 1,893,409 | 21,962,473 | -8,631,263 | 4,126,155 | 57,086,294 | -11,528,179 | 189,341 |
| Occupancy Sensors under 500 W | COMM Equip | COMM | 1.89 | 17,097,778 | 4,919,873 | 32,392,003 | 68,781 | 17,152 | 68,781 | 17,152 | 644,617 | 17,152 | 4,919,873 | 4,059,301 | 32,392,003 | 17,097,778 | 11,207,340 | 64,461,707 | 12,177,904 | 162,372 |
| LED Auto Traffic Signals | COMM Equip | COMM | 1.22 | 4,307,645 | 1,207,200 | 5,241,767 | 13,700 | 1,564 | 13,700 | 1,564 | 128,400 | 1,564 | 1,207,200 | 1,080,000 | 5,241,767 | 4,307,645 | 1,022,036 | 12,840,000 | 3,100,445 | 24,000 |
| LED Pedestrian Signals | COMM Equip | COMM | 4.83 | 480,170 | 181,800 | 2,317,142 | 6,056 | 691 | 6,056 | 691 | 56,760 | 691 | 181,800 | 150,000 | 2,317,142 | 480,170 | 451,784 | 5,676,000 | 298,370 | 6,000 |
| Street Lighting - 175 Mercury to 100 HPS | COMM Equip | COMM | 0.59 | 184 | 184 | 108 | 0 | 0 | 0 | 0 | 3 | 0 | 184 | 50 | 108 | 184 | 0 | 329 | 0 | 1 |
| AC 65,000 - 135,000 | COMM Equip | COMM | 2.58 | 20,412,487 | 9,068,891 | 52,568,325 | 34,171 | 25,394 | 34,171 | 25,394 | 480,382 | 25,394 | 9,068,891 | 7,482,583 | 52,568,325 | 20,412,487 | 22,549,759 | 48,038,185 | 11,343,596 | 29,930 |
| AC 240,000 - 760,000 | COMM Equip | COMM | 3.92 | 10,984,432 | 3,015,481 | 43,075,211 | 26,914 | 21,883 | 26,914 | 21,883 | 378,357 | 21,883 | 3,015,481 | 2,618,904 | 43,075,211 | 10,984,432 | 19,432,084 | 37,835,683 | 7,968,951 | 7,483 |
| Clothes Washer CEE Tier1, Electric Water heater, Electric Dryer | COMM Equip | COMM | 0.68 | 374 | 77 | 254 | 1 | 0 | 1 | 0 | 6 | 0 | 77 | 50 | 254 | 374 | 46 | 633 | 297 | 1 |
| Demand-controlled ventilation (DCV) | COMM Equip | COMM | 1.97 | 1,330,403 | 226,722 | 2,624,384 | 2,555 | 428 | 2,555 | 428 | 35,916 | 428 | 226,722 | 187,065 | 2,624,384 | 1,330,403 | 380,005 | 3,591,640 | 1,103,681 | 374 |
| Efficient Refrigeration Condenser | COMM Equip | COMM | 4.17 | 192,237 | 72,983 | 801,592 | 611 | 601 | 611 | 601 | 8,586 | 601 | 72,983 | 47,701 | 801,592 | 192,237 | 533,319 | 858,626 | 119,254 | 4,770 |
| ENERGY STAR Commercial Solid Door Freezers less than 20ft3 | COMM Equip | COMM | 1.29 | 1,295,684 | 622,252 | 1,672,337 | 3,737 | 424 | 3,737 | 424 | 42,022 | 424 | 622,252 | 336,716 | 1,672,337 | 1,295,684 | 320,481 | 4,202,219 | 673,433 | 6,734 |

# Economic Achievable - TE

| Measure Name | Program | Rate Class | Total Measure TRC Test | **Total Discounted Lifetime Costs ($000)** | **Total Discounted Lifetime Utility Costs ($000)** | **Total Discounted Lifetime Benefits ($000)** | Program Year 2010 Cummultive | | Program Year 2025 Cumm | | Life Time Savings | | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Participants 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MWh Saved | kW Saved | MWh Saved | kW Saved | MWh Saved | kW Saved | Portfolio Budget | Total Incentives | Benefits | Costs | Avoided Capacity | Lost Revene | Participant Costs | Number |
| ENERGY STAR Commercial Solid Door Freezers 20 to 48 ft3 | COMM Equip | COMM | 0.55 | 442 | 92 | 243 | 1 | 0 | 1 | 0 | 6 | 0 | 92 | 50 | 243 | 442 | 47 | 608 | 350 | 1 |
| ENERGY STAR Commercial Solid Door Refrigerators less than 20ft3 | COMM Equip | COMM | 1.48 | 2,789,582 | 881,523 | 4,125,663 | 9,213 | 1,048 | 9,213 | 1,048 | 103,608 | 1,048 | 881,523 | 477,015 | 4,125,663 | 2,789,582 | 792,602 | 10,360,759 | 1,908,059 | 9,540 |
| ENERGY STAR Commercial Solid Door Refrigerators 20 to 48 ft3 | COMM Equip | COMM | 0.94 | 542 | 92 | 511 | 1 | 0 | 1 | 0 | 13 | 0 | 92 | 50 | 511 | 542 | 98 | 1,283 | 450 | 1 |
| ENERGY STAR Ice Machines less than 500 lbs | COMM Equip | COMM | 1.23 | 721,022 | 103,709 | 886,532 | 1,978 | 226 | 1,978 | 226 | 22,250 | 226 | 103,709 | 56,119 | 886,532 | 721,022 | 170,742 | 2,225,021 | 617,313 | 1,122 |
| ENERGY STAR Ice Machines 500 to 1000 lbs | COMM Equip | COMM | 0.84 | 1,542 | 192 | 1,289 | 3 | 0 | 3 | 0 | 32 | 0 | 192 | 150 | 1,289 | 1,542 | 248 | 3,234 | 1,350 | 1 |
| ENERGY STAR Ice Machines more than 1000 lbs | COMM Equip | COMM | 1.42 | 2,042 | 242 | 2,892 | 6 | 1 | 6 | 1 | 73 | 1 | 242 | 200 | 2,892 | 2,042 | 557 | 7,258 | 1,800 | 1 |
| ENERGY STAR Steam Cookers 3 Pan | COMM Equip | COMM | 1.52 | 4,192 | 442 | 6,376 | 12 | 3 | 12 | 3 | 134 | 3 | 442 | 400 | 6,376 | 4,192 | 2,057 | 13,426 | 3,750 | 1 |
| EE Water Heater | COMM Equip | COMM | 0.72 | 277 | 77 | 199 | 0 | 0 | 0 | 0 | 4 | 0 | 77 | 50 | 199 | 277 | 58 | 446 | 200 | 1 |
| HP Water Heater (Base Usage 22831) | COMM Equip | COMM | 2.25 | 65,572,123 | 4,808,308 | 147,459,432 | 238,082 | 48,295 | 238,082 | 48,295 | 3,346,960 | 48,295 | 4,808,308 | 3,142,685 | 147,459,432 | 65,572,123 | 42,885,411 | 334,695,953 | 60,763,814 | 15,713 |
| Plug Load Occupancy Sensors Document Stations | COMM Equip | COMM | 1.04 | 1,162,045 | 301,548 | 1,208,349 | 6,411 | 439 | 6,411 | 439 | 30,043 | 439 | 301,548 | 261,890 | 1,208,349 | 1,162,045 | 144,844 | 3,004,257 | 860,497 | 7,483 |
| Commercial Smart Strip plug outlet | COMM Equip | COMM | 1.16 | 3,605,109 | 1,360,334 | 4,165,959 | 22,036 | 1,548 | 22,036 | 1,548 | 103,260 | 1,548 | 1,360,334 | 1,122,388 | 4,165,959 | 3,605,109 | 510,574 | 10,325,965 | 2,244,775 | 112,239 |
| Pre Rinse Sprayers | COMM Equip | COMM | 5.35 | 161,085 | 111,101 | 861,749 | 4,458 | 370 | 4,458 | 370 | 20,891 | 370 | 111,101 | 104,756 | 861,749 | 161,085 | 122,196 | 2,089,137 | 49,984 | 2,993 |
| Refrigerant charging correction | COMM Equip | COMM | 1.64 | 18,923,453 | 3,995,700 | 30,978,539 | 110,605 | 50,505 | 110,605 | 50,505 | 310,978 | 50,505 | 3,995,700 | 2,805,969 | 30,978,539 | 18,923,453 | 8,211,501 | 31,097,766 | 14,927,754 | 112,239 |
| Refrigeration Commissioning | COMM Equip | COMM | 0.39 | 124 | 36 | 49 | 0 | 0 | 0 | 0 | 1 | 0 | 36 | 25 | 49 | 124 | 7 | 113 | 88 | 1 |
| Strip curtains for walk-ins - freezer | COMM Equip | COMM | 0.51 | 211 | 61 | 107 | 1 | 0 | 1 | 0 | 2 | 0 | 61 | 50 | 107 | 211 | 19 | 245 | 150 | 1 |
| Vending Equipment Controller | COMM Equip | COMM | 1.23 | 13,161,864 | 3,060,377 | 16,125,722 | 63,872 | 16,766 | 63,872 | 16,766 | 299,303 | 16,766 | 3,060,377 | 1,870,646 | 16,125,722 | 13,161,864 | 5,530,401 | 29,930,333 | 10,101,488 | 74,826 |
| Window Film | COMM Equip | COMM | 1.17 | 159 | 30 | 187 | 0 | 0 | 0 | 0 | 3 | 0 | 30 | 25 | 187 | 159 | 102 | 256 | 129 | 1 |
| Setback/Setup | COMM Equip | COMM | 1.30 | 191 | 41 | 247 | 1 | 0 | 1 | 0 | 8 | 0 | 41 | 25 | 247 | 191 | -5 | 758 | 150 | 1 |
| Demand-controlled ventilation (DCV) | IND Equip | IND | 1.97 | 248,002 | 42,263 | 489,213 | 476 | 80 | 476 | 80 | 6,695 | 80 | 42,263 | 34,871 | 489,213 | 248,002 | 70,837 | 669,520 | 205,738 | 70 |
| Exterior HID replacement above 175W to 250W HID retrofit | IND Equip | IND | 0.31 | 505 | 55 | 158 | 0 | 0 | 0 | 0 | 5 | 0 | 55 | 50 | 158 | 505 | 0 | 491 | 450 | 1 |
| HPT8 4ft 4 lamp, T12 to HPT8 | IND Equip | IND | 0.78 | 152 | 30 | 119 | 0 | 0 | 0 | 0 | 3 | 0 | 30 | 25 | 119 | 152 | 39 | 254 | 122 | 1 |
| Occupancy Sensors under 500 W | IND Equip | IND | 1.89 | 111,048 | 31,954 | 210,381 | 447 | 111 | 447 | 111 | 4,187 | 111 | 31,954 | 26,365 | 210,381 | 111,048 | 72,790 | 418,670 | 79,094 | 1,055 |
| Water-Cooled cent Chiller 150 - 300 ton 0.57 kW/ton with 0.46 kW/ton IPLV | IND Equip | IND | 1.13 | 853,702 | 175,305 | 968,167 | 534 | 580 | 534 | 580 | 11,519 | 580 | 175,305 | 158,504 | 968,167 | 853,702 | 651,100 | 1,151,890 | 678,397 | 63 |
| Water-Cooled Centrifugal Chiller < 150 ton 0.56 kW/ton with 0.53 kW/ton IPLV | IND Equip | IND | 2.49 | 435,252 | 175,305 | 1,081,624 | 597 | 648 | 597 | 648 | 12,869 | 648 | 175,305 | 158,504 | 1,081,624 | 435,252 | 727,400 | 1,286,877 | 259,946 | 63 |
| Window Film | IND Equip | IND | 1.68 | 487,941 | 79,588 | 821,606 | 866 | 497 | 866 | 497 | 12,175 | 497 | 79,588 | 79,252 | 821,606 | 487,941 | 441,192 | 1,217,538 | 408,353 | 63 |
| Motors 1 HP 1200 | IND MOTOR | IND | 0.87 | 60 | 25 | 53 | 0 | 0 | 0 | 0 | 1 | 0 | 25 | 20 | 53 | 60 | 7 | 146 | 35 | 1 |
| Motors 5 HP 1200 | IND MOTOR | IND | 2.60 | 288,112 | 250,147 | 749,672 | 1,479 | 113 | 1,479 | 113 | 20,795 | 113 | 250,147 | 227,790 | 749,672 | 288,112 | 99,943 | 2,079,500 | 37,965 | 4,218 |
| Motors 10 HP 1200 | IND MOTOR | IND | 1.85 | 143,740 | 79,410 | 266,169 | 525 | 40 | 525 | 40 | 7,383 | 40 | 79,410 | 73,821 | 266,169 | 143,740 | 35,484 | 738,321 | 64,330 | 1,055 |
| Motors 20 HP 1200 | IND MOTOR | IND | 2.50 | 48,854 | 31,189 | 122,188 | 241 | 18 | 241 | 18 | 3,389 | 18 | 31,189 | 29,792 | 122,188 | 48,854 | 16,289 | 338,934 | 17,664 | 264 |
| Motors 1 HP 3600 | IND MOTOR | IND | 0.60 | 60 | 25 | 36 | 0 | 0 | 0 | 0 | 1 | 0 | 25 | 20 | 36 | 60 | 5 | 100 | 35 | 1 |
| Motors 5 HP 3600 | IND MOTOR | IND | 1.38 | 144,056 | 125,074 | 198,454 | 392 | 30 | 392 | 30 | 5,505 | 30 | 125,074 | 113,895 | 198,454 | 144,056 | 26,457 | 550,488 | 18,983 | 2,109 |
| Motors 10 HP 3600 | IND MOTOR | IND | 1.29 | 71,870 | 39,705 | 92,650 | 183 | 14 | 183 | 14 | 2,570 | 14 | 39,705 | 36,910 | 92,650 | 71,870 | 12,352 | 257,000 | 32,165 | 527 |
| Motors 20 HP 3600 | IND MOTOR | IND | 1.46 | 24,427 | 15,595 | 35,762 | 71 | 5 | 71 | 5 | 992 | 5 | 15,595 | 14,896 | 35,762 | 24,427 | 4,768 | 99,200 | 8,832 | 132 |
| Water Pumps with VFD's | IND MOTOR | IND | 5.07 | 137,412 | 37,227 | 696,186 | 1,530 | 27 | 1,530 | 27 | 21,514 | 27 | 37,227 | 31,638 | 696,186 | 137,412 | 24,008 | 2,151,350 | 100,185 | 1,055 |
| HVAC Fans with VFD's | IND MOTOR | IND | 6.16 | 137,412 | 37,227 | 846,173 | 1,860 | 33 | 1,860 | 33 | 26,148 | 33 | 37,227 | 31,638 | 846,173 | 137,412 | 29,180 | 2,614,839 | 100,185 | 1,055 |
| Air Compressors with VFD's | IND MOTOR | IND | 2.88 | 137,412 | 37,227 | 396,212 | 871 | 15 | 871 | 15 | 12,244 | 15 | 37,227 | 31,638 | 396,212 | 137,412 | 13,663 | 1,224,371 | 100,185 | 1,055 |
| Water Pumps with VFD's | IND MOTOR | IND | 5.15 | 270,353 | 69,982 | 1,392,371 | 3,061 | 54 | 3,061 | 54 | 43,027 | 54 | 69,982 | 63,275 | 1,392,371 | 270,353 | 48,015 | 4,302,700 | 200,371 | 422 |
| HVAC Fans with VFD's | IND MOTOR | IND | 6.26 | 270,353 | 69,982 | 1,692,346 | 3,720 | 66 | 3,720 | 66 | 52,297 | 66 | 69,982 | 63,275 | 1,692,346 | 270,353 | 58,359 | 5,229,679 | 200,371 | 422 |
| Air Compressors with VFD's | IND MOTOR | IND | 2.93 | 270,353 | 69,982 | 792,423 | 1,742 | 31 | 1,742 | 31 | 24,487 | 31 | 69,982 | 63,275 | 792,423 | 270,353 | 27,326 | 2,448,743 | 200,371 | 422 |
| Water Pumps with VFD's | IND MOTOR | IND | 1.05 | 661,909 | 34,432 | 696,186 | 1,530 | 27 | 1,530 | 27 | 21,514 | 27 | 34,432 | 31,638 | 696,186 | 661,909 | 24,008 | 2,151,350 | 627,477 | 105 |
| HVAC Fans with VFD's | IND MOTOR | IND | 1.28 | 661,909 | 34,432 | 846,173 | 1,860 | 33 | 1,860 | 33 | 26,148 | 33 | 34,432 | 31,638 | 846,173 | 661,909 | 29,180 | 2,614,839 | 627,477 | 105 |
| Air Compressors with VFD's | IND MOTOR | IND | 0.60 | 6,277 | 327 | 3,757 | 8 | 0 | 8 | 0 | 116 | 0 | 327 | 300 | 3,757 | 6,277 | 130 | 11,610 | 5,950 | 1 |

# Market Achievable BASE CASE - TE

| Measure Name | Program | Rate Class | Total Measure TRC Test | **Total Discounted Lifetime Costs ($000)** | **Total Discounted Lifetime Utility Costs ($000)** | **Total Discounted Lifetime Benefits ($000)** | Program Year 2010 Cummultive | | Program Year 2025 Cumm | | Life Time Savings | | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Participants 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MWh Saved | kW Saved | MWh Saved | kW Saved | MWh Saved | kW Saved | Portfolio Budget | Total Incentives | Benefits | Costs | Avoided Capacity | Lost Revene | Participant Costs | Number |
| DLC-CAC | Therm DLC | Res | 1.54 | 3,044,467 | 3,044,467 | 4,676,255 | 49 | 976 | 244 | 4,877 | 2,971 | 4,877 | 636,884 | 292,225 | 821,381 | 636,884 | 783,488 | 59,461 | 0 | 1,271 |
| DLC-Pool Pumps | Therm DLC | Res | 1.86 | 160,143 | 160,143 | 298,042 | 2 | 64 | 8 | 318 | 101 | 318 | 37,550 | 13,584 | 52,336 | 37,550 | 51,052 | 2,015 | 0 | 41 |
| DLC-Water Heat | Therm DLC | Res | 1.37 | 160,143 | 160,143 | 218,906 | 2 | 46 | 8 | 231 | 101 | 231 | 37,550 | 13,584 | 38,444 | 37,550 | 37,160 | 2,015 | 0 | 41 |
| Residential Online Audit | On-Line Audit | Res | 5.95 | 544,432 | 544,432 | 3,237,335 | 1,877 | 224 | 13,114 | 1,564 | 61,454 | 1,564 | 82,051 | 14,657 | 385,115 | 82,051 | 73,807 | 879,402 | 0 | 5,863 |
| Residential Online Audit Future | On-Line Audit | Res | 2.72 | 1,825,775 | 1,825,775 | 4,969,242 | 0 | 0 | 13,296 | 1,585 | 62,305 | 1,585 | 5,294 | 33 | 66 | 5,294 | 13 | 150 | 0 | 1 |
| Schools Childern Education | Comprehensive Residential | Res | 2.02 | 361,200 | 361,200 | 730,409 | 240 | 29 | 2,634 | 314 | 12,344 | 314 | 33,700 | 24,750 | 49,267 | 33,700 | 9,442 | 112,500 | 0 | 750 |
| Refrigerator/Freezer recycling | Efficient Appliances | Res | 4.43 | 9,639,010 | 9,639,010 | 42,742,292 | 7,833 | 1,113 | 90,226 | 12,822 | 676,477 | 12,822 | 839,106 | 219,528 | 2,576,691 | 839,106 | 598,299 | 5,872,816 | 0 | 4,391 |
| Room Air Conditioners recycling | Efficient Appliances | Res | 0.63 | 1,483,678 | 1,230,155 | 929,819 | 98 | 68 | 1,124 | 781 | 5,266 | 781 | 110,975 | 21,953 | 54,717 | 132,928 | 22,352 | 45,714 | 21,953 | 878 |
| ASHP - SEER 15 | Comprehensive Residential | Res | 3.19 | 241,256 | 148,173 | 768,953 | 58 | 6 | 932 | 98 | 15,720 | 98 | 10,491 | 7,641 | 35,280 | 16,222 | 6,025 | 97,070 | 5,731 | 19 |
| CAC - SEER 15 | Comprehensive Residential | Res | 1.65 | 18,915,210 | 4,594,772 | 31,210,326 | 978 | 466 | 15,844 | 7,550 | 267,283 | 7,550 | 284,259 | 220,419 | 1,458,306 | 1,165,937 | 463,442 | 1,650,501 | 881,678 | 1,469 |
| CAC - Maintenance | Comprehensive Residential | Res | 3.33 | 16,464,452 | 4,324,505 | 54,750,238 | 2,667 | 2,313 | 43,193 | 37,452 | 283,362 | 37,452 | 267,619 | 186,857 | 2,291,657 | 1,015,049 | 1,095,239 | 1,749,793 | 747,430 | 7,474 |
| EE Ground Source Heat Pump | Comprehensive Residential | Res | 1.13 | 855,228 | 339,692 | 962,591 | 79 | 3 | 1,285 | 54 | 21,674 | 54 | 22,283 | 17,634 | 43,656 | 54,023 | 3,319 | 133,839 | 31,740 | 29 |
| Solar Water Heating | Comprehensive Residential | Res | 0.62 | 80,901 | 14,539 | 50,194 | 4 | 1 | 57 | 13 | 803 | 13 | 1,456 | 786 | 2,265 | 5,542 | 716 | 4,957 | 4,086 | 2 |
| HP Water Heater | Comprehensive Residential | Res | 2.22 | 225,728 | 84,437 | 501,936 | 35 | 8 | 571 | 131 | 8,028 | 131 | 5,760 | 4,714 | 22,649 | 14,459 | 7,161 | 49,572 | 8,699 | 16 |
| EE Water Heater | Comprehensive Residential | Res | 1.00 | 5,359,282 | 1,483,563 | 5,351,316 | 405 | 82 | 6,566 | 1,332 | 86,153 | 1,332 | 91,901 | 59,655 | 237,542 | 330,520 | 69,635 | 532,002 | 238,620 | 1,193 |
| Programable Thermostat_Heat | Comprehensive Residential | Res | 3.26 | 399,563 | 399,563 | 1,301,712 | 512 | 0 | 2,623 | 0 | 36,880 | 0 | 78,271 | 72,192 | 224,725 | 78,271 | 0 | 719,247 | 0 | 1,028 |
| Programable Thermostat_CAC | Comprehensive Residential | Res | 1.57 | 804,339 | 449,057 | 1,261,962 | 81 | 137 | 459 | 776 | 6,447 | 776 | 79,449 | 58,242 | 192,373 | 141,963 | 121,403 | 113,571 | 62,514 | 1,941 |
| LED Lighting Inside | Efficient Appliances | Res | 0.77 | 1,715,659 | 927,801 | 1,322,266 | 0 | 0 | 2,853 | 98 | 24,060 | 98 | 633 | 3 | 3 | 636 | 0 | 9 | 3 | 1 |
| CFL bulbs regular - Inside - 15 | Efficient Appliances | Res | 4.28 | 1,953,001 | 540,888 | 8,367,340 | 4,950 | 170 | 24,729 | 847 | 208,581 | 847 | 108,656 | 70,606 | 1,489,458 | 391,078 | 101,236 | 4,174,912 | 282,423 | 70,606 |
| CFL bulbs regular - Outside - 15 | Efficient Appliances | Res | 7.42 | 639,340 | 177,434 | 4,747,067 | 3,010 | 0 | 15,099 | 0 | 127,357 | 0 | 35,824 | 23,003 | 844,253 | 127,836 | 0 | 2,538,991 | 92,012 | 23,003 |
| LED Lighting Outside | Efficient Appliances | Res | 1.81 | 762,425 | 412,515 | 1,379,360 | 0 | 0 | 3,258 | 0 | 27,478 | 0 | 633 | 3 | 8 | 636 | 0 | 24 | 3 | 1 |
| Clothes Washer Energy Star, Electric Water heater, Electric Dryer | Efficient Appliances | Res | 1.12 | 2,390,078 | 1,656,262 | 2,688,444 | 249 | 16 | 4,025 | 255 | 52,808 | 255 | 102,534 | 75,299 | 116,252 | 147,713 | 13,332 | 326,095 | 45,179 | 1,004 |
| Dehumidifiers | Efficient Appliances | Res | 3.33 | 2,412,387 | 1,624,385 | 8,034,850 | 441 | 20 | 7,142 | 329 | 80,326 | 329 | 100,571 | 48,516 | 334,482 | 149,087 | 15,340 | 496,023 | 48,516 | 1,941 |
| Freezers Energy Star-Chest Freezer | Efficient Appliances | Res | 0.10 | 18,172,256 | 2,409,890 | 1,876,229 | 141 | 35 | 2,289 | 562 | 27,887 | 562 | 148,933 | 71,992 | 82,740 | 1,119,387 | 27,870 | 172,205 | 970,454 | 2,880 |
| Holiday Lights | Efficient Appliances | Res | 0.41 | 11,181,847 | 3,660,517 | 4,609,197 | 604 | 0 | 9,786 | 0 | 91,718 | 0 | 225,931 | 178,105 | 186,132 | 689,003 | 0 | 566,372 | 463,072 | 8,905 |
| LED Night Light | Efficient Appliances | Res | 2.14 | 174,689 | 174,689 | 374,310 | 70 | 0 | 773 | 0 | 8,690 | 0 | 16,424 | 15,000 | 25,479 | 16,424 | 0 | 79,200 | 0 | 1,500 |
| Pump and Motor Single Speed | Efficient Appliances | Res | 10.58 | 145,857 | 47,435 | 1,542,467 | 69 | 36 | 1,118 | 575 | 10,477 | 575 | 3,482 | 1,865 | 65,729 | 9,541 | 23,204 | 64,698 | 6,060 | 93 |
| Refrigerators-Freezers Energy Star - Side by Side | Efficient Appliances | Res | 0.67 | 5,798,607 | 2,742,181 | 3,868,005 | 347 | 40 | 5,626 | 645 | 68,541 | 645 | 169,391 | 89,608 | 166,839 | 357,569 | 31,978 | 423,250 | 188,177 | 2,987 |
| Refrigerators-Freezers Energy Star - Top Freezer | Efficient Appliances | Res | 0.51 | 5,798,607 | 2,742,181 | 2,982,575 | 252 | 40 | 4,077 | 645 | 49,677 | 645 | 169,391 | 89,608 | 129,722 | 357,569 | 31,978 | 306,759 | 188,177 | 2,987 |
| Room Air Conditioners | Efficient Appliances | Res | 3.92 | 1,775,093 | 1,523,819 | 6,967,083 | 281 | 195 | 4,544 | 3,157 | 42,590 | 3,157 | 94,379 | 77,352 | 300,231 | 109,850 | 127,369 | 262,996 | 15,470 | 3,094 |
| Smart Strip plug outlet | Efficient Appliances | Res | 1.32 | 882,387 | 333,641 | 1,163,100 | 1,047 | 74 | 5,382 | 378 | 25,220 | 378 | 65,275 | 53,338 | 197,975 | 171,951 | 24,264 | 490,712 | 106,676 | 5,334 |
| Torchiere Floor Lamps | Efficient Appliances | Res | 1.10 | 116,905 | 28,030 | 128,812 | 15 | 1 | 249 | 14 | 2,331 | 14 | 2,287 | 1,368 | 5,284 | 7,759 | 552 | 14,397 | 5,472 | 137 |
| Residential New Construction - 15% | New Homes | Res | 1.99 | 1,742,442 | 1,334,070 | 3,468,081 | 130 | 103 | 2,108 | 1,660 | 35,567 | 1,660 | 86,820 | 58,666 | 168,119 | 111,963 | 101,926 | 219,630 | 25,143 | 104 |
| Residential New Construction - 30% | New Homes | Res | 2.35 | 328,595 | 245,173 | 770,643 | 29 | 23 | 469 | 369 | 7,907 | 369 | 19,779 | 11,984 | 37,357 | 24,915 | 22,641 | 48,828 | 5,136 | 12 |
| Ceiling Fans | Comprehensive Residential | Res | 0.74 | 3,884,121 | 1,666,403 | 2,887,616 | 336 | 27 | 5,358 | 434 | 50,216 | 434 | 105,208 | 97,155 | 121,223 | 243,816 | 17,774 | 314,781 | 138,607 | 1,295 |
| Estar Windows | Comprehensive Residential | Res | 0.88 | 6,931,582 | 1,750,000 | 6,105,968 | 549 | 35 | 8,761 | 556 | 123,164 | 556 | 110,433 | 86,360 | 272,165 | 434,282 | 30,940 | 772,056 | 323,849 | 864 |
| Duct sealing 20 leakage base | Comprehensive Residential | Res | 2.16 | 10,731,409 | 2,026,351 | 23,224,882 | 694 | 534 | 11,069 | 8,526 | 155,608 | 8,526 | 127,705 | 103,632 | 1,084,102 | 671,771 | 474,564 | 975,433 | 544,066 | 864 |
| Low Flow Showerheads | Comprehensive Residential | Res | 1.35 | 2,180,831 | 522,724 | 2,954,290 | 323 | 39 | 5,160 | 622 | 48,356 | 622 | 33,728 | 29,794 | 125,096 | 137,360 | 25,478 | 303,123 | 103,632 | 1,295 |
| Kitchen Aerator | Comprehensive Residential | Res | 8.89 | 187,695 | 187,695 | 1,668,335 | 176 | 36 | 2,804 | 579 | 23,652 | 579 | 12,789 | 10,075 | 70,959 | 12,789 | 21,658 | 148,264 | 0 | 1,439 |
| Bathroom Aerator | Comprehensive Residential | Res | 4.44 | 187,695 | 187,695 | 834,168 | 88 | 18 | 1,402 | 289 | 11,826 | 289 | 12,789 | 10,075 | 35,479 | 12,789 | 10,829 | 74,132 | 0 | 1,439 |
| Pipe Wrap | Comprehensive Residential | Res | 1.57 | 2,411,116 | 569,662 | 3,774,088 | 346 | 39 | 5,512 | 622 | 67,161 | 622 | 36,662 | 24,911 | 165,444 | 151,753 | 31,298 | 421,004 | 115,091 | 996 |
| Roof Insulation | Comprehensive Residential | Res | 1.05 | 28,530,639 | 3,980,345 | 29,986,081 | 2,141 | 242 | 34,160 | 3,855 | 640,287 | 3,855 | 249,830 | 142,733 | 1,424,494 | 1,784,223 | 254,109 | 4,013,663 | 1,534,393 | 2,855 |
| Wall Insulation | Comprehensive Residential | Res | 0.77 | 11,037,468 | 1,221,478 | 8,451,518 | 520 | 59 | 8,298 | 936 | 233,308 | 936 | 77,400 | 64,770 | 419,211 | 690,900 | 72,380 | 1,462,502 | 613,499 | 432 |
| Whole Building | Comprehensive Residential | Res | 0.00 | 9,824,057 | 7,521,131 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 471,129 | 431,799 | 0 | 615,062 | 0 | 0 | 143,933 | 1,439 |
| Commercial New Construction | COMNEW | COMM | 4.17 | 4,455,680 | 2,328,835 | 18,584,768 | 870 | 279 | 14,093 | 4,517 | 396,236 | 4,517 | 147,843 | 130,945 | 924,213 | 278,788 | 343,956 | 2,446,805 | 130,945 | 37 |
| Commercial CFL Program | COMM Equip | COMM | 21.53 | 4,749,196 | 1,722,575 | 102,247,692 | 62,013 | 894 | 313,287 | 4,517 | 2,642,514 | 4,517 | 343,961 | 299,303 | 17,926,879 | 942,568 | 534,052 | 52,306,849 | 598,607 | 74,826 |
| Exterior HID replacement above 175W to 250W HID retrofit | COMM Equip | COMM | 0.36 | 19,687,094 | 2,162,347 | 7,126,237 | 3,167 | 0 | 16,978 | 0 | 190,946 | 0 | 406,315 | 362,852 | 1,145,819 | 3,671,985 | 0 | 3,561,758 | 3,265,671 | 7,257 |
| HPT8 4ft 4 lamp, T12 to HPT8 | COMM Equip | COMM | 0.74 | 113,769,072 | 22,630,187 | 83,638,864 | 27,033 | 6,611 | 135,057 | 33,030 | 1,518,904 | 33,030 | 4,529,837 | 3,733,364 | 14,778,087 | 22,757,614 | 4,997,730 | 30,402,064 | 18,227,777 | 149,335 |
| LED Exit Signs Electronic Fixtures (Retrofit Only) | COMM Equip | COMM | -4.23 | -1,520,001 | 747,322 | 6,422,706 | 1,912 | 219 | 10,330 | 1,182 | 145,222 | 1,182 | 141,927 | 89,168 | 1,034,301 | -400,981 | 194,317 | 2,688,422 | -542,908 | 8,917 |
| Occupancy Sensors under 500 W | COMM Equip | COMM | 2.15 | 1,887,356 | 547,786 | 4,048,759 | 1,513 | 377 | 7,560 | 1,885 | 70,852 | 1,885 | 113,737 | 89,305 | 712,624 | 381,651 | 246,561 | 1,418,158 | 267,914 | 3,572 |
| LED Auto Traffic Signals | COMM Equip | COMM | 1.13 | 2,623,427 | 610,200 | 2,961,969 | 1,370 | 156 | 6,845 | 781 | 64,149 | 781 | 126,220 | 108,000 | 524,177 | 436,264 | 102,204 | 1,284,000 | 310,044 | 2,400 |
| LED Pedestrian Signals | COMM Equip | COMM | 4.59 | 285,269 | 97,500 | 1,309,349 | 606 | 69 | 3,026 | 345 | 28,358 | 345 | 23,680 | 15,000 | 231,714 | 53,517 | 45,178 | 567,600 | 29,837 | 600 |
| Street Lighting - 175 Mercury to 100 HPS | COMM Equip | COMM | 0.70 | 6,754,878 | 6,754,878 | 4,708,897 | 3,505 | 0 | 14,020 | 0 | 131,400 | 0 | 1,846,425 | 500,000 | 1,079,581 | 1,846,425 | 0 | 3,285,000 | 0 | 10,000 |
| AC 65,000 - 135,000 | COMM Equip | COMM | 3.45 | 3,746,964 | 1,670,056 | 12,918,811 | 385 | 286 | 6,238 | 4,636 | 87,692 | 4,636 | 107,729 | 84,347 | 592,576 | 235,600 | 254,192 | 541,510 | 127,871 | 337 |
| AC 240,000 - 760,000 | COMM Equip | COMM | 5.19 | 903,469 | 255,006 | 4,689,551 | 135 | 110 | 2,184 | 1,775 | 30,697 | 1,775 | 20,608 | 13,121 | 215,807 | 60,532 | 97,355 | 189,557 | 39,924 | 37 |
| Clothes Washer CEE Tier1, Electric Water heater, Electric Dryer | COMM Equip | COMM | 1.00 | 685,269 | 143,835 | 688,166 | 76 | 8 | 1,228 | 129 | 11,505 | 129 | 11,086 | 5,612 | 28,563 | 44,421 | 5,214 | 71,047 | 33,335 | 112 |
| Demand-controlled ventilation (DCV) | COMM Equip | COMM | 2.20 | 1,338,736 | 230,631 | 2,951,503 | 511 | 86 | 2,563 | 429 | 36,032 | 429 | 47,844 | 37,413 | 524,877 | 268,581 | 76,001 | 718,328 | 220,736 | 75 |
| Efficient Refrigeration Condenser | COMM Equip | COMM | 4.73 | 35,133 | 16,052 | 166,031 | 6 | 6 | 97 | 96 | 1,370 | 96 | 3,230 | 477 | 8,016 | 4,422 | 5,333 | 8,586 | 1,193 | 48 |
| ENERGY STAR Commercial Solid Door Freezers less than 20ft3 | COMM Equip | COMM | 1.82 | 170,554 | 84,183 | 309,766 | 30 | 3 | 478 | 54 | 5,374 | 54 | 7,488 | 2,699 | 13,405 | 12,886 | 2,569 | 33,685 | 5,398 | 54 |

# Market Achievable BASE CASE - TE

| Measure Name | Program | Rate Class | Total Measure TRC Test | **Total Discounted Lifetime Costs ($000)** | **Total Discounted Lifetime Utility Costs ($000)** | **Total Discounted Lifetime Benefits ($000)** | Program Year 2010 Cummultive | | Program Year 2025 Cumm | | Life Time Savings | | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Participants 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MWh Saved | kW Saved | MWh Saved | kW Saved | MWh Saved | kW Saved | Portfolio Budget | Total Incentives | Benefits | Costs | Avoided Capacity | Lost Revene | Participant Costs | Number |
| ENERGY STAR Commercial Solid Door Freezers 20 to 48 ft3 | COMM Equip | COMM | 0.73 | 52,139 | 14,351 | 37,805 | 4 | 0 | 58 | 7 | 655 | 7 | 3,123 | 337 | 1,636 | 5,485 | 316 | 4,105 | 2,362 | 7 |
| ENERGY STAR Commercial Solid Door Refrigerators less than 20ft3 | COMM Equip | COMM | 2.11 | 361,441 | 117,210 | 762,613 | 74 | 8 | 1,176 | 134 | 13,223 | 134 | 9,552 | 3,816 | 33,005 | 24,817 | 6,341 | 82,886 | 15,264 | 76 |
| ENERGY STAR Commercial Solid Door Refrigerators 20 to 48 ft3 | COMM Equip | COMM | 1.33 | 169,964 | 32,584 | 225,307 | 22 | 2 | 347 | 40 | 3,905 | 40 | 4,263 | 954 | 9,752 | 12,849 | 1,878 | 24,477 | 8,586 | 19 |
| ENERGY STAR Ice Machines less than 500 lbs | COMM Equip | COMM | 1.67 | 74,782 | 14,502 | 125,205 | 12 | 1 | 193 | 22 | 2,166 | 22 | 3,123 | 337 | 5,330 | 6,835 | 1,027 | 13,377 | 3,711 | 7 |
| ENERGY STAR Ice Machines 500 to 1000 lbs | COMM Equip | COMM | 1.15 | 88,898 | 14,918 | 102,129 | 10 | 1 | 157 | 18 | 1,767 | 18 | 3,149 | 506 | 4,347 | 7,704 | 837 | 10,911 | 4,555 | 3 |
| ENERGY STAR Ice Machines more than 1000 lbs | COMM Equip | COMM | 1.83 | 41,683 | 8,803 | 76,395 | 7 | 1 | 118 | 13 | 1,322 | 13 | 2,773 | 225 | 3,252 | 4,797 | 626 | 8,162 | 2,024 | 1 |
| ENERGY STAR Steam Cookers 3 Pan | COMM Equip | COMM | 2.16 | 21,276,803 | 2,249,133 | 45,854,096 | 3,729 | 850 | 60,392 | 13,765 | 679,198 | 13,765 | 140,705 | 124,959 | 1,991,799 | 1,312,197 | 642,546 | 4,194,129 | 1,171,492 | 312 |
| EE Water Heater | COMM Equip | COMM | 0.99 | 686,220 | 193,023 | 680,972 | 52 | 10 | 836 | 169 | 10,963 | 169 | 14,115 | 7,591 | 30,228 | 44,480 | 8,861 | 67,699 | 30,365 | 152 |
| HP Water Heater (Base Usage 22831) | COMM Equip | COMM | 3.07 | 1,147,771 | 88,219 | 3,521,131 | 256 | 52 | 4,139 | 840 | 58,188 | 840 | 7,662 | 3,374 | 158,308 | 72,896 | 46,041 | 359,320 | 65,234 | 17 |
| Plug Load Occupancy Sensors Document Stations | COMM Equip | COMM | 1.34 | 212,214 | 58,309 | 285,372 | 157 | 11 | 1,145 | 78 | 5,364 | 78 | 9,903 | 6,429 | 29,664 | 31,027 | 3,556 | 73,752 | 21,124 | 184 |
| Commercial Smart Strip plug outlet | COMM Equip | COMM | 1.52 | 656,815 | 250,563 | 995,678 | 547 | 38 | 3,981 | 280 | 18,654 | 280 | 36,291 | 27,880 | 103,483 | 92,051 | 12,683 | 256,497 | 55,760 | 2,788 |
| Pre Rinse Sprayers | COMM Equip | COMM | 5.94 | 164,407 | 114,324 | 976,283 | 893 | 74 | 4,464 | 371 | 20,917 | 371 | 24,765 | 20,993 | 172,694 | 34,781 | 24,488 | 418,663 | 10,017 | 600 |
| Refrigerant charging correction | COMM Equip | COMM | 2.71 | 3,426,311 | 726,919 | 9,268,770 | 1,231 | 562 | 19,941 | 9,106 | 56,067 | 9,106 | 46,985 | 31,240 | 344,894 | 213,181 | 91,421 | 346,222 | 166,196 | 1,250 |
| Refrigeration Commissioning | COMM Equip | COMM | 0.62 | 313,144 | 93,308 | 195,635 | 62 | 7 | 997 | 114 | 2,802 | 114 | 8,058 | 3,903 | 7,589 | 21,798 | 1,160 | 17,565 | 13,740 | 156 |
| Strip curtains for walk-ins - freezer | COMM Equip | COMM | 0.58 | 358,271 | 105,229 | 207,717 | 221 | 25 | 1,103 | 126 | 4,133 | 126 | 22,946 | 16,869 | 36,110 | 73,554 | 6,280 | 82,728 | 50,608 | 337 |
| Vending Equipment Controller | COMM Equip | COMM | 1.62 | 933,292 | 219,790 | 1,511,491 | 447 | 117 | 4,501 | 1,181 | 21,091 | 1,181 | 23,923 | 13,095 | 112,880 | 94,633 | 38,713 | 209,512 | 70,710 | 524 |
| Window Film | COMM Equip | COMM | 1.63 | 973,202 | 188,867 | 1,590,906 | 102 | 59 | 1,659 | 951 | 15,544 | 951 | 13,859 | 9,372 | 69,936 | 62,149 | 38,391 | 95,987 | 48,290 | 375 |
| Setback/Setup | COMM Equip | COMM | 1.99 | 1,049,190 | 228,506 | 2,092,358 | 303 | -3 | 4,911 | -43 | 41,420 | -43 | 16,299 | 8,435 | 83,461 | 66,827 | -1,588 | 255,776 | 50,528 | 337 |
| Demand-controlled ventilation (DCV) | IND Equip | IND | 2.12 | 78,152 | 15,807 | 166,025 | 29 | 5 | 144 | 24 | 2,027 | 24 | 5,061 | 2,113 | 29,649 | 17,530 | 4,293 | 40,577 | 12,469 | 4 |
| Exterior HID replacement above 175W to 250W HID retrofit | IND Equip | IND | 0.35 | 12,307,013 | 1,350,775 | 4,332,323 | 2,108 | 0 | 10,617 | 0 | 119,400 | 0 | 269,662 | 241,557 | 762,791 | 2,443,675 | 0 | 2,371,124 | 2,174,013 | 4,831 |
| HPT8 4ft 4 lamp, T12 to HPT8 | IND Equip | IND | 0.87 | 75,737,029 | 15,064,309 | 66,237,345 | 17,996 | 4,401 | 89,910 | 21,989 | 1,263,951 | 21,989 | 3,014,762 | 2,485,365 | 11,812,756 | 15,149,306 | 3,908,224 | 25,298,969 | 12,134,544 | 99,415 |
| Occupancy Sensors under 500 W | IND Equip | IND | 2.25 | 24,255 | 10,095 | 54,476 | 5 | 1 | 80 | 20 | 747 | 20 | 2,852 | 291 | 2,319 | 3,724 | 802 | 4,615 | 872 | 12 |
| Water-Cooled cent Chiller 150 - 300 ton 0.57 kW/ton with 0.46 kW/ton IPLV | IND Equip | IND | 1.37 | 245,524 | 53,894 | 335,197 | 9 | 10 | 151 | 163 | 3,244 | 163 | 5,549 | 2,757 | 16,838 | 17,347 | 11,323 | 20,033 | 11,798 | 1 |
| Water-Cooled Centrifugal Chiller < 150 ton 0.56 kW/ton with 0.53 kW/ton IPLV | IND Equip | IND | 2.94 | 127,322 | 53,894 | 374,478 | 10 | 11 | 168 | 183 | 3,624 | 183 | 5,549 | 2,757 | 18,811 | 10,070 | 12,650 | 22,380 | 4,521 | 1 |
| Window Film | IND Equip | IND | 2.16 | 142,206 | 26,857 | 306,582 | 15 | 9 | 244 | 140 | 3,429 | 140 | 3,884 | 1,378 | 14,289 | 10,986 | 7,673 | 21,175 | 7,102 | 1 |
| Motors 1 HP 1200 | IND MOTOR | IND | 1.16 | 85,772 | 38,527 | 99,509 | 9 | 1 | 140 | 11 | 1,968 | 11 | 4,634 | 1,687 | 4,448 | 7,587 | 593 | 12,337 | 2,953 | 84 |
| Motors 5 HP 1200 | IND MOTOR | IND | 3.32 | 50,473 | 44,399 | 167,728 | 15 | 1 | 236 | 18 | 3,317 | 18 | 5,001 | 2,278 | 7,497 | 5,381 | 999 | 20,795 | 380 | 42 |
| Motors 10 HP 1200 | IND MOTOR | IND | 2.36 | 50,372 | 29,786 | 119,103 | 11 | 1 | 168 | 13 | 2,356 | 13 | 4,088 | 1,476 | 5,323 | 5,375 | 710 | 14,766 | 1,287 | 21 |
| Motors 20 HP 1200 | IND MOTOR | IND | 2.73 | 20,008 | 14,356 | 54,675 | 5 | 0 | 77 | 6 | 1,081 | 6 | 3,124 | 596 | 2,444 | 3,477 | 326 | 6,779 | 353 | 5 |
| Motors 1 HP 3600 | IND MOTOR | IND | 0.79 | 85,772 | 38,527 | 67,783 | 6 | 0 | 95 | 7 | 1,341 | 7 | 4,634 | 1,687 | 3,030 | 7,587 | 404 | 8,404 | 2,953 | 84 |
| Motors 5 HP 3600 | IND MOTOR | IND | 1.76 | 50,473 | 44,399 | 88,802 | 8 | 1 | 125 | 10 | 1,756 | 10 | 5,001 | 2,278 | 3,969 | 5,381 | 529 | 11,010 | 380 | 42 |
| Motors 10 HP 3600 | IND MOTOR | IND | 1.65 | 50,372 | 29,786 | 82,916 | 7 | 1 | 117 | 9 | 1,640 | 9 | 4,088 | 1,476 | 3,706 | 5,375 | 494 | 10,280 | 1,287 | 21 |
| Motors 20 HP 3600 | IND MOTOR | IND | 1.60 | 20,008 | 14,356 | 32,005 | 3 | 0 | 45 | 3 | 633 | 3 | 3,124 | 596 | 1,430 | 3,477 | 191 | 3,968 | 353 | 5 |
| Water Pumps with VFD's | IND MOTOR | IND | 6.89 | 108,615 | 32,615 | 748,680 | 73 | 1 | 1,157 | 20 | 16,272 | 20 | 4,265 | 1,500 | 33,008 | 9,015 | 1,138 | 102,000 | 4,750 | 50 |
| HVAC Fans with VFD's | IND MOTOR | IND | 8.38 | 108,615 | 32,615 | 909,977 | 88 | 2 | 1,407 | 25 | 19,777 | 25 | 4,265 | 1,500 | 40,119 | 9,015 | 1,383 | 123,975 | 4,750 | 50 |
| Air Compressors with VFD's | IND MOTOR | IND | 3.92 | 108,615 | 32,615 | 426,087 | 41 | 1 | 659 | 12 | 9,261 | 12 | 4,265 | 1,500 | 18,785 | 9,015 | 648 | 58,050 | 4,750 | 50 |
| Water Pumps with VFD's | IND MOTOR | IND | 7.18 | 260,735 | 70,735 | 1,871,701 | 181 | 3 | 2,894 | 51 | 40,679 | 51 | 6,648 | 3,750 | 82,519 | 18,523 | 2,846 | 255,000 | 11,875 | 25 |
| HVAC Fans with VFD's | IND MOTOR | IND | 8.73 | 260,735 | 70,735 | 2,274,943 | 220 | 4 | 3,517 | 62 | 49,443 | 62 | 6,648 | 3,750 | 100,297 | 18,523 | 3,459 | 309,938 | 11,875 | 25 |
| Air Compressors with VFD's | IND MOTOR | IND | 4.09 | 260,735 | 70,735 | 1,065,218 | 103 | 2 | 1,647 | 29 | 23,151 | 29 | 6,648 | 3,750 | 46,963 | 18,523 | 1,619 | 145,125 | 11,875 | 25 |
| Water Pumps with VFD's | IND MOTOR | IND | 1.48 | 506,495 | 30,495 | 748,680 | 73 | 1 | 1,157 | 20 | 16,272 | 20 | 4,133 | 1,500 | 33,008 | 33,883 | 1,138 | 102,000 | 29,750 | 5 |
| HVAC Fans with VFD's | IND MOTOR | IND | 1.80 | 506,495 | 30,495 | 909,977 | 88 | 2 | 1,407 | 25 | 19,777 | 25 | 4,133 | 1,500 | 40,119 | 33,883 | 1,383 | 123,975 | 29,750 | 5 |
| Air Compressors with VFD's | IND MOTOR | IND | 0.84 | 506,495 | 30,495 | 426,087 | 41 | 1 | 659 | 12 | 9,261 | 12 | 4,133 | 1,500 | 18,785 | 33,883 | 648 | 58,050 | 29,750 | 5 |

# Market Achievable HIGH CASE - TE

| Measure Name | Program | Rate Class | Total Measure TRC Test | **Total Discounted Lifetime Costs ($000)** | **Total Discounted Lifetime Utility Costs ($000)** | **Total Discounted Lifetime Benefits ($000)** | Program Year 2010 Cummultive | | Program Year 2025 Cumm | | Life Time Savings | | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Participants 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MWh Saved | kW Saved | MWh Saved | kW Saved | MWh Saved | kW Saved | Portfolio Budget | Total Incentives | Benefits | Costs | Avoided Capacity | Lost Revene | Participant Costs | Number |
| DLC-CAC | Therm DLC | Res | 1.23 | 6,844,097 | 6,844,097 | 8,407,309 | 88 | 1,755 | 438 | 8,768 | 5,341 | 8,768 | 1,450,480 | 525,384 | 1,476,739 | 1,450,480 | 1,408,612 | 106,904 | 0 | 2,284 |
| DLC-Pool Pumps | Therm DLC | Res | 1.61 | 184,561 | 184,561 | 298,042 | 2 | 64 | 8 | 318 | 101 | 318 | 43,047 | 13,584 | 52,336 | 43,047 | 51,052 | 2,015 | 0 | 41 |
| DLC-Water Heat | Therm DLC | Res | 1.19 | 184,561 | 184,561 | 218,906 | 2 | 46 | 8 | 231 | 101 | 231 | 43,047 | 13,584 | 38,444 | 43,047 | 37,160 | 2,015 | 0 | 41 |
| Residential Online Audit | On-Line Audit | Res | 5.97 | 759,475 | 759,475 | 4,532,269 | 2,627 | 313 | 18,360 | 2,189 | 86,036 | 2,189 | 112,771 | 20,519 | 539,160 | 112,771 | 103,330 | 1,231,162 | 0 | 8,208 |
| Residential Online Audit Future | On-Line Audit | Res | 2.73 | 3,280,270 | 3,280,270 | 8,944,583 | 0 | 0 | 23,932 | 2,854 | 112,147 | 2,854 | 5,294 | 33 | 66 | 5,294 | 13 | 150 | 0 | 1 |
| Schools Childern Education | Comprehensive Residential | Res | 2.03 | 720,900 | 720,900 | 1,460,818 | 480 | 57 | 5,268 | 628 | 24,688 | 628 | 66,400 | 49,500 | 98,534 | 66,400 | 18,884 | 225,000 | 0 | 1,500 |
| Refrigerator/Freezer recycling | Efficient Appliances | Res | 4.13 | 11,218,875 | 11,218,875 | 46,312,171 | 9,748 | 1,385 | 99,792 | 14,181 | 748,199 | 14,181 | 1,097,575 | 327,829 | 3,206,548 | 1,097,575 | 744,550 | 7,308,393 | 0 | 5,464 |
| Room Air Conditioners recycling | Efficient Appliances | Res | 0.53 | 1,920,083 | 1,639,728 | 1,008,823 | 121 | 84 | 1,243 | 863 | 5,824 | 863 | 164,138 | 54,638 | 68,093 | 191,457 | 27,816 | 56,888 | 27,319 | 1,093 |
| ASHP - SEER 15 | Comprehensive Residential | Res | 3.21 | 563,138 | 344,467 | 1,806,430 | 135 | 14 | 2,189 | 231 | 36,928 | 231 | 22,577 | 17,951 | 82,880 | 36,040 | 14,153 | 228,038 | 13,463 | 45 |
| CAC - SEER 15 | Comprehensive Residential | Res | 1.65 | 44,432,110 | 19,200,861 | 73,319,497 | 2,298 | 1,095 | 37,221 | 17,736 | 627,902 | 17,736 | 1,183,524 | 1,035,622 | 3,425,862 | 2,736,956 | 1,088,721 | 3,877,368 | 1,553,433 | 3,452 |
| CAC - Maintenance | Comprehensive Residential | Res | 3.33 | 22,140,923 | 9,896,322 | 73,629,630 | 3,587 | 3,110 | 58,087 | 50,366 | 381,073 | 50,366 | 610,664 | 502,582 | 3,081,884 | 1,364,537 | 1,472,907 | 2,353,170 | 753,873 | 10,052 |
| EE Ground Source Heat Pump | Comprehensive Residential | Res | 1.13 | 2,005,485 | 794,385 | 2,261,325 | 186 | 8 | 3,018 | 127 | 50,916 | 127 | 50,277 | 41,425 | 102,556 | 124,842 | 7,797 | 314,415 | 74,565 | 69 |
| Solar Water Heating | Comprehensive Residential | Res | 0.62 | 117,406 | 20,686 | 73,154 | 5 | 1 | 83 | 19 | 1,170 | 19 | 1,835 | 1,145 | 3,301 | 7,790 | 1,044 | 7,225 | 5,955 | 2 |
| HP Water Heater | Comprehensive Residential | Res | 2.23 | 328,483 | 308,557 | 731,545 | 51 | 12 | 832 | 190 | 11,700 | 190 | 19,558 | 18,323 | 33,010 | 20,785 | 10,436 | 72,248 | 1,227 | 23 |
| EE Water Heater | Comprehensive Residential | Res | 1.00 | 7,810,365 | 2,867,793 | 7,799,258 | 591 | 120 | 9,570 | 1,941 | 125,563 | 1,941 | 177,125 | 130,416 | 346,205 | 481,428 | 101,490 | 775,365 | 304,303 | 1,739 |
| Programable Thermostat_Heat | Comprehensive Residential | Res | 3.87 | 1,831,246 | 1,831,246 | 7,087,476 | 696 | 0 | 11,277 | 0 | 158,535 | 0 | 113,307 | 98,261 | 305,876 | 113,307 | 0 | 978,976 | 0 | 1,400 |
| Programable Thermostat_CAC | Comprehensive Residential | Res | 1.56 | 9,286,462 | 6,796,865 | 14,473,531 | 287 | 486 | 4,653 | 7,874 | 65,408 | 7,874 | 419,029 | 276,172 | 684,148 | 572,308 | 431,754 | 403,901 | 153,279 | 6,904 |
| LED Lighting Inside | Efficient Appliances | Res | 0.72 | 1,846,969 | 1,321,730 | 1,322,266 | 0 | 0 | 2,853 | 98 | 24,060 | 98 | 634 | 4 | 3 | 636 | 0 | 9 | 2 | 1 |
| CFL bulbs regular - Inside - 15 | Efficient Appliances | Res | 4.28 | 1,953,001 | 540,888 | 8,367,340 | 4,950 | 170 | 24,729 | 847 | 208,581 | 847 | 108,656 | 70,606 | 1,489,458 | 391,078 | 101,236 | 4,174,912 | 282,423 | 70,606 |
| CFL bulbs regular - Outside - 15 | Efficient Appliances | Res | 6.81 | 1,200,567 | 504,159 | 8,179,521 | 5,187 | 0 | 26,017 | 0 | 219,446 | 0 | 100,908 | 59,454 | 1,454,706 | 239,634 | 0 | 4,374,854 | 138,726 | 39,636 |
| LED Lighting Outside | Efficient Appliances | Res | 1.68 | 1,413,624 | 1,011,678 | 2,376,725 | 0 | 0 | 5,613 | 0 | 47,347 | 0 | 634 | 4 | 8 | 636 | 0 | 24 | 2 | 1 |
| Clothes Washer Energy Star, Electric Water heater, Electric Dryer | Efficient Appliances | Res | 1.10 | 5,009,391 | 4,339,386 | 5,522,999 | 511 | 32 | 8,268 | 524 | 108,486 | 524 | 267,728 | 206,254 | 238,823 | 308,978 | 27,390 | 669,912 | 41,251 | 2,063 |
| Dehumidifiers | Efficient Appliances | Res | 3.21 | 5,148,981 | 4,177,683 | 16,506,377 | 906 | 42 | 14,673 | 675 | 165,018 | 675 | 257,772 | 139,535 | 687,142 | 317,573 | 31,514 | 1,019,004 | 59,801 | 3,987 |
| Freezers Energy Star-Chest Freezer | Efficient Appliances | Res | 0.10 | 34,243,556 | 9,141,169 | 3,508,547 | 264 | 65 | 4,280 | 1,051 | 52,149 | 1,051 | 563,363 | 403,876 | 154,724 | 2,108,862 | 52,117 | 322,024 | 1,545,499 | 5,385 |
| Holiday Lights | Efficient Appliances | Res | 0.41 | 25,912,036 | 11,833,649 | 10,681,630 | 1,400 | 0 | 22,680 | 0 | 212,554 | 0 | 729,133 | 619,125 | 431,354 | 1,595,908 | 0 | 1,312,546 | 866,775 | 20,638 |
| LED Night Light | Efficient Appliances | Res | 2.05 | 364,934 | 364,934 | 748,620 | 141 | 0 | 1,545 | 0 | 17,380 | 0 | 33,719 | 30,000 | 50,957 | 33,719 | 0 | 158,400 | 0 | 3,000 |
| Pump and Motor Single Speed | Efficient Appliances | Res | 10.29 | 280,290 | 124,556 | 2,884,414 | 129 | 66 | 2,091 | 1,075 | 19,593 | 1,075 | 8,230 | 5,230 | 122,913 | 17,818 | 43,391 | 120,986 | 9,588 | 174 |
| Refrigerators-Freezers Energy Star - Side by Side | Efficient Appliances | Res | 0.65 | 11,114,605 | 6,306,313 | 7,233,169 | 650 | 74 | 10,520 | 1,206 | 128,172 | 1,206 | 388,827 | 223,423 | 311,990 | 684,863 | 59,798 | 791,477 | 296,036 | 5,586 |
| Refrigerators-Freezers Energy Star - Top Freezer | Efficient Appliances | Res | 0.50 | 11,114,605 | 6,306,313 | 5,577,414 | 471 | 74 | 7,625 | 1,206 | 92,895 | 1,206 | 388,827 | 223,423 | 242,579 | 684,863 | 59,798 | 573,640 | 296,036 | 5,586 |
| Room Air Conditioners | Efficient Appliances | Res | 3.62 | 3,955,220 | 3,955,220 | 14,312,811 | 576 | 400 | 9,336 | 6,485 | 87,494 | 6,485 | 244,075 | 190,689 | 616,778 | 244,075 | 261,659 | 540,286 | 0 | 6,356 |
| Smart Strip plug outlet | Efficient Appliances | Res | 1.74 | 7,635,004 | 4,177,620 | 13,290,703 | 2,786 | 196 | 45,118 | 3,169 | 211,423 | 3,169 | 257,768 | 212,864 | 526,723 | 470,632 | 64,554 | 1,305,563 | 212,864 | 14,191 |
| Torchiere Floor Lamps | Efficient Appliances | Res | 1.10 | 116,905 | 28,030 | 128,812 | 15 | 1 | 249 | 14 | 2,331 | 14 | 2,287 | 1,368 | 5,284 | 7,759 | 552 | 14,397 | 5,472 | 137 |
| Residential New Construction - 15% | New Homes | Res | 1.90 | 3,408,480 | 2,961,039 | 6,485,312 | 243 | 192 | 3,943 | 3,105 | 66,510 | 3,105 | 186,989 | 129,174 | 314,383 | 214,537 | 190,602 | 410,709 | 27,548 | 195 |
| Residential New Construction - 30% | New Homes | Res | 2.31 | 624,047 | 520,750 | 1,441,103 | 54 | 43 | 877 | 690 | 14,786 | 690 | 36,746 | 25,655 | 69,857 | 43,106 | 42,339 | 91,308 | 6,360 | 22 |
| Ceiling Fans | Comprehensive Residential | Res | 0.74 | 8,088,837 | 4,352,523 | 5,994,078 | 686 | 56 | 11,102 | 899 | 104,049 | 899 | 269,035 | 251,189 | 247,436 | 499,072 | 36,279 | 642,516 | 230,037 | 2,644 |
| Estar Windows | Comprehensive Residential | Res | 0.88 | 14,230,861 | 5,064,649 | 12,463,210 | 1,121 | 71 | 17,883 | 1,135 | 251,396 | 1,135 | 317,599 | 264,410 | 555,530 | 890,487 | 63,153 | 1,575,883 | 572,888 | 1,763 |
| Duct sealing 20 leakage base | Comprehensive Residential | Res | 2.16 | 21,986,887 | 5,628,723 | 47,405,521 | 1,416 | 1,091 | 22,593 | 17,402 | 317,619 | 17,402 | 352,853 | 299,665 | 2,212,818 | 1,375,238 | 968,658 | 1,991,007 | 1,022,385 | 1,763 |
| Low Flow Showerheads | Comprehensive Residential | Res | 1.35 | 4,470,396 | 1,509,004 | 6,030,155 | 660 | 80 | 10,532 | 1,270 | 98,702 | 1,270 | 95,371 | 87,255 | 255,340 | 280,458 | 52,004 | 618,719 | 185,087 | 2,644 |
| Kitchen Aerator | Comprehensive Residential | Res | 8.42 | 404,452 | 404,452 | 3,405,326 | 359 | 74 | 5,724 | 1,181 | 48,278 | 1,181 | 26,336 | 20,565 | 144,837 | 26,336 | 44,208 | 302,630 | 0 | 2,938 |
| Bathroom Aerator | Comprehensive Residential | Res | 4.21 | 404,452 | 404,452 | 1,702,663 | 179 | 37 | 2,862 | 590 | 24,139 | 590 | 26,336 | 20,565 | 72,419 | 26,336 | 22,104 | 151,315 | 0 | 2,938 |
| Pipe Wrap | Comprehensive Residential | Res | 1.56 | 4,951,834 | 2,006,713 | 7,703,488 | 705 | 80 | 11,252 | 1,270 | 137,086 | 1,270 | 126,478 | 101,696 | 337,697 | 310,548 | 63,884 | 859,332 | 184,070 | 2,034 |
| Roof Insulation | Comprehensive Residential | Res | 1.05 | 13,277,644 | 2,965,586 | 13,887,111 | 992 | 112 | 15,820 | 1,785 | 296,529 | 1,785 | 186,407 | 132,205 | 659,710 | 830,911 | 117,682 | 1,858,802 | 644,504 | 1,322 |
| Wall Insulation | Comprehensive Residential | Res | 0.76 | 22,569,294 | 3,238,457 | 17,250,836 | 1,062 | 120 | 16,938 | 1,911 | 476,217 | 1,911 | 203,462 | 176,273 | 855,673 | 1,411,639 | 147,739 | 2,985,189 | 1,208,177 | 881 |
| Whole Building | Comprehensive Residential | Res | 0.00 | 20,191,249 | 15,490,628 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 969,222 | 881,367 | 0 | 1,263,011 | 0 | 0 | 293,789 | 2,938 |
| Commercial New Construction | COMNEW | COMM | 4.14 | 4,598,838 | 2,719,708 | 19,046,874 | 1,305 | 418 | 14,528 | 4,656 | 408,470 | 4,656 | 247,885 | 224,478 | 1,386,319 | 416,243 | 515,934 | 3,670,207 | 168,358 | 56 |
| Commercial CFL Program | COMM Equip | COMM | 21.53 | 4,758,572 | 1,725,964 | 102,448,734 | 62,137 | 896 | 313,907 | 4,526 | 2,647,740 | 4,526 | 344,639 | 299,902 | 17,962,732 | 944,443 | 535,120 | 52,411,463 | 599,804 | 74,975 |
| Exterior HID replacement above 175W to 250W HID retrofit | COMM Equip | COMM | 0.46 | 105,155,670 | 15,854,513 | 48,830,484 | 5,580 | 0 | 90,362 | 0 | 1,016,252 | 0 | 980,589 | 895,036 | 2,018,824 | 6,478,665 | 0 | 6,275,479 | 5,498,076 | 12,786 |
| HPT8 4ft 4 lamp, T12 to HPT8 | COMM Equip | COMM | 0.73 | 201,761,265 | 54,338,893 | 147,363,713 | 47,629 | 11,648 | 237,957 | 58,196 | 2,676,164 | 58,196 | 10,871,579 | 9,208,965 | 26,037,581 | 40,356,053 | 8,805,524 | 53,565,541 | 29,484,474 | 263,113 |
| LED Exit Signs Electronic Fixtures (Retrofit Only) | COMM Equip | COMM | 28.17 | 1,375,423 | 6,330,962 | 38,743,213 | 3,174 | 363 | 51,396 | 5,881 | 722,518 | 5,881 | 394,691 | 295,963 | 1,716,499 | -654,287 | 322,484 | 4,461,636 | -1,048,978 | 14,798 |
| Occupancy Sensors under 500 W | COMM Equip | COMM | 2.13 | 3,631,231 | 1,414,853 | 7,729,449 | 2,889 | 720 | 14,433 | 3,599 | 135,263 | 3,599 | 287,151 | 238,687 | 1,360,464 | 730,426 | 470,708 | 2,707,392 | 443,276 | 6,820 |
| LED Auto Traffic Signals | COMM Equip | COMM | 1.13 | 2,623,427 | 610,200 | 2,961,969 | 1,370 | 156 | 6,845 | 781 | 64,149 | 781 | 126,220 | 108,000 | 524,177 | 436,264 | 102,204 | 1,284,000 | 310,044 | 2,400 |
| LED Pedestrian Signals | COMM Equip | COMM | 4.59 | 285,269 | 97,500 | 1,309,349 | 606 | 69 | 3,026 | 345 | 28,358 | 345 | 23,680 | 15,000 | 231,714 | 53,517 | 45,178 | 567,600 | 29,837 | 600 |
| Street Lighting - 175 Mercury to 100 HPS | COMM Equip | COMM | 0.70 | 6,754,878 | 6,754,878 | 4,708,897 | 3,505 | 0 | 14,020 | 0 | 131,400 | 0 | 1,846,425 | 500,000 | 1,079,581 | 1,846,425 | 0 | 3,285,000 | 0 | 10,000 |
| AC 65,000 - 135,000 | COMM Equip | COMM | 3.42 | 5,029,277 | 2,625,397 | 17,225,082 | 514 | 382 | 8,317 | 6,181 | 116,923 | 6,181 | 166,547 | 134,956 | 790,102 | 314,549 | 338,923 | 722,014 | 148,002 | 450 |
| AC 240,000 - 760,000 | COMM Equip | COMM | 5.19 | 1,205,476 | 381,451 | 6,252,734 | 180 | 146 | 2,911 | 2,367 | 40,929 | 2,367 | 28,393 | 19,993 | 287,742 | 79,126 | 129,806 | 252,742 | 50,733 | 50 |
| Clothes Washer CEE Tier1, Electric Water heater, Electric Dryer | COMM Equip | COMM | 1.00 | 1,434,299 | 401,260 | 1,433,680 | 158 | 17 | 2,558 | 269 | 23,970 | 269 | 26,935 | 17,537 | 59,506 | 90,537 | 10,863 | 148,015 | 63,602 | 234 |
| Demand-controlled ventilation (DCV) | COMM Equip | COMM | 2.20 | 1,338,736 | 230,631 | 2,951,503 | 511 | 86 | 2,563 | 429 | 36,032 | 429 | 47,844 | 37,413 | 524,877 | 268,581 | 76,001 | 718,328 | 220,736 | 75 |
| Efficient Refrigeration Condenser | COMM Equip | COMM | 4.94 | 70,044 | 38,243 | 345,899 | 13 | 13 | 203 | 200 | 2,854 | 200 | 4,617 | 1,491 | 16,700 | 6,604 | 11,111 | 17,888 | 1,988 | 99 |
| ENERGY STAR Commercial Solid Door Freezers less than 20ft3 | COMM Equip | COMM | 1.81 | 355,980 | 221,024 | 645,346 | 62 | 7 | 995 | 113 | 11,195 | 113 | 16,041 | 8,435 | 27,928 | 24,475 | 5,352 | 70,177 | 8,435 | 112 |

# Market Achievable HIGH CASE - TE

| Measure Name | Program | Rate Class | Total Measure TRC Test | **Total Discounted Lifetime Costs ($000)** | **Total Discounted Lifetime Utility Costs ($000)** | **Total Discounted Lifetime Benefits ($000)** | Program Year 2010 Cummultive | | Program Year 2025 Cumm | | Life Time Savings | | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Program Year 2010 | Participants 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MWh Saved | kW Saved | MWh Saved | kW Saved | MWh Saved | kW Saved | Portfolio Budget | Total Incentives | Benefits | Costs | Avoided Capacity | Lost Revene | Participant Costs | Number |
| ENERGY STAR Commercial Solid Door Freezers 20 to 48 ft3 | COMM Equip | COMM | 0.75 | 104,557 | 31,456 | 78,761 | 8 | 1 | 121 | 14 | 1,364 | 14 | 4,193 | 1,054 | 3,409 | 8,761 | 658 | 8,553 | 4,569 | 14 |
| ENERGY STAR Commercial Solid Door Refrigerators less than 20ft3 | COMM Equip | COMM | 2.10 | 755,896 | 310,682 | 1,588,777 | 154 | 17 | 2,449 | 279 | 27,547 | 279 | 21,644 | 11,925 | 68,761 | 49,470 | 13,210 | 172,679 | 27,826 | 159 |
| ENERGY STAR Commercial Solid Door Refrigerators 20 to 48 ft3 | COMM Equip | COMM | 1.34 | 351,260 | 80,952 | 469,389 | 45 | 5 | 723 | 83 | 8,135 | 83 | 7,286 | 2,981 | 20,316 | 24,180 | 3,912 | 50,993 | 16,894 | 40 |
| ENERGY STAR Ice Machines less than 500 lbs | COMM Equip | COMM | 1.72 | 151,741 | 31,866 | 260,844 | 25 | 3 | 401 | 46 | 4,513 | 46 | 4,193 | 1,054 | 11,104 | 11,573 | 2,139 | 27,868 | 7,380 | 14 |
| ENERGY STAR Ice Machines 500 to 1000 lbs | COMM Equip | COMM | 1.18 | 180,807 | 32,391 | 212,768 | 20 | 2 | 327 | 37 | 3,681 | 37 | 4,225 | 1,406 | 9,057 | 13,363 | 1,745 | 22,732 | 9,138 | 7 |
| ENERGY STAR Ice Machines more than 1000 lbs | COMM Equip | COMM | 1.94 | 82,213 | 17,519 | 159,156 | 15 | 2 | 245 | 28 | 2,754 | 28 | 3,309 | 703 | 6,775 | 7,292 | 1,305 | 17,004 | 3,983 | 2 |
| ENERGY STAR Steam Cookers 3 Pan | COMM Equip | COMM | 2.16 | 21,276,803 | 2,249,133 | 45,854,096 | 3,729 | 850 | 60,392 | 13,765 | 679,198 | 13,765 | 140,705 | 124,959 | 1,991,799 | 1,312,197 | 642,546 | 4,194,129 | 1,171,492 | 312 |
| EE Water Heater | COMM Equip | COMM | 0.98 | 1,015,265 | 382,328 | 998,758 | 76 | 15 | 1,225 | 249 | 16,079 | 249 | 25,770 | 16,701 | 44,334 | 64,738 | 12,997 | 99,292 | 38,969 | 223 |
| HP Water Heater (Base Usage 22831) | COMM Equip | COMM | 3.07 | 1,683,364 | 209,728 | 5,164,326 | 375 | 76 | 6,071 | 1,231 | 85,343 | 1,231 | 15,143 | 9,897 | 232,185 | 105,872 | 67,526 | 527,003 | 90,729 | 25 |
| Plug Load Occupancy Sensors Document Stations | COMM Equip | COMM | 1.34 | 212,214 | 58,309 | 285,372 | 157 | 11 | 1,145 | 78 | 5,364 | 78 | 9,903 | 6,429 | 29,664 | 31,027 | 3,556 | 73,752 | 21,124 | 184 |
| Commercial Smart Strip plug outlet | COMM Equip | COMM | 1.52 | 656,815 | 250,563 | 995,678 | 547 | 38 | 3,981 | 280 | 18,654 | 280 | 36,291 | 27,880 | 103,483 | 92,051 | 12,683 | 256,497 | 55,760 | 2,788 |
| Pre Rinse Sprayers | COMM Equip | COMM | 5.94 | 164,407 | 114,324 | 976,283 | 893 | 74 | 4,464 | 371 | 20,917 | 371 | 24,765 | 20,993 | 172,694 | 34,781 | 24,488 | 418,663 | 10,017 | 600 |
| Refrigerant charging correction | COMM Equip | COMM | 2.71 | 3,426,311 | 726,919 | 9,268,770 | 1,231 | 562 | 19,941 | 9,106 | 56,067 | 9,106 | 46,985 | 31,240 | 344,894 | 213,181 | 91,421 | 346,222 | 166,196 | 1,250 |
| Refrigeration Commissioning | COMM Equip | COMM | 0.62 | 658,052 | 278,128 | 407,572 | 130 | 15 | 2,076 | 237 | 5,838 | 237 | 19,610 | 13,011 | 15,811 | 43,355 | 2,416 | 36,594 | 23,745 | 325 |
| Strip curtains for walk-ins - freezer | COMM Equip | COMM | 0.58 | 358,271 | 105,229 | 207,717 | 221 | 25 | 1,103 | 126 | 4,133 | 126 | 22,946 | 16,869 | 36,110 | 73,554 | 6,280 | 82,728 | 50,608 | 337 |
| Vending Equipment Controller | COMM Equip | COMM | 1.62 | 933,292 | 219,790 | 1,511,491 | 447 | 117 | 4,501 | 1,181 | 21,091 | 1,181 | 23,923 | 13,095 | 112,880 | 94,633 | 38,713 | 209,512 | 70,710 | 524 |
| Window Film | COMM Equip | COMM | 1.63 | 973,202 | 188,867 | 1,590,906 | 102 | 59 | 1,659 | 951 | 15,544 | 951 | 13,859 | 9,372 | 69,936 | 62,149 | 38,391 | 95,987 | 48,290 | 375 |
| Setback/Setup | COMM Equip | COMM | 1.98 | 1,412,075 | 390,895 | 2,789,811 | 404 | -4 | 6,548 | -57 | 55,227 | -57 | 26,297 | 15,745 | 111,282 | 89,169 | -2,117 | 341,035 | 62,872 | 450 |
| Demand-controlled ventilation (DCV) | IND Equip | IND | 2.12 | 78,152 | 15,807 | 166,025 | 29 | 5 | 144 | 24 | 2,027 | 24 | 5,061 | 2,113 | 29,649 | 17,530 | 4,293 | 40,577 | 12,469 | 4 |
| Exterior HID replacement above 175W to 250W HID retrofit | IND Equip | IND | 0.35 | 21,686,826 | 3,271,946 | 7,614,323 | 3,715 | 0 | 18,674 | 0 | 210,019 | 0 | 651,966 | 595,841 | 1,343,966 | 4,312,130 | 0 | 4,177,694 | 3,660,164 | 8,512 |
| HPT8 4ft 4 lamp, T12 to HPT8 | IND Equip | IND | 0.87 | 134,314,942 | 36,173,339 | 116,703,894 | 31,707 | 7,755 | 158,412 | 38,742 | 2,226,961 | 38,742 | 7,236,568 | 6,130,566 | 20,812,952 | 26,864,888 | 6,885,919 | 44,574,375 | 19,628,321 | 175,159 |
| Occupancy Sensors under 500 W | IND Equip | IND | 2.44 | 42,688 | 19,261 | 104,000 | 9 | 2 | 152 | 38 | 1,427 | 38 | 3,416 | 777 | 4,427 | 4,859 | 1,532 | 8,810 | 1,442 | 22 |
| Water-Cooled cent Chiller 150 - 300 ton 0.57 kW/ton with 0.46 kW/ton IPLV | IND Equip | IND | 1.37 | 508,074 | 127,501 | 698,328 | 19 | 21 | 314 | 340 | 6,759 | 340 | 10,081 | 6,891 | 35,079 | 33,512 | 23,591 | 41,735 | 23,431 | 2 |
| Water-Cooled Centrifugal Chiller < 150 ton 0.56 kW/ton with 0.53 kW/ton IPLV | IND Equip | IND | 2.98 | 261,821 | 127,501 | 780,163 | 22 | 23 | 350 | 380 | 7,551 | 380 | 10,081 | 6,891 | 39,189 | 18,350 | 26,355 | 46,626 | 8,270 | 2 |
| Window Film | IND Equip | IND | 2.19 | 291,709 | 60,726 | 638,712 | 31 | 18 | 508 | 292 | 7,144 | 292 | 5,969 | 3,446 | 29,768 | 20,191 | 15,985 | 44,114 | 14,221 | 2 |
| Motors 1 HP 1200 | IND MOTOR | IND | 1.17 | 176,764 | 92,398 | 207,311 | 18 | 1 | 292 | 22 | 4,100 | 22 | 8,001 | 4,394 | 9,266 | 13,274 | 1,235 | 25,702 | 5,273 | 176 |
| Motors 5 HP 1200 | IND MOTOR | IND | 3.43 | 101,819 | 103,225 | 349,433 | 31 | 2 | 492 | 37 | 6,911 | 37 | 8,678 | 5,624 | 15,618 | 8,590 | 2,082 | 43,323 | -88 | 88 |
| Motors 10 HP 1200 | IND MOTOR | IND | 2.46 | 100,905 | 68,564 | 248,131 | 22 | 2 | 349 | 27 | 4,908 | 27 | 6,512 | 3,735 | 11,090 | 8,533 | 1,479 | 30,763 | 2,021 | 44 |
| Motors 20 HP 1200 | IND MOTOR | IND | 3.07 | 37,120 | 28,859 | 113,907 | 10 | 1 | 160 | 12 | 2,253 | 12 | 4,030 | 1,461 | 5,091 | 4,547 | 679 | 14,122 | 516 | 11 |
| Motors 1 HP 3600 | IND MOTOR | IND | 0.80 | 176,764 | 92,398 | 141,214 | 12 | 1 | 199 | 15 | 2,793 | 15 | 8,001 | 4,394 | 6,312 | 13,274 | 841 | 17,508 | 5,273 | 176 |
| Motors 5 HP 3600 | IND MOTOR | IND | 1.82 | 101,819 | 103,225 | 185,005 | 16 | 1 | 260 | 20 | 3,659 | 20 | 8,678 | 5,624 | 8,269 | 8,590 | 1,102 | 22,937 | -88 | 88 |
| Motors 10 HP 3600 | IND MOTOR | IND | 1.71 | 100,905 | 68,564 | 172,742 | 15 | 1 | 243 | 18 | 3,417 | 18 | 6,512 | 3,735 | 7,721 | 8,533 | 1,029 | 21,417 | 2,021 | 44 |
| Motors 20 HP 3600 | IND MOTOR | IND | 1.80 | 37,120 | 28,859 | 66,677 | 6 | 0 | 94 | 7 | 1,319 | 7 | 4,030 | 1,461 | 2,980 | 4,547 | 397 | 8,267 | 516 | 11 |
| Water Pumps with VFD's | IND MOTOR | IND | 6.37 | 41,299 | 20,208 | 263,182 | 26 | 0 | 407 | 7 | 5,720 | 7 | 3,490 | 879 | 11,603 | 4,808 | 400 | 35,856 | 1,318 | 18 |
| HVAC Fans with VFD's | IND MOTOR | IND | 7.75 | 41,299 | 20,208 | 319,882 | 31 | 1 | 495 | 9 | 6,952 | 9 | 3,490 | 879 | 14,103 | 4,808 | 486 | 43,581 | 1,318 | 18 |
| Air Compressors with VFD's | IND MOTOR | IND | 3.63 | 41,299 | 20,208 | 149,781 | 15 | 0 | 232 | 4 | 3,255 | 4 | 3,490 | 879 | 6,604 | 4,808 | 228 | 20,406 | 1,318 | 18 |
| Water Pumps with VFD's | IND MOTOR | IND | 6.92 | 95,055 | 35,295 | 657,955 | 64 | 1 | 1,017 | 18 | 14,300 | 18 | 4,433 | 1,758 | 29,008 | 8,168 | 1,000 | 89,640 | 3,735 | 9 |
| HVAC Fans with VFD's | IND MOTOR | IND | 8.41 | 95,055 | 35,295 | 799,705 | 78 | 1 | 1,236 | 22 | 17,381 | 22 | 4,433 | 1,758 | 35,257 | 8,168 | 1,216 | 108,952 | 3,735 | 9 |
| Air Compressors with VFD's | IND MOTOR | IND | 3.94 | 95,055 | 35,295 | 374,454 | 36 | 1 | 579 | 10 | 8,138 | 10 | 4,433 | 1,758 | 16,509 | 8,168 | 569 | 51,015 | 3,735 | 9 |
| Water Pumps with VFD's | IND MOTOR | IND | 1.47 | 446,210 | 41,953 | 657,955 | 64 | 1 | 1,017 | 18 | 14,300 | 18 | 4,849 | 2,197 | 29,008 | 30,115 | 1,000 | 89,640 | 25,266 | 4 |
| HVAC Fans with VFD's | IND MOTOR | IND | 1.79 | 446,210 | 41,953 | 799,705 | 78 | 1 | 1,236 | 22 | 17,381 | 22 | 4,849 | 2,197 | 35,257 | 30,115 | 1,216 | 108,952 | 25,266 | 4 |
| Air Compressors with VFD's | IND MOTOR | IND | 0.84 | 446,210 | 41,953 | 374,454 | 36 | 1 | 579 | 10 | 8,138 | 10 | 4,849 | 2,197 | 16,509 | 30,115 | 569 | 51,015 | 25,266 | 4 |

# 10.0 APPENDICES



## *Appendix D: 2009 Survey Results*

# Appendix D1- 2009 Residential Survey Results

## First Energy Ohio Residential Survey

**1. On a scale of 1 to 5, where 1 = "Not At All Concerned" and 5 = "Very Concerned," please rate the two items listed below: (check one box in each row)**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Rating Average | Response Count |
|---|---|---|---|---|---|
| The cost of electricity | | | | | |
| Not At All Concerned 1 | 6 | 3 | 6 | | |
| 2 | 14 | 7 | 18 | | |
| 3 | 90 | 47 | 69 | | |
| 4 | 67 | 71 | 76 | | |
| Very Concerned 5 | 282 | 268 | 225 | | |
| | 4.32 | 4.50 | 4.26 | 4.36 | 1249 |
| The environment | | | | | |
| Not At All Concerned 1 | 10 | 7 | 16 | | |
| 2 | 32 | 27 | 30 | | |
| 3 | 102 | 74 | 79 | | |
| 4 | 96 | 89 | 81 | | |
| Very Concerned 5 | 192 | 187 | 172 | | |
| | 3.99 | 4.10 | 3.96 | 4.02 | 1194 |
| | | | | ***answered question*** | **1255** |
| | | | | ***skipped question*** | **13** |

**2. Has the cost of electricity caused you to use electricity any differently over the past year? (check one only)**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Yes | 360 | 322 | 288 | 77.4% | 970 |
| | 25 | 17 | 41 | 6.6% | 83 |
| No, I haven't thought about it | 32 | 22 | 38 | 7.3% | 92 |
| Not yet but I'm considering it | 41 | 38 | 30 | 8.7% | 109 |
| | | | | ***answered question*** | **1254** |
| | | | | ***skipped question*** | **14** |

**3. For each item listed below, please indicate if you have made the change, plan to make the change in the next 2 years, would consider the change in the next 2 years, or would not make the change. (Check one box in each row)**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Count |
|---|---|---|---|---|
| A. Purchase a programmable thermostat | | | | |
| Made Change | 174 | 147 | 186 | |
| Plan Change | 59 | 57 | 48 | |
| Consider Change | 119 | 86 | 73 | |
| Wouldn't Change | 92 | 91 | 74 | |
| | 444 | 381 | 381 | 1206 |
| | | | | |
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |
| B. Purchase energy efficient appliance to replace an old one | | | | |
| Made Change | 190 | 183 | 172 | |
| Plan Change | 74 | 63 | 64 | |
| Consider Change | 125 | 85 | 87 | |
| Wouldn't Change | 56 | 45 | 58 | |
| | 445 | 376 | 381 | 1202 |
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |

## First Energy Ohio Residential Survey

| | | | | |
|---|---|---|---|---|
| C. Adjust time of day I use appliances | | | | |
| Made Change | 150 | 110 | 99 | |
| Plan Change | 29 | 23 | 21 | |
| Consider Change | 59 | 56 | 70 | |
| Wouldn't Change | 194 | 173 | 186 | |
| | 432 | 362 | 376 | 1170 |
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |
| D. Replace electric water heater | | | | |
| Made Change | 111 | 114 | 82 | |
| Plan Change | 42 | 25 | 24 | |
| Consider Change | 79 | 58 | 58 | |
| Wouldn't Change | 147 | 126 | 143 | |
| | 379 | 323 | 307 | 1009 |
| | | | | |
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |
| E. Purchase compact fluorescent light bulbs | | | | |
| Made Change | 289 | 244 | 226 | |
| Plan Change | 52 | 48 | 53 | |
| Consider Change | 43 | 42 | 54 | |
| Wouldn't Change | 69 | 48 | 55 | |
| | 453 | 382 | 388 | 1223 |
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |
| F. Purchase a new refrigerator | | | | |
| Made Change | 142 | 124 | 119 | |
| Plan Change | 76 | 54 | 64 | |
| Consider Change | 89 | 89 | 68 | |
| Wouldn't Change | 130 | 106 | 129 | |
| | 437 | 373 | 380 | 1190 |
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |
| G. Replace my Central AC system | | | | |
| Made Change | 83 | 94 | 71 | |
| Plan Change | 29 | 23 | 34 | |
| Consider Change | 84 | 61 | 66 | |
| Wouldn't Change | 212 | 166 | 177 | |
| | 408 | 344 | 348 | 1100 |
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |
| H. Replace my heating system | | | | |
| Made Change | 98 | 99 | 96 | |
| Plan Change | 30 | 30 | 32 | |
| Consider Change | 79 | 60 | 53 | |
| Wouldn't Change | 221 | 179 | 190 | |
| | 428 | 368 | 371 | 1167 |
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |
| I. Unplug/remove old refrigerator or freezer | | | | |
| Made Change | 137 | 128 | 119 | |
| Plan Change | 32 | 30 | 31 | |
| Consider Change | 69 | 50 | 35 | |
| Wouldn't Change | 156 | 120 | 141 | |
| | 394 | 328 | 326 | 1048 |
| | | | ***answered question*** | **1256** |
| | | | ***skipped question*** | **12** |

## First Energy Ohio Residential Survey

**4. Which of the following best describes your household electricity use during the past 12 months? (check one only)**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| | 29 | 17 | 33 | 6.3% | 79 |
| Have taken some steps to reduce usage | 319 | 260 | 260 | 67.0% | 839 |
| Have taken a lot of steps to reduce household electric use | 110 | 120 | 104 | 26.7% | 334 |
| | | | | ***answered question*** | **1252** |
| | | | | ***skipped question*** | **16** |

**5. Do you think that over the next 12 months your household will: (please check one)**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Do a lot more to reduce electric use | 130 | 110 | 95 | 27.0% | 335 |
| Do a little more to reduce electric use | 272 | 237 | 244 | 60.7% | 753 |
| Do a little less to reduce electric use | 16 | 18 | 22 | 4.5% | 56 |
| Do a lot less to reduce electric use | 5 | 7 | 3 | 1.2% | 15 |
| Not do anything to reduce electric use | 31 | 15 | 31 | 6.2% | 77 |
| Increase electric usage | 1 | 2 | 2 | 0.4% | 5 |
| | | | | ***answered question*** | **1241** |
| | | | | ***skipped question*** | **27** |

**6. Which of the following would be your sources for information about energy efficient appliances? (Please choose only ONE primary and any secondary information source.)**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Count |
|---|---|---|---|---|
| Electric company Web site | | | | |
| Primary | 66 | 39 | 58 | |
| Secondary | 130 | 81 | 87 | |
| | 196 | 120 | 145 | 461 |
| Internet search engines(e.g., Google, Yahoo, MSN) | | | | |
| Primary | 137 | 112 | 134 | |
| Secondary | 119 | 87 | 81 | |
| | 256 | 199 | 215 | 670 |
| Hardware store/Large retail store (e.g., Sears/Home Depot/Lowes) | | | | |
| Primary | 171 | 129 | 156 | |
| Secondary | 119 | 112 | 101 | |
| | 290 | 241 | 257 | 788 |
| Appliance Manufacturer | | | | |
| Primary | 102 | 97 | 95 | |
| Secondary | 139 | 116 | 114 | |
| | 241 | 213 | 209 | 663 |
| Friends/Family | | | | |
| Primary | 61 | 44 | 73 | |
| Secondary | 109 | 101 | 97 | |
| | 170 | 145 | 170 | 485 |
| Other (please specify) | | | | 84 |
| | | | ***answered question*** | **1218** |
| | | | ***skipped question*** | **50** |

## First Energy Ohio Residential Survey

**7. Do you have any compact fluorescent light (CFL) bulbs installed in your home?**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Yes | 329 | 286 | 259 | 70.3% | 874 |
| No | 128 | 112 | 129 | 29.7% | 369 |
| | | | | ***answered question*** | **1243** |
| | | | | ***skipped question*** | **25** |

**8. How many compact fluorescent light bulbs do you have in your home?**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Count |
|---|---|---|---|---|
| | 322 | 266 | 254 | 842 |
| | | | ***answered question*** | **842** |
| | | | ***skipped question*** | **426** |

**9. How many lights in your home are on more than 4 hours per day?**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Count |
|---|---|---|---|---|
| | 416 | 350 | 364 | 1130 |
| | | | ***answered question*** | **1130** |
| | | | ***skipped question*** | **138** |

**10. Do you have any outdoor security lights?**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Yes | 272 | 229 | 200 | 57.1% | 701 |
| No | 178 | 162 | 186 | 42.9% | 526 |
| | | | | ***answered question*** | **1227** |
| | | | | ***skipped question*** | **41** |

**11. How many of your outdoor security lights are:**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Owned by you _____ (number) | 273 | 219 | 192 | 97.7% | 684 |
| Owned by your electric company _____ (number) | 112 | 101 | 92 | 43.6% | 305 |
| | | | | ***answered question*** | **700** |
| | | | | ***skipped question*** | **568** |

**12. How many hours per day are they on? ____ (hours)**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Count |
|---|---|---|---|---|
| | 234 | 194 | 160 | 588 |
| | | | ***answered question*** | **588** |
| | | | ***skipped question*** | **680** |

## First Energy Ohio Residential Survey

**13. How are the outdoor security lights operated? (check all that apply)**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Switch | 82 | 69 | 64 | 30.0% | 215 |
| Timer | 54 | 34 | 32 | 16.7% | 120 |
| Photocell | 109 | 81 | 56 | 34.3% | 246 |
| Motion sensitive | 114 | 100 | 97 | 43.4% | 311 |
| don't know | 6 | 6 | 4 | 2.2% | 16 |
| Other (please specify) | 4 | 8 | 6 | 2.5% | 18 |
| | | | | ***answered question*** | **717** |
| | | | | ***skipped question*** | **551** |

**14. How old is your primary refrigerator?**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Under 1 year | 42 | 36 | 36 | 9.1% | 114 |
| 1 to 4 yrs | 130 | 123 | 122 | 29.9% | 375 |
| 5 to 10 yrs | 157 | 133 | 138 | 34.1% | 428 |
| 11 to 20 yrs | 100 | 74 | 73 | 19.7% | 247 |
| Over 20 yrs | 19 | 19 | 13 | 4.1% | 51 |
| Don't know | 12 | 14 | 13 | 3.1% | 39 |
| Don not have a refrigerator at this residence | 1 | 0 | 1 | 0.2% | 2 |
| | | | | ***answered question*** | **1256** |
| | | | | ***skipped question*** | **12** |

**15. Do you have an additional refrigerator?**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Yes | 156 | 127 | 134 | 33.7% | 417 |
| No | 302 | 266 | 254 | 66.3% | 822 |
| | | | | ***answered question*** | **1239** |
| | | | | ***skipped question*** | **29** |

**16.How often do you operate your second refrigerator?**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| All year | 132 | 96 | 107 | 76.7% | 335 |
| Part-time | 22 | 21 | 18 | 14.0% | 61 |
| None, it is unplugged and not in use | 9 | 13 | 19 | 9.4% | 41 |
| | | | | ***answered question*** | **437** |
| | | | | ***skipped question*** | **831** |

**17. What type of stand-alone food freezers do you have in use in this residence? (Only include freezers that are not part of the refrigerator.)**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Count |
|---|---|---|---|---|
| Automatic (frost free) | | | | |
| Freezer 1 | 89 | 83 | 82 | |
| Freezer 2 | 2 | 5 | 5 | |
| Freezer 3 | 0 | 0 | 0 | |
| | 91 | 88 | 87 | 266 |
| Manual defrost | | | | |
| Freezer 1 | 111 | 100 | 63 | |
| Freezer 2 | 10 | 10 | 8 | |
| Freezer 3 | 1 | 0 | 2 | |
| | 122 | 110 | 73 | 305 |

## First Energy Ohio Residential Survey

| | | | | |
|---|---|---|---|---|
| Don't know | | | | |
| Freezer 1 | 10 | 15 | 12 | |
| Freezer 2 | 1 | 1 | 1 | |
| Freezer 3 | 0 | 1 | 0 | |
| | 11 | 17 | 13 | 41 |
| None,do not have | | | | |
| Freezer 1 | 218 | 172 | 210 | |
| Freezer 2 | 57 | 38 | 47 | |
| Freezer 3 | 55 | 39 | 48 | |
| | 330 | 249 | 305 | 884 |
| Other (please specify) | | | | 1 |
| | | | ***answered question*** | **1169** |
| | | | ***skipped question*** | **99** |

**18. What types of fuel are used to operate the water heater(s) in this residence? (If you use more than one, select the fuel that provides most of your water heating as the "Main Water Heater")**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Count |
|---|---|---|---|---|
| **Natural gas** | | | | |
| Main Water Heater | 343 | 272 | 321 | |
| 2nd Water Heater | 14 | 4 | 12 | |
| 3rd Water Heater | 3 | 2 | 3 | |
| | 360 | 278 | 336 | 974 |
| **Electricity** | | | | |
| Main Water Heater | 101 | 90 | 62 | |
| 2nd Water Heater | 7 | 3 | 6 | |
| 3rd Water Heater | 0 | 0 | 0 | |
| | 108 | 93 | 68 | 269 |
| **Propane (bottled gas)** | | | | |
| Main Water Heater | 8 | 30 | 5 | |
| 2nd Water Heater | 0 | 1 | 0 | |
| 3rd Water Heater | 1 | 0 | 1 | |
| | 9 | 31 | 6 | 46 |
| **Oil** | | | | |
| Main Water Heater | 4 | 3 | 2 | |
| 2nd Water Heater | 3 | 1 | 1 | |
| 3rd Water Heater | 2 | 1 | 2 | |
| | 9 | 5 | 5 | 19 |
| **None** | | | | |
| Main Water Heater | 1 | 3 | 1 | |
| 2nd Water Heater | 19 | 16 | 16 | |
| 3rd Water Heater | 19 | 15 | 13 | |
| | 39 | 34 | 30 | 103 |
| | | | ***answered question*** | **1239** |
| | | | ***skipped question*** | **29** |

**19. How old is your MAIN water heater?**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Under 1 year | 38 | 24 | 30 | 7.4% | 92 |
| 1 to 4 yrs | 120 | 112 | 113 | 27.7% | 345 |
| 5 to 10 yrs | 159 | 142 | 158 | 36.9% | 459 |
| 11 to 20 yrs | 83 | 62 | 50 | 15.7% | 195 |
| Over 20 yrs | 19 | 15 | 9 | 3.5% | 43 |
| Don't know | 37 | 40 | 33 | 8.8% | 110 |
| | | | | ***answered question*** | **1244** |
| | | | | ***skipped question*** | **24** |

## First Energy Ohio Residential Survey

**20. Is your MAIN water heater wrapped with insulation?**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Yes | 143 | 136 | 105 | 31.4% | 384 |
| No | 302 | 257 | 266 | 67.5% | 825 |
| Other (please specify) | 5 | 1 | 7 | 1.1% | 13 |
| | | | | ***answered question*** | **1222** |
| | | | | ***skipped question*** | **46** |

**21. Is natural gas available at this residence? (choose one only)**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Yes – natural gas is available here | 371 | 300 | 336 | 80.9% | 1007 |
| No - natural gas is not available here | 75 | 76 | 37 | 15.1% | 188 |
| Don't know | 14 | 19 | 17 | 4.0% | 50 |
| | | | | ***answered question*** | **1245** |
| | | | | ***skipped question*** | **23** |

**22. What types of fuel or energy are used to heat this residence? (If you use more than one heating fuel, describe the one that provides most of your heat as the "Main Heating Source.")**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Count |
|---|---|---|---|---|
| **Natural gas** | | | | |
| Main Heating Source | 354 | 292 | 335 | |
| 2nd Heating Source | 19 | 5 | 12 | |
| 3rd Heating Source | 9 | 2 | 6 | |
| | 382 | 299 | 353 | 1034 |
| **Electricity** | | | | |
| Main Heating Source | 64 | 48 | 39 | |
| 2nd Heating Source | 38 | 34 | 47 | |
| 3rd Heating Source | 4 | 1 | 4 | |
| | 106 | 83 | 90 | 279 |
| **Propane (bottled gas)** | | | | |
| Main Heating Source | 14 | 39 | 6 | |
| 2nd Heating Source | 3 | 7 | 1 | |
| 3rd Heating Source | 3 | 0 | 1 | |
| | 20 | 46 | 8 | 74 |
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |
| **Oil** | | | | |
| Main Heating Source | 17 | 3 | 3 | |
| 2nd Heating Source | 7 | 2 | 1 | |
| 3rd Heating Source | 4 | 2 | 1 | |
| | 28 | 7 | 5 | 40 |
| **None** | | | | |
| Main Heating Source | 1 | 0 | 1 | |
| 2nd Heating Source | 13 | 16 | 19 | |
| 3rd Heating Source | 14 | 15 | 18 | |
| | 28 | 31 | 38 | 97 |
| Other (please specify) | | | | 88 |
| | | | ***answered question*** | **1212** |
| | | | ***skipped question*** | **56** |

## First Energy Ohio Residential Survey

| 23. For each fuel mentioned, what type of heating system is used? | | | | |
|---|---|---|---|---|
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |
| **Furnace** | | | | |
| Main Heating System | 360 | 320 | 329 | |
| 2nd Heating System | 8 | 8 | 4 | |
| 3rd Heating System | 9 | 2 | 2 | |
| | 377 | 330 | 335 | 1042 |
| **Boiler or hot water system** | | | | |
| Main Heating System | 67 | 49 | 69 | |
| 2nd Heating System | 7 | 6 | 1 | |
| 3rd Heating System | 0 | 2 | 1 | |
| | 74 | 57 | 71 | 202 |
| **Heat pump** | | | | |
| Main Heating System | 16 | 9 | 13 | |
| 2nd Heating System | 5 | 5 | 6 | |
| 3rd Heating System | 0 | 0 | 1 | |
| | 21 | 14 | 20 | 55 |
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |
| **Geothermal system** | | | | |
| Main Heating System | 6 | 3 | 3 | |
| 2nd Heating System | 1 | 1 | 0 | |
| 3rd Heating System | 0 | 0 | 0 | |
| | 7 | 4 | 3 | 14 |
| **Baseboard** | | | | |
| Main Heating System | 24 | 17 | 16 | |
| 2nd Heating System | 8 | 5 | 11 | |
| 3rd Heating System | 1 | 0 | 2 | |
| | 33 | 22 | 29 | 84 |
| **Ceiling cable** | | | | |
| Main Heating System | 0 | 5 | 2 | |
| 2nd Heating System | 1 | 1 | 1 | |
| 3rd Heating System | 1 | 0 | 0 | |
| | 2 | 6 | 3 | 11 |
| **Individual room or space heaters** | | | | |
| Main Heating System | 5 | 8 | 7 | |
| 2nd Heating System | 26 | 26 | 32 | |
| 3rd Heating System | 4 | 4 | 3 | |
| | 35 | 38 | 42 | 115 |
| **Free standing stove** | | | | |
| Main Heating System | 16 | 8 | 10 | |
| 2nd Heating System | 12 | 6 | 7 | |
| 3rd Heating System | 1 | 2 | 4 | |
| | 29 | 16 | 21 | 66 |
| **Fireplace** | | | | |
| Main Heating System | 13 | 11 | 16 | |
| 2nd Heating System | 27 | 18 | 26 | |
| 3rd Heating System | 7 | 5 | 7 | |
| | 47 | 34 | 49 | 130 |
| **Don't know** | | | | |
| Main Heating System | 4 | 7 | 8 | |
| 2nd Heating System | 1 | 1 | 2 | |
| 3rd Heating System | 2 | 0 | 3 | |
| | 7 | 8 | 13 | 28 |
| | | | ***answered question*** | **1211** |
| | | | ***skipped question*** | **57** |

## First Energy Ohio Residential Survey

**24. How old is your MAIN heating system?**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Under 1 year | 25 | 15 | 19 | 4.8% | 59 |
| 1 to 4 yrs | 73 | 83 | 69 | 18.5% | 225 |
| 5 to 10 yrs | 126 | 98 | 129 | 29.0% | 353 |
| 11 to 20 yrs | 112 | 92 | 88 | 24.0% | 292 |
| Over 20 yrs | 69 | 60 | 47 | 14.5% | 176 |
| Don't know | 43 | 40 | 29 | 9.2% | 112 |
| | | | | ***answered question*** | **1217** |
| | | | | ***skipped question*** | **51** |

**25. The next time you need to select a main heating fuel, assuming all fuels are available, what would you choose? (choose one only)**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Electricity | 72 | 46 | 55 | 14.8% | 173 |
| Natural gas | 315 | 268 | 285 | 74.1% | 868 |
| Oil | 8 | 2 | 1 | 0.9% | 11 |
| Propane (bottled gas) | 5 | 23 | 2 | 2.6% | 30 |
| Geothermal | 20 | 28 | 14 | 5.3% | 62 |
| Wood | 14 | 6 | 8 | 2.4% | 28 |
| Other (please specify) | | | | | 28 |
| | | | | ***answered question*** | **1172** |
| | | | | ***skipped question*** | **96** |

**26. Do you have central air conditioning?**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Yes | 316 | 278 | 288 | 72.1% | 882 |
| No → SKIP TO QUESTION 31 | 134 | 110 | 98 | 27.9% | 342 |
| | | | | ***answered question*** | **1224** |
| | | | | ***skipped question*** | **44** |

**27. What types of WHOLE HOUSE (central) air conditioning or cooling systems are used to cool this residence? (If you use more than one central cooling system, select the system that provides most of your cooling as the "Main Cooling System.")**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Count |
|---|---|---|---|---|
| Electric whole house central air conditioning | | | | |
| Main Cooling System | 276 | 260 | 268 | |
| 2nd Cooling System | 4 | 2 | 3 | |
| 3rd Cooling System | 2 | 0 | 2 | |
| | 282 | 262 | 273 | 817 |
| Heat pump | | | | |
| Main Cooling System | 21 | 10 | 18 | |
| 2nd Cooling System | 2 | 1 | 2 | |
| 3rd Cooling System | 0 | 0 | 0 | |
| | 23 | 11 | 20 | 54 |
| Geothermal system | | | | |
| Main Cooling System | 5 | 4 | 6 | |
| 2nd Cooling System | 1 | 0 | 0 | |
| 3rd Cooling System | 1 | 0 | 0 | |
| | 7 | 4 | 6 | 17 |
| | | | ***answered question*** | **861** |
| | | | ***skipped question*** | **407** |

## First Energy Ohio Residential Survey

**28. How old is your MAIN central air conditioning unit?**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Under 1 year | 12 | 12 | 12 | 4.1% | 36 |
| 1 to 4 yrs | 65 | 71 | 58 | 22.1% | 194 |
| 5 to 10 yrs | 95 | 89 | 113 | 33.8% | 297 |
| 11 to 20 yrs | 94 | 71 | 68 | 26.5% | 233 |
| Over 20 yrs | 29 | 21 | 21 | 8.1% | 71 |
| Don't know | 16 | 17 | 15 | 5.5% | 48 |
| | | | | ***answered question*** | **879** |
| | | | | ***skipped question*** | **389** |

**29. How often is your MAIN central air conditioner serviced?**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Every year | 112 | 97 | 101 | 36.0% | 310 |
| Every 2 yrs | 77 | 79 | 81 | 27.5% | 237 |
| Every 5 yrs | 43 | 37 | 33 | 13.1% | 113 |
| Over 5 yrs | 22 | 20 | 30 | 8.4% | 72 |
| Don’t know | 54 | 38 | 38 | 15.1% | 130 |
| | | | | ***answered question*** | **862** |
| | | | | ***skipped question*** | **406** |

**30. Choose the statement that BEST DESCRIBES your air conditioning USAGE pattern at this residence during summer months. (choose one only)**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Do not use | 6 | 8 | 11 | 2.9% | 25 |
| Use only on hot or humid days | 189 | 181 | 210 | 66.7% | 580 |
| Turn on and leave on day, evening, night, etc. at a con | 85 | 61 | 36 | 20.9% | 182 |
| Turn on and leave on day, evening, night, etc. using a | 27 | 30 | 25 | 9.4% | 82 |
| Other (please specify) | | | | | 31 |
| | | | | ***answered question*** | **869** |
| | | | | ***skipped question*** | **399** |

**31. How many window or wall air conditioners do you use in this residence?**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Average | Response Total | Response Count |
|---|---|---|---|---|---|---|
| Number of units | 121 | 99 | 117 | 1.67 | 564 | 337 |
| | | | | | ***answered question*** | **337** |
| | | | | | ***skipped question*** | **931** |

**How many window or wall air conditioners do you use in this residence?**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| None, I do not use any | 338 | 285 | 284 | 98.1% | 907 |
| Don’t know | 8 | 10 | 0 | 1.9% | 18 |
| | | | | ***answered question*** | **925** |
| | | | | ***skipped question*** | **343** |

## First Energy Ohio Residential Survey

**32. What is the main type of fuel used for oven cooking? (choose one only)**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Natural gas | 178 | 129 | 176 | 39.0% | 483 |
| Electricity | 271 | 241 | 210 | 58.4% | 722 |
| Propane | 6 | 20 | 3 | 2.3% | 29 |
| Don't know | 0 | 1 | 0 | 0.1% | 1 |
| None, do not have | 1 | 0 | 1 | 0.2% | 2 |
| | | | | ***answered question*** | **1237** |
| | | | | ***skipped question*** | **31** |

**33. What is the main type of fuel used for cooking on top of the range? (choose one only)**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Natural gas | 188 | 136 | 192 | 41.7% | 516 |
| Electricity | 262 | 233 | 194 | 55.7% | 689 |
| Propane | 7 | 20 | 3 | 2.4% | 30 |
| Don't know | 0 | 1 | 0 | 0.1% | 1 |
| None, do not have | 0 | 0 | 2 | 0.2% | 2 |
| | | | | ***answered question*** | **1238** |
| | | | | ***skipped question*** | **30** |

**34. What is the main type of fuel used for clothes drying? Do not include machines in common areas or coin-operated machines. (choose only one)**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Natural gas | 136 | 107 | 122 | 29.6% | 365 |
| Electricity | 291 | 257 | 247 | 64.5% | 795 |
| Propane | 5 | 9 | 0 | 1.1% | 14 |
| Don't know | 3 | 2 | 1 | 0.5% | 6 |
| None, do not have | 18 | 16 | 18 | 4.2% | 52 |
| | | | | ***answered question*** | **1232** |
| | | | | ***skipped question*** | **36** |

**35. Which of the following are used in your residence? (Choose the number that you have)**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Count |
|---|---|---|---|---|
| Clothes washer (in residence) | | | | |
| 1 | 430 | 369 | 365 | |
| 2 | 6 | 4 | 4 | |
| 3 | 1 | 3 | 0 | |
| | 437 | 376 | 369 | 1182 |
| Dishwasher | | | | |
| 1 | 308 | 245 | 270 | |
| 2 | 2 | 1 | 0 | |
| 3 | 0 | 1 | 0 | |
| | 310 | 247 | 270 | 827 |
| Dehumidifier | | | | |
| 1 | 180 | 140 | 136 | |
| 2 | 13 | 6 | 1 | |
| 3 | 1 | 1 | 0 | |
| | 194 | 147 | 137 | 478 |

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| | | | | |
|---|---|---|---|---|
| Well pump | | | | |
| 1 | 120 | 84 | 50 | |
| 2 | 1 | 1 | 0 | |
| 3 | 0 | 1 | 0 | |
| | 121 | 86 | 50 | 257 |
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |
| Heated water bed | | | | |
| 1 | 14 | 7 | 8 | |
| 2 | 0 | 0 | 0 | |
| 3 | 0 | 0 | 0 | |
| | 14 | 7 | 8 | 29 |
| Hot tub/whirlpool tub | | | | |
| 1 | 46 | 17 | 25 | |
| 2 | 1 | 1 | 0 | |
| 3 | 0 | 0 | 0 | |
| | 47 | 18 | 25 | 90 |
| Heated swimming pool | | | | |
| 1 | 8 | 5 | 10 | |
| 2 | 0 | 0 | 0 | |
| 3 | 0 | 0 | 0 | |
| | 8 | 5 | 10 | 23 |
| High efficiency air cleaner, whole house | | | | |
| 1 | 42 | 28 | 30 | |
| 2 | 0 | 0 | 1 | |
| 3 | 0 | 0 | 0 | |
| | 42 | 28 | 31 | 101 |
| Home security system | | | | |
| 1 | 59 | 50 | 79 | |
| 2 | 0 | 0 | 3 | |
| 3 | 0 | 1 | 0 | |
| | 59 | 51 | 82 | 192 |
| Stereo system / home theater | | | | |
| 1 | 181 | 134 | 125 | |
| 2 | 13 | 7 | 10 | |
| 3 | 3 | 1 | 5 | |
| | 197 | 142 | 140 | 479 |
| TiVo / DVR / Hard drive video recorder | | | | |
| 1 | 175 | 116 | 145 | |
| 2 | 16 | 14 | 11 | |
| 3 | 3 | 0 | 7 | |
| | 194 | 130 | 163 | 487 |
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |
| Large screen (40” or larger) TV – Plasma | | | | |
| 1 | 74 | 44 | 63 | |
| 2 | 3 | 5 | 3 | |
| 3 | 2 | 0 | 0 | |
| | 79 | 49 | 66 | 194 |
| Large screen (40” or larger) TV – Rear Projector | | | | |
| 1 | 52 | 43 | 38 | |
| 2 | 5 | 2 | 2 | |
| 3 | 1 | 0 | 0 | |
| | 58 | 45 | 40 | 143 |
| Large screen (40” or larger) TV – LCD | | | | |
| 1 | 62 | 55 | 55 | |
| 2 | 3 | 5 | 8 | |
| 3 | 1 | 0 | 1 | |
| | 66 | 60 | 64 | 190 |
| Other televisions | | | | |
| 1 | 185 | 171 | 182 | |
| 2 | 100 | 86 | 59 | |
| 3 | 106 | 76 | 86 | |
| | 391 | 333 | 327 | 1051 |

## First Energy Ohio Residential Survey

| | | | | |
|---|---|---|---|---|
| Satellite dish / Cable TV service | | | | |
| 1 | 264 | 216 | 187 | |
| 2 | 29 | 26 | 25 | |
| 3 | 24 | 20 | 17 | |
| | 317 | 262 | 229 | 808 |
| Personal computer | | | | |
| 1 | 287 | 256 | 227 | |
| 2 | 36 | 26 | 44 | |
| 3 | 16 | 18 | 23 | |
| | 339 | 300 | 294 | 933 |
| | | | ***answered question*** | **1232** |
| | | | ***skipped question*** | **36** |

**36. We are in the process of developing energy efficiency programs for our customers. On a scale of 1 to 5 where 1 = "Not At All Likely" and 5 = "Very Likely," please rate how likely you are to participate in programs that promote the following energy saving measures: (check one box in each row)**

| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |
|---|---|---|---|---|
| Compact fluorescent bulbs | | | | |
| 1-Not at all Likely | 58 | 46 | 39 | |
| 2 | 25 | 16 | 24 | |
| 3 | 62 | 61 | 60 | |
| 4 | 48 | 45 | 61 | |
| 5-Very Likely | 257 | 220 | 206 | |
| | 450 | 388 | 390 | 1228 |
| Outdoor security lighting | | | | |
| 1-Not at all Likely | 124 | 105 | 120 | |
| 2 | 34 | 28 | 40 | |
| 3 | 74 | 58 | 63 | |
| 4 | 51 | 45 | 45 | |
| 5-Very Likely | 139 | 132 | 99 | |
| | 422 | 368 | 367 | 1157 |
| 2nd refrigerator removal | | | | |
| 1-Not at all Likely | 242 | 213 | 203 | |
| 2 | 25 | 22 | 24 | |
| 3 | 39 | 30 | 25 | |
| 4 | 15 | 11 | 12 | |
| 5-Very Likely | 49 | 45 | 43 | |
| | 370 | 321 | 307 | 998 |
| Energy efficient electric water heaters | | | | |
| 1-Not at all Likely | 149 | 120 | 128 | |
| 2 | 29 | 29 | 29 | |
| 3 | 63 | 62 | 62 | |
| 4 | 69 | 43 | 44 | |
| 5-Very Likely | 118 | 94 | 94 | |
| | 428 | 348 | 357 | 1133 |
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |
| Programmable thermostat | | | | |
| 1-Not at all Likely | 112 | 95 | 90 | |
| 2 | 25 | 19 | 13 | |
| 3 | 65 | 53 | 57 | |
| 4 | 48 | 52 | 56 | |
| 5-Very Likely | 170 | 144 | 146 | |
| | 420 | 363 | 362 | 1145 |

## First Energy Ohio Residential Survey

| | | | | |
|---|---|---|---|---|
| Central air conditioner maintenance service | | | | |
| 1-Not at all Likely | 143 | 119 | 122 | |
| 2 | 23 | 23 | 21 | |
| 3 | 75 | 52 | 57 | |
| 4 | 52 | 40 | 45 | |
| 5-Very Likely | 119 | 116 | 112 | |
| | 412 | 350 | 357 | 1119 |
| Home energy audits | | | | |
| 1-Not at all Likely | 146 | 122 | 120 | |
| 2 | 48 | 36 | 37 | |
| 3 | 82 | 79 | 85 | |
| 4 | 56 | 39 | 40 | |
| 5-Very Likely | 90 | 81 | 76 | |
| | 422 | 357 | 358 | 1137 |
| Air sealing measures | | | | |
| 1-Not at all Likely | 95 | 76 | 80 | |
| 2 | 29 | 23 | 27 | |
| 3 | 77 | 78 | 91 | |
| 4 | 74 | 51 | 47 | |
| 5-Very Likely | 152 | 135 | 105 | |
| | 427 | 363 | 350 | 1140 |
| Timers and controls for appliances, lights, computers | | | | |
| 1-Not at all Likely | 122 | 119 | 94 | |
| 2 | 43 | 31 | 39 | |
| 3 | 81 | 72 | 85 | |
| 4 | 74 | 36 | 45 | |
| 5-Very Likely | 108 | 109 | 96 | |
| | 428 | 367 | 359 | 1154 |
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |
| Special credits or rates for allowing the utility to cycle selected appliances for short periods during times of peak usage | | | | |
| 1-Not at all Likely | 111 | 113 | 95 | |
| 2 | 35 | 26 | 31 | |
| 3 | 91 | 81 | 87 | |
| 4 | 72 | 56 | 59 | |
| 5-Very Likely | 115 | 90 | 95 | |
| | 424 | 366 | 367 | 1157 |
| | | | ***answered question*** | **1248** |
| | | | ***skipped question*** | **20** |

**37. On a scale of 1 to 5 where 1 = "Not Interested" and 5 = "Very Interested," please rate each of the following program types in terms of your interest levels. (check one box in each row)**

| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |
|---|---|---|---|---|
| General information about ways to save energy | | | | |
| 1-Not Interested | 27 | 26 | 21 | |
| 2 | 17 | 17 | 24 | |
| 3 | 82 | 79 | 86 | |
| 4 | 103 | 80 | 97 | |
| 5-Very Interested | 226 | 189 | 166 | |
| | 455 | 391 | 394 | 1240 |
| Customized information about energy saving opportunities specific to my home | | | | |
| 1-Not Interested | 51 | 47 | 37 | |
| 2 | 28 | 14 | 31 | |
| 3 | 66 | 99 | 80 | |
| 4 | 96 | 68 | 88 | |
| 5-Very Interested | 206 | 156 | 143 | |
| | 447 | 384 | 379 | 1210 |

## First Energy Ohio Residential Survey

| | | | | |
|---|---|---|---|---|
| Cash rebates or coupons for energy efficient products | | | | |
| 1-Not Interested | 31 | 24 | 13 | |
| 2 | 10 | 8 | 18 | |
| 3 | 56 | 57 | 60 | |
| 4 | 87 | 82 | 87 | |
| 5-Very Interested | 268 | 216 | 205 | |
| | 452 | 387 | 383 | 1222 |
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |
| Catalog of energy efficient products at reduced rates | | | | |
| 1-Not Interested | 40 | 38 | 22 | |
| 2 | 18 | 10 | 29 | |
| 3 | 65 | 76 | 67 | |
| 4 | 96 | 86 | 92 | |
| 5-Very Interested | 228 | 172 | 175 | |
| | 447 | 382 | 385 | 1214 |
| Ways to track my electric usage on line | | | | |
| 1-Not Interested | 106 | 99 | 81 | |
| 2 | 30 | 29 | 40 | |
| 3 | 77 | 71 | 67 | |
| 4 | 69 | 63 | 66 | |
| 5-Very Interested | 157 | 117 | 122 | |
| | 439 | 379 | 376 | 1194 |
| Incentives for modifying my electric usage behavior | | | | |
| 1-Not Interested | 42 | 41 | 36 | |
| 2 | 28 | 22 | 27 | |
| 3 | 78 | 89 | 71 | |
| 4 | 87 | 89 | 91 | |
| 5-Very Interested | 211 | 145 | 157 | |
| | 446 | 386 | 382 | 1214 |
| | | | ***answered question*** | **1247** |
| | | | ***skipped question*** | **21** |

**38. On a scale of 1 to 5, where 1 = "Completely Disagree" and 5 = "Completely Agree," please rate your level of agreement with the following statements: (check one box in each row)**

| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |
|---|---|---|---|---|
| **I am willing to pay more for an efficient product in order to save energy and reduce energy costs in the future.** | | | | |
| 1-Completely Disagree | 46 | 49 | 34 | |
| 2 | 26 | 27 | 27 | |
| 3 | 154 | 123 | 133 | |
| 4 | 103 | 97 | 99 | |
| 5-Completely Agree | 123 | 92 | 95 | |
| | 452 | 388 | 388 | 1228 |
| | | | | |
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |
| **I am willing to pay more for products that are environmentally friendly.** | | | | |
| 1-Completely Disagree | 57 | 49 | 39 | |
| 2 | 53 | 46 | 63 | |
| 3 | 157 | 143 | 128 | |
| 4 | 102 | 83 | 84 | |
| 5-Completely Agree | 77 | 63 | 71 | |
| | 446 | 384 | 385 | 1215 |
| | | | | |

## First Energy Ohio Residential Survey

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Count |
|---|---|---|---|---|
| I would install a programmable thermostat myself if was provided by my utility company. | | | | |
| 1-Completely Disagree | 69 | 75 | 60 | |
| 2 | 32 | 31 | 26 | |
| 3 | 60 | 53 | 56 | |
| 4 | 75 | 44 | 48 | |
| 5-Completely Agree | 186 | 170 | 165 | |
| | 422 | 373 | 355 | 1150 |
| | | | | |
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |
| I would accept a programmable thermostat if one was provided and installed for me. | | | | |
| 1-Completely Disagree | 67 | 65 | 51 | |
| 2 | 21 | 16 | 18 | |
| 3 | 50 | 44 | 50 | |
| 4 | 52 | 56 | 46 | |
| 5-Completely Agree | 226 | 187 | 186 | |
| | 416 | 368 | 351 | 1135 |
| | | | | |
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |
| **I would buy a higher efficiency water heater or appliance if a rebate was offered.** | | | | |
| 1-Completely Disagree | 67 | 73 | 57 | |
| 2 | 34 | 29 | 27 | |
| 3 | 101 | 88 | 87 | |
| 4 | 88 | 87 | 76 | |
| 5-Completely Agree | 145 | 100 | 120 | |
| | 435 | 377 | 367 | 1179 |
| | | | | |
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |
| I would allow my utility to have limited control of my central AC in times of peak electricity demand in return for a credit | | | | |
| 1-Completely Disagree | 151 | 170 | 139 | |
| 2 | 38 | 42 | 43 | |
| 3 | 97 | 74 | 61 | |
| 4 | 68 | 36 | 55 | |
| 5-Completely Agree | 66 | 48 | 65 | |
| | 420 | 370 | 363 | 1153 |
| | | | | |
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** |
| I would be willing to turn in my second refrigerator if my utility offered to pick it up for free. | | | | |
| 1-Completely Disagree | 168 | 181 | 154 | |
| 2 | 32 | 27 | 34 | |
| 3 | 48 | 37 | 30 | |
| 4 | 29 | 13 | 20 | |
| 5-Completely Agree | 59 | 42 | 59 | |
| | 336 | 300 | 297 | 933 |
| | | | | |
| | | | | |

## First Energy Ohio Residential Survey

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Count |
|---|---|---|---|---|
| I would be willing to turn in my second refrigerator if my utility offered to pick it up and offered me a cash payment. | | | | |
| 1-Completely Disagree | 147 | 161 | 120 | |
| 2 | 25 | 19 | 21 | |
| 3 | 44 | 32 | 32 | |
| 4 | 45 | 21 | 40 | |
| 5-Completely Agree | 76 | 65 | 80 | |
| | 337 | 298 | 293 | 928 |

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Count |
|---|---|---|---|---|
| I am interested in finding out more about energy efficiency opportunities for my home. | | | | |
| 1-Completely Disagree | 34 | 35 | 24 | |
| 2 | 31 | 29 | 36 | |
| 3 | 96 | 89 | 97 | |
| 4 | 83 | 81 | 83 | |
| 5-Completely Agree | 195 | 147 | 137 | |
| | 439 | 381 | 377 | 1197 |
| | | | ***answered question*** | **1245** |
| | | | ***skipped question*** | **23** |

**39. Have you participated in the FirstEnergy Thermostat Program?**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Yes | 12 | 7 | 17 | 2.9% | 36 |
| No - | 356 | 317 | 304 | 78.9% | 977 |
| Don't know | 54 | 58 | 49 | 13.0% | 161 |
| Not offered by my company | 31 | 10 | 23 | 5.2% | 64 |
| | | | | ***answered question*** | **1238** |
| | | | | ***skipped question*** | **30** |

**40. Have you participated in the FirstEnergy Home Performance with Energy Star Program?**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Yes | 6 | 9 | 6 | 1.8% | 21 |
| No - | 333 | 286 | 288 | 76.8% | 907 |
| Don't know | 83 | 68 | 64 | 18.2% | 215 |
| Not offered by my company | 17 | 9 | 12 | 3.2% | 38 |
| | | | | ***answered question*** | **1181** |
| | | | | ***skipped question*** | **87** |

**41. What type of residence do you live in?**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Single family home | 350 | 294 | 291 | 79.6% | 935 |
| Duplex or two family home | 25 | 12 | 21 | 4.9% | 58 |
| Condominium | 35 | 14 | 33 | 7.0% | 82 |
| Mobile home | 7 | 17 | 4 | 2.4% | 28 |
| Apartment in building with less than 5 units | 10 | 8 | 4 | 1.9% | 22 |
| Apartment in building with 5 or more units | 10 | 24 | 16 | 4.3% | 50 |
| Other (please specify) | | | | | 11 |
| | | | | ***answered question*** | **1175** |
| | | | | ***skipped question*** | **93** |

## First Energy Ohio Residential Survey

**42. Do you own or rent this residence?**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Own | 366 | 323 | 325 | 86.2% | 1014 |
| Rent/Lease | 66 | 51 | 45 | 13.8% | 162 |
| | | | | ***answered question*** | **1176** |
| | | | | ***skipped question*** | **92** |

**43. Which best describes the use of this residence? (choose one only**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Year-round residence | 429 | 365 | 356 | 97.2% | 1150 |
| Seasonal – used in summer | 7 | 4 | 11 | 1.9% | 22 |
| Seasonal – used in winter | 1 | 0 | 1 | 0.2% | 2 |
| Second home used throughout the year | 1 | 4 | 4 | 0.8% | 9 |
| Other (please specify) | | | | | 3 |
| | | | | ***answered question*** | **1183** |
| | | | | ***skipped question*** | **85** |

**44. How many rooms are in this residence? Do NOT include bathrooms, closets, hallways, or unfinished basements. (enter number of rooms)**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Average | Response Total | Response Count |
|---|---|---|---|---|---|---|
| Number of rooms | 426 | 366 | 364 | 6.42 | 7422 | 1156 |
| | | | | | ***answered question*** | **1156** |
| | | | | | ***skipped question*** | **112** |

**45. How old is this residence?**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Average | Response Total | Response Count |
|---|---|---|---|---|---|---|
| Years | 342 | 272 | 298 | 42.37 | 38641 | 912 |
| | | | | | ***answered question*** | **912** |
| | | | | | ***skipped question*** | **356** |

**46. How many people live in this residence full time? (Do not include people away at school or in the military)**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Average | Response Total | Response Count |
|---|---|---|---|---|---|---|
| Number of people | 434 | 374 | 371 | 2.61 | 3083 | 1179 |
| | | | | | ***answered question*** | **1179** |
| | | | | | ***skipped question*** | **89** |

**47. What is the highest level of education you have completed?**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Elementary school or less | 4 | 3 | 1 | 0.7% | 8 |
| Some high school | 20 | 16 | 19 | 4.7% | 55 |
| Graduated high school | 123 | 114 | 95 | 28.4% | 332 |
| Some college | 124 | 111 | 108 | 29.3% | 343 |
| Graduated college | 96 | 86 | 83 | 22.6% | 265 |
| Post-graduate degree | 62 | 40 | 66 | 14.3% | 168 |
| | | | | ***answered question*** | **1171** |
| | | | | ***skipped question*** | **97** |

## First Energy Ohio Residential Survey

| 48. Please indicate the number of people in your household in each of the following age ranges. | | | | | |
|---|---|---|---|---|---|
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** | |
| Under 5 years old | | | | | |
| 1 | 16 | 18 | 24 | | |
| 2 | 5 | 8 | 5 | | |
| 3 + | 0 | 1 | 3 | | |
| | 21 | 27 | 32 | 80 | |
| 5 – 18 years old | | | | | |
| 1 | 38 | 31 | 27 | | |
| 2 | 33 | 30 | 30 | | |
| 3 + | 10 | 14 | 10 | | |
| | 81 | 75 | 67 | 223 | |
| 19 – 24 years old | | | | | |
| 1 | 41 | 20 | 28 | | |
| 2 | 7 | 7 | 6 | | |
| 3 + | 2 | 0 | 1 | | |
| | 50 | 27 | 35 | 112 | |
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Count** | |
| 25 - 34 years old | | | | | |
| 1 | 33 | 31 | 28 | | |
| 2 | 19 | 19 | 13 | | |
| 3 + | 0 | 3 | 3 | | |
| | 52 | 53 | 44 | 149 | |
| 35 - 44 years old | | | | | |
| 1 | 45 | 43 | 43 | | |
| 2 | 26 | 20 | 19 | | |
| 3 + | 1 | 0 | 1 | | |
| | 72 | 63 | 63 | 198 | |
| 45 – 54 years old | | | | | |
| 1 | 76 | 59 | 66 | | |
| 2 | 55 | 40 | 35 | | |
| 3 + | 1 | 1 | 0 | | |
| | 132 | 100 | 101 | 333 | |
| 55 – 64 years old | | | | | |
| 1 | 81 | 70 | 63 | | |
| 2 | 46 | 43 | 45 | | |
| 3 + | 0 | 2 | 0 | | |
| | 127 | 115 | 108 | 350 | |
| 65 years or older | | | | | |
| 1 | 95 | 69 | 84 | | |
| 2 | 76 | 64 | 60 | | |
| 3 + | 2 | 2 | 4 | | |
| | 173 | 135 | 148 | 456 | |
| | | | ***answered question*** | **1168** | |
| | | | ***skipped question*** | **100** | |

| 49. What is the age of the household member (or one of the household members) in whose name this residence is owned, being bought, or rented? | | | | | | |
|---|---|---|---|---|---|---|
| **Answer Options** | **Ohio Edison** | **Toledo Edison** | **The Illuminating Company** | **Response Average** | **Response Total** | **Response Count** |
| Years Old | 415 | 357 | 345 | 58.00 | 64783 | 1117 |
| | | | | | ***answered question*** | **1117** |
| | | | | | ***skipped question*** | **151** |

## First Energy Ohio Residential Survey

**50. Please check the category that best describes your total 2008 household income, before taxes, for people living in your residence:**

| Answer Options | Ohio Edison | Toledo Edison | The Illuminating Company | Response Percent | Response Count |
|---|---|---|---|---|---|
| Under $15,000 | 35 | 39 | 31 | 9.2% | 105 |
| $15,000 to just under $25,000 | 45 | 37 | 41 | 10.8% | 123 |
| $25,000 to just under $35,000 | 63 | 38 | 33 | 11.7% | 134 |
| $35,000 to just under $50,000 | 60 | 71 | 61 | 16.8% | 192 |
| $50,000 to just under $75,000 | 67 | 50 | 49 | 14.5% | 166 |
| $75,000 to just under $100,000 | 42 | 41 | 37 | 10.5% | 120 |
| $100,000 to just under $150,000 | 23 | 20 | 25 | 6.0% | 68 |
| $150,000 to just under $200,000 | 10 | 3 | 10 | 2.0% | 23 |
| $200,000 and over | 5 | 3 | 8 | 1.4% | 16 |
| Prefer not to answer | 74 | 61 | 60 | 17.1% | 195 |
| | | | | ***answered question*** | **1142** |
| | | | | ***skipped question*** | **126** |

# 10.0 APPENDICES



## *Appendix D: 2009 Survey Results*

## Appendix D2- 2009 Commercial Survey Results

## First Energy Ohio Commercial Survey

**Q1x1. The price of electricity * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q1x1. The price of electricity | 1 - Not At All Concerned | 1 | 6 | 4 | 11 |
| | 2 | 8 | 8 | 2 | 18 |
| | 3 | 11 | 17 | 8 | 36 |
| | 4 | 19 | 17 | 27 | 63 |
| | 5 - Very Concerned | 61 | 52 | 59 | 172 |
| Total | | 100 | 100 | 100 | 300 |

**Q1x2. The environmental impact of electricity consumption * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q1x2. The environmental impact of electricity consumption | 1 - Not At All Concerned | 16 | 13 | 12 | 41 |
| | 2 | 10 | 13 | 10 | 33 |
| | 3 | 31 | 36 | 26 | 93 |
| | 4 | 23 | 13 | 24 | 60 |
| | 5 - Very Concerned | 20 | 25 | 28 | 73 |
| Total | | 100 | 100 | 100 | 300 |

**Q1x3. Your company's monthly electric bill * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q1x3. Your company's monthly electric bill | 1 - Not At All Concerned | 6 | 6 | 5 | 17 |
| | 2 | 5 | 10 | 5 | 20 |
| | 3 | 15 | 21 | 14 | 50 |
| | 4 | 25 | 16 | 23 | 64 |
| | 5 - Very Concerned | 49 | 47 | 53 | 149 |
| Total | | 100 | 100 | 100 | 300 |

**Q2. What percentage of your company's operating costs goes toward electricity? * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q2. What percentage of your company's operating costs goes toward electricity? | 10% or less | 57 | 56 | 56 | 169 |
| | 11% - 20% | 18 | 19 | 20 | 57 |
| | 21% - 30% | 4 | 11 | 10 | 25 |
| | 31% - 40% | 7 | 3 | 1 | 11 |
| | 41% - 50% | 1 | 1 | 2 | 4 |
| | Over 50% | 1 | 0 | 4 | 5 |
| | Don't Know | 12 | 10 | 7 | 29 |
| Total | | 100 | 100 | 100 | 300 |

**Q3. Has the cost of electricity caused your company to change the way it uses electricity over the past year? Would you say... * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q3. Has the cost of electricity caused your company to change the way it uses electricity over the past year? Would you say... | Yes | 44 | 38 | 48 | 130 |
| | No, electricity prices don't impact our usage decisions | 26 | 39 | 27 | 92 |
| | Not yet, but it is a concern | 30 | 23 | 25 | 78 |
| Total | | 100 | 100 | 100 | 300 |

## First Energy Ohio Commercial Survey

**Q4. Which of the following statements best describes the way your business has used electricity during the past 12 months? Would you say... * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q4. Which of the following statements best describes the way your business has used electricity during the past 12 months? Would you say... | We have not tried to reduce the amount used | 15 | 17 | 14 | 46 |
| | We have taken some steps to reduce electric use | 59 | 64 | 56 | 179 |
| | We have taken a lot of steps to reduce electric use | 26 | 19 | 30 | 75 |
| Total | | 100 | 100 | 100 | 300 |

**Q5. Which of the following statements best describes the way your company will use electricity over the next 12 months? Would you say... * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q5. Which of the following statements best describes the way your company will use electricity over the next 12 months? Would you say... | We will do a lot more to reduce electric use | 26 | 20 | 20 | 66 |
| | We will do a little more to reduce electric use | 42 | 38 | 55 | 135 |
| | We will do a little less to reduce electric use | 8 | 18 | 6 | 32 |
| | We will do a lot less to reduce electric use | 3 | 1 | 3 | 7 |
| | We will not do anything to reduce electric use | 17 | 19 | 16 | 52 |
| | We will increase electric use | 4 | 4 | 0 | 8 |
| Total | | 100 | 100 | 100 | 300 |

**Your electric company's website - Q6. Which of the following information source(s) might your company use to find information about energy efficient measures and equipment. For each source I mention, indicate YES or NO. The first source is... * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Your electric company's website - Q6. Which of the following information source(s) might your company use to find information about energy efficient measures and equipment. For each source I mention, indicate YES or NO. The first source is... | Yes | 51 | 47 | 46 | 144 |
| Total | | 51 | 47 | 46 | 144 |

**Internet search engines such as Google, Yahoo, or MSN - Q6. Which of the following information source(s) might your company use to find information about energy efficient measures and equipment. For each source I mention, indicate YES or NO. The first sour * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Internet search engines such as Google, Yahoo, or MSN - Q6. Which of the following information source(s) might your company use to find information about energy efficient measures and equipment. For each source I mention, indicate YES or NO. The first sour | Yes | 65 | 66 | 67 | 198 |
| Total | | 65 | 66 | 67 | 198 |

## First Energy Ohio Commercial Survey

**Trade magazines - Q6. Which of the following information source(s) might your company use to find information about energy efficient measures and equipment. For each source I mention, indicate YES or NO. The first source is... * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Trade magazines - Q6. Which of the following information source(s) might your company use to find information about energy efficient measures and equipment. For each source I mention, indicate YES or NO. The first source is... | Yes | 20 | 22 | 32 | 74 |
| Total | | 20 | 22 | 32 | 74 |

**Trade shows or seminars - Q6. Which of the following information source(s) might your company use to find information about energy efficient measures and equipment. For each source I mention, indicate YES or NO. The first source is... * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Trade shows or seminars - Q6. Which of the following information source(s) might your company use to find information about energy efficient measures and equipment. For each source I mention, indicate YES or NO. The first source is... | Yes | 14 | 14 | 14 | 42 |
| Total | | 14 | 14 | 14 | 42 |

**Appliance or equipment manufacturers - Q6. Which of the following information source(s) might your company use to find information about energy efficient measures and equipment. For each source I mention, indicate YES or NO. The first source is... * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Appliance or equipment manufacturers - Q6. Which of the following information source(s) might your company use to find information about energy efficient measures and equipment. For each source I mention, indicate YES or NO. The first source is... | Yes | 37 | 30 | 36 | 103 |
| Total | | 37 | 30 | 36 | 103 |

**Your electric company's account representatives - Q6. Which of the following information source(s) might your company use to find information about energy efficient measures and equipment. For each source I mention, indicate YES or NO. The first source is. * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Your electric company's account representatives - Q6. Which of the following information source(s) might your company use to find information about energy efficient measures and equipment. For each source I mention, indicate YES or NO. The first source is. | Yes | 40 | 42 | 43 | 125 |
| Total | | 40 | 42 | 43 | 125 |

**q7. Do you have any exit signs at your company? * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| q7. Do you have any exit signs at your company? | Yes | 91 | 78 | 87 | 256 |
| | No | 9 | 22 | 13 | 44 |
| Total | | 100 | 100 | 100 | 300 |

## First Energy Ohio Commercial Survey

**q8. How many? * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| q8. How many? | 1.00 | 2 | 10 | 4 | 16 |
| | 2.00 | 15 | 11 | 14 | 40 |
| | 3.00 | 16 | 10 | 9 | 35 |
| | 4.00 | 18 | 19 | 13 | 50 |
| | 5.00 | 6 | 5 | 9 | 20 |
| | 6.00 | 10 | 5 | 9 | 24 |
| | 7.00 | 3 | 1 | 3 | 7 |
| | 8.00 | 2 | 2 | 4 | 8 |
| | 9.00 | 1 | 1 | 1 | 3 |
| | 10.00 | 4 | 4 | 4 | 12 |
| | 11.00 | 0 | 1 | 1 | 2 |
| | 12.00 | 2 | 2 | 4 | 8 |
| | 14.00 | 0 | 1 | 0 | 1 |
| | 15.00 | 2 | 2 | 1 | 5 |
| | 16.00 | 0 | 0 | 1 | 1 |
| | 17.00 | 1 | 0 | 1 | 2 |
| | 18.00 | 0 | 0 | 1 | 1 |
| | 20.00 | 0 | 2 | 3 | 5 |
| | 30.00 | 0 | 1 | 0 | 1 |
| | 40.00 | 1 | 0 | 1 | 2 |
| | 50.00 | 0 | 0 | 1 | 1 |
| | 60.00 | 1 | 0 | 0 | 1 |
| | 100.00 | 0 | 0 | 1 | 1 |
| | 200.00 | 1 | 0 | 0 | 1 |
| | 998.00 | 6 | 1 | 2 | 9 |
| Total | | 91 | 78 | 87 | 256 |

**Q9. How many are energy efficient LED exit signs? * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q9. How many are energy efficient LED exit signs? | 0.00 | 37 | 40 | 30 | 107 |
| | 1.00 | 1 | 7 | 0 | 8 |
| | 2.00 | 9 | 7 | 6 | 22 |
| | 3.00 | 6 | 2 | 7 | 15 |
| | 4.00 | 9 | 6 | 6 | 21 |
| | 5.00 | 3 | 1 | 4 | 8 |
| | 6.00 | 2 | 2 | 3 | 7 |
| | 7.00 | 2 | 0 | 2 | 4 |
| | 8.00 | 1 | 0 | 4 | 5 |
| | 9.00 | 0 | 0 | 1 | 1 |
| | 10.00 | 1 | 2 | 1 | 4 |
| | 11.00 | 0 | 0 | 1 | 1 |
| | 12.00 | 1 | 0 | 1 | 2 |
| | 13.00 | 1 | 0 | 0 | 1 |
| | 14.00 | 0 | 1 | 0 | 1 |
| | 15.00 | 0 | 0 | 1 | 1 |
| | 16.00 | 0 | 0 | 2 | 2 |
| | 30.00 | 0 | 1 | 0 | 1 |
| | 40.00 | 1 | 0 | 0 | 1 |
| | 45.00 | 0 | 0 | 1 | 1 |
| | 100.00 | 1 | 0 | 0 | 1 |
| | 998.00 | 16 | 9 | 17 | 42 |
| Total | | 91 | 78 | 87 | 256 |

**Q10. How many water heaters do you have at your company? * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q10. How many water heaters do you have at your company? | One | 72 | 66 | 55 | 193 |
| | Two | 16 | 18 | 30 | 64 |
| | Three or more | 12 | 16 | 15 | 43 |
| Total | | 100 | 100 | 100 | 300 |

## First Energy Ohio Commercial Survey

**Q10Ax1. What fuel(s) do you use for water heating at your place of business? Water heater 1 * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q10Ax1. What fuel(s) do you use for water heating at your place of business? Water heater 1 | Electricity | 26 | 37 | 29 | 92 |
| | Natural gas | 73 | 60 | 67 | 200 |
| | Propane | 0 | 2 | 3 | 5 |
| | Other (SPECIFY) | 1 | 1 | 1 | 3 |
| Total | | 100 | 100 | 100 | 300 |

**Q11x1. What is the age of the electric water heater(s)? Water heater 1 * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q11x1. What is the age of the electric water heater(s)? Water heater 1 | Under 5 years | 13 | 15 | 14 | 42 |
| | 5 to 10 years | 5 | 9 | 7 | 21 |
| | 11 to 20 years | 4 | 6 | 3 | 13 |
| | 21 to 40 years | 0 | 1 | 2 | 3 |
| | Over 40 years | 1 | 0 | 0 | 1 |
| | Don't Know | 3 | 6 | 3 | 12 |
| Total | | 26 | 37 | 29 | 92 |

**Q10Ax2. What fuel(s) do you use for water heating at your place of business? Water heater 2 * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q10Ax2. What fuel(s) do you use for water heating at your place of business? Water heater 2 | Electricity | 10 | 6 | 13 | 29 |
| | Natural gas | 18 | 28 | 29 | 75 |
| | Propane | 0 | 0 | 2 | 2 |
| | Other (SPECIFY) | 0 | 0 | 1 | 1 |
| Total | | 28 | 34 | 45 | 107 |

**Q11x2. What is the age of the electric water heater(s)? Water heater 2 * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q11x2. What is the age of the electric water heater(s)? Water heater 2 | Under 5 years | 3 | 0 | 4 | 7 |
| | 5 to 10 years | 4 | 3 | 3 | 10 |
| | 11 to 20 years | 3 | 3 | 3 | 9 |
| | 21 to 40 years | 0 | 0 | 1 | 1 |
| | Don't Know | 0 | 0 | 2 | 2 |
| Total | | 10 | 6 | 13 | 29 |

**Q10Ax3. What fuel(s) do you use for water heating at your place of business? Water heater 3 * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q10Ax3. What fuel(s) do you use for water heating at your place of business? Water heater 3 | Electricity | 6 | 2 | 5 | 13 |
| | Natural gas | 6 | 14 | 9 | 29 |
| | Propane | 0 | 0 | 1 | 1 |
| Total | | 12 | 16 | 15 | 43 |

**Q11x3. What is the age of the electric water heater(s)? Water heater 3 * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q11x3. What is the age of the electric water heater(s)? Water heater 3 | Under 5 years | 2 | 0 | 3 | 5 |
| | 5 to 10 years | 3 | 1 | 0 | 4 |
| | 11 to 20 years | 1 | 1 | 1 | 3 |
| | Don't Know | 0 | 0 | 1 | 1 |
| Total | | 6 | 2 | 5 | 13 |

## First Energy Ohio Commercial Survey

**Q12. Approximately what percentage of your office equipment (computers, printers, copiers, etc.) is EnergyStar rated? * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q12. Approximately what percentage of your office equipment (computers, printers, copiers, etc.) is EnergyStar rated? | 10% or less | 24 | 36 | 23 | 83 |
| | 11% - 20% | 5 | 12 | 11 | 28 |
| | 21% - 30% | 7 | 5 | 8 | 20 |
| | 31% - 40% | 5 | 2 | 2 | 9 |
| | 41% - 50% | 6 | 10 | 7 | 23 |
| | Over 50% | 30 | 21 | 29 | 80 |
| | Don't Know | 23 | 14 | 20 | 57 |
| Total | | 100 | 100 | 100 | 300 |

**Q13. Approximately what percentage of your total electric usage would you estimate is for plug loads such as office equipment and other plug loads? * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q13. Approximately what percentage of your total electric usage would you estimate is for plug loads such as office equipment and other plug loads? | 10% or less | 31 | 28 | 24 | 83 |
| | 11% - 20% | 9 | 16 | 13 | 38 |
| | 21% - 30% | 14 | 19 | 13 | 46 |
| | 31% - 40% | 5 | 2 | 4 | 11 |
| | 41% - 50% | 11 | 9 | 10 | 30 |
| | Over 50% | 24 | 18 | 27 | 69 |
| | Don't Know | 6 | 8 | 9 | 23 |
| Total | | 100 | 100 | 100 | 300 |

**Q14. Are you a Grocery, Restaurant, or Food Service business? * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q14. Are you a Grocery, Restaurant, or Food Service business? | Yes | 9 | 7 | 12 | 28 |
| | No | 91 | 93 | 88 | 272 |
| Total | | 100 | 100 | 100 | 300 |

**Q15. What is the size of your retail space in square feet? * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q15. What is the size of your retail space in square feet? | 1,000.00 | 0 | 0 | 1 | 1 |
| | 1,500.00 | 0 | 0 | 1 | 1 |
| | 2,000.00 | 0 | 0 | 1 | 1 |
| | 2,400.00 | 1 | 0 | 0 | 1 |
| | 2,500.00 | 0 | 0 | 1 | 1 |
| | 3,000.00 | 1 | 1 | 1 | 3 |
| | 3,700.00 | 1 | 0 | 0 | 1 |
| | 4,000.00 | 1 | 0 | 0 | 1 |
| | 4,700.00 | 0 | 0 | 1 | 1 |
| | 5,000.00 | 0 | 0 | 1 | 1 |
| | 5,500.00 | 0 | 0 | 1 | 1 |
| | 10,000.00 | 1 | 1 | 1 | 3 |
| | 20,000.00 | 0 | 0 | 1 | 1 |
| | 25,000.00 | 1 | 1 | 0 | 2 |
| | 60,000.00 | 0 | 0 | 1 | 1 |
| | 999,998.00 | 3 | 4 | 1 | 8 |
| Total | | 9 | 7 | 12 | 28 |

## First Energy Ohio Commercial Survey

**q16. How many refrigerated display units are at your location? * operating company Crosstabulation**

Count

| | | operating company | | | |
|---|---|---|---|---|---|
| | | CE | OE | TE | Total |
| q16. How many refrigerated display units are at your location? | 0.00 | 3 | 3 | 2 | 8 |
| | 1.00 | 1 | 1 | 4 | 6 |
| | 2.00 | 0 | 0 | 1 | 1 |
| | 3.00 | 1 | 1 | 0 | 2 |
| | 4.00 | 1 | 1 | 4 | 6 |
| | 5.00 | 1 | 0 | 1 | 2 |
| | 6.00 | 1 | 0 | 0 | 1 |
| | 8.00 | 1 | 0 | 0 | 1 |
| | 20.00 | 0 | 1 | 0 | 1 |
| Total | | 9 | 7 | 12 | 28 |

**q17. What percentage of the refrigerated display units at your location have enclosures such as curtains or doors? * operating company Crosstabulation**

Count

| | | operating company | | | |
|---|---|---|---|---|---|
| | | CE | OE | TE | Total |
| q17. What percentage of the refrigerated display units at your location have enclosures such as curtains or doors? | 0.00 | 0 | 1 | 3 | 4 |
| | 1.00 | 0 | 0 | 1 | 1 |
| | 3.00 | 0 | 1 | 0 | 1 |
| | 5.00 | 0 | 0 | 1 | 1 |
| | 8.00 | 1 | 0 | 0 | 1 |
| | 75.00 | 1 | 0 | 0 | 1 |
| | 100.00 | 4 | 2 | 5 | 11 |
| Total | | 6 | 4 | 10 | 20 |

**q18. How many freezer display units are at your location? * operating company Crosstabulation**

Count

| | | operating company | | | |
|---|---|---|---|---|---|
| | | CE | OE | TE | Total |
| q18. How many freezer display units are at your location? | 0.00 | 6 | 4 | 8 | 18 |
| | 1.00 | 0 | 1 | 3 | 4 |
| | 2.00 | 1 | 1 | 1 | 3 |
| | 3.00 | 1 | 0 | 0 | 1 |
| | 4.00 | 1 | 1 | 0 | 2 |
| Total | | 9 | 7 | 12 | 28 |

**q19. What percentage of your freezer display units have gaskets that are due for replacement? * operating company Crosstabulation**

Count

| | | operating company | | | |
|---|---|---|---|---|---|
| | | CE | OE | TE | Total |
| q19. What percentage of your freezer display units have gaskets that are due | 0.00 | 2 | 3 | 4 | 9 |
| | 50.00 | 1 | 0 | 0 | 1 |
| Total | | 3 | 3 | 4 | 10 |

**q20. How many refrigerated storage units are at your location? * operating company Crosstabulation**

Count

| | | operating company | | | |
|---|---|---|---|---|---|
| | | CE | OE | TE | Total |
| q20. How many refrigerated storage units are at your location? | 0.00 | 2 | 0 | 1 | 3 |
| | 1.00 | 0 | 2 | 2 | 4 |
| | 2.00 | 2 | 1 | 3 | 6 |
| | 3.00 | 0 | 3 | 2 | 5 |
| | 4.00 | 3 | 0 | 3 | 6 |
| | 5.00 | 2 | 1 | 0 | 3 |
| | 7.00 | 0 | 0 | 1 | 1 |
| Total | | 9 | 7 | 12 | 28 |

## First Energy Ohio Commercial Survey

**q21. What percentage of your refrigerated storage units have walk-in refrigerator strip curtains? * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| q21. What percentage of your refrigerated storage units have walk-in refrigerator strip curtains? | 0.00 | 4 | 5 | 9 | 18 |
| | 1.00 | 1 | 0 | 1 | 2 |
| | 50.00 | 1 | 1 | 1 | 3 |
| | 100.00 | 1 | 1 | 0 | 2 |
| Total | | 7 | 7 | 11 | 25 |

**q22. How many freezer storage units are at your location? * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| q22. How many freezer storage units are at your location? | 0.00 | 1 | 0 | 1 | 2 |
| | 1.00 | 3 | 3 | 4 | 10 |
| | 2.00 | 2 | 2 | 1 | 5 |
| | 3.00 | 2 | 1 | 5 | 8 |
| | 4.00 | 1 | 1 | 1 | 3 |
| Total | | 9 | 7 | 12 | 28 |

**q23. What percentage of your freezer storage units have walk-in freezer strip curtains? * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| q23. What percentage of your freezer storage units have walk-in freezer strip curtains? | 0.00 | 7 | 5 | 10 | 22 |
| | 1.00 | 1 | 0 | 0 | 1 |
| | 100.00 | 0 | 2 | 1 | 3 |
| Total | | 8 | 7 | 11 | 26 |

**Made Change - Q24x1. Install Strip curtains - Display units * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Made Change - Q24x1. Install Strip curtains - Display units | Yes | 2 | 1 | 0 | 3 |
| Total | | 2 | 1 | 0 | 3 |

**Would Consider Change in 2 years - Q24x1. Install Strip curtains - Display units * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Would Consider Change in 2 years - Q24x1. Install Strip curtains - Display units | Yes | 4 | 2 | 8 | 14 |
| Total | | 4 | 2 | 8 | 14 |

**Neither - Q24x1. Install Strip curtains - Display units * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Neither - Q24x1. Install Strip curtains - Display units | Yes | 3 | 4 | 4 | 11 |
| Total | | 3 | 4 | 4 | 11 |

**Made Change - Q24x2. Gasket Replacement on display units * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Made Change - Q24x2. Gasket Replacement on display units | Yes | 2 | 2 | 3 | 7 |
| Total | | 2 | 2 | 3 | 7 |

## First Energy Ohio Commercial Survey

**Would Consider Change in 2 years - Q24x2. Gasket Replacement on display units * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Would Consider Change in 2 years - Q24x2. Gasket Replacement on display units | Yes | 5 | 4 | 5 | 14 |
| Total | | 5 | 4 | 5 | 14 |

**Neither - Q24x2. Gasket Replacement on display units * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Neither - Q24x2. Gasket Replacement on display units | Yes | 2 | 1 | 4 | 7 |
| Total | | 2 | 1 | 4 | 7 |

**Made Change - Q24x3. Install energy efficient refrigeration units * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Made Change - Q24x3. Install energy efficient refrigeration units | Yes | 2 | 2 | 1 | 5 |
| Total | | 2 | 2 | 1 | 5 |

**Would Consider Change in 2 years - Q24x3. Install energy efficient refrigeration units * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Would Consider Change in 2 years - Q24x3. Install energy efficient refrigeration units | Yes | 5 | 4 | 9 | 18 |
| Total | | 5 | 4 | 9 | 18 |

**Neither - Q24x3. Install energy efficient refrigeration units * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Neither - Q24x3. Install energy efficient refrigeration units | Yes | 2 | 1 | 2 | 5 |
| Total | | 2 | 1 | 2 | 5 |

**q25x1. I would be willing to pay half the cost for the purchase and installation of any of the items just mentioned (strip curtains, gasket replacement, or energy efficient refrigeration units) * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| q25x1. I would be willing to pay half the cost for the purchase and installation of any of the items just mentioned (strip curtains, gasket replacement, or energy efficient refrigeration units) | 1 - Completely Disagree | 1 | 0 | 1 | 2 |
| | 2 | 2 | 0 | 1 | 3 |
| | 3 | 4 | 2 | 6 | 12 |
| | 4 | 1 | 0 | 2 | 3 |
| | 5 - Completely Agree | 1 | 5 | 2 | 8 |
| Total | | 9 | 7 | 12 | 28 |

**q25x2. If any of the items were provided free of charge, I would install them (strip curtains, gasket replacement, or energy efficient refrigeration units) * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| q25x2. If any of the items were provided free of charge, I would install them (strip curtains, gasket replacement, or energy efficient refrigeration units) | 1 - Completely Disagree | 0 | 0 | 1 | 1 |
| | 3 | 1 | 0 | 1 | 2 |
| | 4 | 0 | 1 | 1 | 2 |
| | 5 - Completely Agree | 8 | 6 | 9 | 23 |
| Total | | 9 | 7 | 12 | 28 |

## First Energy Ohio Commercial Survey

**q26. Do you have any occupancy sensors in your company? * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| q26. Do you have any occupancy sensors in your company? | Yes | 7 | 9 | 11 | 27 |
| | No | 93 | 91 | 89 | 273 |
| Total | | 100 | 100 | 100 | 300 |

**q27. How many occupancy sensors do you have? * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| q27. How many occupancy sensors do you have? | 1.00 | 0 | 1 | 2 | 3 |
| | 2.00 | 1 | 3 | 3 | 7 |
| | 3.00 | 0 | 1 | 1 | 2 |
| | 4.00 | 1 | 2 | 0 | 3 |
| | 5.00 | 0 | 0 | 1 | 1 |
| | 6.00 | 0 | 0 | 2 | 2 |
| | 7.00 | 0 | 0 | 1 | 1 |
| | 12.00 | 0 | 2 | 1 | 3 |
| | 25.00 | 1 | 0 | 0 | 1 |
| | 50.00 | 1 | 0 | 0 | 1 |
| | 998.00 | 3 | 0 | 0 | 3 |
| Total | | 7 | 9 | 11 | 27 |

**Conference rooms - q28. Which of the following locations in your company have occupancy sensors. * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Conference rooms - q28. Which of the following locations in your company have occupancy sensors. | Yes | 2 | 1 | 3 | 6 |
| Total | | 2 | 1 | 3 | 6 |

**Hallways - q28. Which of the following locations in your company have occupancy sensors. * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Hallways - q28. Which of the following locations in your company have occupancy sensors. | Yes | 2 | 3 | 3 | 8 |
| Total | | 2 | 3 | 3 | 8 |

**Offices - q28. Which of the following locations in your company have occupancy sensors. * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Offices - q28. Which of the following locations in your company have occupancy sensors. | Yes | 5 | 2 | 4 | 11 |
| Total | | 5 | 2 | 4 | 11 |

**Restrooms - q28. Which of the following locations in your company have occupancy sensors. * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Restrooms - q28. Which of the following locations in your company have occupancy sensors. | Yes | 2 | 5 | 5 | 12 |
| Total | | 2 | 5 | 5 | 12 |

## First Energy Ohio Commercial Survey

**q29. Do you have any outdoor security lights at your company? * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| q29. Do you have any outdoor security lights at your company? | Yes | 77 | 86 | 89 | 252 |
| | No | 23 | 14 | 11 | 48 |
| Total | | 100 | 100 | 100 | 300 |

**q30. How many outdoor security lights do you have? * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| q30. How many outdoor security lights do you have? | 1.00 | 9 | 15 | 7 | 31 |
| | 2.00 | 16 | 18 | 12 | 46 |
| | 3.00 | 7 | 8 | 11 | 26 |
| | 4.00 | 10 | 17 | 11 | 38 |
| | 5.00 | 2 | 4 | 13 | 19 |
| | 6.00 | 9 | 7 | 9 | 25 |
| | 7.00 | 0 | 1 | 4 | 5 |
| | 8.00 | 5 | 1 | 6 | 12 |
| | 10.00 | 3 | 2 | 1 | 6 |
| | 12.00 | 2 | 2 | 2 | 6 |
| | 13.00 | 1 | 0 | 0 | 1 |
| | 15.00 | 1 | 2 | 7 | 10 |
| | 20.00 | 3 | 1 | 1 | 5 |
| | 22.00 | 1 | 0 | 0 | 1 |
| | 25.00 | 1 | 0 | 0 | 1 |
| | 30.00 | 1 | 2 | 1 | 4 |
| | 35.00 | 0 | 0 | 2 | 2 |
| | 50.00 | 0 | 1 | 0 | 1 |
| | 998.00 | 6 | 5 | 2 | 13 |
| Total | | 77 | 86 | 89 | 252 |

**q31. How many hours per night are they on? * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| q31. How many hours per night are they on? | 0.00 | 1 | 1 | 4 | 6 |
| | 1.00 | 1 | 0 | 1 | 2 |
| | 2.00 | 0 | 1 | 1 | 2 |
| | 3.00 | 0 | 1 | 1 | 2 |
| | 4.00 | 4 | 2 | 1 | 7 |
| | 5.00 | 1 | 1 | 3 | 5 |
| | 6.00 | 0 | 4 | 10 | 14 |
| | 7.00 | 6 | 0 | 5 | 11 |
| | 8.00 | 33 | 22 | 31 | 86 |
| | 9.00 | 4 | 8 | 1 | 13 |
| | 10.00 | 12 | 17 | 17 | 46 |
| | 11.00 | 0 | 1 | 0 | 1 |
| | 12.00 | 9 | 15 | 8 | 32 |
| | 98.00 | 6 | 13 | 6 | 25 |
| Total | | 77 | 86 | 89 | 252 |

**Switch - q32. How are the outdoor security lights operated? Would you say by... * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Switch - q32. How are the outdoor security lights operated? Would you say by... | Yes | 7 | 10 | 7 | 24 |
| Total | | 7 | 10 | 7 | 24 |

## First Energy Ohio Commercial Survey

**Timer - q32. How are the outdoor security lights operated? Would you say by... * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Timer - q32. How are the outdoor security lights operated? Would you say by... | Yes | 25 | 22 | 29 | 76 |
| Total | | 25 | 22 | 29 | 76 |

**Photocell - q32. How are the outdoor security lights operated? Would you say by... * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Photocell - q32. How are the outdoor security lights operated? Would you say by... | Yes | 45 | 49 | 50 | 144 |
| Total | | 45 | 49 | 50 | 144 |

**Motion sensors - q32. How are the outdoor security lights operated? Would you say by... * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Motion sensors - q32. How are the outdoor security lights operated? Would you say by... | Yes | 8 | | | 8 |
| Total | | 8 | | | 8 |

**Don't Know - q32. How are the outdoor security lights operated? Would you say by... * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Don't Know - q32. How are the outdoor security lights operated? Would you say by... | Yes | 8 | 11 | 10 | 1 |
| Total | | 8 | 11 | 10 | 1 |

**Q33x1. Install occupancy sensors * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q33x1. Install occupancy sensors | Made change | 3 | 5 | 6 | 14 |
| | Plan change in the next 2 years | 1 | 1 | 4 | 6 |
| | Consider change in the next 2 years | 20 | 16 | 19 | 55 |
| | Would NOT change | 76 | 78 | 71 | 225 |
| Total | | 100 | 100 | 100 | 300 |

**Q33x2. Install energy efficient outdoor security lighting * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q33x2. Install energy efficient outdoor security lighting | Made change | 18 | 16 | 17 | 51 |
| | Plan change in the next 2 years | 5 | 3 | 8 | 16 |
| | Consider change in the next 2 years | 32 | 28 | 26 | 86 |
| | Would NOT change | 45 | 53 | 49 | 147 |
| Total | | 100 | 100 | 100 | 300 |

## First Energy Ohio Commercial Survey

**Q33x3. Replace electric water heater with heat pump water heater * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q33x3. Replace electric water heater with heat pump water heater | Made change | 1 | 5 | 3 | 9 |
| | Plan change in the next 2 years | 1 | 2 | 1 | 4 |
| | Consider change in the next 2 years | 15 | 15 | 12 | 42 |
| | Would NOT change | 83 | 78 | 84 | 245 |
| Total | | 100 | 100 | 100 | 300 |

**Q33x4. Install energy efficient LED exit signs * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q33x4. Install energy efficient LED exit signs | Made change | 24 | 14 | 26 | 64 |
| | Plan change in the next 2 years | 8 | 4 | 6 | 18 |
| | Consider change in the next 2 years | 31 | 28 | 31 | 90 |
| | Would NOT change | 37 | 54 | 37 | 128 |
| Total | | 100 | 100 | 100 | 300 |

**Q34x1. Occupancy sensors * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q34x1. Occupancy sensors | 1 - Not At All Likely | 63 | 63 | 61 | 187 |
| | 2 | 7 | 7 | 2 | 16 |
| | 3 | 14 | 15 | 12 | 41 |
| | 4 | 7 | 5 | 11 | 23 |
| | 5 - Very Likely | 9 | 10 | 14 | 33 |
| Total | | 100 | 100 | 100 | 300 |

**Q34x2. Outdoor security lighting * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q34x2. Outdoor security lighting | 1 - Not At All Likely | 37 | 43 | 35 | 115 |
| | 2 | 5 | 11 | 10 | 26 |
| | 3 | 23 | 19 | 19 | 61 |
| | 4 | 15 | 7 | 11 | 33 |
| | 5 - Very Likely | 20 | 20 | 25 | 65 |
| Total | | 100 | 100 | 100 | 300 |

**Q34x3. Energy efficient LED exit signs * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q34x3. Energy efficient LED exit signs | 1 - Not At All Likely | 39 | 46 | 39 | 124 |
| | 2 | 6 | 10 | 6 | 22 |
| | 3 | 16 | 17 | 18 | 51 |
| | 4 | 17 | 8 | 11 | 36 |
| | 5 - Very Likely | 22 | 19 | 26 | 67 |
| Total | | 100 | 100 | 100 | 300 |

**Q34x4. Rebates for energy efficient heat pump electric water heaters * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q34x4. Rebates for energy efficient heat pump electric water heaters | 1 - Not At All Likely | 44 | 53 | 42 | 139 |
| | 2 | 12 | 6 | 14 | 32 |
| | 3 | 22 | 14 | 17 | 53 |
| | 4 | 7 | 6 | 8 | 21 |
| | 5 - Very Likely | 15 | 21 | 19 | 55 |
| Total | | 100 | 100 | 100 | 300 |

**Q34x5. Strip curtains for refrigerated display units * operating company Crosstabulation**

Count

## First Energy Ohio Commercial Survey

| | | operating company | | | |
|---|---|---|---|---|---|
| | | CE | OE | TE | Total |
| Q34x5. Strip curtains for refrigerated display units | 1 - Not At All Likely | 88 | 91 | 83 | 262 |
| | 2 | 4 | 2 | 2 | 8 |
| | 3 | 1 | 2 | 5 | 8 |
| | 4 | 2 | 0 | 2 | 4 |
| | 5 - Very Likely | 5 | 5 | 8 | 18 |
| Total | | 100 | 100 | 100 | 300 |

**Q34x6. Gasket replacement for refrigerated display units * operating company Crosstabulation**

Count

| | | operating company | | | |
|---|---|---|---|---|---|
| | | CE | OE | TE | Total |
| Q34x6. Gasket replacement for refrigerated display units | 1 - Not At All Likely | 90 | 86 | 77 | 253 |
| | 2 | 1 | 2 | 1 | 4 |
| | 3 | 2 | 3 | 5 | 10 |
| | 4 | 3 | 2 | 5 | 10 |
| | 5 - Very Likely | 4 | 7 | 12 | 23 |
| Total | | 100 | 100 | 100 | 300 |

**Q34x7. Rebates for more energy efficient refrigeration units * operating company Crosstabulation**

Count

| | | operating company | | | |
|---|---|---|---|---|---|
| | | CE | OE | TE | Total |
| Q34x7. Rebates for more energy efficient refrigeration units | 1 - Not At All Likely | 73 | 75 | 62 | 210 |
| | 2 | 4 | 1 | 4 | 9 |
| | 3 | 7 | 6 | 8 | 21 |
| | 4 | 3 | 4 | 9 | 16 |
| | 5 - Very Likely | 13 | 14 | 17 | 44 |
| Total | | 100 | 100 | 100 | 300 |

**Q35x1. My company is willing to pay more to save energy and reduce energy costs in the future. * operating company Crosstabulation**

Count

| | | operating company | | | |
|---|---|---|---|---|---|
| | | CE | OE | TE | Total |
| Q35x1. My company is willing to pay more to save energy and reduce energy costs in the future. | 1 - Completely Disagree | 26 | 31 | 23 | 80 |
| | 2 | 20 | 11 | 12 | 43 |
| | 3 | 29 | 27 | 26 | 82 |
| | 4 | 13 | 7 | 17 | 37 |
| | 5 - Completely Agree | 12 | 24 | 22 | 58 |
| Total | | 100 | 100 | 100 | 300 |

**Q35x2. My company is willing to pay more to be environmentally friendly. * operating company Crosstabulation**

Count

| | | operating company | | | |
|---|---|---|---|---|---|
| | | CE | OE | TE | Total |
| Q35x2. My company is willing to pay more to be environmentally friendly. | 1 - Completely Disagree | 28 | 39 | 29 | 96 |
| | 2 | 12 | 14 | 16 | 42 |
| | 3 | 40 | 25 | 26 | 91 |
| | 4 | 13 | 12 | 15 | 40 |
| | 5 - Completely Agree | 7 | 10 | 14 | 31 |
| Total | | 100 | 100 | 100 | 300 |

## First Energy Ohio Commercial Survey

**Q35x3. My company would buy a higher efficiency heat pump water heater if a rebate was offered. * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q35x3. My company would buy a higher efficiency heat pump water heater if a rebate was offered. | 1 - Completely Disagree | 42 | 49 | 38 | 129 |
| | 2 | 13 | 11 | 14 | 38 |
| | 3 | 23 | 19 | 22 | 64 |
| | 4 | 9 | 7 | 14 | 30 |
| | 5 - Completely Agree | 13 | 14 | 12 | 39 |
| Total | | 100 | 100 | 100 | 300 |

**Q35x4. My company would be willing to install occupancy sensors if they were provided for free. * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q35x4. My company would be willing to install occupancy sensors if they were provided for free. | 1 - Completely Disagree | 37 | 40 | 41 | 118 |
| | 2 | 6 | 8 | 6 | 20 |
| | 3 | 13 | 10 | 11 | 34 |
| | 4 | 14 | 9 | 6 | 29 |
| | 5 - Completely Agree | 30 | 33 | 36 | 99 |
| Total | | 100 | 100 | 100 | 300 |

**Q35x5. My company would be interested in finding out more about efficient outdoor security lighting systems. * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q35x5. My company would be interested in finding out more about efficient outdoor security lighting systems. | 1 - Completely Disagree | 32 | 34 | 33 | 99 |
| | 2 | 13 | 14 | 12 | 39 |
| | 3 | 26 | 22 | 15 | 63 |
| | 4 | 10 | 7 | 19 | 36 |
| | 5 - Completely Agree | 19 | 23 | 21 | 63 |
| Total | | 100 | 100 | 100 | 300 |

**Q35x6. We are interested in finding out more about efficient LED exit signs * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q35x6. We are interested in finding out more about efficient LED exit signs | 1 - Completely Disagree | 40 | 57 | 47 | 144 |
| | 2 | 12 | 7 | 8 | 27 |
| | 3 | 13 | 13 | 20 | 46 |
| | 4 | 16 | 4 | 9 | 29 |
| | 5 - Completely Agree | 19 | 19 | 16 | 54 |
| Total | | 100 | 100 | 100 | 300 |

**Q35x7. We are interested in finding out more about the energy efficient heat pump water heater * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q35x7. We are interested in finding out more about the energy efficient heat pump water heater | 1 - Completely Disagree | 47 | 57 | 49 | 153 |
| | 2 | 11 | 10 | 13 | 34 |
| | 3 | 22 | 12 | 19 | 53 |
| | 4 | 5 | 7 | 8 | 20 |
| | 5 - Completely Agree | 15 | 14 | 11 | 40 |
| Total | | 100 | 100 | 100 | 300 |

## First Energy Ohio Commercial Survey

**Q36x1. Cash rebates * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q36x1. Cash rebates | 1 - No Interest | 9 | 20 | 11 | 40 |
| | 2 | 7 | 12 | 10 | 29 |
| | 3 | 25 | 16 | 19 | 60 |
| | 4 | 18 | 16 | 21 | 55 |
| | 5 - Very Interested | 41 | 36 | 39 | 116 |
| Total | | 100 | 100 | 100 | 300 |

**Q36x2. Energy efficiency incentives * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q36x2. Energy efficiency incentives | 1 - No Interest | 13 | 26 | 14 | 53 |
| | 2 | 11 | 12 | 7 | 30 |
| | 3 | 35 | 23 | 29 | 87 |
| | 4 | 17 | 13 | 22 | 52 |
| | 5 - Very Interested | 24 | 26 | 28 | 78 |
| Total | | 100 | 100 | 100 | 300 |

**Q36x3. Design assistance services * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q36x3. Design assistance services | 1 - No Interest | 51 | 57 | 40 | 148 |
| | 2 | 12 | 7 | 17 | 36 |
| | 3 | 18 | 21 | 19 | 58 |
| | 4 | 13 | 7 | 12 | 32 |
| | 5 - Very Interested | 6 | 8 | 12 | 26 |
| Total | | 100 | 100 | 100 | 300 |

**Q36x4. On-site energy assessments * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q36x4. On-site energy assessments | 1 - No Interest | 29 | 35 | 32 | 96 |
| | 2 | 10 | 13 | 9 | 32 |
| | 3 | 25 | 26 | 23 | 74 |
| | 4 | 14 | 10 | 15 | 39 |
| | 5 - Very Interested | 22 | 16 | 21 | 59 |
| Total | | 100 | 100 | 100 | 300 |

**Q36x5. Account executives and trained technicians * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q36x5. Account executives and trained technicians | 1 - No Interest | 46 | 51 | 45 | 142 |
| | 2 | 15 | 12 | 16 | 43 |
| | 3 | 22 | 22 | 23 | 67 |
| | 4 | 9 | 10 | 8 | 27 |
| | 5 - Very Interested | 8 | 5 | 8 | 21 |
| Total | | 100 | 100 | 100 | 300 |

**Q36x6. Training, education and equipment seminars * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q36x6. Training, education and equipment seminars | 1 - No Interest | 47 | 58 | 41 | 146 |
| | 2 | 17 | 12 | 20 | 49 |
| | 3 | 20 | 21 | 23 | 64 |
| | 4 | 8 | 5 | 7 | 20 |
| | 5 - Very Interested | 8 | 4 | 9 | 21 |
| Total | | 100 | 100 | 100 | 300 |

## First Energy Ohio Commercial Survey

**Q36x7. Recommended upgrades and improvements * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q36x7. Recommended upgrades and improvements | 1 - No Interest | 25 | 30 | 15 | 70 |
| | 2 | 8 | 12 | 15 | 35 |
| | 3 | 40 | 31 | 31 | 102 |
| | 4 | 11 | 12 | 23 | 46 |
| | 5 - Very Interested | 16 | 15 | 16 | 47 |
| Total | | 100 | 100 | 100 | 300 |

**Q36x8. Decision making assistance * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q36x8. Decision making assistance | 1 - No Interest | 42 | 45 | 37 | 124 |
| | 2 | 17 | 13 | 17 | 47 |
| | 3 | 18 | 26 | 28 | 72 |
| | 4 | 13 | 7 | 8 | 28 |
| | 5 - Very Interested | 10 | 9 | 10 | 29 |
| Total | | 100 | 100 | 100 | 300 |

**Q37. Including yourself, how many employees work at your location? * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q37. Including yourself, how many employees work at your location? | 1 | 8 | 8 | 8 | 24 |
| | 2 - 4 | 15 | 32 | 20 | 67 |
| | 5 - 9 | 23 | 19 | 28 | 70 |
| | 10 - 19 | 25 | 24 | 19 | 68 |
| | 20 - 99 | 21 | 14 | 24 | 59 |
| | 100 - 499 | 6 | 1 | 1 | 8 |
| | 500+ | 2 | 1 | 0 | 3 |
| | Don't Know | 0 | 1 | 0 | 1 |
| Total | | 100 | 100 | 100 | 300 |

**Q38. How many employees work at this company across all locations? * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q38. How many employees work at this company across all locations? | 1 | 8 | 6 | 9 | 23 |
| | 2 - 4 | 13 | 26 | 18 | 57 |
| | 5 - 9 | 21 | 21 | 22 | 64 |
| | 10 - 19 | 23 | 19 | 15 | 57 |
| | 20 - 99 | 17 | 14 | 20 | 51 |
| | 100 - 499 | 10 | 4 | 6 | 20 |
| | 500+ | 5 | 8 | 8 | 21 |
| | Don't Know | 3 | 2 | 2 | 7 |
| Total | | 100 | 100 | 100 | 300 |

**Q39. How many locations does your company have? * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q39. How many locations does your company have? | 1 | 71 | 71 | 71 | 213 |
| | 2 - 4 | 12 | 12 | 16 | 40 |
| | 5 - 9 | 6 | 6 | 5 | 17 |
| | 10 - 99 | 7 | 7 | 4 | 18 |
| | 100 - 499 | 1 | 2 | 3 | 6 |
| | 500+ | 3 | 1 | 1 | 5 |
| | Don't Know | 0 | 1 | 0 | 1 |
| Total | | 100 | 100 | 100 | 300 |

## First Energy Ohio Commercial Survey

**Q40. In what country is your organization headquartered? * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q40. In what country is your organization headquartered? | U.S. | 98 | 99 | 99 | 296 |
| | Other country (SPECIFY) | 2 | 1 | 1 | 4 |
| Total | | 100 | 100 | 100 | 300 |

**Q41. In what state is your organization headquartered? * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q41. In what state is your organization headquartered? | | 2 | 1 | 1 | 4 |
| | ca | 0 | 0 | 1 | 1 |
| | dc | 1 | 0 | 0 | 1 |
| | fl | 1 | 0 | 0 | 1 |
| | il | 0 | 1 | 0 | 1 |
| | IL | 0 | 1 | 2 | 3 |
| | in | 1 | 0 | 0 | 1 |
| | KY | 0 | 1 | 0 | 1 |
| | ma | 1 | 0 | 0 | 1 |
| | MI | 0 | 1 | 0 | 1 |
| | mo | 1 | 0 | 0 | 1 |
| | nc | 1 | 0 | 0 | 1 |
| | ny | 0 | 2 | 1 | 3 |
| | oh | 59 | 62 | 72 | 193 |
| | OH | 32 | 29 | 21 | 82 |
| | TN | 0 | 1 | 1 | 2 |
| | tx | 1 | 0 | 0 | 1 |
| | TX | 0 | 0 | 1 | 1 |
| | WA | 0 | 1 | 0 | 1 |
| Total | | 100 | 100 | 100 | 300 |

**Q42. Where are major decisions made on energy efficiency investments? Would you say... * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q42. Where are major decisions made on energy efficiency investments? Would you say... | Headquarters | 64 | 50 | 55 | 169 |
| | Local office | 36 | 49 | 45 | 130 |
| | Other (SPECIFY) | 0 | 1 | 0 | 1 |
| Total | | 100 | 100 | 100 | 300 |

## First Energy Ohio Commercial Survey

**Q43. What is the principal industry of your company? * operating company Crosstabulation**

Count

| | | operating company | | | Total |
|---|---|---|---|---|---|
| | | CE | OE | TE | |
| Q43. What is the principal industry of your company? | Agriculture, Forestry, Fishing and Hunting | 0 | 0 | 1 | 1 |
| | Mining, Quarrying, and Oil and Gas Extraction | 0 | 1 | 0 | 1 |
| | Utilities | 0 | 0 | 1 | 1 |
| | Construction | 4 | 5 | 9 | 18 |
| | Manufacturing | 17 | 12 | 7 | 36 |
| | Wholesale Trade | 6 | 1 | 4 | 11 |
| | Retail Trade | 15 | 20 | 15 | 50 |
| | Transportation and Warehousing | 6 | 3 | 0 | 9 |
| | Finance and Insurance | 1 | 3 | 1 | 5 |
| | Real Estate and Rental and Leasing | 4 | 6 | 12 | 22 |
| | Professional, Scientific, and Technical Services | 2 | 1 | 4 | 7 |
| | Management of Companies and Enterprises | 2 | 0 | 0 | 2 |
| | Administrative and Support and Waste Management and Remediat | 0 | 0 | 2 | 2 |
| | Educational Services | 2 | 3 | 3 | 8 |
| | Health Care and Social Assistance | 5 | 5 | 2 | 12 |
| | Arts, Entertainment, and Recreation | 4 | 5 | 5 | 14 |
| | Accommodation and Food Services | 7 | 9 | 7 | 23 |
| | Other Services (except Public Administration) | 21 | 25 | 23 | 69 |
| | Public Administration | 4 | 1 | 4 | 9 |
| Total | | 100 | 100 | 100 | 300 |

**This foregoing document was electronically filed with the Public Utilities**

**Commission of Ohio Docketing Information System on**

**12/16/2009 2:14:33 PM**

**in**

**Case No(s). 09-0580-EL-EEC, 09-0581-EL-EEC, 09-0582-EL-EEC, 09-1942-EL-EEC, 09-1943-EL-EEC,**

Summary: Application Appendix D to 3-Year Energy Efficiency and Peak Demand Reduction Plan and Initial Benchmark Report electronically filed by Mr. James F Lang on behalf of Ohio Edison Company and The Cleveland Electric Illuminating Company and The Toledo Edison Company