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*prepared for*

# INDIANA MICHIGAN POWER COMPANY



An **AEP** Company

## 2021 POTENTIAL STUDY FINAL REPORT

*September*

# 2021

*prepared by*

**GDS ASSOCIATES INC  
BRIGHTLINE GROUP**

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# 1 EXECUTIVE SUMMARY

## 1.1 BACKGROUND & STUDY SCOPE

As part of their larger 2021 Integrated Resource Plan (IRP), Indiana-Michigan Power (“I&M”) commissioned GDS Associates (“GDS”) and Brightline Group, collectively “the GDS Team”, to assess energy savings potential in both the Indiana and Michigan jurisdictions of the I&M service area to help inform future planning efforts. Separate estimates of electric energy efficiency, demand response, and distributed energy resource (DER) potential were developed.

In addition, I&M also requested that GDS conduct limited primary market research to help inform key inputs in the market potential analysis. The final research sought focused on 1) collecting updated equipment penetration, saturation, and efficiency characteristics, 2) site conditions related to distributed energy resources, and 3) customer willingness to participate (WTP) in program offerings across select end-uses/measures.

This report focuses on the presentation of market research and potential savings for the I&M Indiana service area. A separate report presents the findings for the I&M Michigan service area.

## 1.2 TYPES OF POTENTIAL ANALYZED

This potential study provides a roadmap for both policy makers and I&M as they develop strategies and programs for energy efficiency (EE), demand response (DR), and distributed energy resources (DERs) in the I&M service area. In addition to technical and economic potential estimates, the development of achievable and program potential estimates for a range of feasible measures is useful for program planning and modification purposes. Unlike achievable and program potential estimates, technical and economic potential estimates do not include customer acceptance considerations for measures, which are often among the most important factors when estimating the likely customer response to new programs. For this study, the GDS Team produced the following estimates of demand side management potential:

- Technical potential
- Economic potential
- Achievable potential
  - Maximum achievable potential (“MAP”)
  - Realistically achievable potential (“RAP”)
- Program potential
  - Based off of RAP

## 1.3 APPROACH SUMMARY

The purpose of this market potential study is to provide a foundation for the continuation of utility-administered energy efficiency and demand response programs in the I&M service area, to determine the remaining opportunities for cost-effective energy savings, demand savings, and distributed energy resources for the I&M service area. This study has examined a full array of technologies, programs, and energy efficient building practices that are technically achievable.

The GDS Team used a bottom-up approach to estimate energy efficiency potential in the residential sector. Bottom-up approaches begin with characterizing the eligible equipment stock, estimating savings and screening for cost-effectiveness first at the measure level, then summing savings at the end-use and service area levels. In the commercial and industrial sectors, the GDS team utilized a top-down modeling approach to first estimate measure-level savings and costs as well as cost-effectiveness, and then applied cost-effective

measure savings to all applicable shares of electric energy load. Bottom-up approaches were also used in the demand response and DER analyses for all sectors.

## 1.4 STUDY LIMITATIONS AND CAVEATS

As with any assessment of potential, this study necessarily builds on various assumptions and data sources, including the following:

- Energy efficiency measure lives, savings, and costs (total measure costs, incremental costs, and incentive costs)
- Projected penetration rates for energy efficiency measures
- Projections of energy avoided costs
- Future known changes to codes and standards
- End-use saturations and fuel shares

While the GDS Team has sought to use the best and most current available data (including the use of new primary market research in key market subsegments of interest based on stakeholder feedback) there are often reasonable alternative assumptions which would yield slightly different results. For instance, the analysis assumes that many existing measures, regardless of their current efficiency levels, can be eligible for future installation and savings opportunities. Other studies may select a narrower viewpoint, limiting the amount of potential from equipment that is already considered to be energy efficient. Additionally, the models used in this analysis must make several assumptions regarding program delivery and the timing of equipment replacement that may ultimately occur more rapidly (or more slowly) than currently forecasted.

Furthermore, while the lists of energy efficiency measures examined in this study analysis represent technologies available on the market today as well as a limited number of emerging technologies not currently offered by I&M, these measure lists may not be exhaustive. The GDS Team acknowledges that new efficient technologies may become available over the course of the 20-year study timeframe that could produce efficiency gains and costs at different levels than those currently assumed.

Last, where possible, the GDS Team and I&M collaborated to ensure consistency with assumptions and methodological considerations that are expected to be employed by during the program planning process. However, final program designs and implementation strategies may need additional flexibility to target specific or underserved markets, address equity concerns, or react to changing customer preferences.

## 1.5 POTENTIAL SAVINGS OVERVIEW

The following several sub-sections provide an overview of the energy efficiency potential as well as summary demand response potential and distributed energy resource potential. Chapters 4 through 7 of this report provide additional summary data and methodological considerations and descriptions.

### 1.5.1 Energy Efficiency Potential for Residential Market Rate Customers

Figure 1-1 provides the technical, economic, MAP and RAP results for the 3-year, 10-year, and 20-year timeframes. The cumulative annual 3-year technical potential is 12.0% of forecasted sales, and the economic potential is 9.6% of forecasted sales. The cumulative annual 3-year MAP is 3.8% and the RAP is 3.4%, as a percentage of forecasted sales. Over the duration of the study timeframe the technical and economic potential rise to 39% and 33% of forecasted sales, respectively. This indicates that a large portion of the technical potential is cost-effective. The MAP and RAP rise respectively to 19% and 15% of forecasted sales over the study timeframe. The gap between economic potential and MAP/RAP represents market barriers to prospective program participants, both financial and non-financial, to achieving the full amount of economic potential.

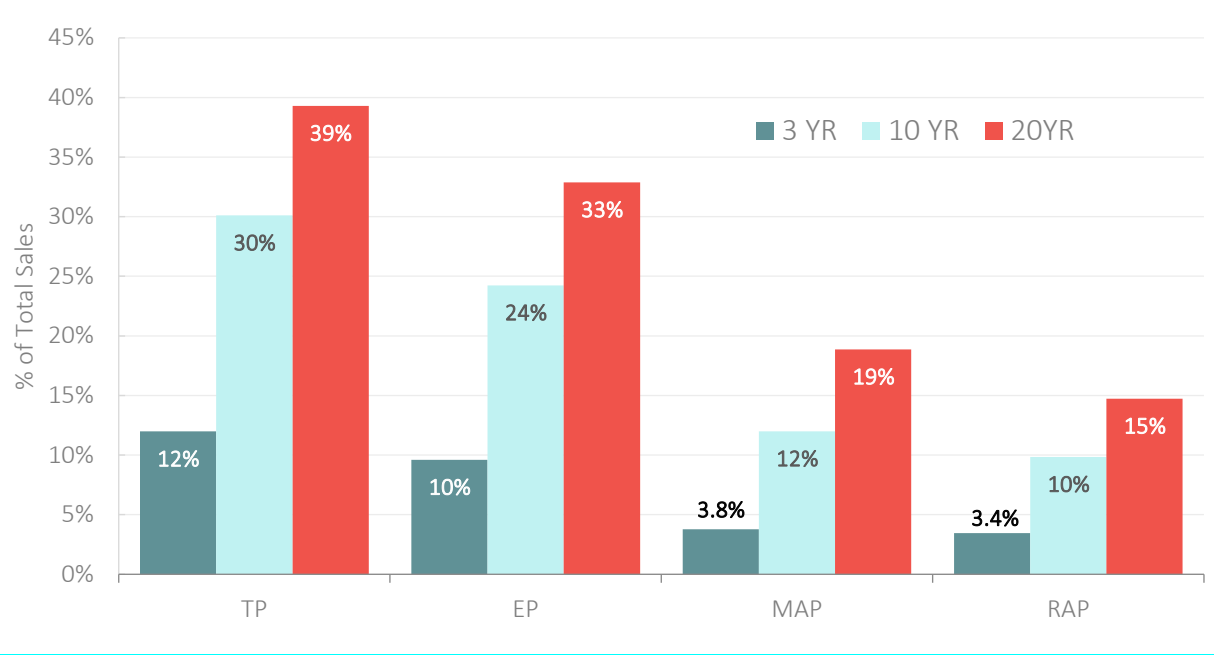


FIGURE 1-1: OVERVIEW OF RESIDENTIAL ENERGY EFFICIENCY POTENTIAL

Table 1-1 provides incremental and cumulative annual energy and demand savings for MAP and RAP across the next five years as well as over the 10-yr and 20-yr time horizons. Incremental RAP energy savings range from 51,000 MWh in 2023 to nearly 82,000 MWh by 2042, and cumulative RAP energy savings rise to more than 654,000 MWh by 2042.

TABLE 1-1 RESIDENTIAL MAP &amp; RAP POTENTIAL

|  | 2023   | 2024    | 2025    | 2026    | 2027    | 2032    | 2042    |
|--|--------|---------|---------|---------|---------|---------|---------|
| <b>Incremental Annual Energy (MWh)</b> |        |         |         |         |         |         |         |
| <b>MAP</b>                             | 54,178 | 60,854  | 68,856  | 74,284  | 79,181  | 93,219  | 92,961  |
| <b>RAP</b>                             | 51,137 | 55,857  | 61,248  | 64,477  | 67,382  | 77,504  | 81,753  |
| <b>Incremental Annual Energy (MW)</b>  |        |         |         |         |         |         |         |
| <b>MAP</b>                             | 12.6   | 14.2    | 16.0    | 17.3    | 18.3    | 20.6    | 20.5    |
| <b>RAP</b>                             | 11.3   | 12.3    | 13.2    | 13.9    | 14.4    | 16.2    | 17.0    |
| <b>Cumulative Annual Energy (MWh)</b>  |        |         |         |         |         |         |         |
| <b>MAP</b>                             | 54,178 | 106,390 | 161,163 | 215,487 | 272,022 | 516,067 | 837,342 |
| <b>RAP</b>                             | 51,137 | 98,599  | 146,823 | 193,585 | 241,112 | 423,566 | 654,240 |
| <b>Cumulative Annual Energy (MW)</b>   |        |         |         |         |         |         |         |
| <b>MAP</b>                             | 12.6   | 25.8    | 40.2    | 53.9    | 68.0    | 121.1   | 186.7   |
| <b>RAP</b>                             | 11.3   | 22.6    | 34.3    | 45.1    | 56.2    | 93.8    | 144.3   |

### 1.5.2 Energy Efficiency Potential for Commercial Customers

**Error! Reference source not found.** provides the technical, economic, MAP and RAP results for the 3-year, 10-year, and 20-year timeframes. The cumulative annual 3-year technical potential is 11% of forecasted commercial sales, and the economic potential is also 11% of forecasted commercial sales. The cumulative annual 3-year MAP is 6.6% and the RAP is 4.8%, as a percentage of forecasted commercial sales. Over the duration of the study timeframe the technical and economic potential rise to 37% of forecasted sales. The nearly identical technical and economic potential indicate that most measure are cost-effective under the UCT screen. The MAP and RAP rise respectively to 20% and 15% of forecasted sales over the study timeframe. The

gap between economic potential and MAP/RAP represents market barriers to prospective program participants, both financial and non-financial, to achieving the full amount of economic potential.

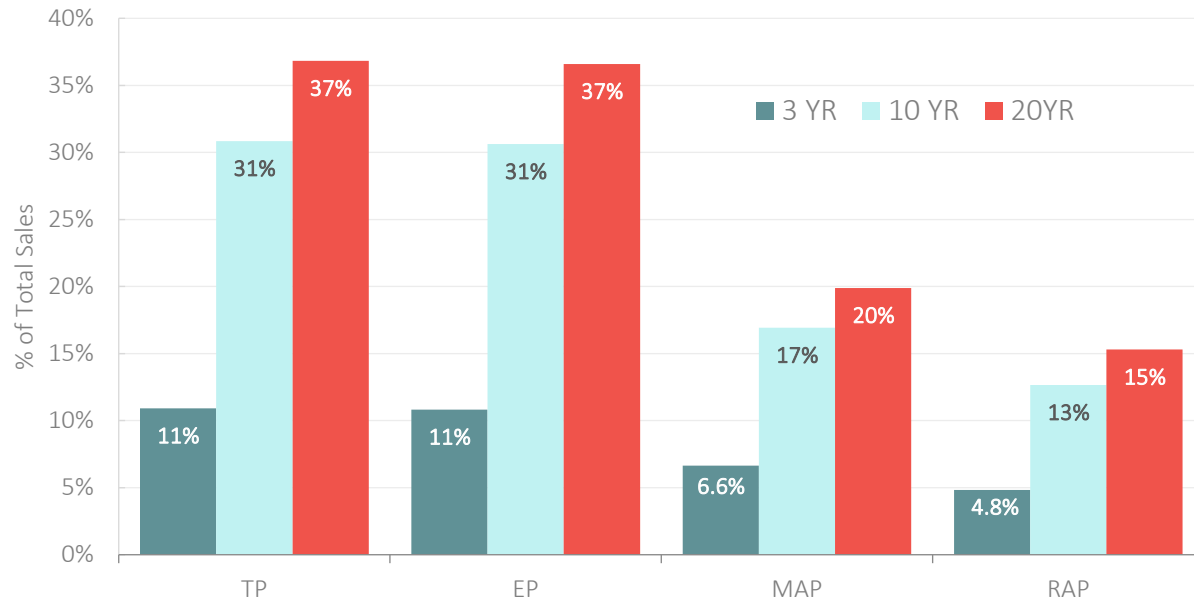


FIGURE 1-2: OVERVIEW OF COMMERCIAL ENERGY EFFICIENCY POTENTIAL

Table 1-2 provides incremental and cumulative annual commercial sector energy and demand savings for MAP and RAP across the next five years as well as over the 10-yr and 20-yr time horizons. Incremental RAP energy savings begin at roughly 80,200 MWh in 2023 followed by a steady decline over the next several years as commercial lighting savings become increasingly difficult to sustain. Cumulative RAP energy savings rise to approximately 600,000 MWh by 2042.

TABLE 1-2 COMMERCIAL MAP & RAP POTENTIAL

|  | 2023   | 2024    | 2025    | 2026    | 2027    | 2032    | 2042    |
|--|--------|---------|---------|---------|---------|---------|---------|
| <b>Incremental Annual Energy (MWh)</b> |        |         |         |         |         |         |         |
| MAP                                    | 80,262 | 76,588  | 76,131  | 77,699  | 77,833  | 77,755  | 89,588  |
| RAP                                    | 58,440 | 55,437  | 55,959  | 58,167  | 58,640  | 61,227  | 72,290  |
| <b>Incremental Annual Energy (MW)</b>  |        |         |         |         |         |         |         |
| MAP                                    | 12.4   | 12.1    | 12.4    | 13.1    | 13.6    | 13.2    | 16.8    |
| RAP                                    | 8.7    | 8.5     | 8.8     | 9.6     | 10.1    | 10.5    | 12.8    |
| <b>Cumulative Annual Energy (MWh)</b>  |        |         |         |         |         |         |         |
| MAP                                    | 80,262 | 156,317 | 231,267 | 304,046 | 369,794 | 623,649 | 780,233 |
| RAP                                    | 58,440 | 113,341 | 168,112 | 221,708 | 270,092 | 466,484 | 600,007 |
| <b>Cumulative Annual Energy (MW)</b>   |        |         |         |         |         |         |         |
| MAP                                    | 12.4   | 24.6    | 36.9    | 49.3    | 61.1    | 112.2   | 166.9   |
| RAP                                    | 8.7    | 17.2    | 26.0    | 34.9    | 43.6    | 82.6    | 124.4   |

### 1.5.3 Energy Efficiency Potential for Industrial Customers

Figure 1-3<sup>1</sup> provides the technical, economic, MAP and RAP results for the 3-year, 10-year, and 20-year timeframes. The cumulative annual 3-year technical and economic potential is 6% of forecasted industrial sales.<sup>1</sup> The cumulative annual 3-year MAP is 3.6% and the RAP is 2.6%, as a percentage

<sup>1</sup> Agriculture is included in the industrial sector savings and forecasted sales.



of forecasted commercial sales. Over the duration of the study timeframe the technical and economic potential rise to 21% of forecasted sales. The identical technical and economic potential indicate that all industrial savings are cost-effective under the UCT screen based on the broader end-use analysis employed for this study. The MAP and RAP rise respectively to 14% and 10% of forecasted sales over the study timeframe. As with the commercial sector the gap between economic potential and MAP/RAP represents market barriers to prospective program participants, both financial and non-financial, to achieving the full amount of economic potential.

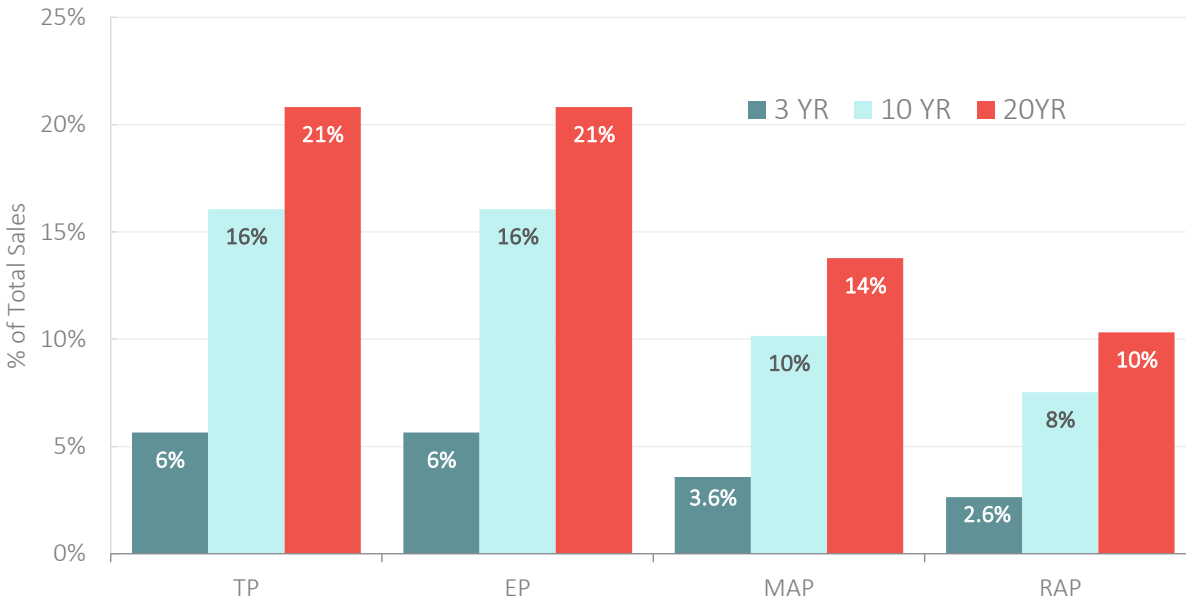


FIGURE 1-3: OVERVIEW OF INDUSTRIAL ENERGY EFFICIENCY POTENTIAL

Table 1-2 provides cumulative annual technical and economic potential results across the 2023-2027 (Years 1-5) timeframe, as well as for 2032 (10<sup>th</sup>-year) and 2042 (20<sup>th</sup>-year). Both technical and economic potential is nearly 194,000 MWh by 2025 and rises to approximately 752,500 MWh by 2042. Peak demand savings associated with technical and economic potential reach just under 34 MW by 2025 and reach approximately 130 MW by 2042.

TABLE 1-3 INDUSTRIAL MAP & RAP POTENTIAL

|  | 2023   | 2024   | 2025    | 2026    | 2027    | 2032    | 2042    |
|--|--------|--------|---------|---------|---------|---------|---------|
| <b>Incremental Annual Energy (MWh)</b> |        |        |         |         |         |         |         |
| MAP                                    | 41,551 | 40,892 | 39,948  | 46,691  | 46,013  | 51,231  | 54,938  |
| RAP                                    | 30,573 | 30,109 | 29,461  | 34,639  | 34,201  | 38,798  | 51,949  |
| <b>Incremental Annual Energy (MW)</b>  |        |        |         |         |         |         |         |
| MAP                                    | 7.2    | 7.1    | 6.9     | 8.0     | 7.9     | 8.8     | 9.4     |
| RAP                                    | 5.3    | 5.2    | 5.1     | 6.0     | 5.9     | 6.7     | 7.2     |
| <b>Cumulative Annual Energy (MWh)</b>  |        |        |         |         |         |         |         |
| MAP                                    | 41,551 | 82,444 | 122,392 | 161,140 | 198,771 | 356,788 | 497,824 |
| RAP                                    | 30,573 | 60,682 | 90,143  | 118,779 | 146,623 | 264,537 | 373,038 |
| <b>Cumulative Annual Energy (MW)</b>   |        |        |         |         |         |         |         |
| MAP                                    | 7.2    | 14.3   | 21.1    | 27.8    | 34.3    | 61.5    | 85.8    |
| RAP                                    | 5.3    | 10.5   | 15.5    | 20.5    | 25.3    | 45.6    | 64.2    |

1.5.4 Demand Response Potential for All Customers

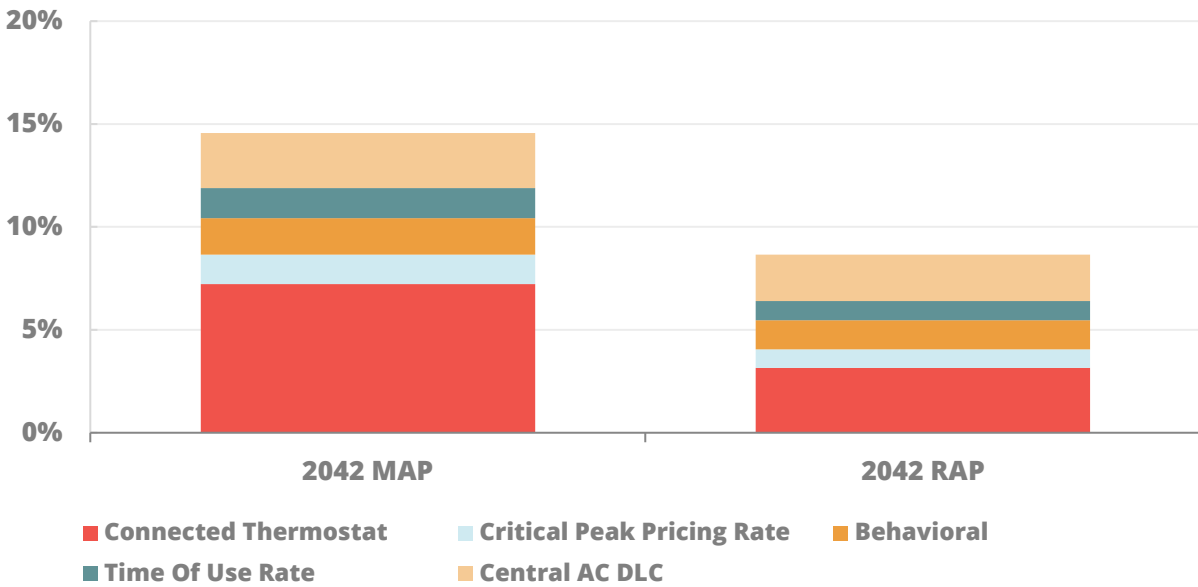


Figure 1-4 shows the 2042 residential MAP and RAP demand response potential for Indiana. These demand reduction values are presented at the customer meter level.

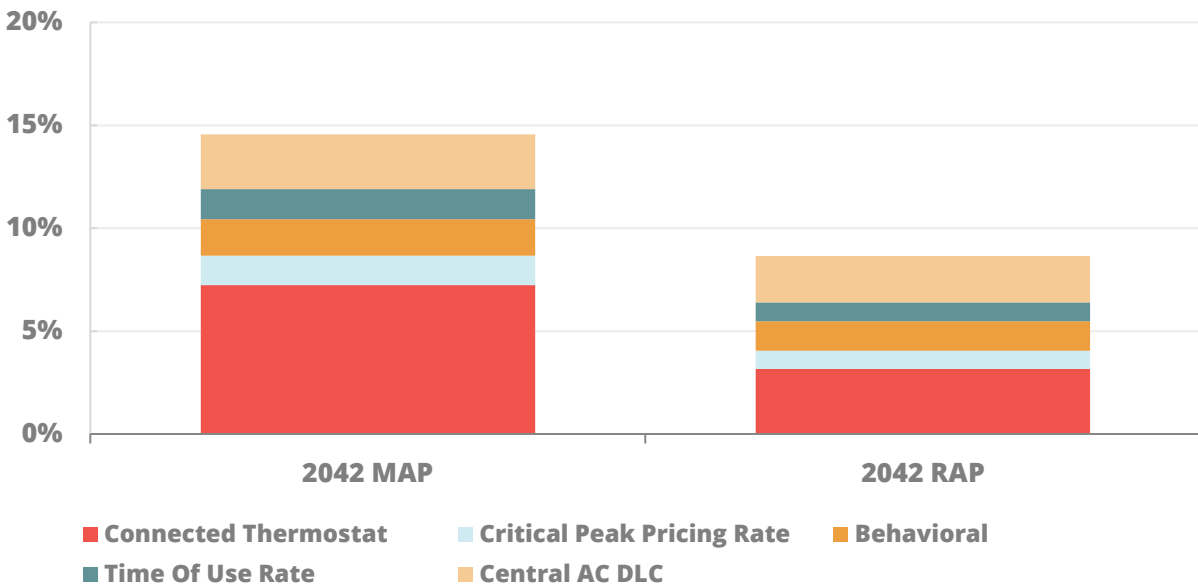


FIGURE 1-4 SUMMER PEAK MW RESIDENTIAL SECTOR BASE CASE RESULTS AS % OF 2042 RESIDENTIAL CLASS LOAD (MI)

Figure 1-5 shows the 2042 C&I sector MAP and RAP demand response potential for Indiana. These demand reduction values are present at the customer meter level.

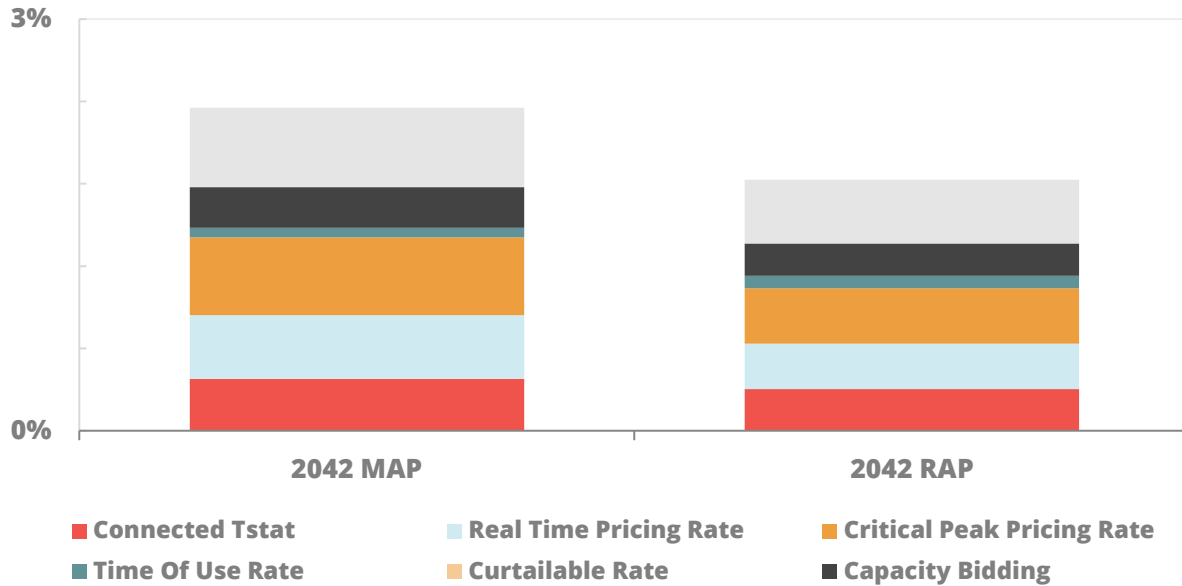


FIGURE 1-5: SUMMER PEAK MW C&I SECTOR BASE CASE RESULTS AS % OF 2042 C&I CLASS LOAD (MI)

**1.5.5 Distributed Energy Resource Potential for All Customers**

Table 1-4 summarizes the CHP cumulative annual potential estimates for electric demand and Table 1-5 for electric energy within I&M’s Indiana service territory. 2042 technical market potential for CHP represents 17.3% of the 2042 non-residential sector sales forecast.

TABLE 1-4: SUMMARY OF CHP ELECTRIC DEMAND MARKET POTENTIAL

| Year | Technical Peak Capacity (MW) | Economic (MW) | MAP (MW) | RAP (MW) |
|------|------------------------------|---------------|----------|----------|
| 2023 | 3                            | 0             | 0        | 0        |
| 2027 | 49                           | 0             | 0        | 0        |
| 2032 | 154                          | 0             | 0        | 0        |
| 2042 | 185                          | 0             | 0        | 0        |

TABLE 1-5: SUMMARY OF CHP ELECTRIC ENERGY MARKET POTENTIAL

| Year | Technical (MWh) | Economic (MWh) | MAP (MWh) | RAP (MWh) |
|------|-----------------|----------------|-----------|-----------|
| 2023 | 73,191          | 0              | 0         | 0         |
| 2027 | 426,286         | 0              | 0         | 0         |
| 2032 | 1,339,712       | 0              | 0         | 0         |
| 2042 | 1,608,618       | 0              | 0         | 0         |

Table 1-6 summarizes the solar PV cumulative annual potential estimates for electric demand and Table 1-7 for electric energy within I&M’s Indiana service territory. The residential 2042 technical market potential for solar PV represents

55.9% of the 2042 residential sector sales forecast. Additionally, the non-residential 2042 technical market potential represents 64% of the 2042 non-residential sector sales forecast.

**TABLE 1-6: SUMMARY OF SOLAR PV ELECTRIC DEMAND MARKET POTENTIAL**

| Year | Technical DC Capacity (MW) | Technical Peak Capacity (MW) | Economic (MW) | MAP (MW) | RAP (MW) |
|------|----------------------------|------------------------------|---------------|----------|----------|
| 2023 | 333                        | 109                          | 0             | 0        | 0        |
| 2027 | 1,918                      | 601                          | 0             | 0        | 0        |
| 2032 | 5,658                      | 1,771                        | 0             | 0        | 0        |
| 2042 | 6,628                      | 2,074                        | 0             | 0        | 0        |

**TABLE 1-7: SUMMARY OF SOLAR ELECTRIC ENERGY MARKET POTENTIAL**

| Year | Technical (MWh) | Economic (MWh) | MAP (MWh) | RAP (MWh) |
|------|-----------------|----------------|-----------|-----------|
| 2023 | 433,828         | 0              | 0         | 0         |
| 2027 | 2,399,988       | 0              | 0         | 0         |
| 2032 | 7,069,659       | 0              | 0         | 0         |
| 2042 | 8,280,565       | 0              | 0         | 0         |

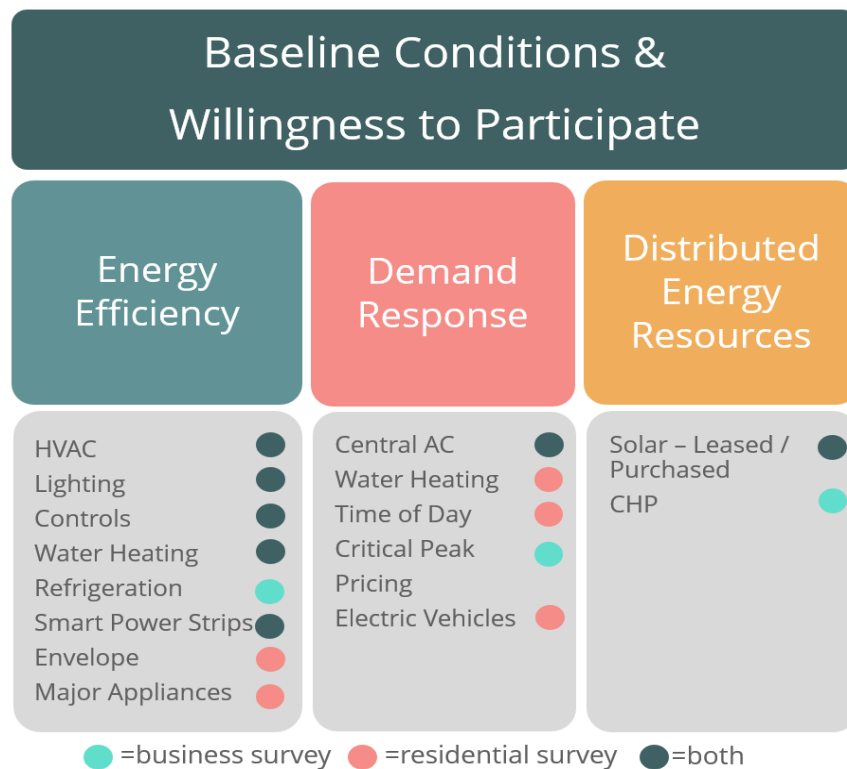
## 2 MARKET RESEARCH

The initial step in the assessment of future potential is to develop a clear understanding of the current market segments, as well as a clear understanding of the market research data available in the I&M service area. In late 2020 I&M requested the GDS team to conduct market research that would inform critical elements of the market potential study. The research objectives were developed in coordination with I&M and the potential study team. Primary market research activities were focused on collecting updated equipment penetration, saturation, and efficiency characteristics; and customer willingness to participate (WTP) in program offerings across select end-uses/measures.

The resulting data was used to develop updated estimates of baseline and efficient equipment saturation estimates in the market potential study and develop expected long-term adoption rates for energy efficiency, demand response, and DERs over the study horizon. The GDS Team conducted surveys of business and residential customers during January and February of 2021 with the objectives of gathering primary data on the following topics:

- Willingness to participate in a variety of energy efficiency, demand response and distributed energy resource (DER) program scenarios.
- Baseline / Saturation of energy-using equipment
- Program awareness
- Barriers

Survey results served as inputs for the market potential model, enabling the market potential analysis to take into consideration the specific market conditions that exist in I&M's service territory. **Error! Reference source not found.** Figure 2-1 presents a summary of the specific technologies and Demand Side Management (DSM) topic areas addressed within the business and residential surveys.



**FIGURE 2-1 SURVEY SCOPE**

Data collection results specific to the I&M's Indiana service area are provided below.

## 2.1 PRIMARY DATA COLLECTION

The following subsections provide an overview of the primary data collection activities conducted by the GDS team to support the market potential analysis of energy efficiency, demand response, and DER potential. The GDS team conducted survey research in the residential and nonresidential sectors.

### 2.1.1 Survey Administration

Surveys were administered in an online format, with email recruitment followed by two reminder emails sent at approximately one-week increments. VuPoint Research administered the business and residential online surveys and conducted telephone follow up to businesses who had initiated but not completed the survey after the initial email recruitment period. BrightLine Group administered the online multifamily property owner and manager survey and conducted both email and telephone follow up recruitment.

Respondents who completed the survey were entered into a drawing to win an electronic gift card. \$100 gift cards were awarded to ten randomly selected business survey respondents and five randomly selected residential survey respondents. All four multifamily property owner / manager respondents received a \$100 gift card.

### 2.1.2 Sampling Approach

The team developed a sampling approach with an objective of achieving industry-standard statistical significance (90% confidence, 10% relative precision, or 90/10) at the strata level for all questions, taking into consideration there would be variation in the willingness to participate (WTP) modules included in each survey to keep survey length manageable for respondents. The sample design assumed a coefficient of variation (CV) of 0.5 for the residential sample, and 0.7 for the business sample, assuming there would likely be greater variation among business responses.

Overall, the response outcomes were positive, and the survey effort produced a robust set of primary data. The team set aggressive sampling targets, with a goal of having high levels of statistical significance for detailed sub-groups within the population. The response fell short on some of those targets, but the team gathered a strong data set that meets the needs of the analysis. Table 2-1 sampling targets and response outcomes.

The business survey achieved 90/10 at the strata level for the baseline questions, and at the state level for other questions (i.e., 189 business respondents started the survey and completed the baseline questions but did not complete the survey in its entirety).<sup>2</sup> The residential survey achieved 90/10 for all strata except multifamily (see Table 2-2).<sup>3</sup>

TABLE 2-1 SURVEY SAMPLING TARGETS AND RESPONSE SUMMARY

| State   | Target Completes | Completes (Entire Survey) | Completes (Baseline Questions) |
|---|------------------|---------------------------|--------------------------------|
| <b>Nonresidential Customer Survey</b><br><i>Stratification: state, small /large</i> |                  |                           |                                |
| Indiana   | 530              | 375                       | 504                            |

<sup>2</sup> The response to business baseline questions would meet 90/10 for IN assuming a CV of 0.7, and for MI assuming a CV of 0.6.

<sup>3</sup> The residential survey achieved 90/10 at the strata level for Indiana multifamily – income qualified, but not for other multifamily strata.

| State  | Target Completes | Completes (Entire Survey) | Completes (Baseline Questions) |
|--|------------------|---------------------------|--------------------------------|
| Michigan   | 522              | 158                       | 218                            |
| <b>Total</b>   | <b>1,052</b>     | <b>533</b>                | <b>722</b>                     |
| Residential Customer Survey  |                  |                           |                                |
| <i>Stratification: state, single / multifamily, and income-qualified / market rate</i> |                  |                           |                                |
| Indiana  | 544              | 820                       | 1,085                          |
| Michigan   | 544              | 829                       | 1,114                          |
| <b>Total</b>   | <b>1,088</b>     | <b>1,649</b>              | <b>2,199</b>                   |

### 2.1.3 Residential Online Survey

The residential customer research targeted homeowners and tenants in the following key segments: income-eligible and market-rate customers, and customers occupying single family and multifamily homes. Income-eligible was defined by household size as 200% of the federal poverty threshold.

A residential online customer survey collected home characteristics, equipment penetration for key end-uses – such as heating, cooling, water heating, insulation, smart power strips, thermostats, major appliances, solar PV systems, pool pumps, and electric vehicles – and information on barriers and willingness to adopt a range of energy efficient measures at varying incentive levels. Table 2-2 provides the targeted and completed residential online surveys in Indiana.

TABLE 2-2 TARGETED AND COMPLETED RESIDENTIAL SECTOR ONLINE SURVEYS – INDIANA

| Strata                      | State   | Target Sample Size | Total Completed |
|-----------------------------|---------|--------------------|-----------------|
| Single Family – Market Rate | Indiana | 136                | 289             |
| Multifamily – Market Rate   | Indiana | 136                | 6               |
| Single Family – IQ          | Indiana | 136                | 441             |
| Multifamily – IQ            | Indiana | 136                | 84              |

### 2.1.4 Business Sector Online Survey

Primary data collection was also conducted in the nonresidential sector via an online survey with business customers. The survey collected business and facility characteristics, as well as equipment penetrations for key end-uses, such as lighting, heating, cooling, water heating, refrigeration, thermostats, and on-site generation (including solar PV systems). The nonresidential online survey also collected information on barriers to energy efficiency and willingness-to-adopt energy efficient measures under various incentive offerings. In total, GDS collected survey data from 722 commercial customers, with 504 in the I&M Indiana service area and 218 from the I&M Michigan service area. GDS examined the annual energy consumption data from the survey participants and developed a weighting adjustment based on the sample's consumption by building type relative to the I&M population in both the Indiana and Michigan service area.

## 2.2 RESIDENTIAL MARKET DATA

The tables below provide some key home and equipment characteristics by key market segment. The results have been weighted to align the sample distribution with that of the overall residential populations in Indiana and Michigan.

Table 2-3 presents some key household and equipment characteristics for the residential sector by I&M service area, housing type, and income type. The data presented below includes the average number of units per household for occupants, water devices, thermostat and plug load controls, and key appliances.

TABLE 2-3: KEY HOUSEHOLD AND EQUIPMENT CHARACTERISTICS (AVG # PER HH)

|                                  | Total | I&M – Indiana | I&M – Michigan | Single Family | Multi-family | Market Rate | Income Qualified |
|----------------------------------|-------|---------------|----------------|---------------|--------------|-------------|------------------|
| <b>Household Characteristics</b> |       |               |                |               |              |             |                  |
| Avg. # of Occupants              | 2.5   | 2.6           | 2.2            | 2.5           | 2.3          | 2.6         | 2.5              |
| Avg # of Showerheads             | 1.7   | 1.6           | 1.9            | 1.7           | 1.4          | 1.5         | 1.8              |
| Avg # of Faucets                 | 3.8   | 3.6           | 4.2            | 3.9           | 3.0          | 3.2         | 4.1              |
| Avg # of Thermostats             | 1.4   | 1.4           | 1.6            | 1.5           | 1.3          | 1.4         | 1.5              |
| Avg # of Smart Thermostats       | 0.2   | 0.2           | 0.3            | 0.2           | 0.1          | 0.1         | 0.2              |
| Avg # of Smart Power Strips      | 0.5   | 0.4           | 0.5            | 0.5           | 0.5          | 0.6         | 0.4              |
| Avg # of Refrigerators           | 1.5   | 1.5           | 1.7            | 1.6           | 1.1          | 1.3         | 1.6              |
| Avg # of Stand-Alone Freezers    | 0.6   | 0.6           | 0.6            | 0.6           | 0.4          | 0.6         | 0.6              |

Table 2-4 provides example summary data by market segment for major residential end-uses. These data points of electric appliances and water heating equipment penetrations help quantify the eligible population of equipment by market segment. In addition, the research also provided recent market conditions for remaining efficiency opportunities. For example, the research determined the percent of households that have emerging technologies such as heat pump dryers and heat pump water heaters, as well as the percent of homes with insulation and air sealing needs.

TABLE 2-4: SELECT RESIDENTIAL MARKET RESEARCH RESULTS FOR KEY END-USES

| End-Use   | Equipment                               | Total | I&M – Indiana | I&M – Michigan | Single Family | Multi-family | Market Rate | Income Qualified |
|-----------|---|-------|---------------|----------------|---------------|--------------|-------------|------------------|
| WH        | Electric WH                             | 36%   | 36%           | 37%            | 34%           | 57%          | 37%         | 35%              |
|           | Heat Pump WH<br>(as a % of electric WH) | 2%    | 2%            | 2%             | 2%            | 2%           | 3%          | 2%               |
| Shell     | Uninsulated Attic                       | 3%    | 3%            | 2%             | 3%            | 6%           | 5%          | 2%               |
|           | Uninsulated Walls                       | 3%    | 4%            | 3%             | 3%            | 13%          | 6%          | 2%               |
|           | Uninsulated Basement Wall               | 24%   | 22%           | 30%            | 24%           | 15%          | 29%         | 22%              |
|           | Uninsulated Basement Floor/Crawl        | 30%   | 26%           | 42%            | 31%           | 12%          | 29%         | 30%              |
|           | Single Pane Windows                     | 14%   | 15%           | 9%             | 13%           | 40%          | 20%         | 12%              |
|           | Prior Insulation/Sealing Activities     | 55%   | 55%           | 56%            | 57%           | 23%          | 50%         | 57%              |
| Appliance | In Unit Clothes Washer                  | 86%   | 86%           | 88%            | 90%           | 62%          | 81%         | 89%              |
|           | Common Area Clothes Washer              | 5%    | 5%            | 4%             | 3%            | 15%          | 7%          | 3%               |
|           | In Unit Clothes Dryer                   | 86%   | 85%           | 87%            | 89%           | 61%          | 80%         | 88%              |



| End-Use | Equipment                                 | Total | I&M – Indiana | I&M – Michigan | Single Family | Multi-family | Market Rate | Income Qualified |
|---------|---|-------|---------------|----------------|---------------|--------------|-------------|------------------|
|         | Heat Pump Dryer<br>(as a % of all Dryers) | 5%    | 6%            | 4%             | 5%            | 9%           | 6%          | 5%               |
| DER     | Solar Panels Present?                     | 1%    | 1%            | 1%             | 1%            | 0%           | 0%          | 1%               |
|         | Electric Vehicle                          | 2%    | 2%            | 2%             | 2%            | 1%           | 1%          | 2%               |

**Error! Reference source not found.** provides current information on LED lighting in the residential market for I&M market segments. At least one LED bulb can be found in 90% of I&M Indiana residences. According to survey participants, roughly 60% of all sockets in the I&M Indiana service area have LEDs.<sup>4</sup>

TABLE 2-5 RESIDENTIAL LIGHTING BULB TYPE

|                               | Total | I&M – Indiana | I&M – Michigan | Single Family | Multi-family | Market Rate | Income Qualified |
|-------------------------------|-------|---------------|----------------|---------------|--------------|-------------|------------------|
| <b>% w/ at least one lamp</b> |       |               |                |               |              |             |                  |
| LED                           | 91%   | 90%           | 95%            | 93%           | 78%          | 88%         | 92%              |
| CFL                           | 62%   | 62%           | 62%            | 63%           | 53%          | 59%         | 63%              |
| Incandescent/Halogen          | 62%   | 62%           | 65%            | 63%           | 55%          | 56%         | 65%              |
| Fluorescent                   | 49%   | 48%           | 55%            | 51%           | 36%          | 42%         | 52%              |
| <b>% of all lamps</b>         |       |               |                |               |              |             |                  |
| LED                           | 59%   | 59%           | 59%            | 60%           | 53%          | 57%         | 60%              |
| CFL                           | 16%   | 16%           | 15%            | 15%           | 18%          | 18%         | 15%              |
| Incandescent/Halogen          | 19%   | 19%           | 20%            | 18%           | 23%          | 19%         | 19%              |
| Fluorescent                   | 6%    | 6%            | 6%             | 6%            | 7%           | 6%          | 7%               |

## 2.3 BUSINESS MARKET DATA

Table 2-6 provides select demographic information in the business sector. In general, I&M Indiana commercial facilities had similar characteristics to the I&M Michigan service area. I&M Indiana commercial participants indicated a slightly higher likelihood of leasing their facilities and operating slightly smaller facilities.

TABLE 2-6 COMMERCIAL BUILDING CHARACTERISTICS

|                                  | Total | I&M Indiana | I&M Michigan |
|----------------------------------|-------|-------------|--------------|
| Own                              | 78%   | 75%         | 85%          |
| Lease                            | 21%   | 24%         | 15%          |
| <b>Occupy Entire Facility</b>    | 80%   | 80%         | 80%          |
| <b>Occupy Part of Facility</b>   | 11%   | 11%         | 11%          |
| <b>Occupy None (Manage Only)</b> | 9%    | 9%          | 9%           |

<sup>4</sup> Estimates are based on participant self-report data. GDS anticipates that participants likely overestimate the overall saturation of LED lighting relative to the total number of sockets found in the residence. Still, the data supports that LED saturation is rapidly increasing and becoming the dominant bulb type in residences.

|                                    | Total  | I&M Indiana | I&M Michigan |
|------------------------------------|--------|-------------|--------------|
| % of Facilities Built Before 1990  | 67%    | 68%         | 65%          |
| Average Size of Facility (Sq. Ft)  | 31,820 | 29,990      | 36,287       |
| Average Weekday Hours of Operation | 9.4    | 9.0         | 10.6         |
| Average Weekend Hours of Operation | 7.5    | 6.9         | 9.1          |

The penetration of different lighting fixtures in I&M businesses is shown in Table 2-7. Linear LED fixtures are estimated to be nearly 50% of all facilities. In I&M Indiana area, participants indicated lower saturation of LED lighting (as a % of total facility lighting) than I&M Michigan. The table also includes the % of facilities with different lighting control types as well as % of lighting that is controlled. Table 2-8 provides example summary data by business size for major end-uses.

TABLE 2-7: COMMERCIAL SECTOR LIGHTING END-USE CHARACTERISTICS

| End Use                         | Equipment                       | Total | I&M Indiana | I&M Michigan |
|---------------------------------|---------------------------------|-------|-------------|--------------|
| Lighting<br>(% with Type)       | Linear Fluorescent              | 71%   | 73%         | 65%          |
|                                 | Linear LED                      | 47%   | 47%         | 47%          |
|                                 | Nonlinear LED                   | 50%   | 48%         | 53%          |
|                                 | Incandescent                    | 43%   | 42%         | 45%          |
| Lighting<br>(% of all Lighting) | Linear Fluorescent              | 43%   | 46%         | 33%          |
|                                 | Linear LED                      | 23%   | 22%         | 26%          |
|                                 | Nonlinear LED                   | 16%   | 15%         | 21%          |
|                                 | Other                           | 18%   | 18%         | 19%          |
| Lighting Controls               | Occupancy Sensors               | 14%   | 13%         | 16%          |
|                                 | <i>% of Lighting Controlled</i> | 4%    | 4%          | 4%           |
|                                 | Daylight Dimming                | 6%    | 5%          | 8%           |
|                                 | <i>% of Lighting Controlled</i> | 1%    | 1%          | 2%           |
|                                 | Time Controls                   | 17%   | 17%         | 17%          |
|                                 | <i>% of Lighting Controlled</i> | 2%    | 2%          | 3%           |
|                                 | Advanced Lighting Controls      | 3%    | 2%          | 4%           |
|                                 | <i>% of Lighting Controlled</i> | >1%   | >1%         | 2%           |

TABLE 2-8 COMMERCIAL SECTOR EQUIPMENT PENETRATION ACROSS KEY END-USES

| End Use | Equipment            | Penetration |             |              |
|---------|----------------------|-------------|-------------|--------------|
|         |                      | Total       | I&M Indiana | I&M Michigan |
| Heating | Boiler               | 6%          | 6%          | 6%           |
|         | Furnace              | 70%         | 71%         | 65%          |
|         | Heat Pump            | 1%          | 1%          | 1%           |
|         | Electric Resistance  | >1%         | 1%          | >1%          |
|         | Unit Heater          | 9%          | 8%          | 12%          |
|         | Infrared             | 3%          | 3%          | 2%           |
| Cooling | Packaged System AC   | 45%         | 43%         | 51%          |
|         | Split System AC      | 51%         | 52%         | 49%          |
|         | Heat Pump (Ducted)   | 25%         | 23%         | 32%          |
|         | Heat Pump (Ductless) | 5%          | 4%          | 9%           |

| End Use            | Equipment                                 | Penetration |             |              |
|--------------------|---|-------------|-------------|--------------|
|                    |   | Total       | I&M Indiana | I&M Michigan |
|                    | Chiller                                   | 4%          | 4%          | 4%           |
|                    | Window AC                                 | 22%         | 21%         | 23%          |
| Thermostats        | Smart Thermostats                         | 9%          | 10%         | 6%           |
|                    | % of Space Controlled by Smart Thermostat | 57%         | 55%         | 66%          |
| Ventilation        | Demand Controlled Ventilation             | 5%          | 5%          | 6%           |
|                    | Vent Hoods                                | 20%         | 19%         | 23%          |
|                    | Vent Hoods with Demand Controlled Vent.   | 27%         | 24%         | 32%          |
| Refrigeration      | Has Commercial Refrigeration?             | 16%         | 15%         | 19%          |
|                    | Display Cases w/ Night Covers             | 21%         | 17%         | 31%          |
|                    | Ref. Walk-Ins with Strip Curtains         | 31%         | 26%         | 41%          |
|                    | Ice Machines                              | 11%         | 11%         | 11%          |
| Smart Strips       | Smart Strips (% of All Strips)            | 48%         | 57%         | 25%          |
| Water Heating      | Electric WH                               | 47%         | 44%         | 56%          |
| On-Site Generation | Renewable Energy Generation               | 2%          | 1%          | 2%           |
|                    | Emergency/Backup Generation               | 7%          | 7%          | 6%           |
|                    | Cogeneration/CHP                          | 0%          | 0%          | 0%           |

## 2.4 ADOPTION CURVE MARKET DATA

In addition to new primary research on building and energy-consuming equipment characteristics in the I&M service area, one of the major objectives of the primary research was to develop survey research that could be utilized to develop measure/program adoption curves to develop estimates of achievable potential. Table 2-9 describes the end-uses or categories in which adoption rate estimates were developed for energy efficiency, demand response programs, or distributed energy resources by the GDS team.

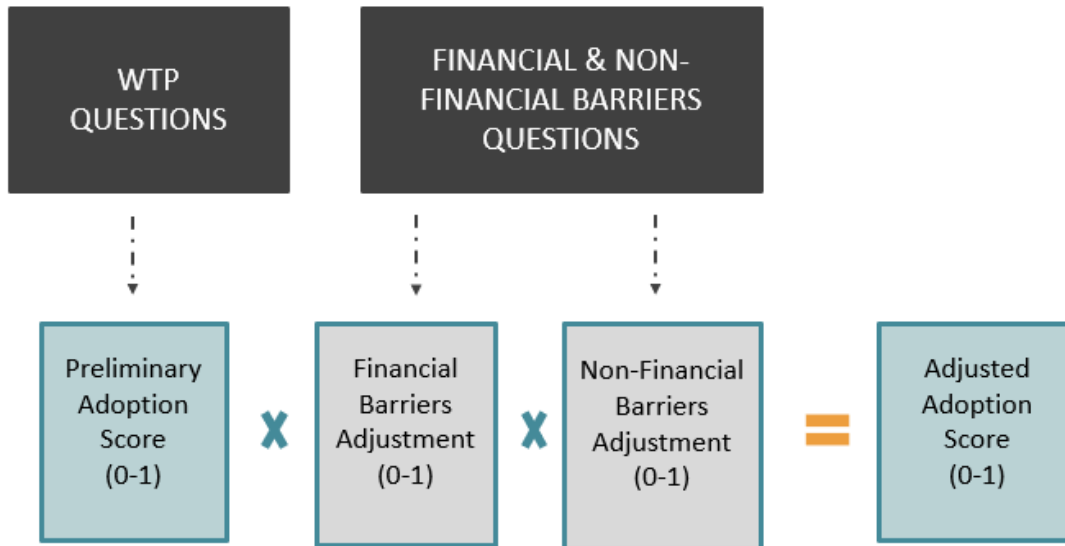
TABLE 2-9 ADOPTION RATE CATEGORIES ANALYZED

| Willingness to Participate | EE End Uses   | DR Programs   | DER   |
|----------------------------|---|---|---|
| Residential Customers      | Heating/CAC<br>Water Heating<br>Major Appliances<br>Insulation/Air Sealing    | Central AC Control<br>Water Heater<br>Control<br>Customized DR<br>(Time of Use) | Solar PV (Purchase)<br>Electric Vehicles<br>(Evs) |
| Business Customers         | HVAC Equipment<br>Water Heating Equip.<br>Refrigeration<br>Lighting Equipment | Central AC Control<br>Customized DR<br>(Critical Peak<br>Pricing)               | Solar PV (Purchase)<br>Solar PV (Lease)           |

Adoption rate calculations were based on a battery of questions which assessed (1) the respondent's willingness to adopt energy efficiency technologies or participate in demand response programs in scenarios

with varying levels of program support, (2) the magnitude of the respondent's financial and non-financial barriers to adoption/participation. Adoption rates were calculated based on the equation shown below.

EQUATION 2-1 ADOPTION RATE FORMULA FOR FINAL ADOPTION SCORE



Direct willingness-to-participate questions are the starting point of measure/program-specific adoption curve calculations. For each item, respondents were asked to rate the likelihood that they would purchase the energy efficient version of the equipment, or participate in the DR program, at various incentive levels, including no incentive and an incentive that covers the full incremental (or total) cost.

Responses to financial and non-financial barrier questions were then used to adjust the preliminary adoption score. If "cost" was a consideration to prevent customers from purchasing energy efficient equipment, GDS assumed a financial barrier adjustment. The 0% incentive level was reduced by 100%, the 25% incentive level was reduced by 80%, the 50% incentive level was reduced by 60%, the 75% incentive level was reduced by 40%, and the 100% incentive level was reduced by 20%.

If another reason was a consideration to prevent customers from purchasing energy efficient equipment, GDS assumed a non-financial barrier adjustment. The 0% incentive level was reduced by 50%, the 25% incentive level was reduced by 40%, the 50% incentive level was reduced by 30%, the 75% incentive level was reduced by 20%, and the 100% incentive level was reduced by 10%.

#### 2.4.1 Residential Sector Final Adoption Scores

Table 2-10 presents the adjusted adoption scores (after financial and non-financial adjustments) for I&M Indiana residential customers. In general, Indiana residential customers indicated a lesser willingness to participate and install HVAC-related energy efficiency measures compared to Michigan residential customers, particularly at lower incentive levels relative to other end-uses.

TABLE 2-10 RESIDENTIAL FINAL ADOPTION SCORES BY INCENTIVE LEVEL

| Indiana (All Homeowners) | Annual Incentive (% of incremental measure cost) |     |     |     |      |
|--------------------------|--|-----|-----|-----|------|
|                          | 0%   | 25% | 50% | 75% | 100% |
| HVAC                     | 31%  | 41% | 54% | 66% | 81%  |
| Water Heat               | 18%  | 28% | 41% | 54% | 74%  |
| Insulation/Air Sealing   | 15%  | 27% | 41% | 55% | 80%  |
| Appliances               | 18%  | 27% | 41% | 56% | 73%  |

Final adoption scores for residential direct load control (DLC) of central AC and water heating systems are shown in Table 2-11, depending on varying annual incentive levels. Current annual incentive offerings are \$25 for direct load control of central air conditioning systems. Table 2-12 provides the final adoption score for a Time of Use (TOU) rate option based on a prescribed difference between peak and off-peak rates.

TABLE 2-11 DLC DEMAND RESPONSE FINAL ADOPTION SCORES BY INCENTIVE LEVEL

| DR – DLC        | Annual Incentive (% of incremental measure cost) |      |      |      |      |      |
|-----------------|--|------|------|------|------|------|
|                 | Market Rate                                      | \$0  | \$15 | \$25 | \$35 | \$50 |
| Central AC – SF |  | 13%  | 25%  | 32%  | 37%  | 46%  |
| Central AC – MF |  | 20%  | 26%  | 29%  | 31%  | 43%  |
| Water Heat – SF |  | 11%  | 16%  | 20%  | 24%  | 31%  |
| Water Heat – MF |  | 19%  | 22%  | 24%  | 26%  | 34%  |
| Income-Eligible | \$0  | \$15 | \$25 | \$35 | \$50 |      |
| Central AC – SF |  | 16%  | 27%  | 32%  | 35%  | 41%  |
| Central AC – MF |  | 20%  | 28%  | 32%  | 34%  | 41%  |
| Water Heat – SF |  | 10%  | 16%  | 20%  | 25%  | 32%  |
| Water Heat – MF |  | 12%  | 18%  | 23%  | 29%  | 38%  |

TABLE 2-12 TOU DEMAND RESPONSE FINAL ADOPTION SCORES BY INCENTIVE LEVEL

| DR – Rate       | Lower off-peak rate |        |        |        |        |
|-----------------|---------------------|--------|--------|--------|--------|
|                 | Market Rate         | \$0.08 | \$0.06 | \$0.04 | \$0.03 |
| DR-TOU – SF     |                     | 18%    | 25%    | 33%    | 41%    |
| DR TOU – MF     |                     | 16%    | 16%    | 16%    | 24%    |
| Income-Eligible | \$0.08              | \$0.06 | \$0.04 | \$0.03 |        |
| DR-TOU – SF     |                     | 22%    | 26%    | 31%    | 38%    |
| DR TOU – MF     |                     | 24%    | 27%    | 35%    | 39%    |

The final adoption scores related to select distributed energy resources are presented in Table 2-13. Survey questions asked participants about their likelihood to purchase and/or lease solar PV systems as well as electric vehicles assuming different incentive level amounts (or payback periods).

TABLE 2-13: RESIDENTIAL DER FINAL ADOPTION SCORES

| Solar Purchase     | Annual Incentive (% of incremental measure cost) |     |     |     |      |
|--------------------|--|-----|-----|-----|------|
|                    | 0%   | 25% | 50% | 75% | 100% |
| Homeowners/Tenants | 6%   | 14% | 28% | 45% | 72%  |
| Electric Vehicle   | Annual Incentive (% of incremental measure cost) |     |     |     |      |
|                    | 0%   | 25% | 50% | 75% | 100% |
| Homeowners/Tenants | 5%   | 12% | 24% | 14% | 38%  |

#### 2.4.2 Business Sector Final Adoption Scores

Table 2-14 presents the adjusted adoption scores (after financial and non-financial adjustments) for I&M Indiana nonresidential customers across several end-uses, depending on whether the investment is a minor or

major investment. Small businesses indicated a minor investment to be approximately \$4,000 or less. Final adoption scores were generally similar regardless of the initial investment amount.

In contrast to the residential sector energy efficiency WTP research, the nonresidential WTP survey questions incentives were described in the form of payback periods to better align with how purchasing decisions are likely to be considered.

**TABLE 2-14 NONRESIDENTIAL FINAL ADOPTION SCORES BY INCENTIVE LEVEL AND INVESTMENT TYPE – I&M INDIANA**

| Minor Inv.    | Payback Performance (after incentive) |         |         |         |         |
|---------------|---------------------------------------|---------|---------|---------|---------|
|               | 10 Years                              | 5 Years | 3 Years | 1 Year  | 0 Years |
| HVAC          | 33%                                   | 44%     | 55%     | 67%     | 75%     |
| Lighting      | 48%                                   | 60%     | 71%     | 79%     | 84%     |
| Refrigeration | 28%                                   | 37%     | 50%     | 63%     | 72%     |
| Water Heat    | 50%                                   | 61%     | 72%     | 82%     | 87%     |
| Major Inv.    | Payback Performance (after incentive) |         |         |         |         |
|               | 10 Years                              | 5 Years | 3 Years | 1 Years | 0 Years |
| HVAC          | 39%                                   | 48%     | 57%     | 67%     | 74%     |
| Lighting      | 54%                                   | 63%     | 71%     | 79%     | 83%     |
| Refrigeration | 32%                                   | 40%     | 52%     | 64%     | 69%     |
| Water Heat    | 57%                                   | 67%     | 74%     | 82%     | 86%     |

Final adoption scores for business sector demand response options are shown in Table 2-15, depending on varying annual incentive levels for direct load control as well as volunteer load reduction. The table also provides business sector responses for participation likelihood in a Critical Peak Pricing (CPP) DR rate program on a prescribed difference between peak and off-peak rates designs.

**TABLE 2-15 NONRESIDENTIAL DEMAND RESPONSE FINAL ADOPTION SCORES**

| DR – DLC              | Annual Incentive        |      |      |      |      |
|-----------------------|-------------------------|------|------|------|------|
|                       | \$0                     | \$15 | \$25 | \$35 | \$50 |
| Central AC            | 21%                     | 24%  | 27%  | 30%  | 34%  |
| DR – Rates            | Lower than current rate |      |      |      |      |
|                       | 5%                      | 10%  | 20%  | 40%  |      |
| Critical Peak Pricing | 18%                     | 22%  | 30%  | 40%  |      |

Table 2-16 provides the final adoption scores for solar PV purchasing and/or leasing in the business sector.

**TABLE 2-16 NONRESIDENTIAL DER FINAL ADOPTION SCORES**

| Purchased Solar | Payback Years |      |      |      |      |
|-----------------|---------------|------|------|------|------|
|                 | 10 YR         | 5 YR | 3 YR | 1 YR | 0 YR |
| Business        | Did not ask   | 39%  | 51%  | 66%  | 72%  |
| Solar Lease     |               |      |      |      |      |

|          | 0%  | 10% | 33% | 67% | 85% |
|----------|-----|-----|-----|-----|-----|
| Business | 17% | 24% | 32% | 41% | 49% |

## 3 BASELINE FORECAST

The load forecast is a critical input into I&M's 2021 DSM Market Potential Study, having various uses in estimation of residential and business sector potential. Therefore, the GDS Team took considerable time and effort to review I&M's most recently completed load forecast models and documentation to produce the various forecast components necessary as inputs into this analysis. The chapter describes the various ways in which the forecast is used for this study, presents the baseline and disaggregated forecasts, and describes the methodology and data sources used by GDS for the purposes of generating the load forecasts that were used in the potential analysis.

### 3.1 I&M LOAD FORECASTING SYSTEM

I&M employs a sophisticated load forecasting system that uses econometric and Statistically Adjusted End-Use ("SAE") models to project number of consumers, average consumption per consumer, and total energy sales by class. Residential, Commercial, and Industrial consumers are projected using traditional econometric techniques. Residential average usage and commercial energy sales are projected using SAE model specifications. Industrial energy sales are projected using econometric techniques.

A residential SAE model specification takes end-use data drawn from utility, regional, and even national sources and develops monthly end-use indices designed to predict average household consumption. The end-use data includes market shares of key electric consuming appliances, average device efficiency trends, average building shell efficiency trends, price elasticity of demand, income elasticity of demand, and elasticity associated with the average number of people per household. A cooling index is developed to represent space cooling load and is further modified by Cooling Degree Days to incorporate summer weather into the model. Likewise, a heating index representing space heating is modified by Heating Degree Days. Finally, a base index is developed to represent consumption of all other end-uses in the home.

A commercial SAE model specification is very similar to a residential specification, except end-use energy intensity indices are developed for each commercial building type based on area employment in various industry codes. National and regional commercial data is used to estimate end-use consumption for various industries (for example, restaurants will have higher cooking usage shares than offices).

I&M also projects the impacts of DSM programs it has run in the past. The DSM impacts included in the load forecast are inputs derived from the previous IRP study conducted by I&M in 2018 and 2019.

### 3.2 ADJUSTMENTS TO THE I&M INDIANA LOAD FORECAST

Before assessing the future potential for energy efficiency, demand response, or distributed energy resources in the I&M Indiana service area, a few modifications to I&M's 2020-vintage forecast were necessary to create an adjusted baseline forecast. These modifications are addressed in more detail below.

#### 3.2.1 Code Frozen Efficiency Adjustments

The base case forecast I&M developed uses the appliance efficiency forecast published in the Energy Information Administration's (EIA) Annual Energy Outlook (AEO) as inputs for the various end-use indices contained within the SAE models. While this is the best practice for developing a base case forecast, to determine potential impacts of DSM/EE programs it is helpful to understand how energy sales would be impacted if appliance efficiencies were held constant at the prevailing U.S. code level. If the base case efficiency level is below code in a given year, the base case forecasted energy sales will be adjusted downward in said year, and if the base case efficiency level is above code in a given year, forecasted energy sales will be adjusted upward. The process for the code frozen efficiency adjustments follows, using residential cooling load as an



example. The “code frozen” forecast allows for a comparison to the base case forecast so that energy savings due to above or below code appliances can be isolated and accounted for separately from DSM/EE programs.

A forecast number of customers is multiplied by the cooling end-use market share saturation and the year over year change in the number of appliances to determine the number of cooling end-use appliances in the I&M service territory. The change in the number of appliances from year to year is then multiplied by the prevailing U.S code efficiency level in that year, while the number of existing appliances is multiplied by the base year efficiency level. The result is a weighted average of existing and new stock appliances and their efficiencies, creating the code frozen efficiency level for the I&M Indiana service territory. Next, the percent difference between the Base Case efficiency level and the Code Frozen efficiency level is multiplied by the base case energy consumption for cooling load, resulting in the adjustment applicable to the base case forecast for cooling load. The results of the code frozen efficiency adjustments are shown below in Figure 3-1 and Figure 3-2.

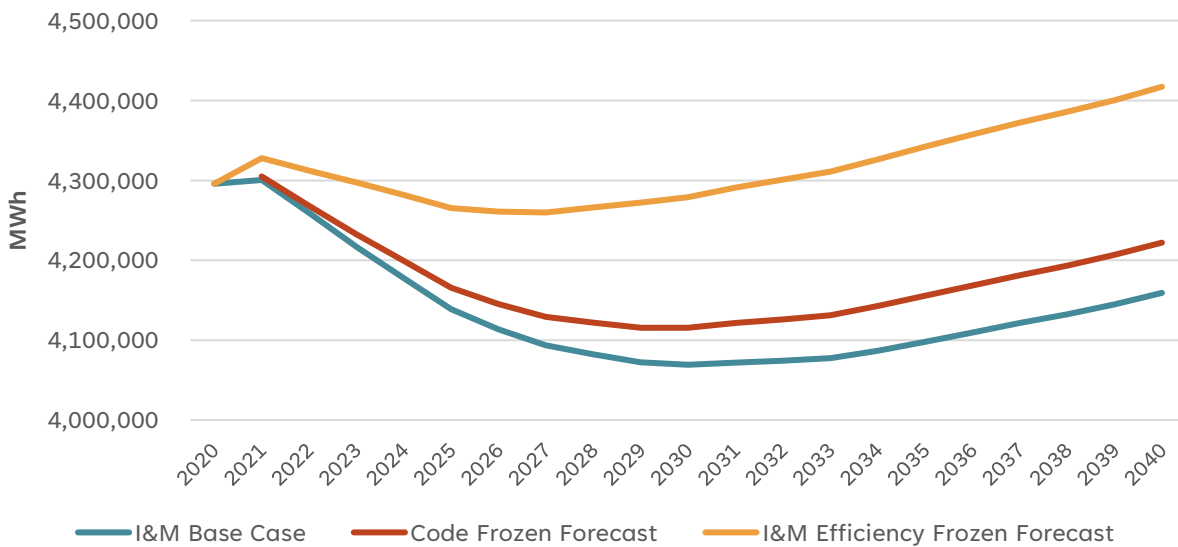
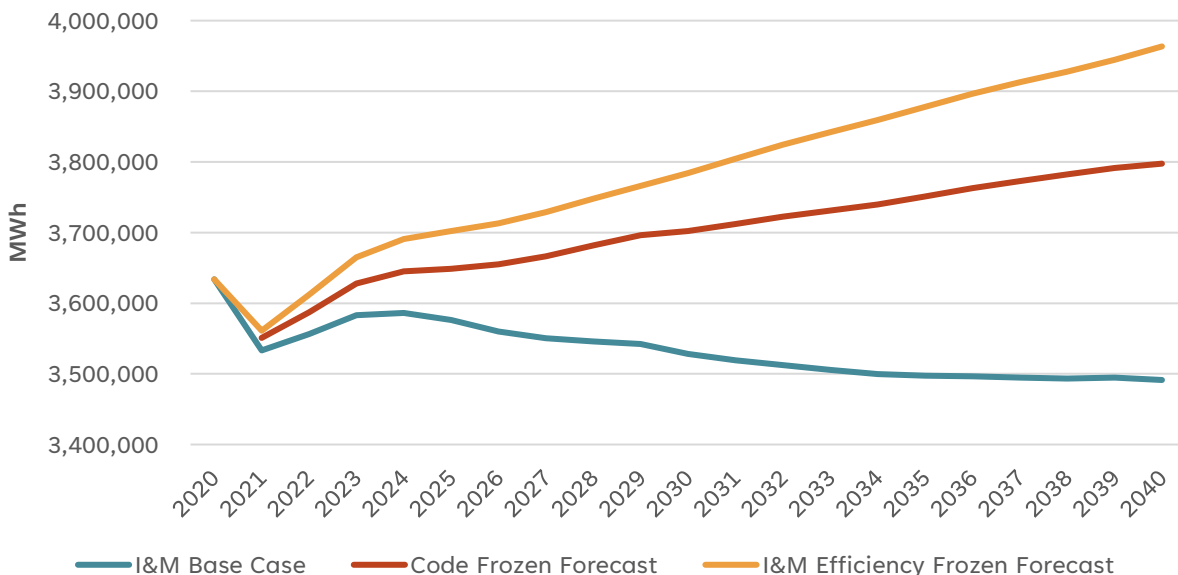


FIGURE 3-1. INDIANA RESIDENTIAL SECTOR FORECAST TRENDS



## FIGURE 3-2. INDIANA COMMERCIAL SECTOR FORECAST TRENDS

### 3.2.2 Adjustment for Large C&I Opt-Out Customers

The 2019 I&M Indiana business sector customer database containing usage and demographic data for all C&I customers, with indication for large customer opt-out of DSM/EE programs status was utilized to determine how to adjust for opt-out customers. The number of customers and total energy use was calculated both including and excluding opt-out customers. The load forecast for the C&I sectors was adjusted down by the percent of load attributed to opt-out customers from the customer database, in effect excluding from the potential analysis any load of opt-out customers. The opt-out adjustment was held constant for all years of the load forecast. In total, GDS removed approximately 9% of commercial energy sales and 50% of industrial energy sales due to large customer opt-out.

### 3.2.3 Reclassification of Load

The 2019 I&M Indiana C&I sector customer database designated commercial and industrial rate code based on current tariff definition. When only using the account type/tariff definition to classify customers as either commercial or industrial, there were several manufacturing type premises classified as commercial, as well as several customers that GDS typically classifies as commercial classified as industrial, (i.e. a retail service building coded as an industrial account).

Additionally, the dataset also identified each business by Standard Industry Code (SIC). To reclassify I&M C&I sector data, GDS mapped industry codes to a specified building type and classified the building type as either commercial or industrial. Customers with a building type classified as “Industrial Manufacturing” were coded as Industrial customers, while all other building types were coded as Commercial. While the goal for this analysis is to determine the actual amount of energy sales attributable to the commercial and industrial customer classes as a whole, it is only achievable by analyzing individual customer data. The result of this reclassification was a shift of approximately 0.5% of industrial sector sales, or 32,925 MWh, to the commercial sector. This 0.5% shift was then applied to the I&M base case forecasted sales for the commercial and industrial classes. It is important to have accurate energy sales by customer class so that specific DSM/EE programs have the correct amount of energy sales eligible for savings.

## 3.3 LOAD FORECAST DISAGGREGATION

The baseline forecasts represent projected total energy sales by class. For the potential studies, it is useful to have the class forecasts disaggregated in several different ways. This section presents the forecast disaggregation scenarios used by GDS to determine intensity by end-use.

### 3.3.1 Residential Sector

The residential electric calibration effort led to an end-use intensity breakdown as shown below in . Overall, we estimated per home consumption to be 10,470 kWh per year. The “Other” end use is the leading end-use which includes plug loads such as electronics and miscellaneous small appliances,. This reflects the increasing prominence of electronics and other plug-in load devices.

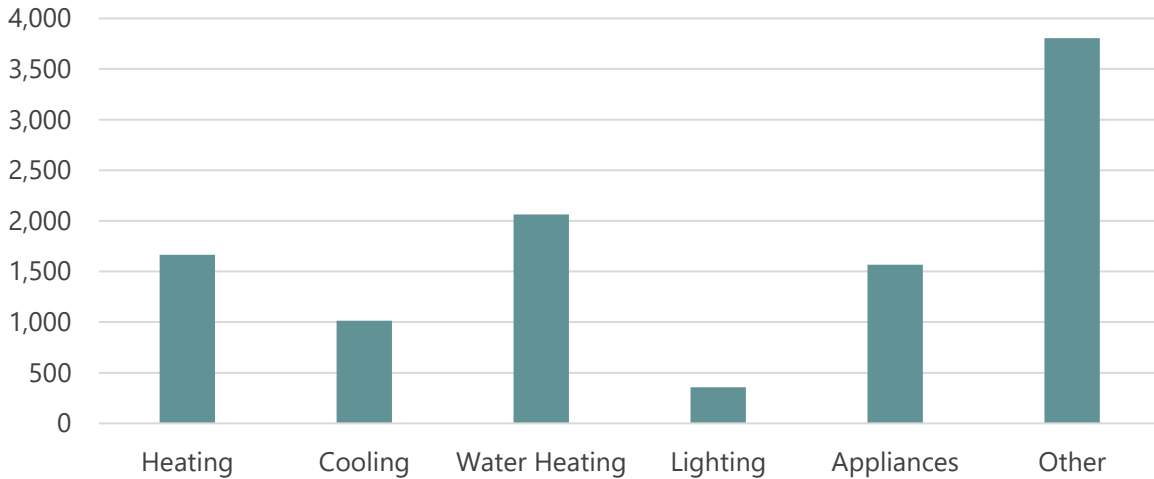


FIGURE 3-3 RESIDENTIAL ELECTRIC END-USE BREAKDOWN

3.3.2 C&I Sector

In the C&I sector, disaggregated forecast data provides the foundation for the development of energy efficiency potential estimates. GDS received a base case sales forecast from I&M for the residential, commercial and industrial sectors. As noted above, the C&I forecast was adjusted from the base case by using SIC information from I&M to reclassify usage as commercial or industrial. SIC information from I&M, along with CBECS building type consumption tables, was then used to segment the forecast into building types. The forecast was further segmented into end-uses by building type using CBECS 2012 end-use survey data. Figure 3-4 provides a breakdown of commercial electric sales by building type and industrial sales by sector.<sup>5</sup>

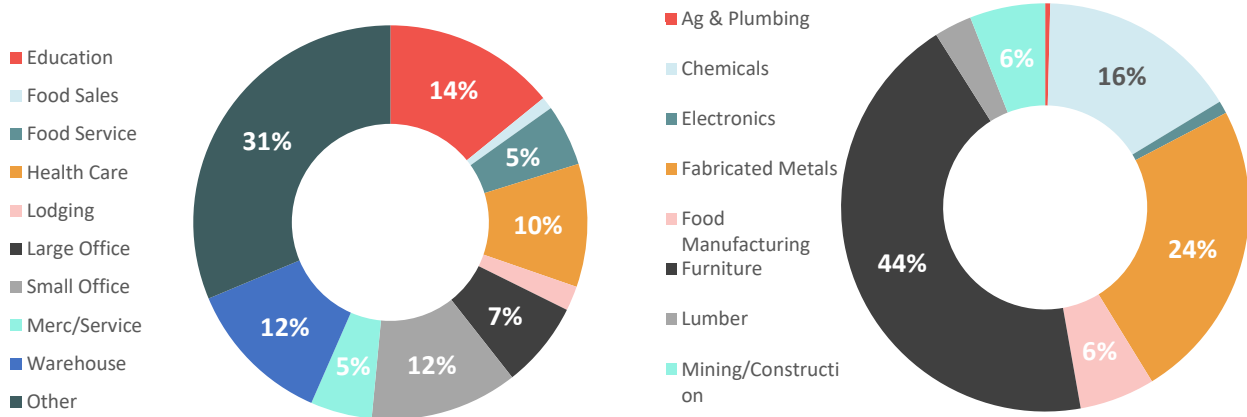


FIGURE 3-4: COMMERCIAL ELECTRIC SALES BREAKDOWN BY BUILDING TYPE

Figure 3-5 provides an illustration of the leading end-uses across all building types in the commercial sector. Lighting, space cooling, and ventilation are the primary end-uses with a significant share of load across most building types. Shares of refrigeration and office/computing are often dependent on the type of building, with

<sup>5</sup> “Other” commercial building types include buildings that engage in several different activities, a majority of which are commercial (e.g. retail space), though the single largest activity may be industrial or agricultural; “other” also includes miscellaneous buildings that do not fit into any other category.

refrigeration loads greatest in food sales and food service while office/computing loads are greatest in offices and education.

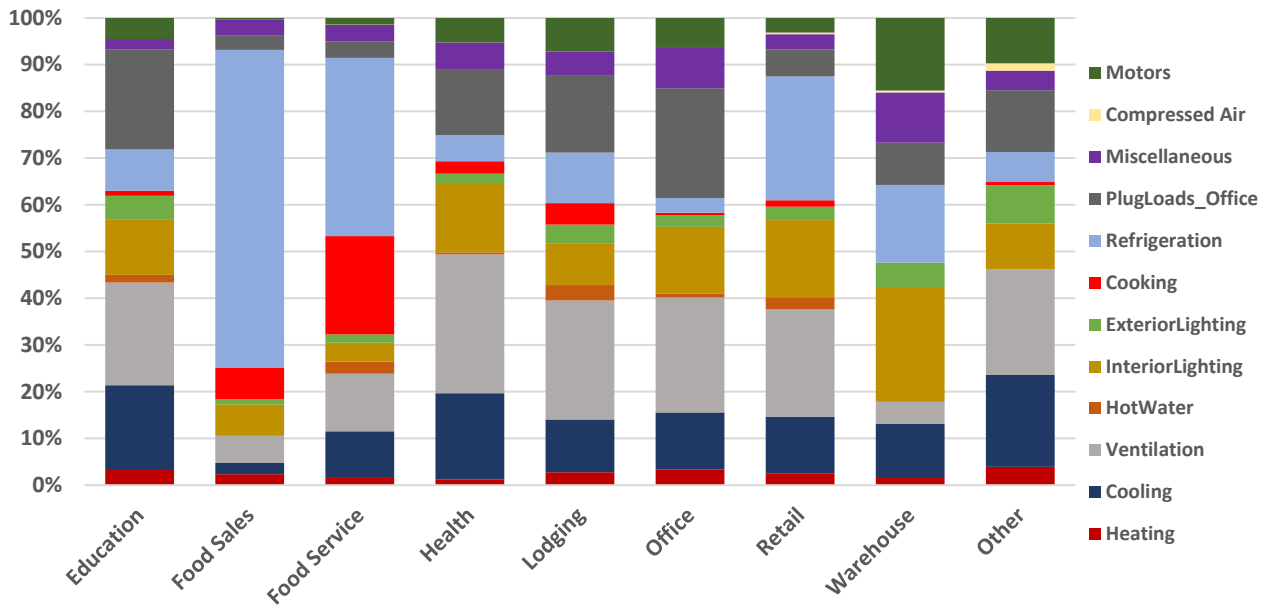


FIGURE 3-5: COMMERCIAL ELECTRIC END-USE BREAKDOWN BY BUILDING TYPE<sup>6</sup>

Industrial sales were also segmented by end-use based on the overall distribution of sales by industry type and EIA MECS data on end-use consumption by industrial segment. Figure 3-5 provides a breakdown of the sales by end-use. Overall, the weighted average industrial sales by end-use in the I&M Indiana service area was roughly 38% Machine Drive, 16% Process Heat, 10% HVAC, 9% Compressed Air, 9% Lighting, and 7% Process Refrigeration. The remaining 12% was split between other process and other facility loads.

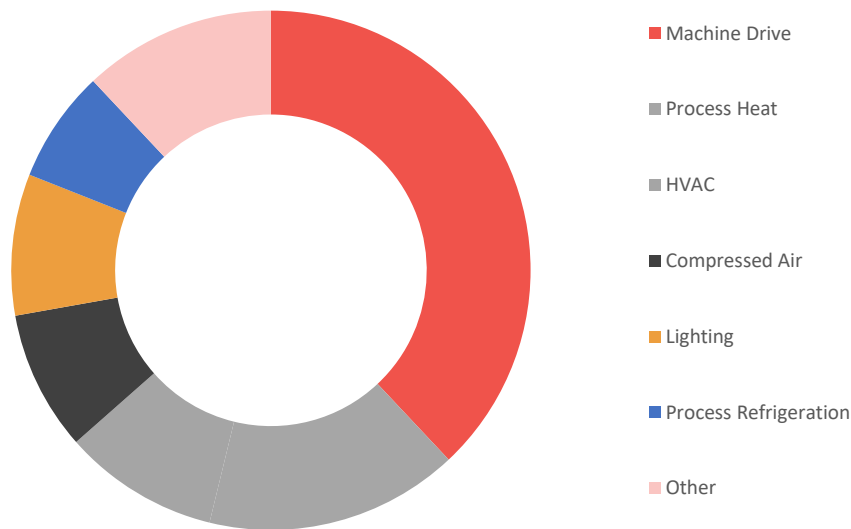


FIGURE 3-6: INDUSTRIAL ELECTRIC END-USE BREAKDOWN BY BUILDING TYPE

<sup>6</sup> Data labels for segments that contribute less than 5% of the total sector sales were removed to improve Figure readability.

## 4 ENERGY EFFICIENCY POTENTIAL ANALYSIS

### 4.1 ANALYSIS APPROACH

This section describes the overall methodology utilized to assess the electric energy efficiency potential in the I&M service area. The main objectives of the energy efficiency potential analysis were to estimate the technical, economic, maximum, and realistic achievable potential savings from energy efficiency in the I&M Indiana service territory; and to quantify these estimates of potential in terms of MWh and MW savings, for each level of energy efficiency potential.

#### 4.1.1 Overview of Approach

For the residential sector, GDS utilized a bottom-up approach to the modeling of energy efficiency potential, whereby measure-level estimates of costs, savings, and useful lives were used as the basis for developing the technical, economic, and achievable potential estimates. The measure data was used to build-up the technical potential, by applying the data to each relevant market segment. The measure data allowed for benefit-cost screening to assess economic potential, which was in turn used as the basis for achievable potential, taking into consideration incentives and estimates of annual adoption rates. For the C&I sector, GDS employed a bottom-up modeling approach to first estimate measure-level savings, costs, and cost-effectiveness, and then applied measure savings to all applicable shares of energy load.

#### 4.1.2 Market Characterization

The initial step in the analysis was to gather a clear understanding of the current market segments in the I&M Indiana service area. The GDS team coordinated with I&M to gather utility sales and customer data and existing market research to define appropriate market sectors, market segments, vintages, saturation data and end uses. This information served as the basis for completing a forecast disaggregation and market characterization of both the residential and nonresidential sectors.

##### 4.1.2.1 Forecast Disaggregation

As noted in Chapter 3, through the development of the baseline forecasts, the GDS Team produced disaggregated forecasts by sector and end-use. The resulting aggregate baseline forecasts were disaggregated by sector and then further segmented as follows:

- **Residential.** The residential forecast was broken out by housing type between existing income qualified and market-rate customers as well as new construction.
- **Commercial.** Typically based on major EIA CBECS business types: retail, warehouse, food sales, office, lodging, health, food service, education, and miscellaneous.
- **Industrial.** As determined by actual load consumption shares and major industry types as defined by EIA's Manufacturing Energy Consumption Survey (MECS) data.

The segmentation analysis was performed by applying I&M Indiana-specific segment and end-use consumption shares, derived from I&M's customer database and SIC code analysis (building segmentation), and by EIA CBECS and MECS data (end-use segmentation) to forecast year sales. Within the residential, commercial, and industrial market segments, the sector level disaggregated forecasts were further segmented by the major end uses shown in Table 4-1.

TABLE 4-1: ELECTRIC END-USE LOADS

| Residential    | C&I                           |                              |
|----------------|-------------------------------|------------------------------|
|                | Commercial                    | Industrial                   |
| Heating        | Interior Lighting             | Lighting                     |
| Cooling        | Exterior Lighting             | HVAC                         |
| Water Heating  | Refrigeration                 | Machine Drive                |
| Cooking        | Space Cooling                 | Process Heat                 |
| Refrigerator   | Space Heating                 | Process Cool / Refrigeration |
| Freezer        | Ventilation                   | Other Process                |
| Dishwasher     | Water Heating                 | Process – Machine Drive      |
| Clothes Washer | Plug Loads / Office Equipment | Other Facility               |
| Dryer          | Cooking                       | Compressed Air               |
| TV             | Other                         | Water / Wastewater           |
| Light          | Whole Building / Behavioral   | Process – Agriculture        |
| Miscellaneous  |                               | Whole Building / Behavior    |
|                |                               |                              |
|                |                               |                              |

**4.1.2.2 Eligible Opt-Out Customers**

In Indiana, individual commercial or industrial customer sites with a peak load greater than 1MW are eligible to opt out of utility-funded electric energy efficiency programs. In the I&M Indiana service area, approximately 9% of total retail commercial sales have opted out of utility-funded electric energy efficiency programs, while roughly 50% of total retail industrial sales have opted out.

Figure 4-1 shows the total sales for the C&I sectors, as well as the sales, by sector, that have currently opted out of paying the charge levied to support utility-administered energy efficiency programs. The portion of sales that have not opted out include both ineligible load (i.e., does not meet the 1 MW peak demand requirement) as well as eligible load that has not yet opted out.

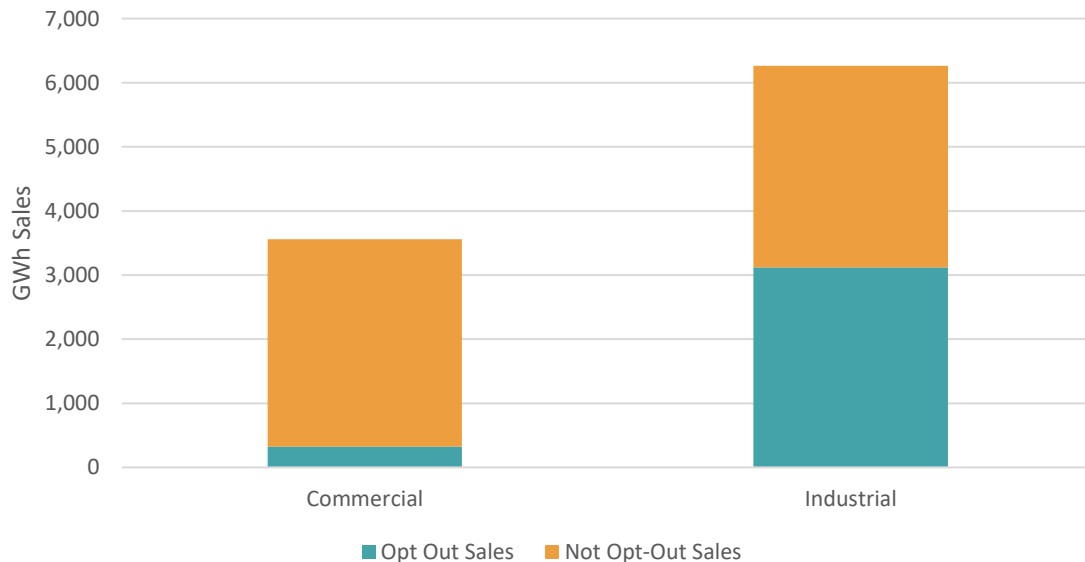


FIGURE 4-1 OPT-OUT SALES BY C&I SECTOR

GDS removed the sales from opt-out customers in the assessment of technical, economic, and achievable potential reflected in this report. As a sensitivity (included in Appendix A), GDS also examined the full potential in the C&I sector if these customers were no longer able to opt-out of utility-funded electric energy efficiency programs.

### **4.1.2.3 Building Stock/Equipment Saturation**

To assess the potential electric energy efficiency savings available, estimates of the current saturation of baseline equipment and energy efficiency measures are necessary.

#### 4.1.2.3.1 Residential Sector

For the residential sector, GDS relied on the primary research efforts noted in Chapter 2 of this report, as well as the 2018 Residential Appliance Saturation Survey. The GDS-led market research results allowed for the GDS Team to characterize the baseline and efficiency saturations of the residential sector using housing-type specific data. Other data sources included ENERGY STAR unit shipment data, I&M evaluation reports, and the EIA Residential Energy Consumption Survey data from 2015. The ENERGY STAR unit shipment data filled data gaps related to the increased saturation of energy efficient equipment across the U.S. in the last decade.

#### 4.1.2.3.2 Business Sector

For the commercial sector, building stock and equipment saturation data was informed from a combination of primary market research (online surveys noted in Section 2), as well as other available regional or national data. The survey data helped inform the disaggregation of the end-use sales forecast further into measure groups consistent with the measures included in the potential analysis as well as saturation of energy efficient equipment.

Beyond the primary data collection, EIA regional data, as well as national studies on commercial energy consumption were used to inform consumption in the remaining end-uses where data from the primary market research was even more limited.<sup>7</sup> These sources typically informed estimates of base equipment saturation for cooking, refrigeration, water heating, plug loads, and other miscellaneous end-uses.

For the industrial sector, the analysis employed a top-down analysis at the end-use level. Accordingly, it was not critical to disaggregate the industrial sales at a measure-level. Instead, measures were developed to estimate savings at a total end-use level.

### **4.1.2.4 Remaining Factor**

The remaining factor is the proportion of a given market segment that is not yet efficient and can still be converted to an efficient alternative. It is the inverse of the saturation of an energy efficient measure, prior to any adjustments. In this study, two key adjustments were made in order to recognize that the energy efficient saturation does not necessarily always fully represent the state of market transformation. First, while a percentage of installed measures may already be efficient, some customers may backslide (i.e. revert to standard technologies, or otherwise less efficient alternatives in the future, based on considerations like measure cost and availability and customer preferences). For example, historically, some customers have disliked CFL light quality, and have reverted to incandescent and halogen bulbs after the CFLs burn out.

Second, for measures categorized as market opportunity (i.e. replace-on-burnout), we assumed that 50% of the instances in which an efficient measure is already installed, the burnout or failure of those measures would be eligible for inclusion in the estimate of future savings potential. This adjustment assumes that 50% of the market is transformed, and no future savings potential exists, whereas the remaining 50% of the market is not transformed and could backslide without the intervention of an I&M program and an incentive. Similarly, for retrofit measures, we assumed that only 10% of the instances in which an efficient measure is already installed, the burnout or failure of those measures would be eligible for inclusion in the estimate of future savings potential. This recognizes the more proactive nature of retrofit measures, as the implementation of these

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<sup>7</sup> Examples of secondary research include: Energy Savings Potential RD&D Opportunities for Commercial Building Appliances. 2016. DOE and Energy Star Shipment Data.

measures are more likely to be elective in nature, compared to market opportunity measures, which are more likely to be needs-based. The uncertainty in these assumptions are appropriate, as they factor in a key component of natural customer decision making.

### 4.1.3 Measure Characterization

#### 4.1.3.1 Measure Lists

The study's sector-level energy efficiency measure lists were informed by a range of sources including the MEMD, the Illinois and Indiana TRMs, current I&M Indiana program offerings, and commercially viable emerging technologies, among others. Measure list development was a collaborative effort in which GDS developed draft lists that were shared with I&M and stakeholders. The final measure lists ultimately included in the study reflected the informed comments and considerations from the parties that participated in the measure list review process.

In total, GDS analyzed 353 measure types for this study. Several measures were included with multiple permutations to account for different specific market segments, such as different building types, efficiency levels, and replacement options. In total, GDS developed 2,106 measure permutations for this study. Each permutation was screened for cost-effectiveness under the UCT cost test. The parameters for cost-effectiveness under the UCT are discussed in detail later in Section 4.1.6.

TABLE 4-2: NUMBER OF ELECTRIC MEASURES EVALUATED

|                        | # of Measures | Total # of Measure Permutations |
|------------------------|---------------|---------------------------------|
| <b>I&amp;M Indiana</b> |               |                                 |
| <b>Residential</b>     | 168           | 673                             |
| <b>Commercial</b>      | 157           | 1,405                           |
| <b>Industrial/Ag</b>   | 28            | 28                              |
| <b>Total</b>           | <b>353</b>    | <b>2,106</b>                    |

#### 4.1.3.2 Emerging Technologies

GDS considered several specific emerging technologies as part of analyzing future potential. In the residential sector, these technologies include several smart technologies, including smart appliances, smart water heater (WH) tank controls, smart window coverings, smart TVs, heat pump dryers and smart vents/sensors. In the non-residential sector, specific emerging technologies that were considered as part of the analysis include AMI data presentment, building integrated energy management systems, advanced rooftop controls, variable refrigerant flow heat pumps, ozone commercial laundry, advanced lighting controls, power distribution equipment upgrades, server virtualization, escalator motor controls, and grow lighting. While this is likely not an exhaustive list of possible emerging technologies over the next twenty years it does consider many of the known technologies that are available today but may not yet have widespread market acceptance and/or product availability.

In addition to these specific technologies, GDS acknowledges that there could be future opportunities for new technologies as equipment standards improve and market trends occur. While this analysis does not make any explicit assumption about unknown future technologies, the methodology assumes that subsequent equipment replacement that occurs over the course of the 20-year study timeframe, and at the end of the initial equipment's useful life, will continue to achieve similar levels of energy savings, relative to improved baselines, at similar incremental costs.

#### 4.1.3.3 Assumptions & Sources

A significant amount of data is needed to estimate the electric savings potential for individual energy efficiency measures or programs across the residential and nonresidential customer sectors. GDS utilized data specific to I&M



Indiana when it was available and current. GDS used the most recent I&M Indiana evaluation report findings (as well as I&M Indiana program planning documents), the Michigan Energy Measures Database (“MEMD”), the Indiana TRM, the Illinois TRM, for a large amount of the data requirements. Additional source documents included American Council for an Energy-Efficient Economy (ACEEE) research reports covering topics like emerging technologies.

**Measure Savings:** GDS relied on existing I&M Indiana evaluation report findings and the MEMD to inform calculations supporting estimates of annual measure savings as a percentage of base equipment usage. For custom measures and measures not included in the MEMD, GDS estimated savings from a variety of sources, including:

- Illinois TRM, IN TRM, and other regional/state TRMs
- Secondary sources such as the ACEEE, Department of Energy (DOE), EIA, ENERGY STAR®, and other technical potential studies

**Measure Costs:** Measure costs represent either incremental or full costs. These costs typically include the incremental cost of measure installation, when appropriate based on the measure definition. For purposes of this study, nominal measure costs held constant over time.

GDS obtained measure cost estimates primarily from I&M Indiana evaluation report findings and the MEMD. GDS also used the following supplementary data sources:

- Illinois TRM, IN, and other regional/state TRMs
- Secondary sources such as the ACEEE, ENERGY STAR, and NREL

Costs and savings for new construction and replace on burnout measures were calculated as the incremental difference between the code minimum equipment and the energy efficiency measure. This approach was utilized because the consumer must select an efficiency level that is at least the code minimum equipment when purchasing new equipment. The incremental cost is calculated as the difference between the cost of high efficiency and standard efficiency (code compliant) equipment. However, for retrofit or direct install measures, the measure cost was the “full” cost of the measure, as the baseline scenario assumes the consumer would not make energy efficiency improvements in the absence of a program. In general, the savings for retrofit measures are calculated as the difference between the energy use of the removed equipment and the energy use of the new high efficiency equipment (until the removed equipment would have reached the end of its useful life).

**Measure Life:** Measure life represents the number of years that energy using equipment is expected to operate. GDS obtained measure life estimates from the I&M Indiana evaluation report findings and the MEMD:

- Illinois TRM, IN TRM, and other regional/state TRMs
- Manufacturer data
- Savings calculators and life-cycle cost analyses

All measure savings, costs, and useful life assumption sources are documented in the Appendices volume of this report.

#### 4.1.3.4 Treatment of Codes & Standards

By law, the U.S. Department of Energy (DOE) is expected to review each national appliance standard every six years and publish either a proposed rule to update the standard or determine that no change to the existing standard is needed. As of January 2020, DOE has missed legal deadlines for twenty-eight product standards since 2016.<sup>8</sup> Given these delays in future standard updates, the initial start year of 2023 for this analysis, and that the analysis is not intended to predict how or when energy codes and standards will change over time, there are only limited known improvements to federal codes and standards to reasonably account for in this analysis.

<sup>8</sup> Missed Deadlines for Appliance Standards. Prepared by the Appliance Standards Awareness Project. Updated March 2021.

Although not exhaustive, other key adjustments include:

- The baseline efficiency for air source heat pumps (ASHP) is anticipated to improve to 15 SEER/8.8 HSPF<sup>9</sup> in 2023. As the new standards allow for a sell-through period, the baseline efficiency will be assumed to be the new federal standard, beginning in 2024.
- The baseline efficiency for split system central AC systems is anticipated to improve to 14 SEER in 2023. As the new standards allow for a sell-through period, the baseline efficiency will be assumed to be the new federal standard, beginning in 2024.
- DOE established the first national standards for pool pumps in 2017, becoming effective in 2021. The new standards will cut energy use for in-ground pool pumps by approximately 70% and can be met by switching from single-speed to variable-speed pool pumps.
- In 2019, the DOE established new standards effective for residential portable and whole-home dehumidifiers. The new standards are based on a new metric, integrated energy factor (IEF) and improves the test procedure to better reflect the actual energy consumption of dehumidifiers in the home. The new standards range from 1.30 L/kWh for small dehumidifiers up to 2.8 L/kWh for larger capacity dehumidifiers.
- In July 2019, the DOE established new standards effective for more efficient furnace fan/motors. The standards are expected to improve the efficiency by approximately 45% over the current baselines. To date, many furnaces are equipped with standard induction motors, which operate at about 60-65% efficiency. The new standard will create a shift to electronically commutated motors (ECMs).
- DOE established new standards for pre-rinse spray valves, setting maximum flow rates between 1.0 and 1.28 gallons per minute. The new standards took effect in early 2019 and are reflected in the analysis.

#### **4.1.3.5 Net to Gross**

All estimates of technical, economic, and achievable potential, as well as measure level cost-effectiveness screening were conducted in terms of gross savings to reflect the absence of program design considerations in these phases of the analysis. The impacts of free-riders (participants who would have installed the high efficiency option in the absence of the program) and spillover customers (participants who install efficiency measures due to program activities, but never receive a program incentive) were considered in the development of program potential (Chapter 7).

#### **4.1.4 Types of Potential**

This section reviews the types of potential analyzed in this report, as well as some key methodological considerations in the development of technical, economic, and achievable potential.

The first two types of potential, technical and economic, provide a theoretical upper bound for energy savings from energy efficiency measures. Still, even the best-designed portfolio of programs is unlikely to capture 100% of the technical or economic potential. Therefore, achievable potential attempts to estimate what savings can be realistically achieved through market interventions, when it can be captured, and how much it would cost to do so. Figure 4-2 illustrates the types of energy efficiency potential considered in this analysis.

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<sup>9</sup> SEER: Seasonal Energy Efficiency Ratio; HSPF: Heating Seasonal Performance Factor.

|                          |                     |                    |                              |                                |
|--------------------------|---------------------|--------------------|------------------------------|--------------------------------|
| Not Technically Feasible | TECHNICAL POTENTIAL |                    |                              |                                |
| Not Technically Feasible | Not Cost Effective  | ECONOMIC POTENTIAL |                              |                                |
| Not Technically Feasible | Not Cost Effective  | Market Barriers    | MAXIMUM ACHIEVABLE POTENTIAL |                                |
| Not Technically Feasible | Not Cost Effective  | Market Barriers    | Partial Incentives           | REALISTIC ACHIEVABLE POTENTIAL |

FIGURE 4-2 TYPE OF ENERGY EFFICIENCY POTENTIAL<sup>10</sup>

#### 4.1.5 Technical Potential

Technical potential is the theoretical maximum amount of energy use that could be displaced by efficiency, disregarding all non-engineering constraints such as cost-effectiveness and the willingness of end users to adopt the efficiency measures. Technical potential is only constrained by factors such as technical feasibility and applicability of measures. Under technical potential, GDS assumed that 100% of new construction and market opportunity measures are adopted as those opportunities become available (e.g., as new buildings are constructed, they immediately adopt efficiency measures, or as existing measures reach the end of their useful life). For retrofit measures, implementation was assumed to be resource constrained and that it was not possible to install all retrofit measures all at once. Rather, retrofit opportunities were assumed to be replaced incrementally until 100% of stock was converted to the efficient measure over a period of no more than 15 years.

The core equation used in the residential sector energy efficiency technical potential analysis for each individual efficiency measure is shown in Equation 4-1 below. The C&I sector employs a similar analytical approach.

EQUATION 4-1 CORE EQUATION FOR RESIDENTIAL SECTOR TECHNICAL POTENTIAL



#### Where...

**Base Case Equipment End-Use Intensity** = the electricity used per customer per year by each base-case technology in each market segment. In other words, the base case equipment end-use intensity is the consumption of the electrical energy using equipment that the efficient technology replaces or affects.

**Saturation Share** = the fraction of the end-use electrical energy that is applicable for the efficient technology in a given market segment. For example, for residential water heating, the saturation share would be the fraction of all residential electric customers that have electric water heating in their household.

**Remaining Factor** = the fraction of equipment that is not considered to already be energy efficient. To extend the example above, the fraction of electric water heaters that is not already energy efficient.

<sup>10</sup> Reproduced from “Guide to Resource Planning with Energy Efficiency.” November 2007. US Environmental Protection Agency (EPA). Figure 2-1. Modified to depict the additional levels of achievable and program potential included in this study.

**Feasibility Factor** = (also functions as the applicability factor) the fraction of the applicable units that is technically feasible for conversion to the most efficient available technology from an engineering perspective (e.g., it may not be possible to install heat pump water heaters in all homes because of space limitations).

**Savings Factor** = the percentage reduction in electricity consumption resulting from the application of the efficient technology.

#### 4.1.5.1 Competing Measures & Interactive Effects Adjustments

GDS prevents double-counting of savings, and accounts for competing measures and interactive savings effects, through three primary adjustment factors:

**Baseline Saturation Adjustment.** Competing measure shares are factored into the baseline saturation estimates. For example, nearly all homes can receive insulation. To account for this, GDS' analysis used multiple measure permutations that account for varying impacts of different heating/cooling combinations and baseline saturations were applied to reflect the proportions of households with each heating/cooling combination.

**Applicability Factor Adjustment.** Combined measures into measure groups, where total applicability factor across measures is set to 100%. For example, homes cannot receive a programmable thermostat, connected thermostat, and smart thermostat. In general, the models assign the measure with the most savings the greatest applicability factor in the measure group, with competing measures picking up any remaining share.

**Interactive Savings Adjustment.** As savings are introduced from select measures, the per-unit savings from other measures need to be adjusted (downward) to avoid over-counting. The analysis typically prioritizes market opportunity equipment measures (versus retrofit measures that can be installed at any time). For example, the savings from a smart thermostat are adjusted down to reflect the efficiency gains of installing an efficient air source heat pump.

#### 4.1.6 Economic Potential

Economic potential refers to the subset of the technical potential that is economically cost-effective (based on screening with the UCT) as compared to conventional supply-side energy resources.

##### 4.1.6.1 Utility Cost Test & Incentive Levels

The economic potential assessment included a screen for cost-effectiveness using the UCT at the measure level. In the I&M territory, the UCT considers electric energy, capacity, and transmission & distribution (T&D) savings as benefits, and utility incentives and direct install equipment expenses as the cost. Consistent with application of economic potential according to the National Action Plan for Energy Efficiency, the measure level economic screening does not consider non-incentive/measure delivery costs (e.g. admin, marketing, evaluation etc.) in determining cost-effectiveness.<sup>11</sup>

Apart from the low-income segment of the residential sector, all measures were required to have a UCT benefit-cost ratio greater than 1.0 to be included in economic potential and all subsequent estimates of energy efficiency potential. Low-income measures were not required to be cost-effective.

For both the calculation of the measure-level UCT, as well as the determination of RAP, historical incentive levels (as a % of incremental measure cost) were calculated for current measure offerings. GDS relied on the prior I&M DSM plan estimates and historical I&M Indiana evaluation reports files to map current measure offerings to their historical incentive levels.

- In the residential sector, incentives by program ranged from 33% to 100% and averaged 68%.
- In the non-residential sector, prescriptive incentives averaged 31% of the measure cost for interior lighting, 6% for exterior lighting and 21% for non-lighting measures.

<sup>11</sup> National Action Plan for Energy Efficiency: Understanding Cost-Effectiveness of Energy Efficiency Programs. *Note: Non-incentive delivery costs are included in the assessment of achievable potential.*

- Custom measures received incentives equal to \$0.052 per first-year kWh saved.
- In the MAP scenario, incentives were increased up to 100% of the incremental measure cost.<sup>12</sup>

#### 4.1.6.2 Avoided Costs

Avoided energy supply costs are used to assess the value of energy savings. Avoided cost values for electric energy, electric capacity, and avoided T&D were provided by I&M as part of an initial data request. Electric energy is based on an annual system marginal cost. For years outside of the avoided cost forecast timeframe, future year avoided costs are escalated by the rate of inflation.

I&M provided the GDS Team with monthly on and off-peak avoided energy costs. GDS used this data to create 8,760 avoided cost values for each forecast year. GDS then applied these avoided costs to the 8,760 savings from each measure based on assigned end-use load shapes<sup>13</sup> to determine the value of measures that save more energy during peak periods than those that might saving during off-peak periods. In addition, the avoided capacity and T&D avoided costs were applied to the estimated coincident peak demand savings for each measure.

#### 4.1.7 Achievable Potential

Achievable potential is the amount of energy that can realistically be saved given various market barriers. Achievable potential considers real-world barriers to encouraging end users to adopt efficiency measures; the non-measure costs of delivering programs (for administration, marketing, analysis, and EM&V); and the capability of programs and administrators to boost program activity over time. Barriers include financial, customer awareness and WTP in programs, technical constraints, and other barriers the “program intervention” is modeled to overcome. Additional considerations include political and/or regulatory constraints. The potential study evaluated two achievable potential scenarios:

- **MAP** estimates achievable potential on paying incentives equal to up to 100% of measure incremental costs and aggressive adoption rates.<sup>14</sup>
- **RAP** estimates achievable potential with I&M paying incentive levels (as a percent of incremental measure costs) closely calibrated to historical levels but is not constrained by any previously determined spending levels.

##### 4.1.7.1 Market Adoption Rates

GDS assessed achievable potential on a measure-by-measure basis. In addition to accounting for the natural replacement cycle of equipment in the achievable potential scenario, GDS estimated measure specific maximum adoption rates that reflect the presence of possible market barriers and associated difficulties in achieving the 100% market adoption assumed in the technical and economic scenarios.

The initial step was to assess the long-term market adoption potential for energy efficiency technologies. Due to the wide variety of measures across multiple end-uses, GDS employed varied measure and end-use-specific ultimate adoption rates versus a singular universal market adoption curve. These long-term market adoption estimates were based on I&M Indiana-specific WTP market research. The I&M Indiana-specific research included questions to residential homeowners and nonresidential facility managers regarding their perceived willingness to purchase and install energy efficient technologies across various end uses and incentive/payback performance levels. This research is discussed in additional detail in Section 2.4.

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<sup>12</sup> The GDS team lowered MAP incentives to less than 100% of measure incremental cost in some cases if 100% incentives would preclude the measure from being cost-effective. MAP incentives were lowered to either 75% or 50% of the incremental measure cost if either of those incentive levels would allow for a measure to remain cost-effective.

<sup>13</sup> End-use load shapes were derived from building energy simulation models created by housing type and building type, specific to the I&M Indiana service area.

<sup>14</sup> *ibid.*

One caveat to this approach is that the WTP adoption score is generally a simple function of incentive levels and/or payback performance. There are other factors that may influence a customer's willingness to purchase an energy efficiency measure. For example, increased marketing and education programs can have a critical impact on the success of energy efficiency programs. To reflect market barriers beyond total and up-front costs, GDS also included a program awareness factor into the determination of the long-term adoption rate. The adoption rate was based on the WTP survey research as well as other market research conducted by I&M related to customer engagement and awareness of energy efficiency programs. Based on this data, the program awareness for the realistic achievable potential was set at 74% and increased in the maximum achievable scenario (85%) to reflect the likelihood of increase program and awareness under the maximum achievable scenario. Although we recognize this approach does not capture every possible factor in determining appropriate long-term adoption levels, it does assign some weight to non-financial considerations in the assessment of long-term energy efficiency potential.

GDS utilized likelihood and willingness-to-participate data to estimate the long-term market adoption potential for both the maximum and realistic achievable scenarios. Table 4-3 presents the long-term market adoption rates at varied incentive levels used for the residential sector. Most end-uses are based on the WTP primary market research. Behavior was set to 100% to reflect that the program design is typically opt-out and participation levels are dictated by the utility. Awareness factors for this program was also modified accordingly. Last, GDS adjusted the I&M Indiana-specific adoption curves to reflect observed differences in WTP between the income-qualified and market-rate customers.<sup>15</sup>

**TABLE 4-3 RESIDENTIAL LONG-TERM MARKET ADOPTION RATES AT DISCRETE INCENTIVE LEVELS**

| End Use         | 0% Incentive | 25% Incentive | 50% Incentive | 75% Incentive | 100% Incentive | RAP Awareness | MAP Awareness |
|-----------------|--------------|---------------|---------------|---------------|----------------|---------------|---------------|
| Water Heat – MR | 19%          | 28%           | 42%           | 55%           | 74%            | 74%           | 85%           |
| Water Heat – LI | 13%          | 26%           | 37%           | 49%           | 73%            | 74%           | 85%           |
| HVAC Equip – MR | 33%          | 43%           | 55%           | 67%           | 81%            | 74%           | 85%           |
| HVAC Equip – LI | 22%          | 32%           | 45%           | 59%           | 78%            | 74%           | 85%           |
| Appliances – MR | 19%          | 27%           | 42%           | 57%           | 73%            | 74%           | 85%           |
| Appliances – LI | 15%          | 23%           | 36%           | 51%           | 71%            | 74%           | 85%           |
| HVAC Shell – MR | 18%          | 31%           | 45%           | 59%           | 81%            | 74%           | 85%           |
| HVAC Shell – LI | 12%          | 21%           | 34%           | 50%           | 78%            | 74%           | 85%           |
| Behavior        | 100%         | 100%          | 100%          | 100%          | 100%           | 100%          | 100%          |

Table 4-4 presents the long-term market adoption rates used in the nonresidential sector. Again, the adoption scores were primarily informed by the I&M Indiana-specific WTP research. GDS included a 20-year payback performance level to reflect reduced adoption rates for measures with extremely long payback performance levels. The 20-year payback performance was set to 2/3<sup>rd</sup> of the 10-year level. To reflect differences in delivery strategy, varying awareness factors were created for different C&I program offerings based on available market data collected by I&M and assumptions about trade ally involvement and impact on future adoption rates.

<sup>15</sup> I&M 2018 JD Customer Satisfaction Survey. This research indicated higher levels of program awareness and engagement than the WTP data and was considered to likely be more representative of the I&M customer population. The awareness factor was applied to the adjusted adoption rate to get a final adoption rate. For example, at 75% incentives the adjusted adoption rate is 62%. 62% \* Awareness Factor (74%) = 46% final adoption rate in the RAP scenario.

TABLE 4-4 NONRESIDENTIAL LONG-TERM MARKET ADOPTION RATES AT DISCRETE PAYBACK INTERVALS

| End-Use       | 20 Year Payback Period | 10 Year Payback Period | 5 Year Payback Period | 3 Year Payback Period | 1 Year Payback Period | 0 Year Payback Period | MAP Awareness Factor | RAP Awareness Factor |
|---------------|------------------------|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|----------------------|
| Lighting      | 34%                    | 51%                    | 61%                   | 71%                   | 79%                   | 84%                   | 74%                  | 85%                  |
| HVAC          | 24%                    | 36%                    | 46%                   | 56%                   | 67%                   | 74%                   | 74%                  | 85%                  |
| Refrigeration | 20%                    | 30%                    | 39%                   | 51%                   | 63%                   | 71%                   | 74%                  | 85%                  |
| Water Heat    | 35%                    | 55%                    | 64%                   | 73%                   | 82%                   | 86%                   | 74%                  | 85%                  |
| Other         | 30%                    | 46%                    | 56%                   | 66%                   | 75%                   | 81%                   | 74%                  | 85%                  |

In the maximum achievable potential scenario, incentives were assumed to represent 100% of the measure cost (0-year payback) and awareness factor were set at a minimum of 85%.

GDS then estimated initial year adoption rates by reviewing the current saturation levels of efficient technologies and (if necessary) calibrating the estimates of 2023 annual potential to recent historical levels achieved by I&M's current DSM portfolio. The calibration was only considered if recent historical savings outpaced the estimated near-term potential. The most impactful example of this calibration was to front-load commercial lighting savings to achieve with I&M Indiana's recent program achievements related to LED lighting. To align with these efforts, it was necessary to move forward in time the estimated lighting potential savings. The GDS team did not scale back near-term potential in instances where historical savings were lower than the estimated potential in the I&M Indiana service area. GDS then assumed a non-linear ramp rate from the initial year market adoption rate to the various long-term market adoption rates for each specific end-use.

#### 4.1.7.2 Non-Incentive Costs

Consistent with National Action Plan for Energy Efficiency (NAPEE) guidelines<sup>16</sup>, utility non-incentive costs were included in the overall assessment of cost-effectiveness at the RAP scenario. Non-incentive costs were calibrated to recent I&M Indiana levels and set at:

- \$0.120 per first year kWh saved for the Home Energy Products Program
- \$0.175 per first year kWh saved for the Home Appliance Recycling Program
- \$0.023 per first year kWh saved for the Home Energy Reports Program
- \$0.023 per first year kWh saved for the Low Income Home Energy Reports Program
- \$0.75 per first year kWh saved for the Home Weatherproofing Program
- \$0.928 per first year kWh saved for the Residential Income Qualified Program
- \$0.009 per first year kWh saved for the Home Energy Engagement Program
- \$1.598 per first year kWh saved for the Home Energy Management Program
- \$0.171 per first year kWh saved for the School Education Program
- \$0.151 per first year kWh saved for the Residential Online Energy Checkup Program
- \$0.282 per first year kWh saved for the Residential New Construction Program
- \$0.050 per first year kWh saved for prescriptive C&I measures
- \$0.060 per first year kWh saved for custom C&I measures; and
- \$0.040 per first year kWh saved for Streetlighting.

Non-incentive costs were then escalated annually at the rate of inflation.<sup>17</sup>

<sup>16</sup> National Action Plan for Energy Efficiency (2007). Guide for Conducting Energy Efficiency Potential Studies. Prepared by Optimal Energy. This study notes that economic potential only considers the cost of efficiency measures themselves, ignoring programmatic costs. Conversely, achievable potential should consider the non-measures costs of delivering programs. Pg. 2-4.

<sup>17</sup> As noted earlier in the report, measure costs and utility incentives were not escalated over the 20-year analysis timeframe to keep those costs constant in nominal dollars.

## 4.2 RESIDENTIAL ENERGY EFFICIENCY POTENTIAL FINDINGS

Figure 4-32 provides the technical, economic, MAP and RAP results for the 3-year, 10-year, and 20-year timeframes. The cumulative annual 3-year technical potential is 12.0% of forecasted sales, and the economic potential is 9.6% of forecasted sales. The cumulative annual 3-year MAP is 3.8% and the RAP is 3.4%, as a percentage of forecasted sales. Over the duration of the study timeframe the technical and economic potential rise to 39% and 33% of forecasted sales, respectively. This indicates that a large portion of the technical potential is cost-effective. The MAP and RAP rise respectively to 19% and 15% of forecasted sales over the study timeframe. The gap between economic potential and MAP/RAP represents market barriers to prospective program participants, both financial and non-financial, to achieving the full amount of economic potential.

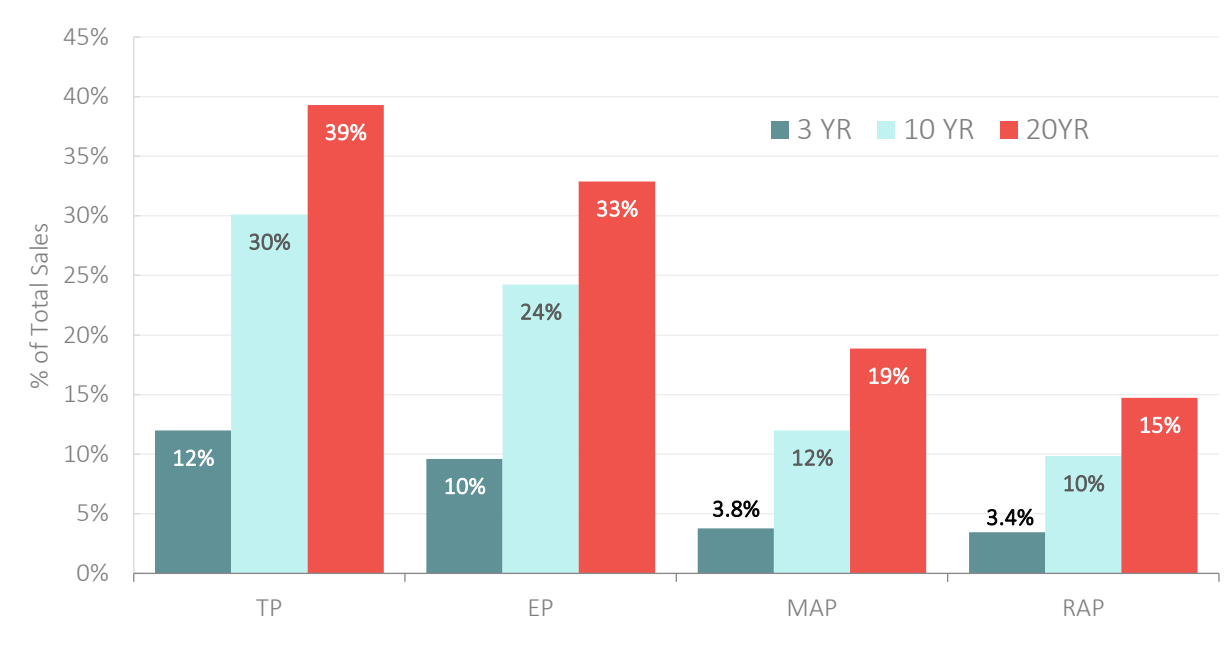


FIGURE 4-3: OVERVIEW OF RESIDENTIAL POTENTIAL

### 4.2.1 Technical/Economic Potential

Table 4-55 provides cumulative annual technical and economic potential results across the 2023-2027 (Years 1-5) timeframe, as well as for 2032 (10<sup>th</sup>-year) and 2042 (20<sup>th</sup>-year). The technical potential is more than 500,000 MWh by 2025 and rises to more than 1,740,000 MWh by 2042. Economic potential rises to nearly 1,460,000 MWh by 2042 as well. Peak demand savings associated with technical potential reach more than 135 MW by 2025 and reach 423 MW by 2042, and peak demand savings associated with economic potential reach 313 MW by 2042.

TABLE 4-5 TECHNICAL & ECONOMIC RESIDENTIAL POTENTIAL

|                         | 2023    | 2024    | 2025    | 2026    | 2027    | 2032      | 2042      |
|-------------------------|---------|---------|---------|---------|---------|-----------|-----------|
| <b>Energy (MWh)</b>     |         |         |         |         |         |           |           |
| <b>Technical</b>        | 202,959 | 368,233 | 511,100 | 649,734 | 783,433 | 1,294,838 | 1,744,269 |
| <b>Economic</b>         | 178,920 | 298,870 | 409,797 | 518,152 | 625,391 | 1,042,513 | 1,459,637 |
| <b>Peak Demand (MW)</b> |         |         |         |         |         |           |           |
| <b>Technical</b>        | 49.3    | 93.8    | 135.1   | 172.0   | 207.8   | 332.2     | 423.2     |
| <b>Economic</b>         | 36.6    | 66.3    | 94.9    | 119.8   | 144.5   | 229.2     | 313.1     |



Figure 4-43 shows a comparison of the technical and economic potential (20-year) by end use. HVAC Equipment is the leading end-use among technical and economic potential, followed by Appliances and Water Heating. Building Shell and Plug Loads also provide a significant amount of technical potential.<sup>18</sup>

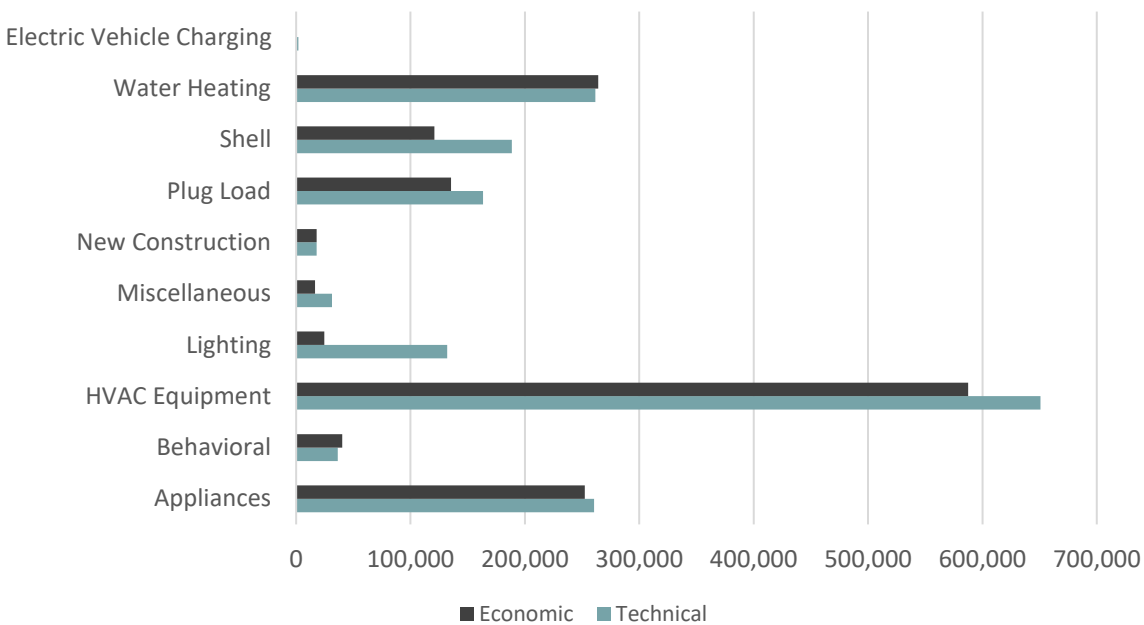


FIGURE 4-4: 20-YR RESIDENTIAL TECHNICAL & ECONOMIC POTENTIAL, BY END-USE

#### 4.2.2 Achievable Potential

Figure 4-54 provides the MAP and RAP across the 20-yr timeframe of the study. The green and red bars provide the respective incremental annual MAP and RAP in MWh per year energy savings. The green and orange lines provide the corresponding cumulative annual MAP and RAP as a percent of forecasted annual sales. The MAP rises to 19% by 2042, and the RAP rises to 15%.

<sup>18</sup> Water Heating and Behavioral savings are greater in Economic Potential than Technical Potential due differences in interactive effects impacts.

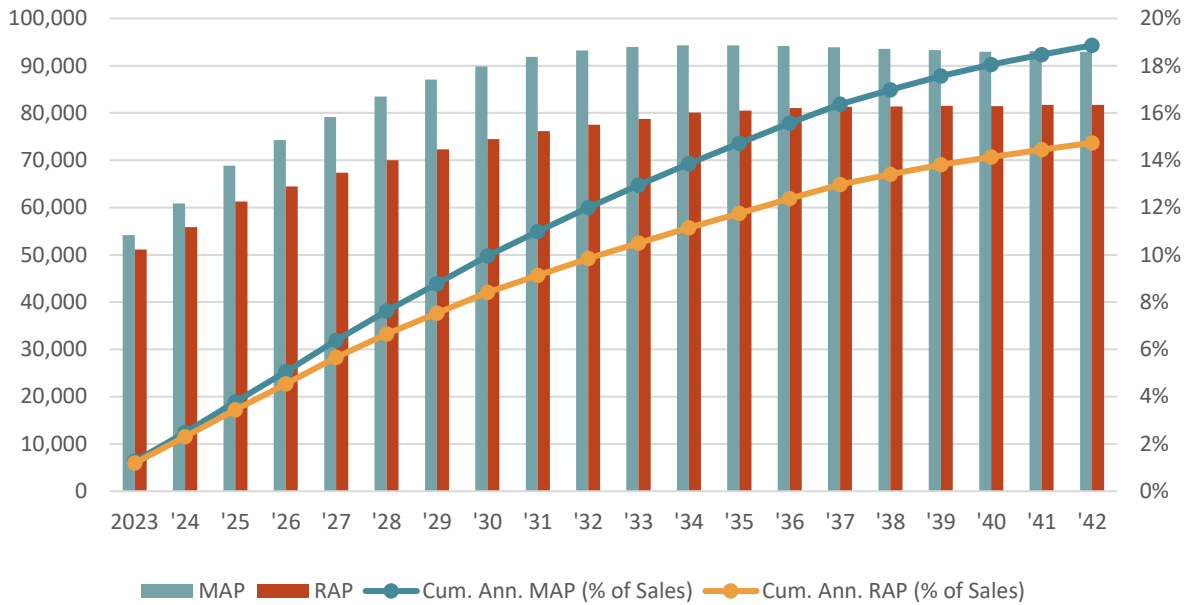


FIGURE 4-5: OVERVIEW OF RESIDENTIAL POTENTIAL – RAP 2042

Figure 4-65 provides a breakdown of the RAP potential in 2042 across end-uses and building type market segments. As in technical and economic potential, the HVAC Equipment is the leading end-use accounting for 29% of the total. The Building Shell, Water Heating and Appliances end-uses combine to account for an additional 52% of the RAP. The single-family housing segment represents 69% of the potential and the multifamily segment represents 9% of the potential. The new construction segment accounts for 4% of potential, and measures dedicated to low-income customers account for 19% of potential.

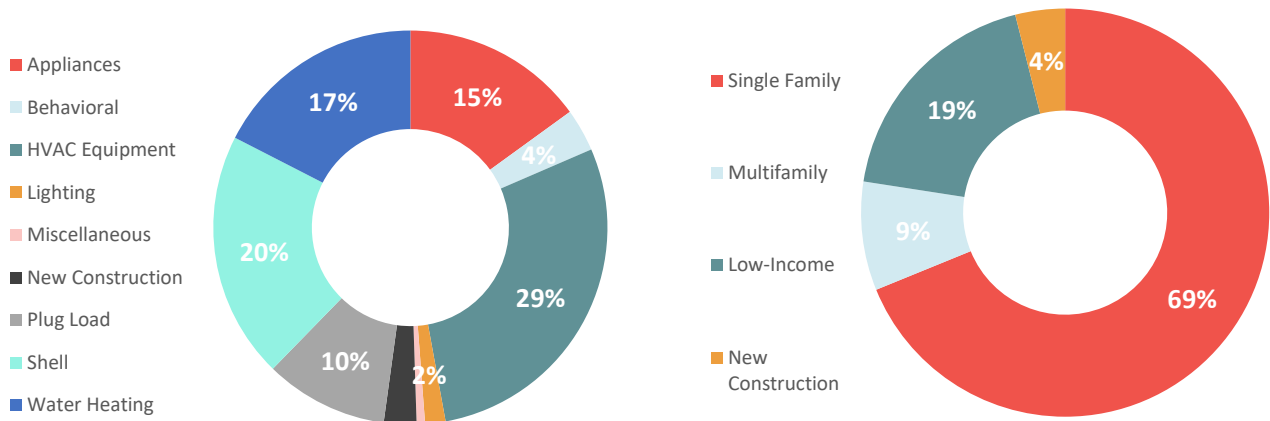


FIGURE 4-6: RESIDENTIAL POTENTIAL BY END-USE AND BUILDING TYPE – RAP 2042

Table 4-66 provides incremental and cumulative annual energy and demand savings for MAP and RAP across the next five years as well as over the 10-yr and 20-yr time horizons. Incremental RAP energy savings range from 51,000 MWh in 2023 to nearly 82,000 MWh by 2042, and cumulative RAP energy savings rise to more than 654,000 MWh by 2042.

TABLE 4-6 RESIDENTIAL MAP &amp; RAP POTENTIAL

|  | 2023   | 2024    | 2025    | 2026    | 2027    | 2032    | 2042    |
|--|--------|---------|---------|---------|---------|---------|---------|
| <b>Incremental Annual Energy (MWh)</b> |        |         |         |         |         |         |         |
| <b>MAP</b>                             | 54,178 | 60,854  | 68,856  | 74,284  | 79,181  | 93,219  | 92,961  |
| <b>RAP</b>                             | 51,137 | 55,857  | 61,248  | 64,477  | 67,382  | 77,504  | 81,753  |
| <b>Incremental Annual Energy (MW)</b>  |        |         |         |         |         |         |         |
| <b>MAP</b>                             | 12.6   | 14.2    | 16.0    | 17.3    | 18.3    | 20.6    | 20.5    |
| <b>RAP</b>                             | 11.3   | 12.3    | 13.2    | 13.9    | 14.4    | 16.2    | 17.0    |
| <b>Cumulative Annual Energy (MWh)</b>  |        |         |         |         |         |         |         |
| <b>MAP</b>                             | 54,178 | 106,390 | 161,163 | 215,487 | 272,022 | 516,067 | 837,342 |
| <b>RAP</b>                             | 51,137 | 98,599  | 146,823 | 193,585 | 241,112 | 423,566 | 654,240 |
| <b>Cumulative Annual Energy (MW)</b>   |        |         |         |         |         |         |         |
| <b>MAP</b>                             | 12.6   | 25.8    | 40.2    | 53.9    | 68.0    | 121.1   | 186.7   |
| <b>RAP</b>                             | 11.3   | 22.6    | 34.3    | 45.1    | 56.2    | 93.8    | 144.3   |

### 4.3 COMMERCIAL ENERGY EFFICIENCY POTENTIAL

Figure 4-76 provides the technical, economic, MAP and RAP results for the 3-year, 10-year, and 20-year timeframes. The cumulative annual 3-year technical potential is 11% of forecasted commercial sales, and the economic potential is also 11% of forecasted commercial sales.<sup>19</sup> The cumulative annual 3-year MAP is 6.6% and the RAP is 4.8%, as a percentage of forecasted commercial sales. Over the duration of the study timeframe the technical and economic potential rise to 37% of forecasted sales. The nearly identical technical and economic potential indicate that most measure are cost-effective under the UCT screen. The MAP and RAP rise respectively to 20% and 15% of forecasted sales over the study timeframe. The gap between economic potential and MAP/RAP represents market barriers to prospective program participants, both financial and non-financial, to achieving the full amount of economic potential.

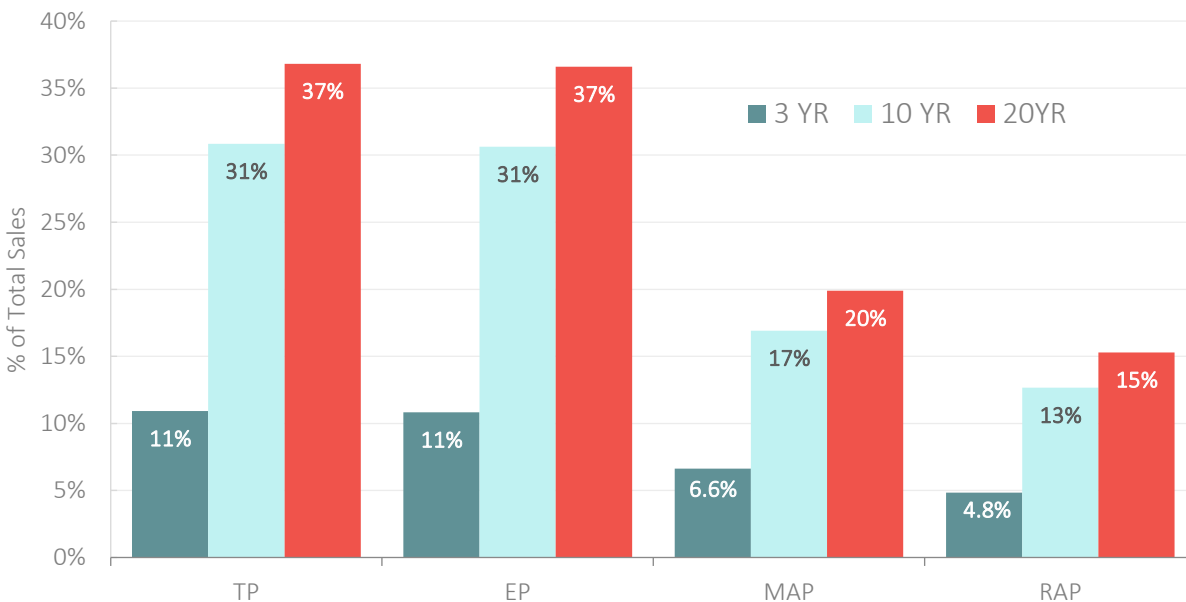


FIGURE 4-7: OVERVIEW OF COMMERCIAL POTENTIAL

<sup>19</sup> Streetlighting is included in the commercial sector savings and forecasted sales.

### 4.3.1 Technical/Economic Potential

Table 4-77 provides cumulative annual technical and economic potential results across the 2023-2027 (Years 1-5) timeframe, as well as for 2032 (10<sup>th</sup>-year) and 2042 (20<sup>th</sup>-year). The technical potential is just above 380,000 MWh by 2025 and rises to more than 1.4 million MWh by 2042. Economic potential rises to more than 1.4 million MWh by 2042 as well. Peak demand savings associated with technical potential reach 77 MW by 2025 and reach approximately 359 MW by 2042.

TABLE 4-7 TECHNICAL & ECONOMIC COMMERCIAL POTENTIAL

|                         | 2023    | 2024    | 2025    | 2026    | 2027    | 2032      | 2042      |
|-------------------------|---------|---------|---------|---------|---------|-----------|-----------|
| <b>Energy (MWh)</b>     |         |         |         |         |         |           |           |
| <b>Technical</b>        | 121,042 | 248,113 | 380,307 | 513,567 | 636,945 | 1,137,241 | 1,444,333 |
| <b>Economic</b>         | 120,024 | 246,004 | 377,077 | 509,243 | 631,605 | 1,128,813 | 1,435,460 |
| <b>Peak Demand (MW)</b> |         |         |         |         |         |           |           |
| <b>Technical</b>        | 24      | 50      | 77      | 104     | 130     | 248       | 359       |
| <b>Economic</b>         | 24      | 50      | 76      | 103     | 129     | 247       | 357       |

Figure 4-87 shows a comparison of the technical and economic potential (20-year) by end use. HVAC and Lighting are the leading end-use among technical and economic potential. Plug Loads, Whole Building and Refrigeration savings also account for significant technical and economic potential.

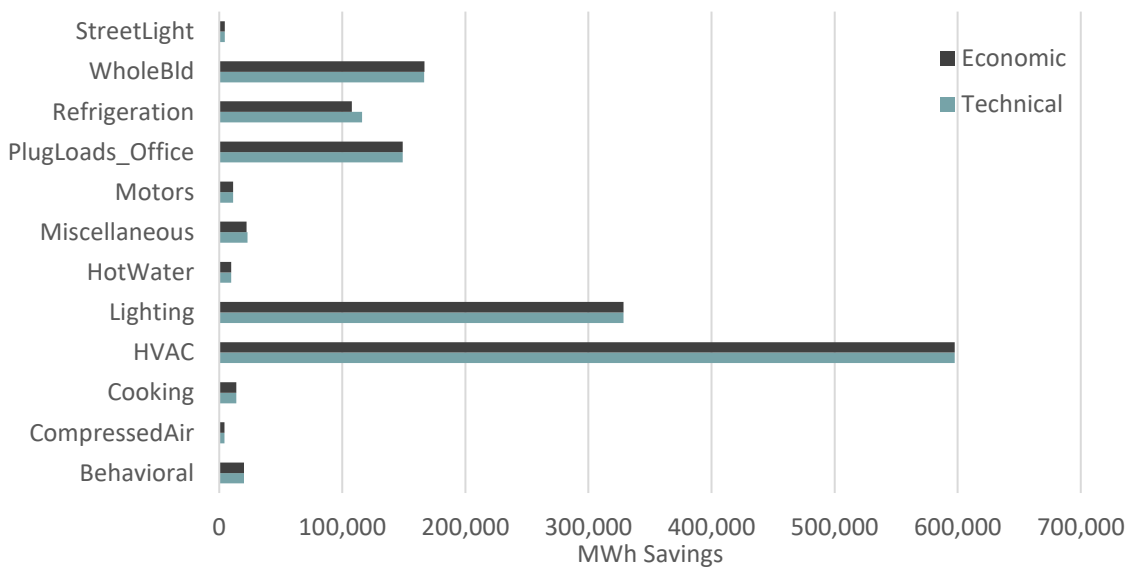


FIGURE 4-8: 20-YR COMMERCIAL TECHNICAL & ECONOMIC POTENTIAL, BY END-USE

### 4.3.2 Achievable Potential

Figure 4-98 provides the MAP and RAP across the 20-yr timeframe of the study. The green and red bars provide the respective incremental annual MAP and RAP in MWh per year energy savings.<sup>20</sup> The green and orange lines provide the corresponding cumulative annual MAP and RAP as a percent of forecasted annual commercial sector sales. The MAP rises to 20% by 2042, and the RAP rises to 15%.

<sup>20</sup> The decrease in incremental MAP and RAP savings beginning in early years of the analysis is a result of decreased lighting retrofit opportunities in the business sector over time. As noted in Section 4.1.7.1, to calibrate initial year savings close to recent historical levels, the GDS Team had to effectively front-load lighting retrofit opportunities in the initial analysis timeframe. After a period of four to five years, other non-lighting opportunities ramp up to halt the decline in annual savings. The increase in annual savings in the second decade is a result of the early lighting opportunities needing to be replaced to maintain savings relative to the code frozen forecast. From a programmatic standpoint, a portion of these savings may be transformed in the market and difficult to claim.

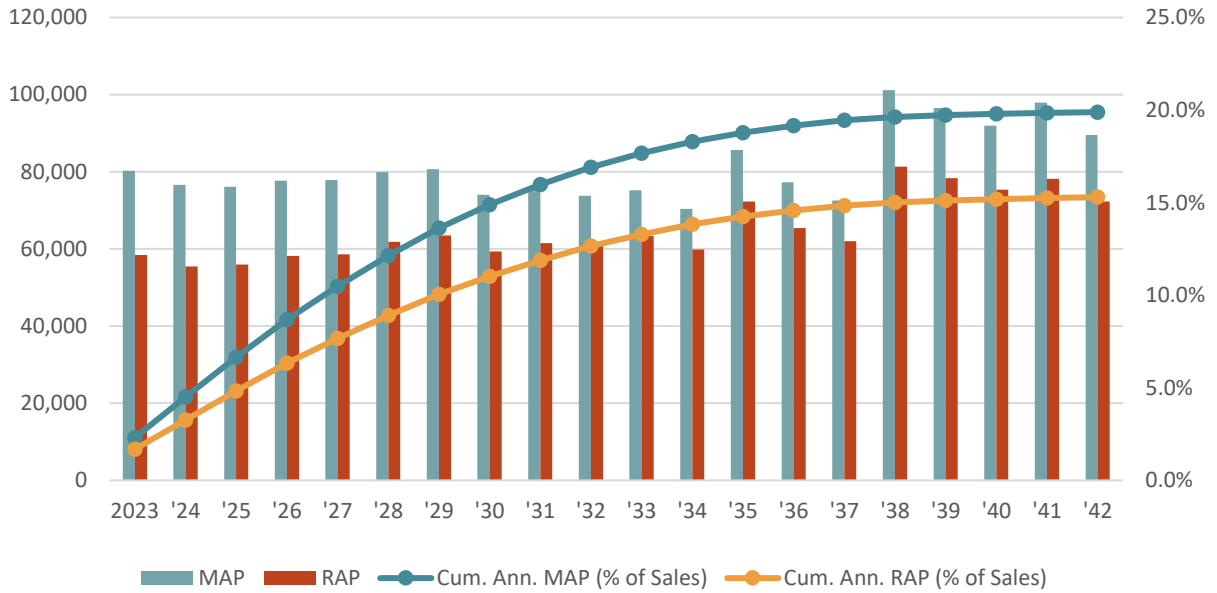


FIGURE 4-9: OVERVIEW OF COMMERCIAL POTENTIAL – RAP 2042

Figure 4-109 provides a breakdown of the RAP potential in 2042 across commercial end-uses and building type market segments.<sup>21</sup> In the RAP scenario, Lighting and HVAC account for greater than 50% of the potential. Across building types, “other” commercial buildings (defined as buildings that engage in several different activities in Section 3.3.2) represent roughly 28% of the remaining achievable potential. Office buildings, education, and warehouse represent another 48% of the achievable potential. The remaining building types each represent 9% (or less) of the achievable potential.

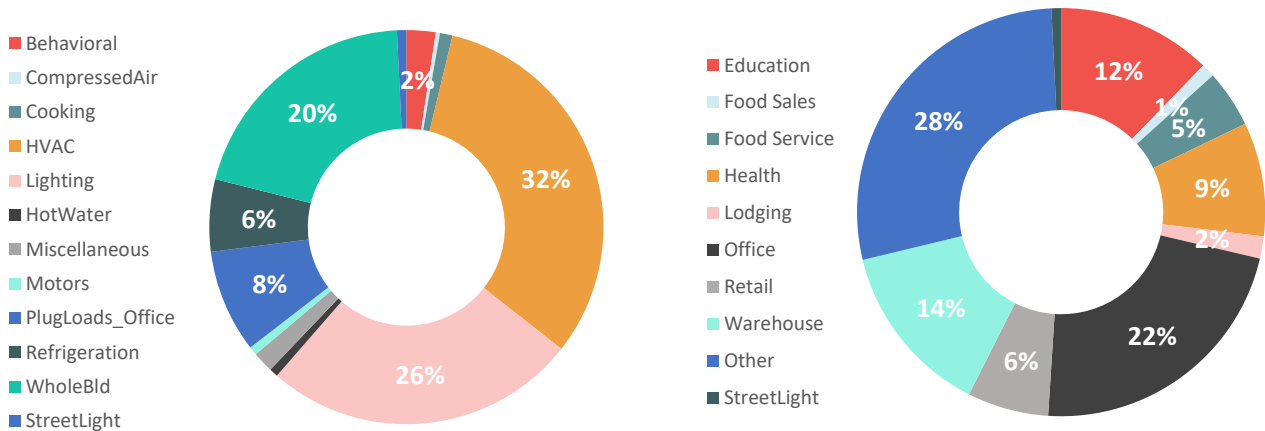


FIGURE 4-10: COMMERCIAL POTENTIAL BY END-USE AND BUILDING TYPE – RAP 2042

Table 4-88 provides incremental and cumulative annual commercial sector energy and demand savings for MAP and RAP across the next five years as well as over the 10-yr and 20-yr time horizons. Incremental RAP energy savings begin at roughly 80,200 MWh in 2023 followed by a steady decline over the next several years

<sup>21</sup> Segments with less than 3% of total end-use or building type share do not display a data label (%) in pie-charts to improve readability of data.

as commercial lighting savings become increasingly difficult to sustain. Cumulative RAP energy savings rise to approximately 600,000 MWh by 2042.

TABLE 4-8 COMMERCIAL SECTOR MAP & RAP POTENTIAL

|  | 2023   | 2024    | 2025    | 2026    | 2027    | 2032    | 2042    |
|--|--------|---------|---------|---------|---------|---------|---------|
| <b>Incremental Annual Energy (MWh)</b> |        |         |         |         |         |         |         |
| <b>MAP</b>                             | 80,262 | 76,588  | 76,131  | 77,699  | 77,833  | 77,755  | 89,588  |
| <b>RAP</b>                             | 58,440 | 55,437  | 55,959  | 58,167  | 58,640  | 61,227  | 72,290  |
| <b>Incremental Annual Energy (MW)</b>  |        |         |         |         |         |         |         |
| <b>MAP</b>                             | 12.4   | 12.1    | 12.4    | 13.1    | 13.6    | 13.2    | 16.8    |
| <b>RAP</b>                             | 8.7    | 8.5     | 8.8     | 9.6     | 10.1    | 10.5    | 12.8    |
| <b>Cumulative Annual Energy (MWh)</b>  |        |         |         |         |         |         |         |
| <b>MAP</b>                             | 80,262 | 156,317 | 231,267 | 304,046 | 369,794 | 623,649 | 780,233 |
| <b>RAP</b>                             | 58,440 | 113,341 | 168,112 | 221,708 | 270,092 | 466,484 | 600,007 |
| <b>Cumulative Annual Energy (MW)</b>   |        |         |         |         |         |         |         |
| <b>MAP</b>                             | 12.4   | 24.6    | 36.9    | 49.3    | 61.1    | 112.2   | 166.9   |
| <b>RAP</b>                             | 8.7    | 17.2    | 26.0    | 34.9    | 43.6    | 82.6    | 124.4   |

#### 4.4 INDUSTRIAL ENERGY EFFICIENCY POTENTIAL

Figure 4-110 provides the technical, economic, MAP and RAP results for the 3-year, 10-year, and 20-year timeframes. The cumulative annual 3-year technical and economic potential is 6% of forecasted industrial sales.<sup>22</sup> The cumulative annual 3-year MAP is 3.6% and the RAP is 2.6%, as a percentage of forecasted commercial sales. Over the duration of the study timeframe the technical and economic potential rise to 21% of forecasted sales. The identical technical and economic potential indicate that all industrial savings are cost-effective under the UCT screen based on the broader end-use analysis employed for this study. The MAP and RAP rise respectively to 14% and 10% of forecasted sales over the study timeframe. As with the commercial sector the gap between economic potential and MAP/RAP represents market barriers to prospective program participants, both financial and non-financial, to achieving the full amount of economic potential.

<sup>22</sup> Agriculture is included in the industrial sector savings and forecasted sales.

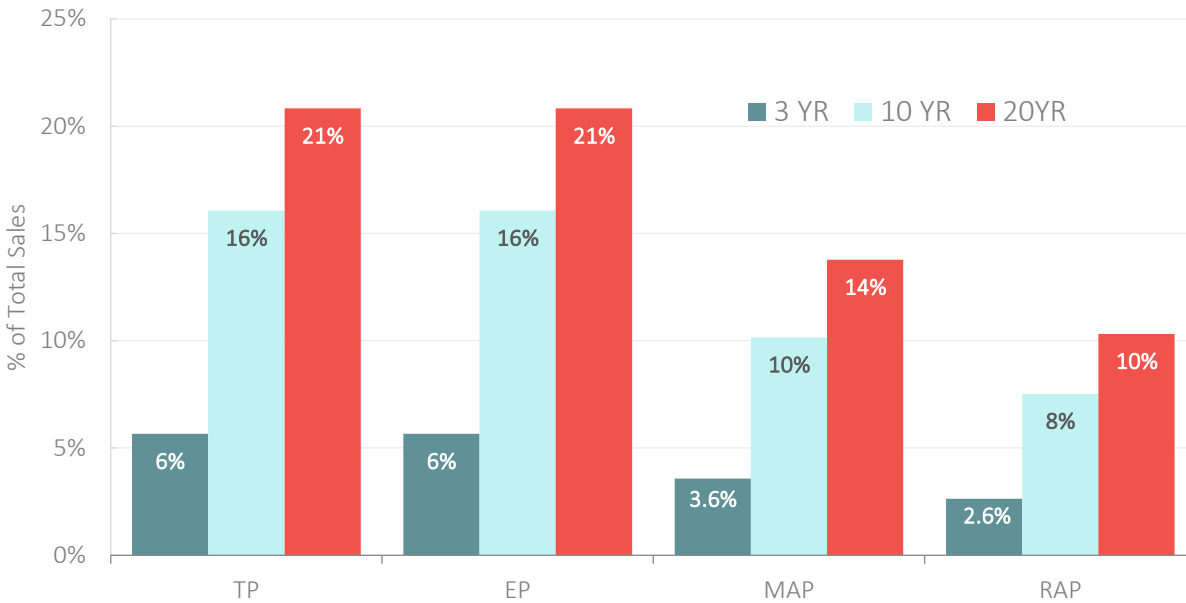


FIGURE 4-11: OVERVIEW OF INDUSTRIAL POTENTIAL

#### 4.4.1 Technical/Economic Potential

Table 4-79 provides cumulative annual technical and economic potential results across the 2023-2027 (Years 1-5) timeframe, as well as for 2032 (10<sup>th</sup>-year) and 2042 (20<sup>th</sup>-year). Both technical and economic potential is nearly 194,000 MWh by 2025 and rises to approximately 752,500 MWh by 2042. Peak demand savings associated with technical and economic potential reach just under 34 MW by 2025 and reach approximately 130 MW by 2042.

TABLE 4-9 TECHNICAL &amp; ECONOMIC INDUSTRIAL POTENTIAL

|                         | 2023   | 2024    | 2025    | 2026    | 2027    | 2032    | 2042    |
|-------------------------|--------|---------|---------|---------|---------|---------|---------|
| <b>Energy (MWh)</b>     |        |         |         |         |         |         |         |
| <b>Technical</b>        | 63,929 | 129,242 | 193,768 | 255,465 | 314,171 | 564,211 | 752,557 |
| <b>Economic</b>         | 63,929 | 129,242 | 193,768 | 255,465 | 314,171 | 9,508   | 752,557 |
| <b>Peak Demand (MW)</b> |        |         |         |         |         |         |         |
| <b>Technical</b>        | 11.1   | 22.4    | 33.5    | 44.2    | 54.4    | 97.7    | 130.1   |
| <b>Economic</b>         | 11.1   | 22.4    | 33.5    | 44.2    | 54.4    | 97.7    | 130.1   |

Figure 4-121 shows the technical and economic potential (20-year) by end use. Motors / Machine drive, which makes up nearly 40% of the industrial sector sales, also make up most of the technical/economic potential in the industrial segment. The remainder of the technical/economic potential savings are fairly evenly distributed across the remaining end-uses.

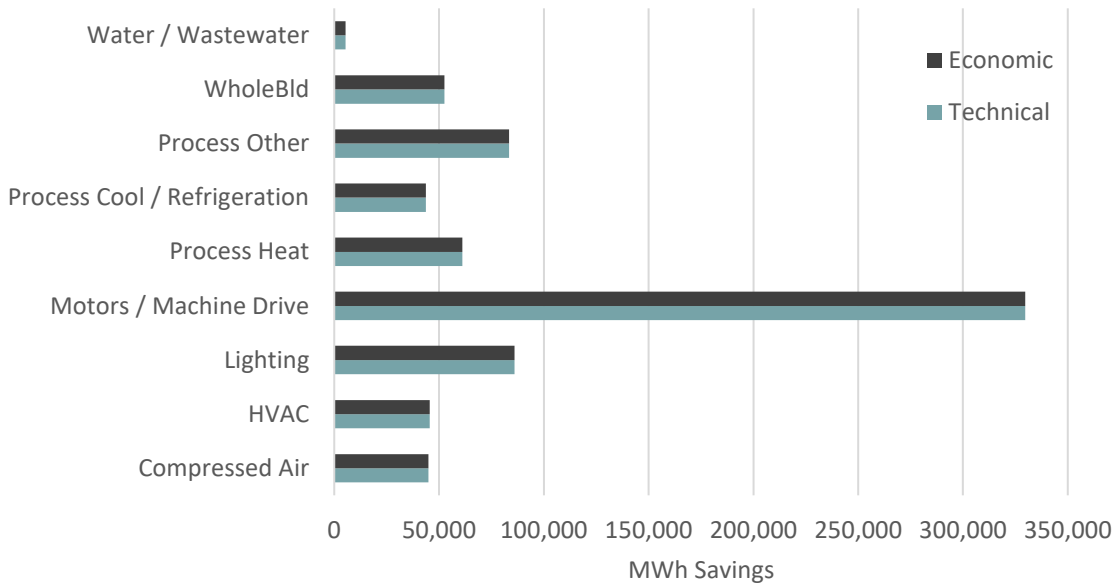


FIGURE 4-12: 20-YR INDUSTRIAL TECHNICAL & ECONOMIC POTENTIAL, BY END-USE

#### 4.4.2 Achievable Potential

Figure 4-132 provides the MAP and RAP across the 20-yr timeframe of the study. The green and red bars provide the respective incremental annual MAP and RAP in MWh per year energy savings. The green and orange lines provide the corresponding cumulative annual MAP and RAP as a percent of forecasted annual industrial sector sales. The MAP rises to 14% by 2042, and the RAP rises to 10%.

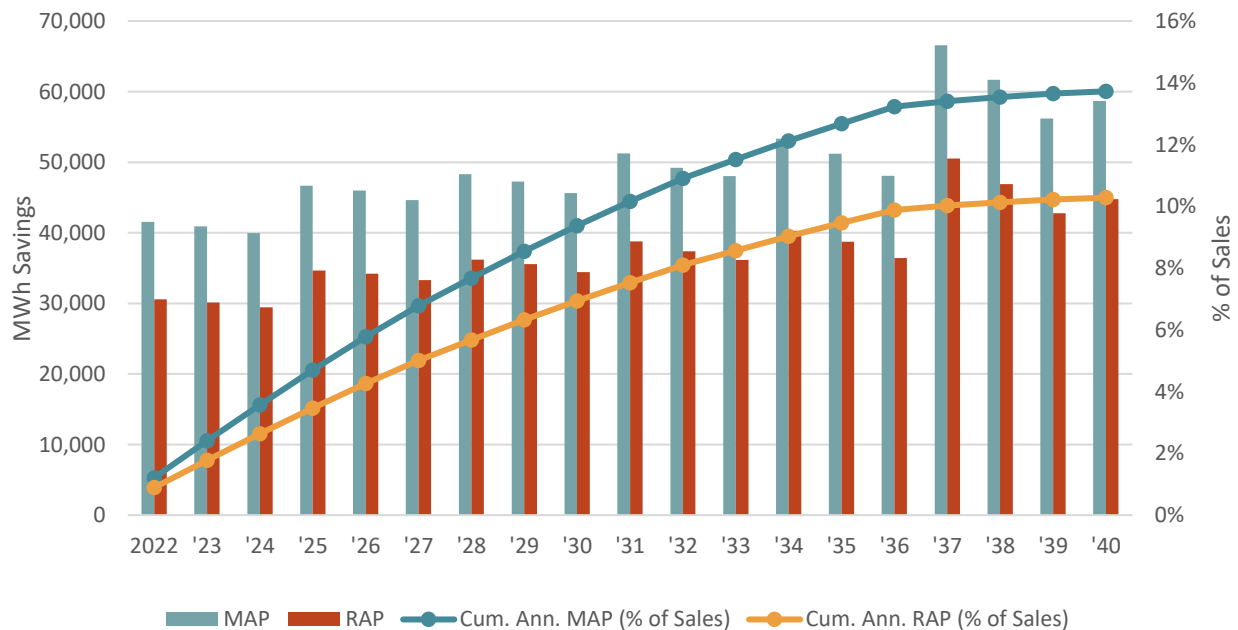


FIGURE 4-13: OVERVIEW OF INDUSTRIAL POTENTIAL – RAP 2042

Figure 4-143 provides a breakdown of the RAP potential in 2042 across commercial end-uses and building type market segments. Machine drive savings account for the largest share of savings (46%), followed by industrial



process savings (25% for all process heat, cool, and other combined) and lighting savings. SEM savings are represented by the Whole Building end-use and represent roughly 7% of the realistic achievable potential in the industrial sector.

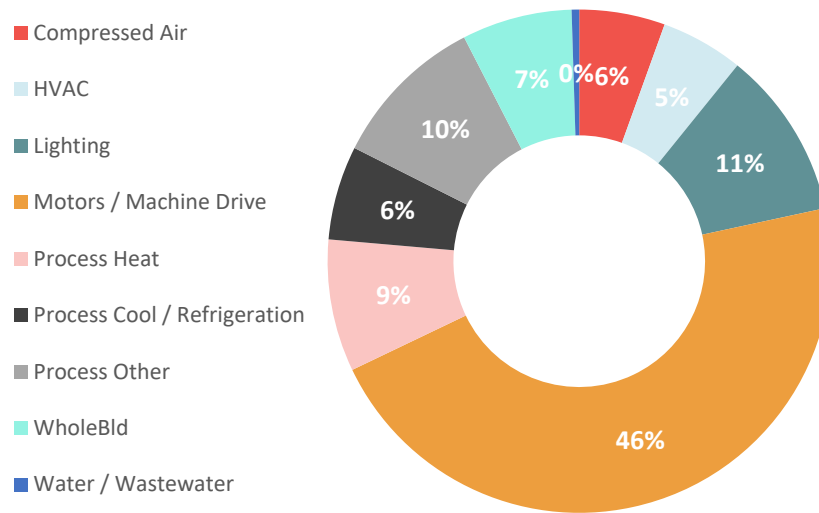


FIGURE 4-14: INDUSTRIAL POTENTIAL BY END-USE – RAP 2042

Table 4-1010 provides incremental and cumulative annual industrial sector energy and demand savings for MAP and RAP across the next five years as well as over the 10-yr and 20-yr time horizons. Incremental MAP energy savings begin at roughly 41,500 MWh and increase to just under 55,000 MWh by 2042. Cumulative annual RAP energy savings rise to approximately 373,000 MWh by 2042.

TABLE 4-10 INDUSTRIAL SECTOR MAP & RAP POTENTIAL

|  | 2023   | 2024   | 2025    | 2026    | 2027    | 2032    | 2042    |
|--|--------|--------|---------|---------|---------|---------|---------|
| <b>Incremental Annual Energy (MWh)</b> |        |        |         |         |         |         |         |
| MAP                                    | 41,551 | 40,892 | 39,948  | 46,691  | 46,013  | 51,231  | 54,938  |
| RAP                                    | 30,573 | 30,109 | 29,461  | 34,639  | 34,201  | 38,798  | 51,949  |
| <b>Incremental Annual Energy (MW)</b>  |        |        |         |         |         |         |         |
| MAP                                    | 7.2    | 7.1    | 6.9     | 8.0     | 7.9     | 8.8     | 9.4     |
| RAP                                    | 5.3    | 5.2    | 5.1     | 6.0     | 5.9     | 6.7     | 7.2     |
| <b>Cumulative Annual Energy (MWh)</b>  |        |        |         |         |         |         |         |
| MAP                                    | 41,551 | 82,444 | 122,392 | 161,140 | 198,771 | 356,788 | 497,824 |
| RAP                                    | 30,573 | 60,682 | 90,143  | 118,779 | 146,623 | 264,537 | 373,038 |
| <b>Cumulative Annual Energy (MW)</b>   |        |        |         |         |         |         |         |
| MAP                                    | 7.2    | 14.3   | 21.1    | 27.8    | 34.3    | 61.5    | 85.8    |
| RAP                                    | 5.3    | 10.5   | 15.5    | 20.5    | 25.3    | 45.6    | 64.2    |

## 5 DR POTENTIAL RESULTS

### 5.1 ANALYSIS APPROACH

This section provides an overview of the demand response potential methodology. Summary results of the demand response analysis are provided in Section 5.2. Additional results details are provided in Appendix D.

#### 5.1.1 Definition of Demand Response

According to the Federal Energy Regulatory Commission (FERC), demand response is defined as changes in electric usage by demand-side resources from their normal consumption patterns in response to changes in the price of electricity over time, or to incentive payments designed to induce lower electricity use at times of high wholesale market prices or when system reliability is jeopardized.

PJM defines a demand response program as providing end-use customers with the ability to manage their electricity use in response to conditions in the wholesale market. In short, resources must be dispatchable and measurable. Demand response rate options such as TOU rates do not meet these requirements. However, these rates can provide value for I&M by lowering their peak demand requirements.

This study uses the broader FERC definition of demand response so that all potential DR, including rate options, are identified. I&M's integrated resource planning team will analyze and adjust as necessary the identified DR potential for what can be counted in the PJM market and/or how DR potential will be used to construct alternative resource plans.

#### 5.1.2 Demand Response Program Options

Table 5-1 provides a brief description of the demand response (DR) program options that were considered as part of the base analysis and identifies the eligible customer segment for each demand response program to be considered in this study. The list of DR options was determined based on a review of the I&M's current and/or planned offerings, offerings of other peer utilities, and market research into emerging DR technologies. The base case analysis includes direct load control (DLC), rate design, and aggregator options.

TABLE 5-1 DEMAND RESPONSE BASE CASE PROGRAM OPTIONS AND ELIGIBLE MARKETS

| DR Program Option           | Program Description  | Eligible Markets                 |
|-----------------------------|--|----------------------------------|
| <b>Central AC DLC</b>       | The compressor of the air conditioner is remotely shut off (cycled) by the system operator for periods that may range from 7 ½ to 15 minutes during every 30-minute period (i.e., 25%-50% duty cycle). | Residential Low-Income Customers |
| <b>Connected Thermostat</b> | The system operator can remotely raise the AC's thermostat set point during peak load conditions, lowering AC and/or heating load.   | Residential and C&I Customers    |
| <b>Smart Water Heater</b>   | The system operator can remotely change the water heater's set point or shut off the water heater during peak load conditions.   | Residential and C&I Customers    |
| <b>DHW DLC</b>              | The water heater is remotely shut off by the system operator for periods normally ranging from 2 to 8 hours.   | C&I Customers                    |
| <b>Room AC DLC</b>          | The compressor of the air conditioner is remotely shut off (cycled) by the system operator for periods that may range from 7 ½ to 15 minutes during every 30-minute period (i.e., 25%-50% duty cycle)  | Residential Customers            |

| DR Program Option   | Program Description  | Eligible Markets              |
|---|--|-------------------------------|
| <b>Smart Appliance</b>                                      | Direct utility control of smart appliances.  | Residential Customers         |
| <b>Electric Vehicle Charging Control</b>                    | Direct utility control of electric vehicle charging stations.  | Residential and C&I Customers |
| <b>DLC Lighting</b>   | A portion of the lighting load is remotely shut off by the system operator for periods normally ranging from 2 to 4 hours.   | C&I Customers                 |
| <b>Connected Energy Management System</b>                   | The system operator can remotely shut off or setback a portion of a building's loads controlled through the connected energy management system.  | C&I Customers                 |
| <b>Thermal Storage</b>                                      | The use of a cold storage medium such as ice, chilled water, or other liquids. Off-peak energy is used to produce chilled water or ice for use in cooling during peak hours. The cool storage process is limited to off-peak periods.  | Residential and C&I Customers |
| <b>Battery Storage</b>                                      | The system operator remotely calls for energy stored in batteries to be discharged to the grid during peak conditions.   | Residential and C&I Customers |
| <b>Behavioral</b>   | The system operator uses electronic messaging, like text messaging or email, to alert participating customers to an upcoming peak event. Customers receive incentives for reducing their usage during the peak window but are not penalized for lack of participation.   | Residential Customers         |
| <b>Electric Vehicle Off-Peak Charging Rate</b>              | Special rate service for electric vehicles that charge off-peak.   | Residential and C&I Customers |
| <b>Time-of-use (TOU) Rate</b>                               | A retail rate with different prices for usage during different blocks of time. Daily pricing blocks could include on-peak, mid-peak, and off-peak periods. Pricing is pre-defined, and once established, does not vary with actual cost conditions.  | Residential and C&I Customers |
| <b>Critical peak pricing (CPP) Rate</b>                     | A retail rate in which an extra-high price for electricity is provided during a limited number of critical periods of the year. Market-based prices are typically provided on a day-ahead basis, or an hour ahead basis.   | Residential and C&I Customers |
| <b>Peak Time Rebates (PTR) Rate</b>                         | A program where customers are rewarded if they reduce electricity consumption during peak times with monetary rebates.   | Residential and C&I Customers |
| <b>Capacity Bidding Programs (Large C&amp;I Aggregator)</b> | CBP is a flexible bidding program offering qualified businesses payments for agreeing to reduce when a CBP event is called. Businesses make monthly nominations and receive capacity payments based on the amount of capacity reduction nominated each month, plus energy payments based on your actual kilowatt-hour (kWh) energy reduction when an event is called. Penalties occur if load nominations are not met. | C&I Customers                 |
| <b>Demand Bidding Programs (Small C&amp;I Aggregator)</b>   | DBP is a year-round, flexible, Internet-based bidding program that offers business customers credits for voluntarily reducing power when a DBP event is called.  | C&I Customers                 |
| <b>Curtable Rate</b>  | A discounted rate is offered to the customer for agreeing to interrupt or curtail load during peak period. The interruption is mandatory.  | C&I Customers                 |

| DR Program Option                   | Program Description  | Eligible Markets |
|-------------------------------------|--|------------------|
| <b>Real Time Pricing (RTP) Rate</b> | A retail rate with hourly energy prices closely matched to either the underlying wholesale electricity market or the utility's cost of production. | C&I Customers    |

Double-counting savings from demand response programs that affect the same end uses is a common issue that must be addressed when calculating the demand response savings potential. For example, a direct load control (DLC) program of air conditioning and a rate program both assume load reduction of the customers' air conditioners. For this reason, it is typically assumed that customers cannot participate in programs that affect the same end uses.

### 5.1.3 Demand Response Potential Assessment Approach Overview

The analysis of DR, where possible, closely follows the approach outlined for energy efficiency. The framework for assessing the cost-effectiveness of demand response programs is based on *A Framework for Evaluating the Cost-Effectiveness of Demand Response, prepared for the National Forum on the National Action Plan (NAPA) on Demand Response*.<sup>23</sup> Additionally, the GDS Team reviewed the May 2017 National Standard Practice Manual published by the National Efficiency Screening Project.<sup>24</sup> The GDS Team utilized this guide to define avoided ancillary services and energy and/or capacity price suppression benefits.

The demand response program potential for I&M was analyzed using a spreadsheet-based tool incorporating segment forecasts, program performance and economic definitions, and measure applicability estimates. The DR model determines the estimated savings for each demand response program by performing a review of all benefits and cost associated with each program. The GDS Team developed the model such that the value of future programs could be determined and will help facilitate demand response program planning strategies. The model contains approximately 50 required inputs for each program including: expected life, coincident peak ("CP") kW load reductions, proposed rebate levels, program related expenses such as vendor service fees, marketing and evaluation cost and on-going O&M expenses.

The UCT Test was used to determine the cost-effectiveness of each demand response program. Benefits are based on avoided generation capacity, energy (including load shifting) and T&D infrastructure costs. Costs include incentive costs, increased supply costs, fixed program capital costs (such as the cost of a central controller), program administrative, marketing and evaluation costs.

The demand response analysis includes estimates of technical, economic, achievable, and program potential. Achievable potential is broken into maximum and realistic potential in this study:

**MAP** represents an estimate of the maximum cost-effective demand response potential that can be achieved over the study period. For this study, this will be defined as customer participation in demand response program options that reflect a "best practice" estimate of what could eventually be achieved. MAP assumes no barriers to effective delivery of programs.

**RAP** represents an estimate of the amount of demand response potential that can be realistically achieved over the study period. For this study, this will be defined as achieving customer participation in demand response program options that reflect a realistic estimate of what could eventually be achieved assuming typical or "average" industry experience. RAP is a discounted MAP, by considering program barriers that limit

<sup>23</sup> Study was prepared by Synapse Energy Economics and the Regulatory Assistance Project, February 2013.

<sup>24</sup> National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources, May 18, 2017, Prepared by The National Efficiency Screening Project

participation, therefore reducing savings that could be achieved. Both MAP and RAP include the impact of energy efficiency gains realized in the Energy Efficiency Potential study. These gains account for peak demand reductions achieved as the population adopts more energy efficient equipment. Yearly energy efficiency gains were developed for the space cooling end use and for whole building impacts, which were applied for rate programs that affect multiple end uses.

#### 5.1.4 Avoided Costs

Demand response avoided costs are consistent with those utilized in the energy efficiency potential analysis and were provided by I&M. The primary benefit of demand response is avoided generation capacity, resulting from a reduction in the need for new peaking generation capacity and/or additional market-based capacity resources. Demand response also produces avoided energy related benefits and potentially delay the upgrade or new construction of transmission and distribution lines and facilities, reflected as avoided T&D costs.

If the demand response option is considered “load shifting”, such as direct load control of electric water heating, the consumption of energy is shifted from the control period to the period immediately following the period of control. If the program is not considered to be “load shifting” the measure is turned off during peak control hours, and the energy is saved altogether. For demand response program options where event participation also results in energy savings, such as lighting control programs, the energy savings benefit was included in the analysis. The number of annual control hours for all direct load control programs was determined by the GDS Team in collaboration with I&M.

#### 5.1.5 Demand Response Program Assumptions

This section briefly discusses the general assumptions and sources that will be used to complete the demand response potential analysis.

**Load Reduction:** Demand reductions were based on various secondary data sources including I&M evaluation reports, other peer program evaluation reports, and other industry reports, including demand response potential studies. Direct load control options are typically calculated based on a per-unit kW demand reduction whereas rate-based DR options and aggregator programs are typically assumed to reduce a percentage of the total facility peak load.

TABLE 5-2 DEMAND RESPONSE LOAD REDUCTION IMPACTS

| Program                                 | Residential Load Reduction (kW) |          | C&I Load Reduction (kW) |
|---|---------------------------------|----------|-------------------------|
| Central AC DLC                          | 0.80                            |          | N/A                     |
| Connected Thermostat                    | 1.06                            |          | 1.4                     |
| Smart Water Heater                      | 0.50                            |          | 1.3                     |
| DHW DLC                                 | 0.50                            |          | 1.3                     |
| Room AC DLC                             | 0.185                           |          | N/A                     |
| Smart Appliance                         | 0.24                            |          | N/A                     |
| Electric Vehicle Charging Control       | 1.50                            |          | 0.17                    |
| DLC Lighting                            | N/A                             |          | 8.3%                    |
| Connected Energy Management System      | N/A                             |          | 10%                     |
| Thermal Storage                         | N/A                             |          | 54                      |
| Battery Storage                         | 2.71                            |          | 11.25                   |
| Behavioral                              | SF: 0.15                        | MF: 0.08 | N/A                     |
| Electric Vehicle Off-Peak Charging Rate | 0.92                            |          | 0.092                   |
| Time-of-use (TOU) Rate w/ tech          | 8.70%                           |          | 3.80%                   |

| Program  | Residential Load Reduction (kW) | C&I Load Reduction (kW) |
|--|---------------------------------|-------------------------|
| Time-of-use (TOU) Rate w/o tech                  | 5.40%                           | 1.70%                   |
| Critical peak pricing (CPP) Rate w/ tech         | 23.90%                          | 15.40%                  |
| Critical peak pricing (CPP) Rate w/o tech        | 12.40%                          | 4.30%                   |
| Peak Time Rebates (PTR) Rate                     | 18.90%                          | 0.60%                   |
| Capacity Bidding Programs (Large C&I Aggregator) | N/A                             | 20.80                   |
| Demand Bidding Programs (Small C&I Aggregator)   | N/A                             | 7.00%                   |
| Ancillary Services Bidding Programs              | N/A                             | 4.80%                   |
| Curtable Rate                                    | N/A                             | 41.30                   |
| Real Time Pricing (RTP) Rate                     | N/A                             | 14.10%                  |

**Eligible Control Units:** The number of control units (or demand response equipment) per participant were calculated based on the average number of units in homes in the I&M's Indiana territory. This was used to determine the total equipment cost.

**Useful Life:** The useful life of equipment used in demand response programs, such as load control switches, smart thermostats, or AMI equipment, was determined using TRMs, and data from manufacturers. For this study, the GDS Team used a useful life of 20 years for equipment and included O&M costs to account for equipment replacements required within the study period.

**Equipment and Incentive Costs:** Equipment costs as applicable were included for each new participant. Incentives were included for all programs in the Base Case. These costs were either on a per participant, per kW or per kWh basis (noted in table).

TABLE 5-3 ASSUMED BASE CASE EQUIPMENT AND INCENTIVE COSTS

| Sector      | Program   | Equipment & Installation Cost | RAP Incentive Cost    |
|-------------|---|-------------------------------|-----------------------|
| Residential | Connected Thermostat                                    | \$299                         | \$15/peak period      |
|             | Central AC DLC  | \$100                         | \$14/peak period      |
|             | Connected Water Heater                                  | \$300                         | \$20/peak period      |
|             | DHW DLC   | \$200                         | \$20/peak period      |
|             | Room AC DLC   | \$750                         | \$17/peak period      |
|             | Smart Appliance   |                               | \$10/peak period      |
|             | Battery Storage   | \$15,061                      | \$3,850/battery       |
|             | Electric Vehicle Charging Control                       | \$1,309                       | \$15/peak period      |
|             | Time-of-use (TOU) Rate w/ enabling technology           | \$299                         | N/A                   |
|             | Critical peak pricing (CPP) Rate w/ enabling technology | \$299                         | N/A                   |
|             | Electric Vehicle Off-Peak Charging Rate                 | \$1,559                       | \$500/Level 2 charger |
| C&I         | Connected Thermostat                                    | \$299                         | \$11/peak period      |
|             | Connected Water Heater                                  | \$700                         | \$27/peak period      |

| Sector | Program   | Equipment & Installation Cost | RAP Incentive Cost |
|--------|---|-------------------------------|--------------------|
|        | Battery Storage   | \$33,200                      | \$8.5/kW           |
|        | Thermal Storage   | \$45,000                      | \$8.5/kW           |
|        | DLC Lighting  | \$19,494                      | \$8.5/kW           |
|        | Connected Energy Management System                      | \$47,084                      | \$8.5/kW           |
|        | Electric Vehicle Charging Control                       | \$1,309                       | \$8.5/kW           |
|        | Time-of-use (TOU) Rate w/ enabling technology           | \$400                         | N/A                |
|        | Critical peak pricing (CPP) Rate w/ enabling technology | \$400                         | N/A                |
|        | Electric Vehicle Off-Peak Charging Rate                 | \$1,309                       | N/A                |

**Program Costs:** Program development costs of \$332,298 were included in the first year of the analysis for new DLC programs, \$100,000 for commercial rate programs, and \$50,000 for residential rate programs. This cost was split between Indiana and Michigan based on the allocation of customers between the two territories. For residential program costs, Indiana took 79% of the program cost share and for C&I program costs, Indiana took 85% of the program cost share. No program development costs were included for existing I&M demand response programs. Each program includes an evaluation cost, marketing cost (higher for MAP than RAP), and administration cost. All program costs were escalated each year by the general rate of inflation assumed for this study.

**Eligible Market Size:** For direct load control programs, the size of the eligible market was determined by multiplying the forecast of I&M's customers by the saturation of the end use to be controlled. End use saturations were obtained from the I&M's RASS and primary research conducted by the GDS Team in the I&M service area to help inform the market potential studies.

I&M expects AMI infrastructure to be fully deployed in mid-2023. A forecast of AMI deployment rates for years 2021-2023 was provided by I&M and applied to the eligible customers for those rate programs that require smart meters. Two-way communication is fundamental for these pricing programs and AMI meters allow for hourly load data to be read and transmitted to the utility. Since it is imperative that hourly data must be read for rate programs, the GDS Team assumed AMI meters were required to participate in the Time of Use, Critical Peak Pricing, and Peak Time Rebate programs.

### 5.1.6 DR Program Adoption Levels

Long-term program adoption levels (or "steady state" participation) represent the enrollment rate once the fully achievable participation has been reached. The GDS Team used market research to determine steady state adoption rates for key program types. For the residential sector, the GDS Team collected data for direct load control of air conditioning/connected thermostats and rate programs. For the business sector, the GDS Team had data for direct load control of air conditioning and the CPP rate program. For rate programs, the residential survey included willingness to participate in time-of-use rates, while the business survey included Critical Peak Pricing rates. For programs where the GDS Team did not have primary data, other research or potential studies were used.

Customer participation in new demand response programs is assumed to reach the steady state adoption rate over a five-year period. The path to steady state customer participation follows an "S-shaped" curve, in which participation growth accelerates over the first half of the five-year period, and then slows over the second half of the period (see Figure 5-1). Table 5-4 provides the Base Case long-term adoption rates for MAP and RAP. Annual adoption rates, sources, and specific assumptions for each program are in Appendix D.

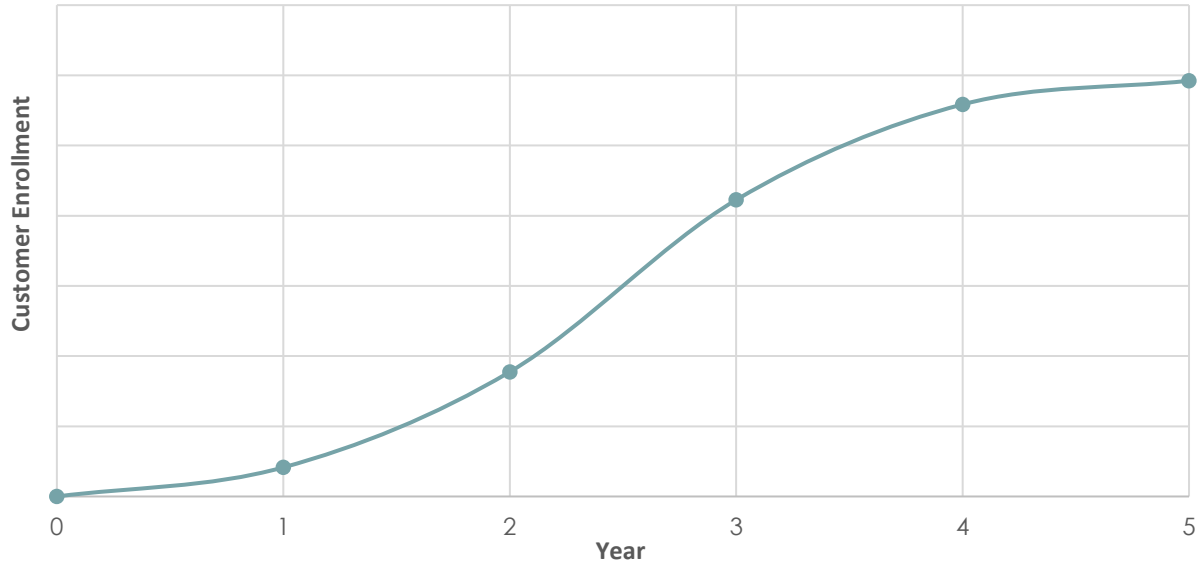


FIGURE 5-1 ILLUSTRATION OF S-SHAPED MARKET ADOPTION CURVE

TABLE 5-4 BASE CASE ADOPTION RATES

| Sector           | Program  | Steady State MAP Adoption Rate |             | Steady State RAP Adoption Rate |             |
|------------------|--|--------------------------------|-------------|--------------------------------|-------------|
|                  |  | Single Family                  | Multifamily | Single Family                  | Multifamily |
| Residential (MR) | Connected Thermostat                                     | 37%                            | 31%         | 25%                            | 26%         |
|                  | Connected Water Heater                                   | 24%                            | 24%         | 16%                            | 16%         |
|                  | DWH DLC  | 24%                            | 24%         | 16%                            | 16%         |
|                  | Behavioral   | 25%                            | 25%         | 20%                            | 20%         |
|                  | Room AC DLC  | 37%                            | 31%         | 25%                            | 26%         |
|                  | Smart Appliance  | 24%                            | 24%         | 16%                            | 16%         |
|                  | Electric Vehicle Charging Control                        | 25%                            | 25%         | 15%                            | 15%         |
|                  | Electric Vehicle Off-Peak Charging Rate                  | 25%                            | 25%         | 15%                            | 15%         |
|                  | Time-of-use (TOU) Rate w/o enabling technology           | 29%                            | 17%         | 17%                            | 11%         |
|                  | Critical Peak Pricing (CPP) Rate w/o enabling technology | 12%                            | 7%          | 7%                             | 5%          |
|                  | Peak Time Rebate (PTR) Rate                              | 8%                             | 5%          | 5%                             | 3%          |
| Residential (IE) | Connected Thermostat                                     | 35%                            | 35%         | 27%                            | 27%         |
|                  | Central AC DLC   | 32%                            | 32%         | 27%                            | 28%         |
|                  | Connected Water Heater                                   | 25%                            | 25%         | 16%                            | 16%         |
|                  | DWH DLC  | 25%                            | 25%         | 16%                            | 16%         |
|                  | Behavioral   | 25%                            | 25%         | 20%                            | 20%         |
|                  | Room AC DLC  | 35%                            | 32%         | 27%                            | 28%         |



| Sector | Program  | Steady State MAP Adoption Rate |             | Steady State RAP Adoption Rate |             |
|--------|--|--------------------------------|-------------|--------------------------------|-------------|
|        |  | Single Family                  | Multifamily | Single Family                  | Multifamily |
|        | Time-of-use (TOU) Rate w/o enabling technology           | 26%                            | 28%         | 18%                            | 19%         |
|        | Critical Peak Pricing (CPP) Rate w/o enabling technology | 11%                            | 12%         | 8%                             | 8%          |
| C/I    | Connected Thermostat                                     | 30%                            | 30%         | 24%                            | 24%         |
|        | DWH DLC  | 30%                            | 30%         | 24%                            | 24%         |
|        | Real Time Pricing (RTP) Rate                             | 8%                             | 8%          | 4%                             | 4%          |
|        | Critical Peak Pricing (CPP) Rate w/o enabling technology | 32%                            | 32%         | 18%                            | 18%         |
|        | Critical Peak Pricing (CPP) Rate w/ enabling technology  | 0%                             | 0%          | 13%                            | 13%         |
|        | Time-of-use (TOU) Rate w/o enabling technology           | 15%                            | 15%         | 10%                            | 10%         |
|        | Capacity Bidding   | 10%                            | 10%         | 5%                             | 5%          |
|        | Curtable Rate  | 25%                            | 25%         | 20%                            | 20%         |

Double-counting savings from demand response programs that affect the same end uses is a common issue that must be addressed when calculating the demand response savings potential. For example, a customer cannot elect to participate in both DLC programs and rate programs and claim savings from both programs for curtailing the same end use. One cannot save a kW of load in a specific hour more than once. In general, the hierarchy of demand response programs is accounted for by subtracting the number participants in a higher priority program from the eligible market for a lower priority program. Table 5-5 shows the hierarchy for each sector, with 1 being the top priority.

TABLE 5-5 BASE CASE DR HIERARCHY FOR EACH SECTOR

| Order | Residential Hierarchy                                    | Commercial Hierarchy                                     |
|-------|--|--|
| 1     | Critical Peak Pricing (CPP) Rate w/ enabling technology  | Connected Thermostat                                     |
| 2     | Critical Peak Pricing (CPP) Rate w/o enabling technology | Battery Storage  |
| 3     | Peak Time Rebates  | Thermal Storage  |
| 4     | Time-of-use (TOU) Rate w/ enabling technology            | Connected Energy Management System                       |
| 5     | Time-of-use (TOU) Rate w/o enabling technology           | Capacity Bidding   |
| 6     | Connected Thermostat                                     | Demand Bidding   |
| 7     | Battery Storage  | Ancillary Services                                       |
| 8     | Behavioral   | Curtable Rate  |
| 9     |  | Critical Peak Pricing (CPP) Rate w/ enabling technology  |
| 10    |  | Real Time Pricing Rate                                   |
| 11    |  | Critical Peak Pricing (CPP) Rate w/o enabling technology |
| 12    |  | Peak Time Rebates  |

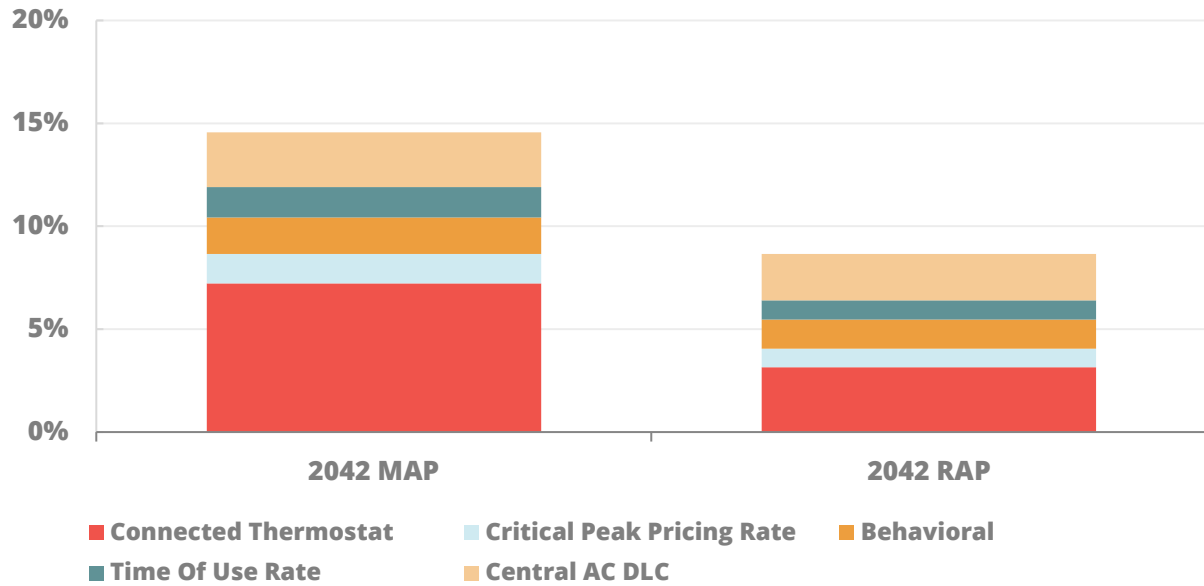
| Order | Residential Hierarchy | Commercial Hierarchy                           |
|-------|-----------------------|--|
| 13    |                       | Time-of-use (TOU) Rate w/ enabling technology  |
| 14    |                       | Time-of-use (TOU) Rate w/o enabling technology |

## 5.2 DEMAND RESPONSE POTENTIAL

### 5.2.1 Residential Potential

Figure 5-2 shows the 2042 residential market rate and income-eligible MAP and RAP demand response potential for Indiana. These demand reduction values are presented at the customer meter level.

FIGURE 5-2: SUMMER PEAK MW RESIDENTIAL SECTOR BASE CASE RESULTS AS % OF 2042 RESIDENTIAL CLASS LOAD (IN)



### 5.2.2 C&I Sector Potential

Figure 5-3 shows the 2042 C&I sector MAP and RAP demand response potential for Indiana. These demand reduction values are present at the customer meter level.

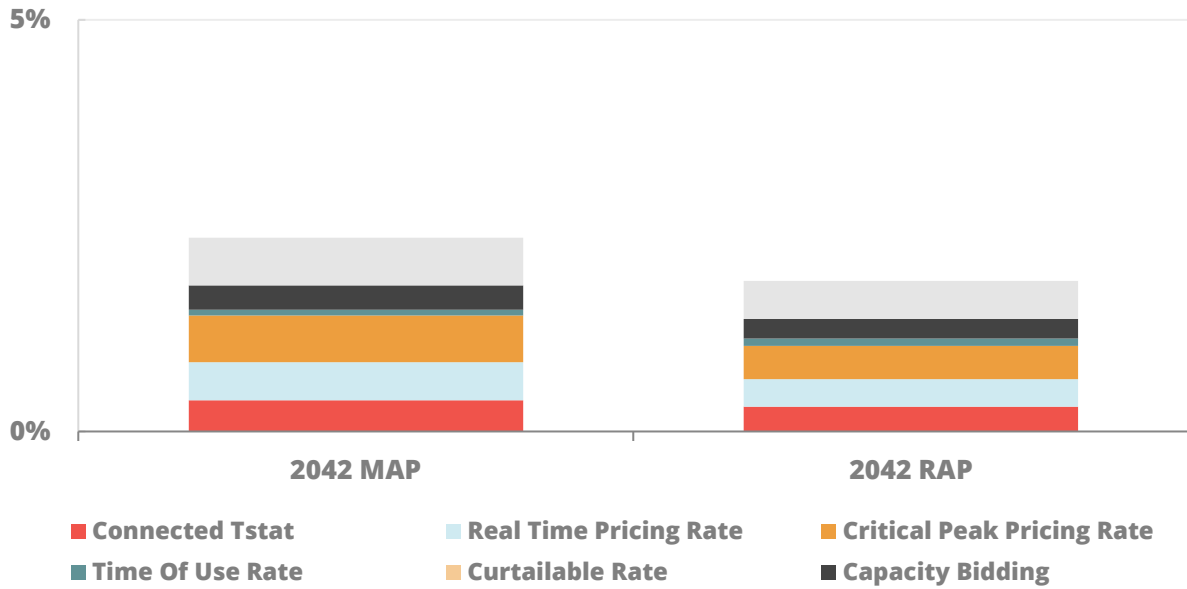


FIGURE 5-3 SUMMER PEAK MW C&I SECTOR BASE CASE RESULTS AS % OF 2042 C&I CLASS LOAD (IN)

### 5.2.3 Total Potential

Figure 5-4 shows the annual demand response RAP potential for the Base Case by sector in Indiana. These demand reduction values are present at the customer meter level.

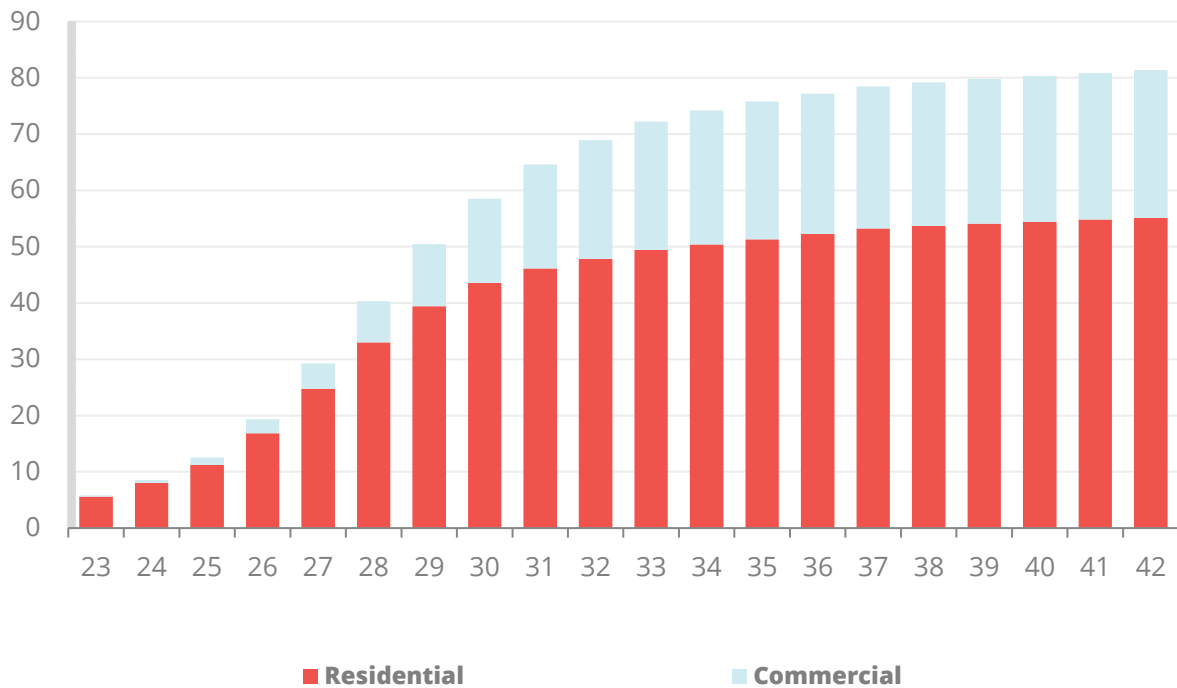


FIGURE 5-4 CUMULATIVE ANNUAL BASE CASE SUMMER PEAK MW RAP POTENTIAL BY SECTOR (IN)

### 5.2.4 Benefits/Costs of Program Potential

Cost-effectiveness of demand response measures was determined based on screening using the UCT test, which includes program administrative costs and incentives. Table 5-6 shows the residential and business benefits, costs, and UCT ratios for each program for MAP and Table 5-7 for RAP in the Base Case for Indiana.

TABLE 5-6 BASE CASE MAP BENEFITS, COSTS, AND UCT RATIOS

| Sector      | Program  | NPV Benefits | NPV Costs    | UCT Ratio |
|-------------|--|--------------|--------------|-----------|
| Residential | Connected Thermostat                                     | \$25,361,055 | \$13,307,610 | 1.9       |
|             | Central AC DLC   | \$15,082,389 | \$8,838,755  | 1.7       |
|             | Behavioral   | \$10,043,756 | \$6,827,219  | 1.5       |
|             | Time-of-use (TOU) Rate w/o enabling technology           | \$8,607,980  | \$1,879,045  | 4.6       |
|             | Critical Peak Pricing (CPP) Rate w/o enabling technology | \$8,087,310  | \$1,628,564  | 5.0       |
| C&I         | Connected Thermostat                                     | \$3,263,490  | \$1,288,039  | 2.5       |
|             | DHW DLC  | \$6,898,832  | \$6,274,867  | 1.1       |
|             | Time-of-use (TOU) Rate w/o tech                          | \$861,513    | \$498,073    | 1.7       |
|             | Critical peak pricing (CPP) Rate w/o tech                | \$6,899,243  | \$1,047,544  | 6.6       |
|             | Curtable Rate  | \$3,592,335  | \$1,361,625  | 2.6       |
|             | Real Time Pricing (RTP) Rate                             | \$5,655,774  | \$1,323,127  | 4.3       |

TABLE 5-7 BASE CASE RAP BENEFITS, COSTS, AND UCT RATIOS

| Sector      | Program  | NPV Benefits | NPV Costs   | UCT Ratio |
|-------------|--|--------------|-------------|-----------|
| Residential | Connected Thermostat                                     | \$14,361,923 | \$6,336,337 | 2.3       |
|             | Central AC DLC   | \$12,740,983 | \$5,976,588 | 2.1       |
|             | Behavioral   | \$8,021,777  | \$5,258,339 | 1.5       |
|             | Time-of-use (TOU) Rate w/o enabling technology           | \$5,422,071  | \$1,240,005 | 4.4       |
|             | Critical Peak Pricing (CPP) Rate w/o enabling technology | \$5,053,400  | \$1,193,982 | 4.2       |
| C&I         | Connected Thermostat                                     | \$2,508,976  | \$904,827   | 2.8       |
|             | DHW DLC  | \$4,366,748  | \$4,223,246 | 1.0       |
|             | Time-of-use (TOU) Rate w/o tech                          | \$877,886    | \$532,191   | 1.7       |
|             | Critical peak pricing (CPP) Rate w/o tech                | \$3,869,341  | \$1,160,279 | 3.3       |
|             | Curtable Rate  | \$2,258,551  | \$1,357,150 | 1.7       |
|             | Real Time Pricing (RTP) Rate                             | \$3,171,960  | \$1,351,310 | 2.4       |

## DISTRIBUTED ENERGY RESOURCES POTENTIAL

As part of the overall potential modeling exercise, the GDS Team considered distributed energy resources (DER) as sources of behind-the-meter customer-sited generation. The DER potential study followed the same method as the energy efficiency potential study in that the DER analysis reviewed the opportunity for technical, economic, and achievable potential. We used the same forecast data as used in the energy efficiency study to assess DER potential. The analysis limited resources for this potential study to technologies that are behind-the-meter and owned by the customer and did not consider market potential for supply-side resources. Specifically, this market potential assessment for DER focused on solar photovoltaic (PV) and combined heat and power (CHP) systems for the period 2023 to 2042.

### 6.1 APPROACH

The following section discusses the methods used to conduct the DER potential analysis. We detail approaches used to assess technical, economic, and achievable potential for solar PV and CHP.

#### 6.1.1 Technical Potential

##### 6.1.1.1 Solar Photovoltaic

Photovoltaic systems utilize solar panels, a packaged collection of photovoltaic cells, to convert sunlight into electricity. A system is constructed with multiple solar panels, a DC/AC inverter(s), a racking system to hold the panels, and electrical system interconnections. These systems are often roof-mounted and face south-west, south, and/or, south-east.

The study analyzed the potential associated with roof-mounted systems installed on residential and non-residential sector buildings. For the non-residential sector, the analysis also estimated potential for ground mounted (or covered parking) systems for a few specific business types. The analysis included battery storage as an additional configuration with each solar PV system type; however, due to the uncertainty associated with battery dispatch schedules, potential battery generation is excluded from this analysis. As noted above, this study did not explore the market potential associated utility-scale solar PV installations.

The approach to estimating technical potential required calculating the total square footage of suitable rooftop area within the Indiana regions of I&M's territory and calculating solar PV system generation based on building and regional characteristics. Technical potential is computed using Equation 6-1.

#### EQUATION 6-1 SOLAR PV TECHNICAL POTENTIAL CALCULATION

$$PV \text{ Technical Potential} = \Sigma(\text{Suitable Rooftop Square Footage} \times PV \text{ System Generation per Sq. Ft.})$$

The two key parameters in Equation 6-1 were estimated based on multiple data sources relevant to each state's region in the I&M territory. Methods for defining these parameters are discussed below.

The GDS Team estimated total rooftop square footage using the forecast disaggregation analysis to characterize the residential and non-residential building stocks. The building stocks were characterized based on relevant parameters such as number of facilities, average number of floors, average premise consumption, and premise EUI. The GDS Team used these parameters to estimate the total rooftop square footage.

To estimate the fraction of the total roof area that is suitable for rooftop solar PV, the GDS Team relied on research completed by the National Renewable Energy Laboratory (NREL). NREL has developed estimates of the portion of total rooftops across the country that are suitable for solar PV based on analysis of LIDAR data. NREL criteria for suitable roof area include:

- **Contiguous rooftop area size:** Rooftops with fewer than 10 square meters of contiguous roof area excluded.
- **Rooftop orientation (tilt and azimuth):** Northeast through northwest orientation and roof pitches greater than 60 degrees excluded.
- **Shading:** Roof areas that had a minimum solar exposure of less than 80% relative to an unshaded roof were excluded.

Based on NREL's data, the GDS Team was able to apply unique suitability factors to estimate the total square footage of suitable rooftop for residential and non-residential buildings across I&M's territory.

The second key parameter – PV system generation – was estimated by developing standardized solar PV system configurations. These included system sizes for residential premises ranging from 3 to 20 kW (DC) and 10 to 2,000 kW (DC) for non-residential premises. Additionally, the GDS Team selected battery system sizes for each solar PV system size to dispatch energy for 2-4 hours.

The Team relied on NREL's PVWatts<sup>25</sup> (Version 6.1.4) and System Advisor Model (SAM)<sup>26</sup> tools to estimate system generation for both residential and non-residential sited systems. These tools model PV power density based on site specific data from NREL's LIDAR-based NSRDB to estimate total solar irradiance in conjunction with PV system specifications. The PV system simulations were generated based on Fort Wayne, IN and Niles, MI. The GDS Team based assumptions for PV system azimuth on rooftop orientation data sourced from Google's Project Sunroof also based on Fort Wayne, IN and Niles, MI. The analysis assumptions are summarized in Table 6-1.

TABLE 6-1 KEY ASSUMPTIONS IN SOLAR PV ANALYSIS

| Parameter   | Assumptions  |
|---|--|
| Residential System Sizes<br>(Nominal DC Capacity)     | 3 kW, 5 kW, 7.5 kW, 10 kW, 15 kW, 20 kW  |
| Non-Residential System Sizes<br>(Nominal DC Capacity) | 10 kW, 15 kW, 20 kW, 25 kW, 50 kW, 100 kW,<br>250 kW, 500 kW, 1,000 kW, 2,000 kW |
| System losses   | 14.1%  |
| Tilt  | By region  |
| Azimuth:  | By region  |
| DC to AC size ratio                                   | 1.2  |
| Inverter efficiency                                   | 96% (micro-inverter)   |
| Battery Round-Trip Efficiency                         | 85%  |

Based on the simulations and resulting capacity factors for residential and non-residential buildings for the Indiana and Michigan regions, we applied the state-specific capacity factor to the system size to estimate annual electricity generation. These system generation values were used to calculate total energy generation per square foot of rooftop and extrapolated based on the total suitable rooftop square footage to estimate overall all technical potential. As a final step, the GDS Team removed from the technical potential for any generation occurring from existing systems. Data on existing systems was provided directly by I&M.

<sup>25</sup> PVWatts estimates solar PV energy production and costs. Developed by the National Renewable Energy Laboratory. (NREL) <http://pvwatts.nrel.gov/>

<sup>26</sup> SAM estimates hourly solar PV energy production and costs with more detailed inputs and outputs than PVwatts. Developed by the National Renewable Energy Laboratory. (NREL) [http:// https://sam.nrel.gov/](http://https://sam.nrel.gov/)

### 6.1.1.2 Combined Heat and Power

CHP systems generate electric power and useful thermal energy in a single integrated system. Heat that is normally wasted in conventional power generation is recovered as useful thermal energy. Due to the integration of both power and thermal generation, CHP systems are more efficient than separate sources for electric power generation and thermal energy production.

In most CHP applications, a heat engine creates shaft power that drives an electrical generator (fuel cells can produce electrical power directly from electrochemical reactions). The waste heat from the engine is then recovered to provide steam or hot water to meet on-site needs. By combining the thermal and electrical energy generation in one process, the total efficiency of a CHP application far exceeds that of a separate plant and boiler system. Overall, the efficiency of CHP technologies can reach 80% or more, while simple-cycle electricity generation reaches only 30% and combined cycle generation typically achieves 50%. When considering both thermal and electric energy generation, CHP requires 40% less energy input to achieve the same energy output as a separate plant and boiler system. Figure 6-1 **Error! Reference source not found.** illustrates this point.

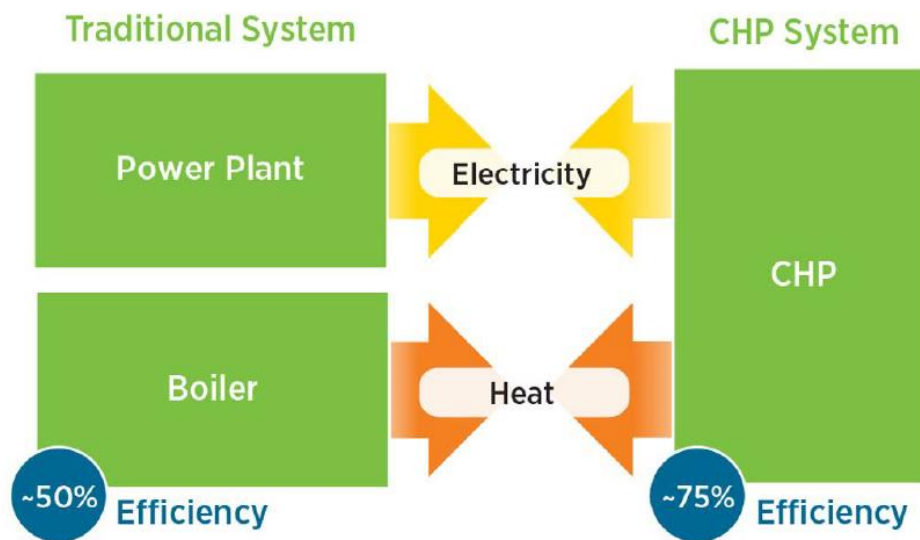


Figure courtesy of US DOE Energy Efficiency & Renewable Energy

FIGURE 6-1 CHP ENERGY FLOW DIAGRAM

Common technologies used in CHP applications and explored in this study include:

- Steam turbines
- Gas turbines
- Micro turbines
- Fuel Cells
- Reciprocating engines

Applications with steady demand for electricity and thermal energy are potentially good economic targets for CHP deployment. Industrial applications, particularly in industries with continuous processing and high steam requirements, are very economic and represent a large share of existing CHP capacity today. Commercial applications such as hospitals, nursing homes, laundries, and hotels with large hot water needs are well suited for CHP. Institutional applications such as colleges and schools, prisons, and residential and recreational facilities are also excellent prospects for CHP.

Selecting a specific CHP technology depends on several factors, which include but are not limited to power requirements, the duty cycle, space constraints, thermal energy needs, emission regulations, fuel availability, utility prices, and interconnection issues. Table 6-2 summarizes the CHP technologies evaluated in this study and their assumed operating parameters.

TABLE 6-2 CHP TECHNOLOGY COMPARISON<sup>27</sup>

| Parameter                          | Reciprocating Engine                            | Gas Turbine  | Steam Turbine                                 | Micro-Turbine                                | Fuel Cell                               |
|------------------------------------|---|--|---|--|---|
| Size (kW)                          | 50-5,000  | 500-50,000   | 10-100,000                                    | 30-250                                       | 200-2,000                               |
| Electric Efficiency                | 28-39%  | 25-40% (simple)<br>40-60% (combined)                                   | 5-15%   | 25-28%                                       | 36-42%                                  |
| Overall Efficiency                 | 73-79%  | 64-72%   | ~80%  | 67-72%                                       | 62%-67%                                 |
| Fuels                              | Natural gas, biogas, propane, liquid fuels      | Natural gas, biogas, propane, distillate oil                           | All   | Natural gas, biogas, propane, distillate oil | Hydrogen, natural gas, propane          |
| NO <sub>x</sub> Emissions (lb/MWh) | 0.15-2.17                                       | 0.55-0.68  | Function of boiler emissions                  | 0.14-0.17                                    | 0.01-0.04                               |
| Uses for Heat Recovery             | Hot water, low pressure steam, district heating | Direct heat, hot water-, low- or high-pressure steam, district heating | Low- or high-pressure steam, district heating | Direct heat, hot water, low pressure steam   | Hot water-, low- or high-pressure steam |
| Thermal Output (Btu/kWh)           | 3,000-6,100                                     | 3,200-5,000  | n/a   | 4,800-6,300                                  | 1,500-3,000                             |
| Useable Temp (°F)                  | 200-500   | 500-1,100  | n/a   | 400-650                                      | 140-700                                 |

To estimate technical potential for CHP, the GDS Team first developed a screening process based on the DOE's national technical potential study of CHP resources<sup>28</sup> to identify probable CHP candidate premises. First, customers with less than 50,000 kWh annual consumption were removed from eligibility as a CHP candidate. Second, we considered customer loads to assess if and what CHP system type and size may be a potential match to a customer. To effectively utilize CHP, a facility must have coincident electric and thermal energy requirements for a large load factor of the year. A continuous process industry with nearly constant steam or hot water demand electric load is an excellent target, such as a chemicals manufacturer or a hospital. Facilities with intermittent electric and thermal loads are progressively less attractive as the number of hours of coincident load diminishes. We therefore screened for eligible customers based on the customer's annual kWh usage and an approximate sized CHP system based on a thermal factor.

The Team calculated and applied a thermal factor to potential candidate customer loads to reflect thermal load considerations in CHP sizing. In most cases, on-site thermal energy demand is smaller than electrical demand. Thus, CHP size is usually dictated by the thermal load to achieve proper efficiencies and adequate

<sup>27</sup> Combined Heat and Power Market Assessment. ICF International for the California Energy Commission, April 2010.

<sup>28</sup> U.S. Department of Energy. Combined Heat and Power (CHP) Technical Potential in the United States, March 2016.



returns on investment. The Team used power to heat ratios<sup>29</sup> for both the CHP technology as well as different market segments to calculate the thermal factor as shown in following equation.

EQUATION 6-2 THERMAL FACTOR CALCULATION

$$\text{Thermal Factor} = \frac{P/H \text{ (CHP System)}}{P/H \text{ (Customer Segment)}}$$

A thermal factor of one (1.0) would result in the CHP system capacity being equal to the electric demand of the facility. A thermal factor of less than one would indicate that the application is thermally limited, and the resulting CHP system size would be below the electric demand of the facility. A thermal factor greater than one indicates that a CHP system sized to the thermal load would produce more electricity than can be used on-site, resulting in excess power that could be exported to the grid. Following the method applied in the DOE national technical potential study, the thermal factor was multiplied by each customer's annual consumption to estimate the appropriate CHP system size. The Team screened and removed any CHP technology that did not fall within +/- 15% generation of the customer's annual kWh consumption. A summary of the power to heat ratios by segment is listed in Table 6-3, as sourced from the DOE EPA CHP potential study.

TABLE 6-3 POWER TO HEAT RATIO BY SEGMENT

| Industrial Segment           | Heat to Power Ratio | Commercial Segment | Heat to Power Ratio |
|------------------------------|---------------------|--------------------|---------------------|
| Utilities                    | 1.29                | Education          | 0.50                |
| Smelting                     | 0.26                | Healthcare         | 0.75                |
| Food Manufacturing           | 1.10                | Institutions       | 0.94                |
| Transportation Manufacturing | 0.33                | Grocery            | 0.62                |
| Paper Manufacturing          | 2.37                | Lodging            | 0.62                |
| Plastics Manufacturing       | 0.31                | Office             | 0.20                |
| Misc. Manufacturing          | 1.34                | Retail             | 0.84                |
| Agriculture                  | 0.25                | Warehouse          | 0.68                |
| Construction                 | 0.25                | Misc.              | 0.68                |
| Metal Manufacturing          | 3.83                |                    |                     |

After applying the screening method, we reviewed which CHP systems were eligible matches for given customer sites. In cases where multiple CHP technologies were viable for a single customer site, an applicability factor was assigned for each eligible CHP technology. After assigning applicability factors, the Team summed the total CHP generation across the population. The GDS Team removed from the technical potential any generation occurring from existing systems. Data on existing systems was provided directly by I&M.

### 6.1.2 Economic Potential

Economic potential represents the DER generation possible given full adoption of all cost-effective DER measures. For the cost effectiveness analysis on solar PV and CHP, the GDS Team used a Total Resource Cost (TRC) hurdle of 1.0. To assess the TRC, the GDS Team relied on the same avoided energy and capacity costs

<sup>29</sup> Power to heat ratios were sourced from a combination of the following sources:

- U.S. Environmental Protection Agency Combined Heat and Power Partnership. Catalog of CHP Technologies, September 2017.
- U.S. Environmental Protection Agency Combined Heat and Power Partnership. Spark Spread Estimator Version 1.2
- U.S. Department of Energy. Combined Heat and Power (CHP) Technical Potential in the United States, March 2016.

used in the energy efficiency analysis. These avoided costs serve as the benefits while the costs are represented as the installation and O&M costs of the modeled solar PV and CHP measures.

#### 6.1.2.1 Solar Photovoltaic

To estimate economic potential for solar PV, we gathered pertinent data on system costs along with calculated generation benefits to use in the benefit-cost analysis, which we conducted at the system measure level. The GDS Team assessed system component costs based on data included in the National Renewable Energy Laboratory's (NREL) Q1 2020 Benchmarking report as well as public data files from Tracking the Sun<sup>30</sup> and compared these national cost parameters to I&M-specific values by using various market data provided by Energy Sage.<sup>31</sup> This analysis produced an estimated installation cost per watt installed, which we applied to each system size to estimate total installed cost. Additionally, the GDS Team included O&M costs that scale with system size<sup>32</sup>. Finally, we assumed the impact of the federal investment tax credit (ITC) to follow the existing schedule at the time of this report which equates to a 10% tax credit for commercial systems by 2024 and a 0% tax credit for residential systems by 2024.

In addition to modeling solar PV system costs, the GDS Team estimated cost impacts for solar PV systems coupled with battery storage based on analysis from NREL's Q1 2020 Benchmarking report and Lazard's Levelized Cost of Storage Analysis<sup>33</sup>. The GDS Team estimated an average lithium-ion battery installation cost of \$1,093/kWh and \$721/kWh for the residential and non-residential sectors, respectively, inclusive of the ITC.

TABLE 6-4 AVERAGE SOLAR PV INSTALLATION COST

| Sector                               | System Cost (\$/ DC W) <sup>1</sup> |
|--------------------------------------|-------------------------------------|
| Residential                          | \$3.05                              |
| Non-Residential (<100 kW)            | \$2.56                              |
| Non-Residential (>100 kW)            | \$2.20                              |
| Non-Residential - Tracking (<100 kW) | \$3.95                              |
| Non-Residential - Tracking (>100 kW) | \$3.39                              |

<sup>1</sup>Costs reflect impact of federal investment tax credit; battery systems not reflected in cost.

#### 6.1.2.2 Combined Heat and Power

To assess costs for the various CHP technologies analyzed in the potential study, the GDS Team relied on data sourced from the EPA Catalog of CHP Technologies<sup>34</sup>. Costs were calculated for fuel cell, gas turbine, micro turbine, reciprocating engine, and steam turbine CHP configurations at various capacity sizes. These costs reflect the inclusion of the ITC based on the existing schedule at the time of this report which equates to a 10% tax credit for CHP through 2023.

Table 6-5 summarizes detailed CHP cost considerations and assumptions utilized in the cost-effectiveness screening. These costs reflect the inclusion of the ITC based on the existing schedule at the time of this report which equates to a 10% tax credit for CHP through 2023.

<sup>30</sup> Feldman, D, et. al., U.S. Solar Photovoltaic System and Energy Storage Cost Benchmark: Q1 2020. NREL, January 2021.

<sup>31</sup> <https://www.energysage.com/solar-panels/in/>; <https://www.energysage.com/solar-panels/mi/> (accessed March 2021).

<sup>32</sup> Feldman, D, et. al., U.S. Solar Photovoltaic System and Energy Storage Cost Benchmark: Q1 2020. NREL, January 2021.

<sup>33</sup> Ibid.

<sup>34</sup> U.S. Environmental Protection Agency Combined Heat and Power Partnership. Catalog of CHP Technologies, September 2017.

TABLE 6-5 DETAILED CHP COST CONSIDERATION SUMMARY

| Technology Type | Size (kW) | Installed System Cost (\$/W) | O&M Costs (\$/kWh) | Technology Type      | Size (kW)     | Installed System Cost (\$/W) | O&M Costs (\$/kWh) |
|-----------------|-----------|------------------------------|--------------------|----------------------|---------------|------------------------------|--------------------|
| Fuel Cell       | 125       | \$17.33                      | \$0.35             | Reciprocating Engine | 125           | \$2.85                       | \$0.07             |
|                 | 250       | \$12.42                      | \$0.31             |                      | 250           | \$2.81                       | \$0.07             |
|                 | 500       | \$6.69                       | \$0.27             |                      | 500           | \$2.73                       | \$0.07             |
|                 | 750       | \$6.10                       | \$0.27             |                      | 750           | \$2.64                       | \$0.07             |
|                 | 1000      | \$5.50                       | \$0.26             |                      | 1000          | \$2.55                       | \$0.06             |
|                 | 1250      | \$4.91                       | \$0.26             |                      | 1250          | \$2.47                       | \$0.06             |
|                 | 1500      | \$4.32                       | \$0.26             |                      | 1500          | \$2.38                       | \$0.06             |
|                 | 2000      | \$3.13                       | \$0.26             |                      | 2000          | \$2.21                       | \$0.06             |
| Gas Turbine     | 750       | \$3.84                       | \$0.09             |                      | 2500          | \$2.04                       | \$0.05             |
|                 | 1000      | \$3.77                       | \$0.09             |                      | 3000          | \$1.86                       | \$0.05             |
|                 | 1250      | \$3.69                       | \$0.09             |                      | 3000          | \$1.86                       | \$0.05             |
|                 | 1500      | \$3.62                       | \$0.09             |                      | 4000          | \$1.74                       | \$0.05             |
|                 | 2000      | \$3.48                       | \$0.09             |                      | 4500          | \$1.71                       | \$0.05             |
|                 | 2500      | \$3.34                       | \$0.09             |                      | 5000          | \$1.68                       | \$0.04             |
|                 | 3000      | \$3.20                       | \$0.09             |                      | Steam Turbine | 500                          | \$4.95             |
|                 | 3500      | \$3.06                       | \$0.09             | 750                  |               | \$4.95                       | \$0.18             |
|                 | 4000      | \$2.92                       | \$0.09             | 1000                 |               | \$4.95                       | \$0.18             |
|                 | 4500      | \$2.78                       | \$0.09             | 1250                 |               | \$4.95                       | \$0.18             |
|                 | 5000      | \$2.64                       | \$0.09             | 1500                 |               | \$4.95                       | \$0.18             |
| 5500            | \$2.50    | \$0.09                       | 2000               | \$4.95               |               | \$0.18                       |                    |
| 6000            | \$2.36    | \$0.08                       | 2500               | \$4.95               |               | \$0.18                       |                    |
| Micro Turbine   | 50        | \$3.50                       | \$0.05             | 3000                 |               | \$4.95                       | \$0.18             |
|                 | 100       | \$3.30                       | \$0.05             | 3500                 |               | \$4.95                       | \$0.18             |
|                 | 150       | \$3.10                       | \$0.05             | 4000                 |               | \$4.95                       | \$0.18             |
|                 | 200       | \$2.90                       | \$0.05             | 4500                 |               | \$4.95                       | \$0.18             |
|                 |           |                              |                    | 5000                 | \$4.95        | \$0.18                       |                    |
|                 |           |                              |                    | 5500                 | \$4.95        | \$0.18                       |                    |
|                 |           |                              |                    | 6000                 | \$4.95        | \$0.18                       |                    |

### 6.1.3 Market Potential

Market potential is the amount of energy that can realistically be saved given likely future utility program intervention and various market barriers. The anticipated approach to assess achievable potential for the DER potential analysis was to follow the same logic and methods as used in the energy efficiency achievable potential analysis. However, as discussed in Section 6.2 below, market potential was not assessed as neither the solar PV nor CHP technologies passed a TRC screen of 1.0.

## 6.2 DER POTENTIAL FINDINGS

This section of the report presents the Technical, Economic, Achievable (MAP and RAP) for CHP and solar PV.

### 6.2.1 Solar Photovoltaics

Table 6-6 summarizes the solar PV cumulative annual potential estimates for electric demand and Table 6-7 for electric energy within I&M's Indiana territory. The residential 2042 technical market potential for solar PV represents 55.9% of the 2042 residential sector sales forecast. Additionally, the non-residential 2042 technical market potential represents 64.0% of the 2042 non-residential sector sales forecast.

TABLE 6-6 SUMMARY OF SOLAR PV ELECTRIC DEMAND MARKET POTENTIAL

| Year | Technical DC Capacity (MW) | Technical Peak Capacity (MW) | Economic (MW) | MAP (MW) | RAP (MW) |
|------|----------------------------|------------------------------|---------------|----------|----------|
| 2023 | 333                        | 109                          | 0             | 0        | 0        |
| 2027 | 1,918                      | 601                          | 0             | 0        | 0        |
| 2032 | 5,658                      | 1,771                        | 0             | 0        | 0        |
| 2042 | 6,628                      | 2,074                        | 0             | 0        | 0        |

TABLE 6-7 SUMMARY OF SOLAR ELECTRIC ENERGY MARKET POTENTIAL

| Year | Technical (MWh) | Economic (MWh) | MAP (MWh) | RAP (MWh) |
|------|-----------------|----------------|-----------|-----------|
| 2023 | 433,828         | 0              | 0         | 0         |
| 2027 | 2,399,988       | 0              | 0         | 0         |
| 2032 | 7,069,659       | 0              | 0         | 0         |
| 2042 | 8,280,565       | 0              | 0         | 0         |

Table 6-8 summarizes the cost effectiveness results for each technology and for the TRC cost-effectiveness perspective.

TABLE 6-8 SUMMARY OF SOLAR PV COST-EFFECTIVENESS

| Solar PV Technologies  | TRC Test Range |
|--|----------------|
| Residential Roof-mounted<br>(3 – 20 kW)                                | 0.44           |
| Residential Roof-mounted with Batteries<br>(3 – 20 kW)                 | 0.20 – 0.37    |
| Non-residential Roof mounted<br>(10 – 50 kW)                           | 0.43           |
| Non-residential Roof mounted with Batteries<br>(10 – 50 kW)            | 0.33 – 0.36    |
| Non-residential Ground mounted<br>(100 kW – 2MW)                       | 0.50           |
| Non-residential Ground mounted with Batteries<br>(100 kW – 2MW)        | 0.43 – 0.44    |
| Non-residential Ground mounted Tracking<br>(100 kW – 2MW)              | 0.46           |
| Non-residential Ground mounted Tracking with Batteries<br>(10 – 50 kW) | 0.40 – 0.41    |

It is notable that no solar PV technologies pass cost-effectiveness screening under the TRC. This test is the primary cost-effectiveness criteria used to determine whether a utility sponsored program intervention is prudent. Low avoided costs serve as the primary driver behind the cost effectiveness results. At a technology level, the introduction of battery storage reduces cost effectiveness despite potential capacity benefit gains. Similarly, benefits achieved through additional generation using tracking-enabled systems are ultimately outweighed by the higher installation cost associated with the tracking technology.

The GDS Team conducted additional sensitivity analysis to understand how various cost parameters impact solar PV cost effectiveness and to what extent these costs are required to change in order for any of the modeled solar PV measures to pass a TRC of 1.0. Specifically, the Team reviewed mutually exclusively the impacts of:

- Transmission and distribution (T&D) costs
- Solar PV materials and installation cost

To simulate the locational benefits associated with DERs, the Team conducted the cost-effectiveness testing with an increase of 500% to the T&D values. Despite this increase, no solar PV measure permutation passed the TRC. T&D values would need to increase 1250% to allow a limited number of non-residential measures to pass cost-effectiveness. We also considered a 35% cost reduction and reassessed solar PV cost-effectiveness. However, we ultimately found a cost reduction of 55% was required for a limited number of measures to achieve a TRC ratio of 1.0 or greater.

### 6.2.2 Combined Heat & Power

Table 6-9 summarizes the CHP cumulative annual potential estimates for electric demand and Table 6-10 for electric energy within I&M's Indiana territory. 2042 technical market potential for CHP represents 17.3% of the 2042 non-residential sector sales forecast.

TABLE 6-9 SUMMARY OF CHP ELECTRIC DEMAND MARKET POTENTIAL

| Year | Technical Peak Capacity (MW) | Economic (MW) | MAP (MW) | RAP (MW) |
|------|------------------------------|---------------|----------|----------|
| 2023 | 8                            | 0             | 0        | 0        |
| 2027 | 49                           | 0             | 0        | 0        |
| 2032 | 154                          | 0             | 0        | 0        |
| 2042 | 185                          | 0             | 0        | 0        |

TABLE 6-10 SUMMARY OF CHP ELECTRIC ENERGY MARKET POTENTIAL

| Year | Technical (MWh) | Economic (MWh) | MAP (MWh) | RAP (MWh) |
|------|-----------------|----------------|-----------|-----------|
| 2023 | 73,191          | 0              | 0         | 0         |
| 2027 | 426,286         | 0              | 0         | 0         |
| 2032 | 1,339,712       | 0              | 0         | 0         |
| 2042 | 1,608,618       | 0              | 0         | 0         |

Table 6-11 summarizes the cost effectiveness results for each technology and for the TRC cost-effectiveness perspective.

TABLE 6-11 SUMMARY OF CHP COST-EFFECTIVENESS

| CHP Technologies                         | TRC Test Range |
|--|----------------|
| Fuel Cell<br>(125 – 2,000 kW)            | 0.12 – 0.40    |
| Gas Turbine<br>(750 – 6,000 kW)          | 0.40 – 0.59    |
| Micro-Turbine<br>(50 – 200 kW)           | 0.22 – 0.26    |
| Reciprocating Engine<br>(125 – 5,000 kW) | 0.30 – 0.53    |
| Steam Turbine<br>(500 – 6,000KW)         | Less than 0.1  |

It is notable that no CHP technologies pass cost-effectiveness screening under the TRC. This test is the primary cost-effectiveness criteria used to determine whether a utility sponsored program intervention is prudent. Low avoided costs serve as the primary driver behind the cost effectiveness results. However, it may be the case that certain site location conditions have important performance parameters that allow for a favorable cost-effectiveness assessment for that specific site, even if the average system and facility is not cost-effective as analyzed.

## 7 PROGRAM DESIGN

The GDS Team conducted research and analysis to identify ideas for I&M to consider for potential improvements to their program portfolio. The objective was to highlight industry trends and best practices, as well as possible opportunities to close gaps between I&M's portfolio of offerings and other portfolios that are achieving higher volumes of savings, and/or are ranked among the nation's top DSM portfolios. The GDS Team then revised the concepts and suggested modifications to the market potential study program potential modeling inputs to reflect the outcomes of this analysis. This task was not a comprehensive portfolio optimization analysis. Rather it involved a high level, largely qualitative review of industry trends and comparison of utility portfolio characteristics. There may be additional factors beyond the scope of this analysis that would make certain considerations presented here infeasible for I&M to pursue or concepts that need to be tested with actual market conditions.

### 7.1 ANALYSIS APPROACH

The GDS Team sought to gather insight into the latest industry trends and best practices by reviewing literature (e.g., industry association trends report, conference papers, government agency white papers, evaluation reports, and DSM plans), as well as data associated with the program portfolios offered by peer utilities. Outcomes from the MPS market research and initial modeling outputs, as well as stakeholder input on the MPS and I&M's most recent DSM Plan submittals in Indiana and Michigan also were considered in the analysis.

The Team selected seven utilities for benchmarking comparison (Figure 7-1) based on a combination of proximate geography, availability of granular measure-level data, references to utilities included in stakeholder comments, and ranking as top programs in ACEEE's 2020 Utility Energy Efficiency Scorecard. For each of the comparison utilities, the Team assembled data regarding program and measure offerings, as well as program cost-effectiveness and related values. Data sources included DSM Plan filings, evaluation reports, program websites, and other sources where available.

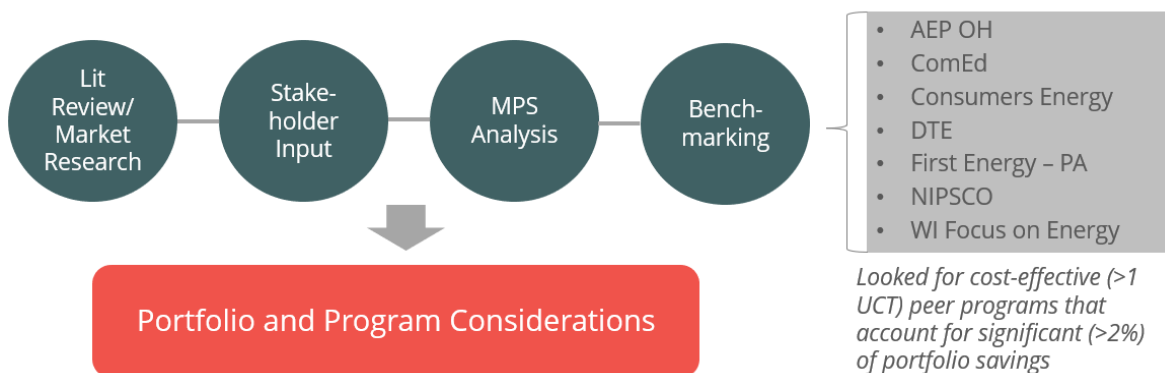


FIGURE 7-1: METHODS FOR DEVELOPING PROGRAM AND PORTFOLIO CONSIDERATIONS

Guiding principles for the analysis were to:

- Identify cost-effective program opportunities (>1 UCT) that can deliver significant energy savings (>2% of total portfolio savings based on comparison utility experiences);
- Look for opportunities to shape a portfolio that exhibits characteristics identified as optimal for advancing the long-term success of energy efficiency markets; and
- Consider program objectives I&M highlighted in its most recent DSM Plan filings.

ACEEE's 2020 Utility Energy Efficiency Scorecard served as a key reference for identifying the optimal DSM program characteristics that look beyond the basic components of high impact energy savings and cost-effectiveness. ACEEE's

Scorecard ranks DSM programs based on a variety of characteristics, recognizing that many factors shape the context for what a utility can offer, as well as the range of benefits a program may provide. Characteristics identified as optimal for utility energy efficiency portfolios include:<sup>35</sup>

- **Comprehensive** – serving the full spectrum of customer needs and end uses.
- **Responsive to market changes** - including emerging program areas and strategies that address major or growing end uses.
- **Innovative and engaging** - bringing in new technologies and strategies (e.g., geo-targeting, grid-interactive efficient buildings, bundling efficiency with other resources, emphasizing technologies with multi-benefits).
- **Simple, accessible, and hassle free** - to maximize customer participation.
- **Tailored** - to meet the unique needs of different customers and offering incentives at the most effective point in the supply chain for a given market.
- Operating in a jurisdiction with **policy support and enabling mechanisms**

It was through the lens of these guiding principles that the GDS Team considered potential refinements to I&M’s current portfolio of programs. The considerations described in the following sections were the result of this analysis. The Team presents these considerations in an effort to help put I&M in the best position possible to achieve deeper savings cost-effectively over the long term. However, the Team recognizes the limitations of this analysis and that factors beyond the scope of this work may limit the applicability of these considerations. The GDS team would recommend that I&M gather program costs and measure details from market implementations contractors and vendors to validate these findings. Additionally, markets in the I&M service territory may not react immediately and/or the program may require time to mature operations; consequently, some of these findings should be implemented as a pilot or have cost effectiveness assessed after several years.

### 7.1.1 Application of Considerations to Program Potential

The GDS team applied the research findings to refine the realistic achievable potential into the program potential scenario. The program potential scenario simulates the expected program outcomes in forecasted years by included the following updated factors informed by best practice research:

- **Program Net-to-Gross values (NTG)**
  - Existing program offering utilize 2019/2020 program NTG estimates
  - New program offerings are defaulted to 0.8 unless research dictates otherwise
- **Incentive levels and structures**
  - Measures within existing I&M programs were modeled within their current framework unless research dictates otherwise
- **Program non-incentive costs (admin)**
- **Measure Assignments**
  - In some cases, achievable potential cost-effective measures were reassigned to new program types.

## 7.2 PROGRAM POTENTIAL RESULTS

This section provides an overview of the costs and savings associated with the program potential for energy efficiency. Residential and C&I sector results are provided.

Table 7-1 below shows the residential and C&I program potential. The first set of numbers shows the RAP, followed by the gross program potential, and then lastly the net program potential. The drop from RAP to Program RAP is driven

<sup>35</sup> ACEEE 2020 Utility EE Scorecard, see “Practices of Leading Energy-Saving Utilities,” p. 91.



by changes in program mapping for certain measures, as well as programs being dropped from the program potential if not cost-effective at the program-level. The reduction from gross Program RAP to net Program RAP is due to the estimated prospective net-to-gross ratios of the measures and programs retained in the program potential analysis.

TABLE 7-1 PROGRAM POTENTIAL (MWH)

| Program      | RAP (gross)      | Program RAP (gross) | Program RAP (net) |
|--------------|------------------|---------------------|-------------------|
| Residential  | 654,240          | 319,404             | 251,412           |
| C&I          | 973,046          | 979,544             | 817,768           |
| <b>Total</b> | <b>1,627,285</b> | <b>1,298,947</b>    | <b>1,069,180</b>  |

Figure 7-2 provides the incremental program RAP in the residential sector across the next five, then ten and twenty years. The Home Energy Products program provides a steady contribution towards the total. The Home Energy Engagement and HVAC Midstream programs steadily increase in savings over time.

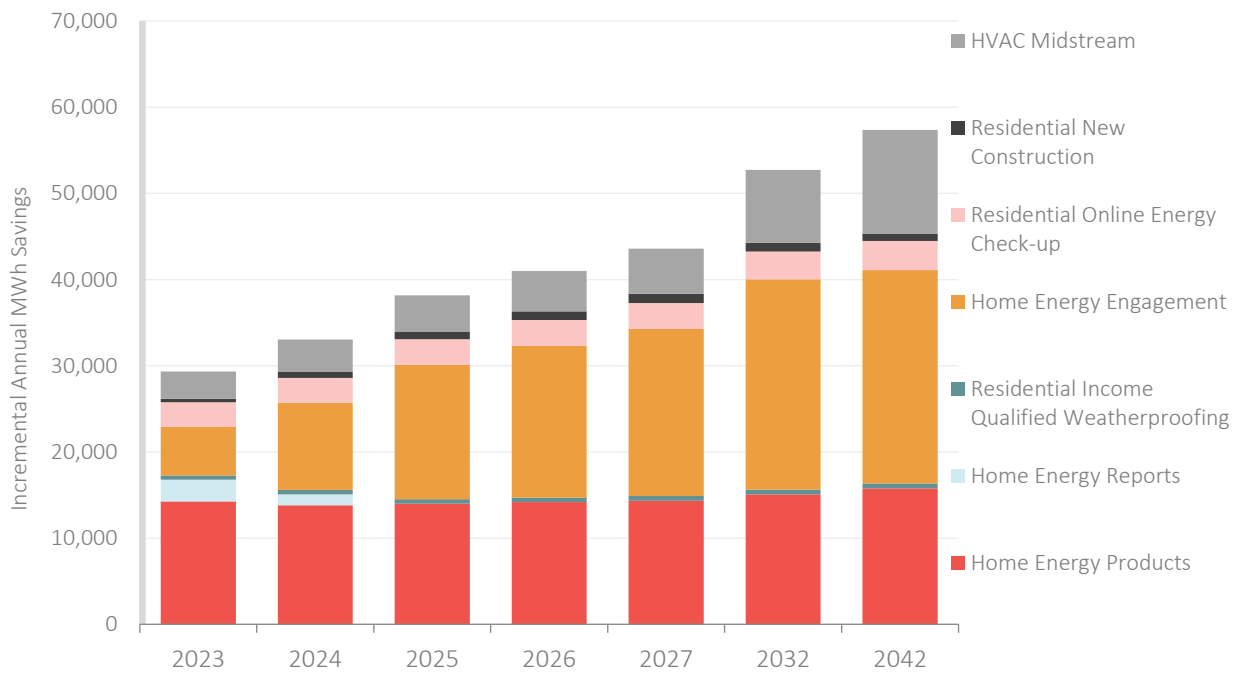


FIGURE 7-2: RESIDENTIAL PROGRAM POTENTIAL – GROSS MWH

Figure 7-2 provides the incremental program RAP in the C&I sector across the next five, then ten and twenty years. The Biz-Custom program provides a steady contribution towards the total. The Biz-Prescriptive program provides a large share of the savings in the early years, and then declines across the first decade of the study. The Biz-SEM and Biz-Industrial Systems programs savings increase gradually over time across the study timeframe.

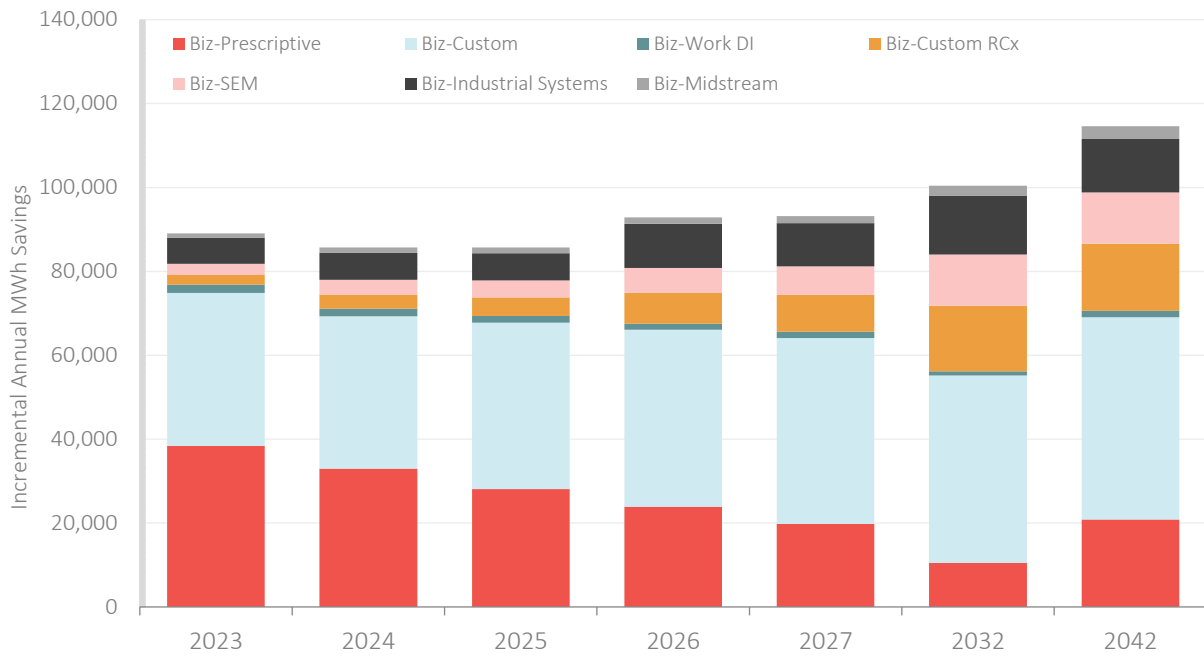


FIGURE 7-3: C&I PROGRAM POTENTIAL – GROSS MWH

Figure 7-4 provides the program RAP budgets for the residential sector. Total budgets increase from \$7.0 million to \$13.6 million, with incentive costs accounting for approximately 46% of the total budget on an annual basis on average.

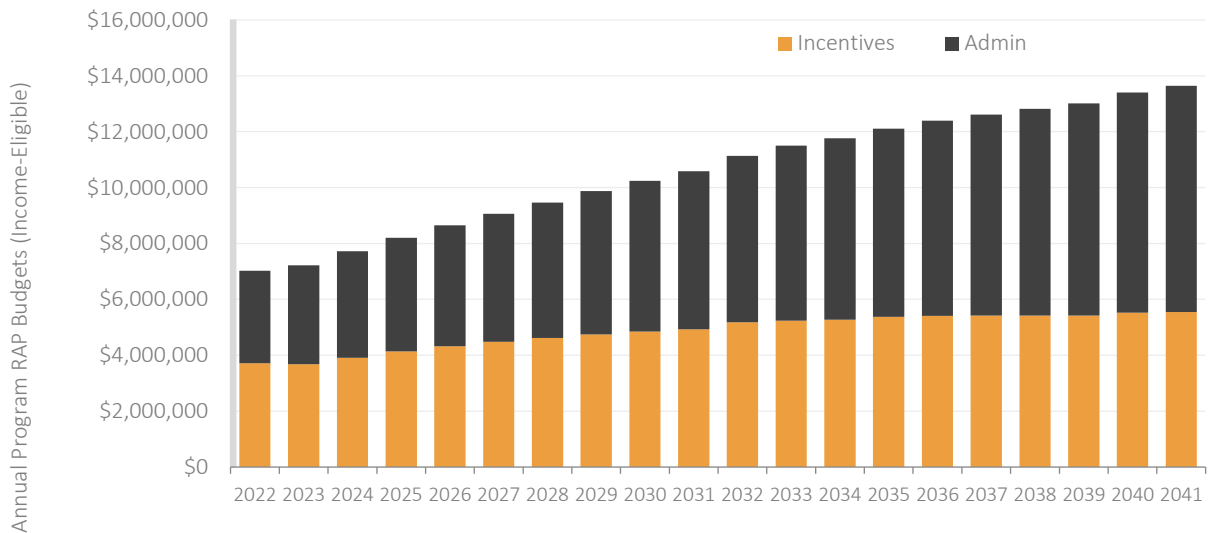


FIGURE 7-4: RESIDENTIAL PROGRAM POTENTIAL BUDGETS – INCENTIVES AND ADMIN

Table 7-2 provides the NPV benefits and costs by program in the residential sector. The overall UCT ratio in the residential sector is 1.80.

TABLE 7-2: RESIDENTIAL PROGRAM RAP UCT NPV BENEFITS AND COSTS –BY 2042 (\$, IN MILLIONS)

| Program                                      | NPV Benefits | NPV Costs    | UCT Ratio  |
|--|--------------|--------------|------------|
| Home Energy Products                         | \$84.4       | \$49.4       | 1.7        |
| Home Energy Reports                          | \$0.1        | \$0.1        | 1.2        |
| Residential Income Qualified Weatherproofing | \$4.1        | \$9.9        | 0.4        |
| Home Energy Engagement                       | \$12.6       | \$2.9        | 4.4        |
| Residential Online Energy Check-up           | \$11.1       | \$7.8        | 1.4        |
| Residential New Construction                 | \$12.5       | \$6.4        | 2.0        |
| HVAC Midstream                               | \$79.3       | \$34.5       | 2.3        |
| <b>Total</b>                                 | <b>\$204</b> | <b>\$111</b> | <b>1.8</b> |

Figure 7-5 provides the program RAP budgets for the C&I sector. Total budgets increase from \$10.7 million to \$17.0 million, with incentive costs accounting for approximately 42% of the total budget on an annual basis on average.

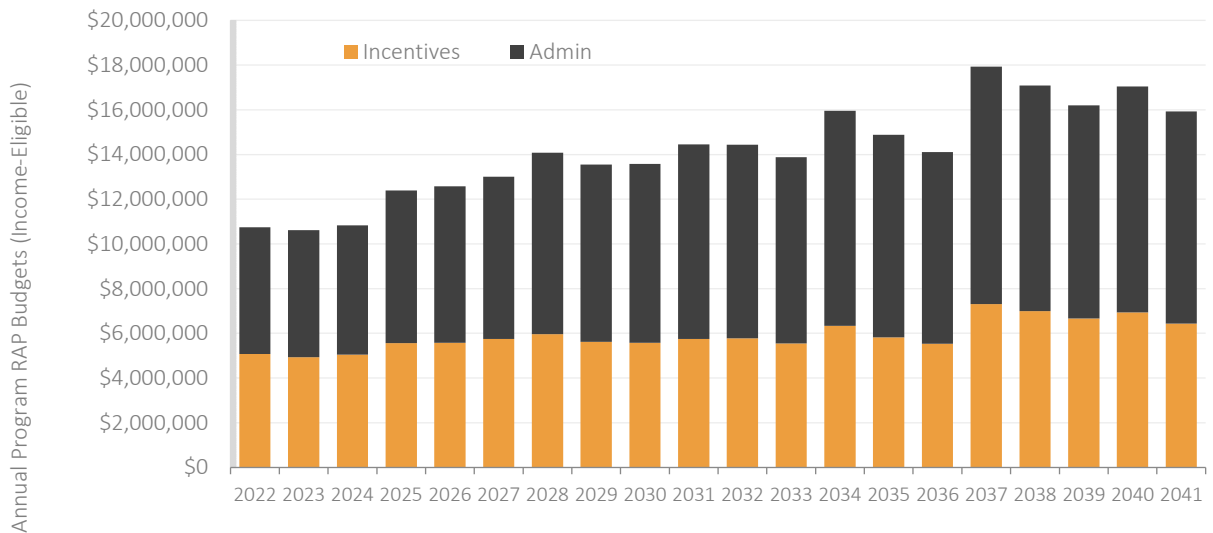


FIGURE 7-5: C&amp;I PROGRAM POTENTIAL BUDGETS – INCENTIVES AND ADMIN

Table 7-3 provides the NPV benefits and costs by program in the C&I sector. The overall UCT ratio in the C&I sector is 2.9.

TABLE 7-3: C&amp;I PROGRAM RAP UCT NPV BENEFITS AND COSTS –BY 2042 (\$, IN MILLIONS)

| Program                | NPV Benefits   | NPV Costs      | UCT Ratio  |
|------------------------|----------------|----------------|------------|
| Biz-Prescriptive       | \$95.9         | \$21.6         | 4.4        |
| Biz-Work DI            | \$236.6        | \$58.4         | 4.0        |
| Biz-Midstream          | \$7.1          | \$5.5          | 1.3        |
| Biz-Custom             | \$14.6         | \$20.0         | 0.7        |
| Biz-SEM                | \$32.5         | \$16.7         | 1.9        |
| Biz-Industrial Systems | \$23.5         | \$27.4         | 0.9        |
| Biz-Custom RCx         | \$29.7         | \$2.8          | 10.8       |
| <b>Total</b>           | <b>\$439.8</b> | <b>\$152.5</b> | <b>2.9</b> |

### 7.3 KEY CONSIDERATIONS

Figure 7-6 presents the top four considerations emerging from the analysis and is followed by a discussion of each.

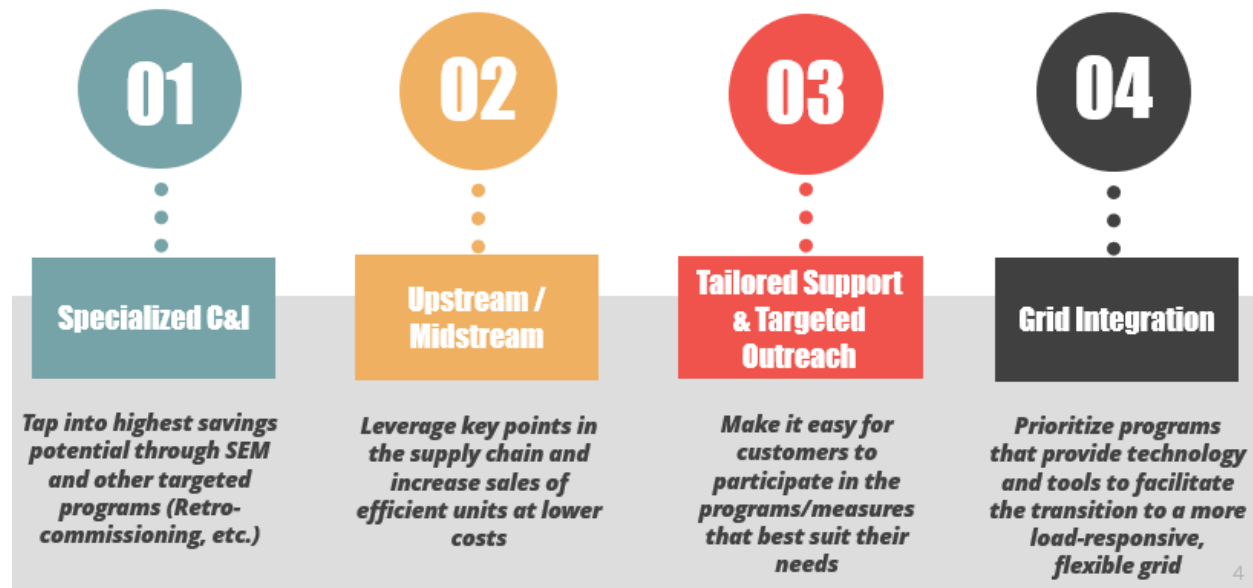


FIGURE 7-6: TOP CONSIDERATIONS

#### 7.3.1 Specialized C&I: Introduce targeted C&I program offerings to tap into savings potential from large energy users.

The greatest volume of economic savings potential exists with C&I markets, and it is important to devote attention and strategic planning to ensure I&M is effectively tapping into that potential. The decreasing savings potential available from traditional energy efficiency measures, such as lighting, requires a shift to more innovative and targeted program activities that can provide deeper savings, boost participation by customers with high savings-potential, and provide overall value to ratepayers. Specifically, the Team believes I&M would benefit from carefully considering offering a Strategic Energy Management (SEM) program component within the broader Work Custom program. We also encourage I&M to consider offering an additional “large users – specialty program” component within the Work Custom program.

SEM programs take a holistic approach to managing energy use with a goal of continuously improving energy performance and achieving persistent energy and cost savings over the long term. SEM programs focus on changing business practices and organizational culture to reduce energy waste and use energy more effectively. SEM emphasizes equipping plant management and staff with the information and tools needed to reduce energy consumption through behavior and operational change. SEM activities may also include recommendations for equipment upgrades and capital investments.<sup>36</sup>

Several energy efficiency portfolios currently include an SEM program (e.g., Energy Trust of Oregon, ComEd, Nicor Gas, Efficiency Nova Scotia, NYSERDA, BPA) and these programs serve an increasingly wide range of customers (e.g., industrial, municipal, colleges and universities). A 2015 ACEEE analysis estimated that SEM could be applied to 20% of commercial load and 50% of industrial load in the United States.<sup>37</sup>

<sup>36</sup> Ethan Rogers, Andrew Whitlock, and Kelly Rohrer. 2019. “Features and Performance of Energy Management Programs.” ACEEE, Report IE1901. Also see CEE’s SEM platform: <https://www.cee1.org/content/strategic-energy-management-platform>

<sup>37</sup> ACEEE blog, February 2021: <https://www.aceee.org/blog-post/2021/02/strategic-energy-management-programs-expand-serving-new-customers>

An SEM program provides ongoing coordination and support that requires maintaining interaction and relationships with participants over a long duration. Thus, this type of program may warrant its own focused management attention and staffing. An additional program component could target large users with a focus on other high impact measures like retro-commissioning, improvements to industrial systems and networked lighting controls. Networked lighting controls hold a particularly strong promise given their ability to combine a variety of different control strategies deployed with the benefit of networked, intelligent operations. The majority of lighting equipment installed in the U.S. is not controlled, and this percentage may be higher in I&M's service territory as it has a significant population of older building stock.<sup>38</sup>

It is common among the comparison utilities to offer program components focusing on measures such as retro-commissioning and opportunities that are particularly beneficial for large users. All of the comparison utilities offer a retro-commissioning program, all but one offers networked lighting controls as a measure (though not necessarily offered as a focused program component), and four offer a program component focusing on industrial systems and/or process improvements.

### 7.3.2 Upstream / Midstream

Moving incentives upstream and leveraging a smaller number of key points in the supply chain (i.e., retailers and distributors rather than only focusing on contractors and installers) can greatly increase the number of units sold at a lower cost per unit than in a downstream program model, as evidenced through numerous utilities' experiences (e.g., California, Connecticut, Maine, Massachusetts, New York, Vermont).<sup>39</sup> The GDS Team encourages I&M to consider offering a range of upstream and midstream programs, including:

- Residential upstream non-lighting retail program component within the Home Energy Products program
- Residential midstream HVAC program component within the Home Energy Products program
- C&I midstream Lighting, HVAC, and Food Service program components, potentially within the Work Prescriptive program

An **upstream retail non-lighting program** could build on I&M's existing / previous relationships with retailers, transitioning to feature non-lighting products. This program model leverages a nationwide effort by utilities to boost consumer awareness and provide easy access to energy saving products at the locations where home products are purchased. The program can also help consumers build a trusted relationship with their utility as a source of information about energy saving opportunities (e.g., through in-store co-branding opportunities, etc.). Small incentives paid to the retailer increases their profit margins leading to prioritized stocking and product placement (supplemented with additional utility purchases of end cap placement, etc.). I&M could leverage the existing program model and resources available through the ENERGY STAR Retail Products Platform (RPP). The RPP is designed based on deep knowledge of retailer needs and motivations, how to best leverage retailer partnerships as the market evolves, and how other utilities are addressing evaluation challenges.<sup>40</sup>

<sup>38</sup> Reference to the proportion of buildings in the U.S. that lighting controls: Energy Savings Forecast of Solid-State Lighting in General Illumination Applications, Figure 4.7. [https://www.energy.gov/sites/prod/files/2019/12/f69/2019\\_ssl-energy-savings-forecast.pdf](https://www.energy.gov/sites/prod/files/2019/12/f69/2019_ssl-energy-savings-forecast.pdf).

<sup>39</sup> Gunn, Kelly, and Jim Fay. 2020. ComEd Energy Efficiency Program: Incorporating an Upstream and Midstream Strategy in Energy Efficiency. SAG Upstream Working Group; Backen, Dave, Christopher Burmester and Mary Ann Sheehan. 2017. Moving to the Middle – How to Navigate the ins and Outs of C&I Midstream Programs. [Blog post series]; Dunn, Alex, Joe Van Clock, Sara Conzemius, Scott Dimetrosky. 2016. Paradigm Shift Needed! Without it, Midstream Lift Yields NTG Woes for Plug Load Programs. ACEEE Summer Study on Energy Efficiency in Buildings; Vaidya, Rohit. 2019. The Great Migration: Moving Energy Efficiency Programs to Midstream. IEPEC.

<sup>40</sup> See: [https://www.energystar.gov/partner\\_resources/energy\\_star\\_retail\\_products\\_platform](https://www.energystar.gov/partner_resources/energy_star_retail_products_platform). Also see "Pitch Deck"-[https://www.energystar.gov/sites/default/files/asset/document/ESRPP%20Pitch%20Deck\\_Draft\\_06-23-2020\\_0.pdf](https://www.energystar.gov/sites/default/files/asset/document/ESRPP%20Pitch%20Deck_Draft_06-23-2020_0.pdf)

The **midstream program** model has gained industry support for its ability to achieve higher participation rates with lower administrative costs due to requiring fewer points of contact to administer incentives than in a downstream program model (i.e., the program interacts directly with distributors, each of which reaches a relatively large share of the market through their operations). These programs also have an ability to employ more advanced and efficient data tracking systems since they are dealing with fewer, upstream market actors. This program model is also viewed favorably because research finds that distributors and supply houses serve as a key source of information for installers and contractors, giving them significant influence over equipment purchase decisions.<sup>41</sup>

Upstream and midstream program models seek to increase the stocking practices and availability of high-efficiency units, which consequently improves market awareness of these units. Therefore, these programs have both resource acquisition and market transformation components (i.e., causing permanent structural changes in the market in the form of increased stocking and awareness). Measuring program attribution through traditional means may not fully capture the savings resulting from the market transformation impacts / market effects resulting from these programs over time. It is important to work with regulators to ensure the full market transformation impacts of these programs can be captured. Evaluation methods are available for capturing market effects, but they require tracking changes in key market indicators over time (starting close to program launch), and the methods are improving with refinements over time.<sup>42</sup>

Lighting, HVAC, and Food Service are popular C&I equipment types to offer through midstream programs because they: a) rely on quick replacement when equipment breaks down, and b) those markets rely heavily on established relationships between contractors and their distributors/suppliers.<sup>43</sup>

I&M's Indiana DSM Plan filing settlement agreement calls for offering a residential HVAC midstream pilot starting in March 2021. Therefore, I&M will be gaining experience with the midstream program model that can help serve as a foundation for further considerations in additional technologies and markets. There are also opportunities for I&M to collaborate with NIPSCO and IPL on offering midstream incentive programs.

### 7.3.3 Targeted & Tailored Outreach

Customers prefer information that is tailored to their needs, and direct support can help overcome the inertia that keeps customers from taking action to address their energy saving opportunities. Tailored programs that provide direct customer support also align with I&M's commitment to offering programs that will educate, encourage, and entice customers. Tailoring and targeting program outreach to specific audiences also aligns with industry best practice guidance to make programs easy to participate in. Specifically, the GDS Team encourages I&M to consider taking the following steps:

- Offer a Multifamily program component and/or delivery stream, in particular, for the IQ residential sector.
- Resume the Work Direct Install program (small business audit and direct install).
- Take steps to improve customers' ability to be routed to the program offering that best serves their needs, such as through an Energy Advisor or Concierge service.
- Conduct targeted outreach to key market segments, including municipal customers, universities, K-12 schools, and hospitals.

Multifamily-focused program components are offered in all jurisdictions included in this study's benchmarking comparison. The multifamily market is unique in several ways, including building structural and energy use characteristics, property ownership arrangements, and the network of public and private entities that develop and

<sup>41</sup> Vaidya, Rohit (NMR), Ann Clarke (National Grid), James Fay (Commonwealth Edison), Jenna Bagnall-Reilly (NMR), Jared Powell (NMR), Sam Manning (NMR) 2019. "The Great Migration: Moving Energy Efficiency Programs to Midstream." IEPEC.

<sup>42</sup> Agapay-Reed, Laura, Jan Harris. 2020. Attributing Savings of Utility Midstream Energy Efficiency Programs: Standardizing a Protocol to Estimate Free Ridership. Energy Evaluation Europe.

<sup>43</sup> Daughton, Brysen. 2019. Upstream Program Designs for Different DSM Measures. ESource white paper.

maintain the facilities. Tailored marketing/outreach and measure offerings are appropriate for this unique market, serving both income qualified and market customers.

Resuming the **Work Direct Install program, a small business direct install program (SBDI)**, is another way I&M could offer tailored support and outreach to better serve a key segment within its service territory. This would align with the practices of all seven of the peer utilities included in the benchmarking exercise, as well as I&M's mission of offering easy-to-access programs. I&M serves a large population of small businesses (Figure 7-7), and an energy assessment is an important first step to help set these businesses on a course to pursue energy saving opportunities.

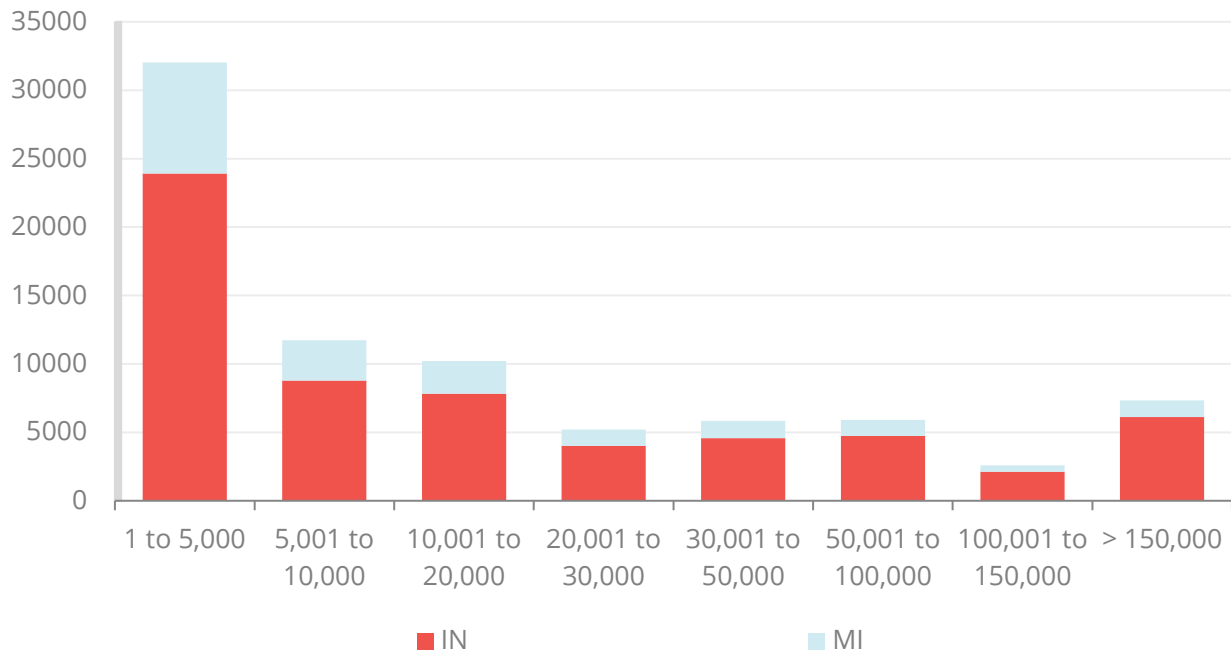


FIGURE 7-7. ANNUAL KWH USAGE OF ACTIVE BUSINESS CUSTOMERS

SBDI programs can have lower cost effectiveness than other program types, but of the four comparison utilities with cost effectiveness data available for their SBDI programs, all were cost effective under either the UCT or TRC. These programs also provide important benefits not easily captured in cost effectiveness analysis. Small businesses benefit from the educational aspects of the program, and the program can help build customer trust in their utility as a source of energy-related guidance. I&M can explore the program characteristics that make this program cost-effective in peer utility jurisdictions (e.g., measure offerings, incentive levels, program strategies that may improve cost-effectiveness).

Offering an **Energy Advisor or Concierge Service** would help overcome inertia by making it easier for customers to connect with the program that best suits their needs. Efforts to make program participation as convenient and seamless as possible become increasingly important as energy efficiency markets need to seek out "higher hanging fruit" and harder to reach customers. An Energy Advisor service could include dedicated staff available to answer more advanced questions about DSM programs than typical call center staff can answer, and more proactive engagement with customers to boost participation in program areas that have historically seen lower program participation rates. Four peer utilities offer some sort of Energy Advisor-related service to help their customers navigate participation in DSM programs.<sup>44</sup>

<sup>44</sup> AEP OH's Consolidated Outreach Program is designed to create a hub of communication and information around trained regional energy advisors to increase customer knowledge and enroll customers in the most appropriate program for their needs. ComEd's Small Business programs provide a "ComEd Energy Efficiency Service Provider (i.e., advisor) to fully manage the participation process for the customer, including all the paperwork". Consumers Energy offers "Assistance in specifying projects and preparing bid requests" for their Custom program. WI Focus on Energy assigns "Energy Advisors" to large users to help them identify savings opportunities.

I&M could also consider whether there are additional opportunities to **target outreach to key market segments such as municipal and other public entities, as well as universities**. These types of customers typically have high energy usage, unique energy needs, and a longer-term investment outlook that makes them good candidates for energy efficiency program participation. They also often experience staff capacity challenges that may make it difficult to be proactive in pursuing energy saving opportunities, meaning they could benefit from additional outreach and tailored support to encourage program participation. The surveys conducted for the MPS found that the respondents with office, government, and education building types had the top 3 highest average WTP scores for major energy efficiency investments with a 10-year payback period.

### 7.3.4 Grid Integration

AEP is working to reduce carbon emissions 80% by 2030 and to achieve net-zero emissions by 2050. Furthermore, AEP plans to add more than 16,500 MW of renewable energy by 2030.<sup>45</sup> These commitments will require I&M and other AEP utilities to leverage consumers as a resource in achieving greater load flexibility to accommodate a growing supply of intermittent renewable energy sources. I&M is already making progress in this direction with investments in advanced metering infrastructure (AMI), and demand-responsive program offerings.

In Indiana, I&M offers a Home Energy Engagement (HEE) program that leverages AMI data to inform behavioral changes, and in Indiana, I&M offers a Home Energy Management program that uses WiFi connected thermostats to control the timing of HVAC system operation and run time. The GDS Team encourages I&M to consider opportunities to offer both programs to customers in both states. These programs integrate demand-responsive functionality and mechanisms to facilitate more informed decisions about energy use behaviors. These are the types of programs that will prepare I&M to operate a more advanced electric grid capable of accommodating more renewable energy resources and making more efficient use of both supply and demand-side resources.

The HEE program includes AMI Data Portal, Home Energy Report and Online Energy Checkup components. The **AMI Data Portal** component aligns well with the ongoing transition to a more connected two-way power grid. There are opportunities to adapt the **Home Energy Report** program component to leverage insight arising from the availability of AMI data, and to use this communication channel to educate consumers about cost-effective energy saving opportunities and build consumer trust in their utility as a source of energy-related guidance. An AMI portal-type of program is currently offered by three peer utilities included in the benchmarking exercise and will likely be a component of a growing number of jurisdictions' DSM portfolios going forward. Home Energy Report programs are offered by all seven peer utilities. Direct load programs, like the Home Energy Management program, are offered in three of the peer utilities.

## 7.4 ADDITIONAL CONSIDERATIONS

In addition to the top four considerations presented previously, the GDS Team encourages I&M to consider making an on-going commitment to investing in pilot programs.

### 7.4.1 Pilot Investment: Dedicate funds for pilot programs to explore emerging technologies and business models.

Energy-related markets are rapidly evolving, and ongoing improvements in technology performance and costs, as well as regulatory factors will drive changes in the cost-benefit ratio of energy saving opportunities over time. It is important to continuously invest resources in exploring and preparing for new potential program offerings to serve the evolving market and tap available energy savings.

Agriculture-related programs could be another area of potential focus for pilot programs. The agriculture community can benefit both from increased awareness of traditional energy efficiency opportunities, as well as unique agriculture-

<sup>45</sup> <https://www.indianamichiganpower.com/lib/docs/cleanenergy/renewable/2021TransitioningFleetUpdate.pdf>



focused opportunities. Four of the benchmarked utilities currently offer an agriculture-focused program, and I&M's rural service territory in Indiana could be a strong candidate for such a program.

The Pay-for-Performance program model, or a related RFP-based project selection model could also prove promising to explore through a pilot. Pay-for-performance programs can motivate aggregators to employ innovative strategies to recruit customers with high savings potential. Pay-for-performance programs can present challenges (e.g., risk associated with energy savings commitments). However, the growing need to achieve deeper energy savings, along with advancements in metering capabilities may provide reason to consider a next generation of pay-for-performance programs.<sup>46</sup> Three of the peer utilities currently offer a pay-for-performance or RFP-based project selection program model.

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<sup>46</sup> Polis, Hilary. 2019. "We Say We Want a Revolution... What is it Going to Take to Get There with Pay for Performance?" IEPEC.

## APPENDIX A: SENSITIVITIES

The GDS Team conducted sensitivity analyses to assess the impacts of key input assumptions on the estimates of EE/DR/DER potential. The GDS Team coordinated with I&M to develop appropriate and reasonable sensitivity cases.

### ENERGY EFFICIENCY SENSITIVITIES

#### *Sensitivities Overview*

**Sensitivity 1. Hi-Touch Administration.** This scenario explored the strategy of increasing marketing/high-touch administration to increase program participation. The intent of such an analysis is to help inform optimal program design.

To examine the impacts of hi-touch marketing, the sensitivity utilized the same data used to develop the MAP and RAP scenarios. The RAP scenario assumes historical incentive levels and that program awareness remains at current levels. The MAP scenario assumes up to 100% incentives and that program awareness increases to a maximum of 85%. The Hi-Touch marketing maintains the historical incentive levels but assumes that program awareness reaches the same level as the MAP scenario. As a result, the hi-touch marketing scenario produces a result between the current RAP and MAP levels and provide an indication which strategy (increased incentives or increased marketing) is likely to have a larger impact on adoption.

In addition to increased adoption levels, the hi-touch marketing scenario assumes that for every 1 percent increase in program awareness, non-incentive costs increase by 0.5% (on a cost per kWh basis) to recognize that in the absence of increased incentives, additional funding will be necessary to market programs and achieve awareness levels commensurate with a MAP scenario. In this scenario, the awareness adjustment resulted in a 15% increase to participation, and a corresponding 7.5% increase to the per-unit (\$/kWh) non-incentive cost.

**Sensitivity 2. Large Customer Opt-Outs.** The base case excludes sales and savings from all eligible customers that currently opt out of I&M's energy efficiency programs. This sensitivity looks at the range of potential if no C&I customers were to opt out.

**Sensitivity 3. 35% Reduced Technology Cost.** This scenario assumes a 35% reduction for emerging technology costs. The cost reduction applies to both measure costs and incentives. The reduced incentive levels required a reassessment of measure-level cost-effectiveness. Although incentives were reduced, adoption levels were not significantly impacted due to the corresponding change to measure cost. The reduction in measure cost was assumed to happen "overnight." Although this is not expected to happen in practice, this scenario establishes the impact of alternative measures cost on the overall potential.

**Sensitivity 4. Alternative Incentive.** This scenario that established a floor of 50% incentives to examine the impact on measure mix and adoption rates. GDS did not reduce the incentive below 50% to keep measures cost-effective, nor did GDS lower the incentive in instances where the current incentive exceeds 50%. This scenario altered the economic potential as well as the RAP scenario.

#### *Sensitivity Results*

Figure A-1 below illustrates the magnitude of the 20-yr achievable potential (2042) in the base case (RAP) as well as the three sensitivities. The Large Customer Opt-Out sensitivity yields the greatest potential, followed next by the High Touch Administration and the 35% Reduced Technology Cost scenarios. The Alternative Incentive scenario is slightly less than RAP as some measures with savings in the RAP scenario fail the benefit-cost screening in the Alternative Incentive scenario.

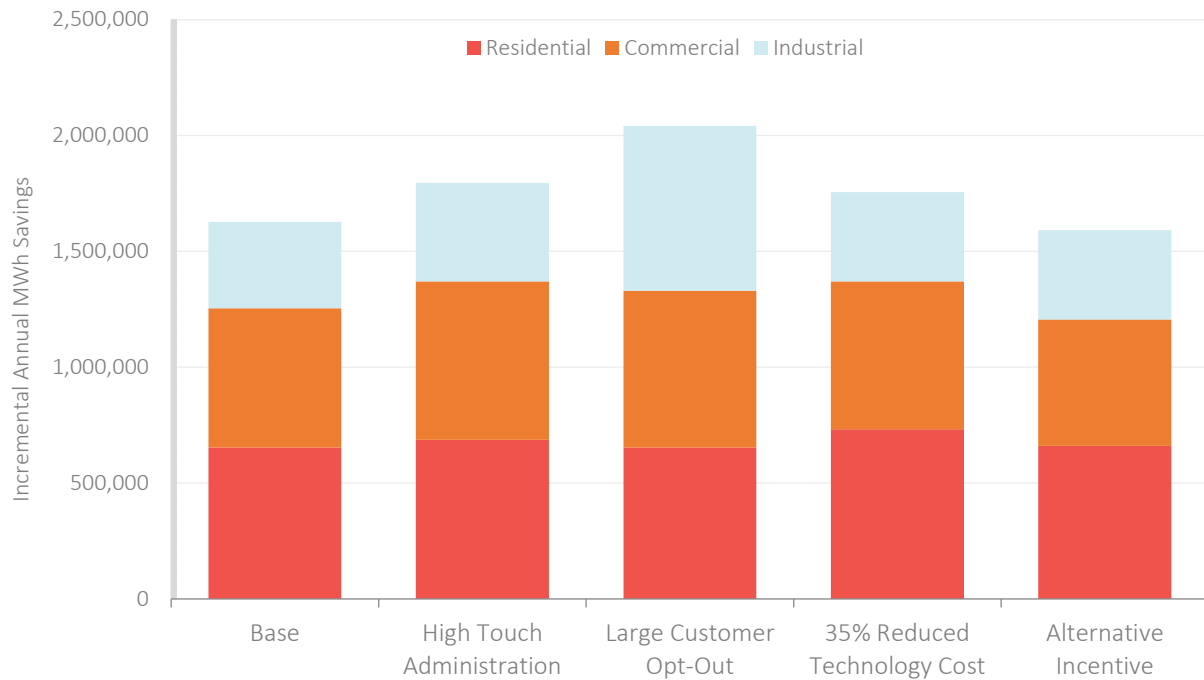


FIGURE A-1: ENERGY EFFICIENCY POTENTIAL SENSITIVITIES (2042)

Table A-1 below provides the NPV benefits and costs for the sensitivities. The Large Customer Opt-Out sensitivity yields the greatest NPV benefits and highest UCT ratio at 2.0. The Alternative Incentive scenario yields the lowest benefits and lowest UCT Ratio at 1.5.

TABLE A-1: NPV OF SENSITIVITIES

| Scenario                    | NPV Benefits    | NPV Costs     | UCT Ratio |
|-----------------------------|-----------------|---------------|-----------|
| RAP                         | \$889,733,066   | \$498,242,311 | 1.8       |
| High Touch Administration   | \$965,971,991   | \$545,881,587 | 1.8       |
| Large Customer Opt-Out      | \$1,110,830,407 | \$551,033,474 | 2.0       |
| 35% Reduced Technology Cost | \$955,155,771   | \$507,788,168 | 1.9       |
| Alternative Incentive       | \$861,379,467   | \$563,249,371 | 1.5       |

## DEMAND RESPONSE SENSITIVITIES

As with the energy efficiency potential analysis, several sensitivities on the RAP base case were analyzed to determine the impact of uncertain conditions surrounding customer participation and/or cost-effectiveness. While many of the sensitivities are similar to those discussed in prior sections, there are some distinct differences. Notably, demand response includes a sensitivity that examines various demand response rate options on future peak savings potential.

### Sensitivities Overview

**Sensitivity 1. Avoided Costs.** The GDS Team analyzed the impacts of varied avoided costs on the RAP potential.

#### High Sensitivity

- T&D costs were doubled, with no change to energy and capacity costs.

*Low Sensitivity*

- Avoided energy and generation capacity costs were decreased by 50%, with no change to T&D costs.

**Sensitivity 2. Large Customer Opt-Outs.** The base case excludes sales and savings from all eligible customers that currently opt out of I&M’s demand response programs. This sensitivity looks at the range of potential if no C&I customers were to opt out.

*High Sensitivity*

- Includes currently opted-out customers in analysis.

**Sensitivity 3. High Touch Marketing.** A RAP-only sensitivity intended to explore strategy of increasing marketing/high-touch administration to increase participation.

*High Sensitivity*

- Assume historical incentive levels but raises the program awareness threshold to the MAP level. Non-incentive costs were estimated to be higher as well.

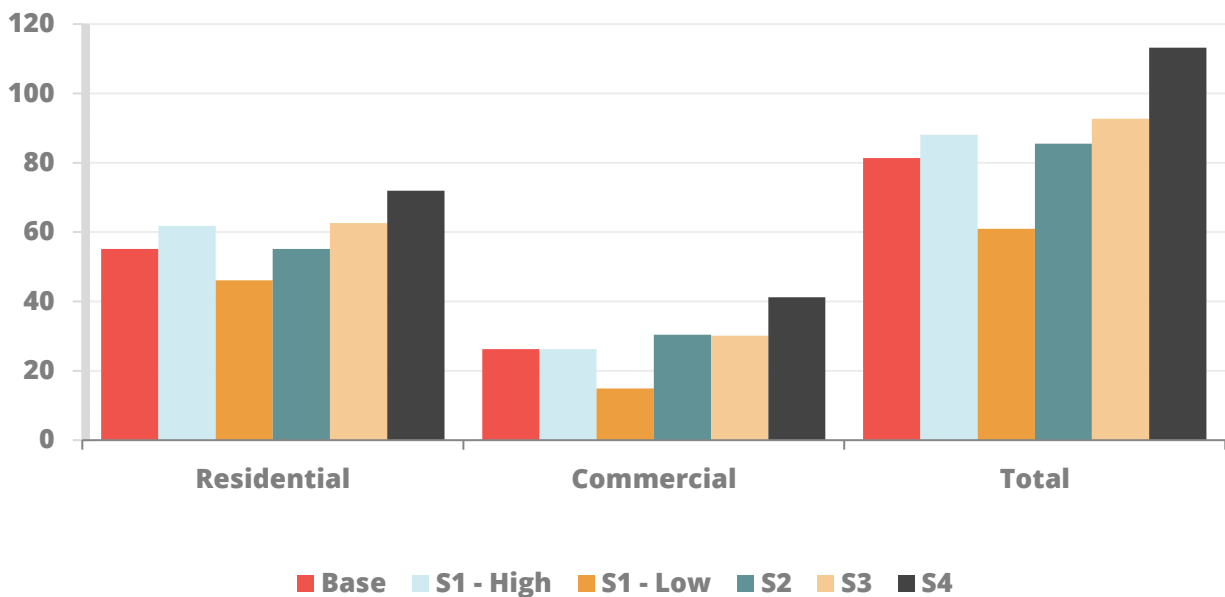
**Sensitivity 4. 35% Reduced Technology Cost Scenario.** Assume a 35% reduction for DR technology costs and reassess overall impact on cost-effectiveness and assumed adoption rates.

*High Sensitivity*

- 35% reduction in all technology costs. Reduction will be an overnight reduction.

**Sensitivity Results**

Figure A-2 shows the results of each sensitivity compared to the Base Case for each sector in Indiana. Sensitivities that led to a higher total RAP potential include the High Touch Marketing and 35% reduced technology cost sensitivities. Sensitivities that led to a lower total RAP potential include the low Avoided Cost Scenario #1 (50% decrease in energy and capacity avoided costs).



FIGUREA-2: DEMAND RESPONSE RAP MW POTENTIAL SENSITIVITIES 2042 (MI)

## DER SENSITIVITIES

### *CHP Sensitivities Overview*

The GDS Team conducted additional sensitivity analysis to understand how various cost parameters impact CHP cost effectiveness and to what extent these costs are required to change in order for any modeled CHP measures to pass a TRC of 1.0. Specifically, the Team reviewed mutually exclusively the impacts of:

- Transmission and distribution (T&D) costs
- CHP materials and installation cost

### *CHP Sensitivities Results*

To simulate the locational benefits associated with DERs, the Team conducted the cost-effectiveness testing with an increase of 500% to the T&D values. Despite this increase, no CHP measure permutation passed the TRC. T&D values would need to increase 750% to allow a limited number of CHP measures to pass cost-effectiveness. We also considered a 35% cost reduction and reassessed CHP cost-effectiveness. However, we ultimately found a cost reduction of 55% was required for a limited number of measures to achieve a TRC ratio of 1.0 or greater.

### *Solar PV Sensitivities Overview*

The GDS Team conducted additional sensitivity analysis to understand how various cost parameters impact solar PV cost effectiveness and to what extent these costs are required to change in order for any of the modeled solar PV measures to pass a TRC of 1.0. Specifically, the Team reviewed mutually exclusively the impacts of:

- Transmission and distribution (T&D) costs
- Solar PV materials and installation cost

### *Solar PV Sensitivities Results*

In an attempt to simulate the locational benefits associated with DERs, the Team conducted the cost-effectiveness testing with an increase of 500% to the T&D values. Despite this increase, no solar PV measure permutation passed the TRC. T&D values would need to increase 1250% to allow a limited number of non-residential measures to pass cost-effectiveness. We also considered a 35% cost reduction and reassessed solar PV cost-effectiveness. However, we ultimately found a cost reduction of 55% was required for a limited number of measures to achieve a TRC ratio of 1.0 or greater.

## APPENDIX B: RESIDENTIAL ENERGY EFFICIENCY DETAIL

Appendix B: Residential Energy Efficiency Detail

| Measure # | End-Use    | Measure Name                                       | Program                  | Building Type | Replacement Type | Base Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|------------|--|--------------------------|---------------|------------------|----------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 1         | Appliances | ENERGY STAR Air Purifier                           | Home Energy Products     | SF            | MO               | 733                  | 67%            | 488                   | 0.08               | 9      | \$70         | 100%              | 66%               | 36%              | 10%             | 29%           | 62.1%             | 37.6%             | 24.3%            | 4.0       |
| 2         | Appliances | ENERGY STAR Refrigerator                           | Home Energy Products     | SF            | MO               | 534                  | 9%             | 50                    | 0.01               | 17     | \$40         | 66%               | 66%               | 13%              | 133%            | 33%           | 62.1%             | 37.6%             | 16.8%            | 1.1       |
| 3         | Appliances | CEE Tier 2 Refrigerator                            | Home Energy Products     | SF            | MO               | 534                  | 25%            | 134                   | 0.02               | 17     | \$140        | 100%              | 66%               | 18%              | 133%            | 33%           | 62.1%             | 37.6%             | 18.2%            | 0.9       |
| 4         | Appliances | Smart Refrigerator                                 | Home Energy Products     | SF            | MO               | 534                  | 12%            | 66                    | 0.01               | 17     | \$680        | 100%              | 66%               | 4%               | 133%            | 33%           | 62.1%             | 37.6%             | 14.7%            | 0.1       |
| 5         | Appliances | ENERGY STAR Refrigerator - early replacement       | IQ Weatherproofing       | SF            | DI               | 1,696                | 53%            | 901                   | 0.01               | 17     | \$600        | 100%              | 100%              | 100%             | 133%            | 33%           | 60.5%             | 52.7%             | 52.7%            | 0.6       |
| 6         | Appliances | Refrigerator Recycling                             | Home Appliance Recycling | SF            | Recycle          | 909                  | 100%           | 909                   | 0.11               | 8      | \$78         | 100%              | 100%              | 32%              | 8%              | 0%            | 62.1%             | 54.0%             | 22.9%            | 3.6       |
| 7         | Appliances | ENERGY STAR Clothes Washer (Electric WH/Dryer)     | Home Energy Products     | SF            | MO               | 522                  | 22%            | 112                   | 0.01               | 14     | \$84         | 66%               | 66%               | 12%              | 32%             | 57%           | 62.1%             | 37.6%             | 16.6%            | 1.0       |
| 8         | Appliances | ENERGY STAR Clothes Washer (NG WH/E Dryer)         | Home Energy Products     | SF            | MO               | 384                  | 27%            | 102                   | 0.01               | 14     | \$84         | 100%              | 66%               | 12%              | 54%             | 57%           | 62.1%             | 37.6%             | 16.6%            | 0.9       |
| 9         | Appliances | Smart/CEE Tier3 Clothes Washer (Electric WH/Dryer) | Home Energy Products     | SF            | MO               | 522                  | 40%            | 209                   | 0.03               | 14     | \$141        | 66%               | 66%               | 14%              | 32%             | 57%           | 62.1%             | 37.6%             | 17.2%            | 1.1       |
| 10        | Appliances | Smart/CEE Tier3 Clothes Washer (NG WH/E Dryer)     | Home Energy Products     | SF            | MO               | 384                  | 26%            | 101                   | 0.01               | 14     | \$141        | 100%              | 66%               | 14%              | 54%             | 57%           | 62.1%             | 37.6%             | 17.2%            | 0.5       |
| 11        | Appliances | ENERGY STAR Dishwasher (E WH)                      | Home Energy Products     | SF            | MO               | 307                  | 12%            | 37                    | 0.00               | 11     | \$76         | 100%              | 66%               | 66%              | 25%             | 83%           | 62.1%             | 37.6%             | 37.6%            | 0.3       |
| 12        | Appliances | ENERGY STAR Dishwasher (NG WH)                     | Home Energy Products     | SF            | MO               | 135                  | 12%            | 16                    | 0.00               | 11     | \$79         | 100%              | 66%               | 66%              | 42%             | 83%           | 62.1%             | 37.6%             | 37.6%            | 0.1       |
| 13        | Appliances | Smart Dishwasher (E WH)                            | Home Energy Products     | SF            | MO               | 307                  | 15%            | 45                    | 0.00               | 11     | \$395        | 100%              | 66%               | 66%              | 25%             | 83%           | 62.1%             | 37.6%             | 37.6%            | 0.1       |
| 14        | Appliances | Smart Dishwasher (NG WH)                           | Home Energy Products     | SF            | MO               | 135                  | 15%            | 20                    | 0.00               | 11     | \$395        | 100%              | 66%               | 66%              | 42%             | 83%           | 62.1%             | 37.6%             | 37.6%            | 0.0       |
| 15        | Appliances | ENERGY STAR Dehumidifier                           | Home Energy Products     | SF            | MO               | 1,005                | 19%            | 195                   | 0.04               | 12     | \$45         | 100%              | 56%               | 56%              | 16%             | 92%           | 62.1%             | 33.1%             | 33.1%            | 4.0       |
| 16        | Appliances | ENERGY STAR Most Efficient Dehumidifier            | Home Energy Products     | SF            | MO               | 1,005                | 30%            | 306                   | 0.07               | 12     | \$75         | 100%              | 66%               | 66%              | 16%             | 92%           | 62.1%             | 37.6%             | 37.6%            | 3.3       |
| 17        | Appliances | ENERGY STAR Freezer                                | Home Energy Products     | SF            | MO               | 349                  | 10%            | 35                    | 0.01               | 22     | \$35         | 66%               | 66%               | 57%              | 57%             | 15%           | 43.2%             | 37.6%             | 33.8%            | 1.1       |
| 18        | Appliances | Freezer Recycling                                  | Home Appliance Recycling | SF            | Recycle          | 758                  | 100%           | 758                   | 0.09               | 8      | \$78         | 100%              | 100%              | 32%              | 57%             | 0%            | 62.1%             | 54.0%             | 22.9%            | 3.0       |
| 19        | Appliances | ENERGY STAR Clothes Dryer (Electric)               | Home Energy Products     | SF            | MO               | 769                  | 21%            | 160                   | 0.02               | 16     | \$152        | 100%              | 66%               | 13%              | 69%             | 10%           | 62.1%             | 37.6%             | 17.0%            | 0.9       |
| 20        | Appliances | Smart Clothes Dryer (Electric)                     | Home Energy Products     | SF            | MO               | 769                  | 26%            | 203                   | 0.03               | 16     | \$236        | 100%              | 66%               | 42%              | 69%             | 10%           | 62.1%             | 37.6%             | 27.2%            | 0.7       |
| 21        | Appliances | Heat Pump Dryer                                    | Home Energy Products     | SF            | MO               | 769                  | 49%            | 378                   | 0.14               | 16     | \$412        | 66%               | 66%               | 24%              | 69%             | 10%           | 43.2%             | 37.6%             | 20.1%            | 1.1       |
| 22        | Appliances | ENERGY STAR Air Purifier                           | Home Energy Products     | SF            | NC               | 733                  | 67%            | 488                   | 0.08               | 9      | \$70         | 100%              | 66%               | 36%              | 10%             | 0%            | 62.1%             | 37.6%             | 24.3%            | 4.0       |
| 23        | Appliances | ENERGY STAR Refrigerator                           | Home Energy Products     | SF            | NC               | 534                  | 9%             | 50                    | 0.01               | 17     | \$40         | 66%               | 66%               | 13%              | 133%            | 0%            | 43.2%             | 37.6%             | 16.8%            | 1.1       |
| 24        | Appliances | CEE Tier 2 Refrigerator                            | Home Energy Products     | SF            | NC               | 534                  | 25%            | 134                   | 0.02               | 17     | \$140        | 100%              | 66%               | 18%              | 133%            | 0%            | 62.1%             | 37.6%             | 18.2%            | 0.9       |
| 25        | Appliances | Smart Refrigerator                                 | Home Energy Products     | SF            | NC               | 534                  | 12%            | 66                    | 0.01               | 17     | \$680        | 100%              | 66%               | 4%               | 133%            | 0%            | 62.1%             | 37.6%             | 14.7%            | 0.1       |
| 26        | Appliances | ENERGY STAR Clothes Washer (Electric WH/Dryer)     | Home Energy Products     | SF            | NC               | 522                  | 22%            | 112                   | 0.01               | 14     | \$84         | 66%               | 66%               | 12%              | 32%             | 0%            | 43.2%             | 37.6%             | 16.6%            | 1.0       |
| 27        | Appliances | ENERGY STAR Clothes Washer (NG WH/E Dryer)         | Home Energy Products     | SF            | NC               | 384                  | 27%            | 102                   | 0.01               | 14     | \$84         | 100%              | 66%               | 12%              | 54%             | 0%            | 62.1%             | 37.6%             | 16.6%            | 0.9       |
| 28        | Appliances | Smart/CEE Tier3 Clothes Washer (Electric WH/Dryer) | Home Energy Products     | SF            | NC               | 522                  | 40%            | 209                   | 0.03               | 14     | \$141        | 66%               | 66%               | 14%              | 32%             | 0%            | 43.2%             | 37.6%             | 17.2%            | 1.1       |
| 29        | Appliances | Smart/CEE Tier3 Clothes Washer (NG WH/E Dryer)     | Home Energy Products     | SF            | NC               | 384                  | 26%            | 101                   | 0.01               | 14     | \$141        | 100%              | 66%               | 14%              | 54%             | 0%            | 62.1%             | 37.6%             | 17.2%            | 0.5       |
| 30        | Appliances | ENERGY STAR Dishwasher (E WH)                      | Home Energy Products     | SF            | NC               | 307                  | 12%            | 37                    | 0.00               | 11     | \$76         | 100%              | 66%               | 66%              | 25%             | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.3       |
| 31        | Appliances | ENERGY STAR Dishwasher (NG WH)                     | Home Energy Products     | SF            | NC               | 135                  | 12%            | 16                    | 0.00               | 11     | \$79         | 100%              | 66%               | 66%              | 42%             | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.1       |
| 32        | Appliances | Smart Dishwasher (E WH)                            | Home Energy Products     | SF            | NC               | 307                  | 15%            | 45                    | 0.00               | 11     | \$395        | 100%              | 66%               | 66%              | 25%             | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.1       |
| 33        | Appliances | Smart Dishwasher (NG WH)                           | Home Energy Products     | SF            | NC               | 135                  | 15%            | 20                    | 0.00               | 11     | \$395        | 100%              | 66%               | 66%              | 42%             | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.0       |
| 34        | Appliances | ENERGY STAR Dehumidifier                           | Home Energy Products     | SF            | NC               | 1,005                | 19%            | 195                   | 0.04               | 12     | \$45         | 100%              | 56%               | 56%              | 16%             | 0%            | 62.1%             | 33.1%             | 33.1%            | 4.0       |
| 35        | Appliances | ENERGY STAR Most Efficient Dehumidifier            | Home Energy Products     | SF            | NC               | 1,005                | 30%            | 306                   | 0.07               | 12     | \$75         | 100%              | 66%               | 66%              | 16%             | 0%            | 62.1%             | 37.6%             | 37.6%            | 3.3       |
| 36        | Appliances | ENERGY STAR Freezer                                | Home Energy Products     | SF            | NC               | 349                  | 10%            | 35                    | 0.01               | 22     | \$35         | 66%               | 66%               | 57%              | 57%             | 0%            | 43.2%             | 37.6%             | 33.8%            | 1.1       |
| 37        | Appliances | ENERGY STAR Clothes Dryer (Electric)               | Home Energy Products     | SF            | NC               | 769                  | 21%            | 160                   | 0.02               | 16     | \$152        | 100%              | 66%               | 13%              | 69%             | 0%            | 62.1%             | 37.6%             | 17.0%            | 0.9       |
| 38        | Appliances | Smart Clothes Dryer (Electric)                     | Home Energy Products     | SF            | NC               | 769                  | 26%            | 203                   | 0.03               | 16     | \$236        | 100%              | 66%               | 42%              | 69%             | 0%            | 62.1%             | 37.6%             | 27.2%            | 0.7       |
| 39        | Appliances | Heat Pump Dryer                                    | Home Energy Products     | SF            | NC               | 769                  | 49%            | 378                   | 0.14               | 16     | \$412        | 66%               | 66%               | 24%              | 69%             | 0%            | 43.2%             | 37.6%             | 20.1%            | 1.1       |
| 40        | Appliances | ENERGY STAR Air Purifier                           | Home Energy Products     | MF            | MO               | 733                  | 67%            | 488                   | 0.08               | 9      | \$70         | 100%              | 66%               | 36%              | 10%             | 29%           | 62.1%             | 37.6%             | 24.3%            | 4.0       |
| 41        | Appliances | ENERGY STAR Refrigerator                           | Home Energy Products     | MF            | MO               | 534                  | 9%             | 50                    | 0.01               | 17     | \$40         | 66%               | 66%               | 13%              | 133%            | 33%           | 43.2%             | 37.6%             | 16.8%            | 1.1       |
| 42        | Appliances | CEE Tier 2 Refrigerator                            | Home Energy Products     | MF            | MO               | 534                  | 25%            | 134                   | 0.02               | 17     | \$140        | 100%              | 66%               | 18%              | 133%            | 33%           | 62.1%             | 37.6%             | 18.2%            | 0.9       |
| 43        | Appliances | Smart Refrigerator                                 | Home Energy Products     | MF            | MO               | 534                  | 12%            | 66                    | 0.01               | 17     | \$680        | 100%              | 66%               | 4%               | 133%            | 33%           | 62.1%             | 37.6%             | 14.7%            | 0.1       |
| 44        | Appliances | ENERGY STAR Refrigerator - early replacement       | IQ Weatherproofing       | MF            | DI               | 1,696                | 53%            | 901                   | 0.01               | 17     | \$600        | 100%              | 100%              | 100%             | 133%            | 33%           | 60.5%             | 52.7%             | 52.7%            | 0.6       |
| 45        | Appliances | Refrigerator Recycling                             | Home Appliance Recycling | MF            | Recycle          | 909                  | 100%           | 909                   | 0.11               | 8      | \$78         | 100%              | 100%              | 32%              | 8%              | 0%            | 62.1%             | 54.0%             | 22.9%            | 3.6       |
| 46        | Appliances | ENERGY STAR Clothes Washer (Electric WH/Dryer)     | Home Energy Products     | MF            | MO               | 522                  | 22%            | 112                   | 0.01               | 14     | \$84         | 66%               | 66%               | 12%              | 22%             | 25%           | 43.2%             | 37.6%             | 16.6%            | 1.0       |
| 47        | Appliances | ENERGY STAR Clothes Washer (NG WH/E Dryer)         | Home Energy Products     | MF            | MO               | 384                  | 27%            | 102                   | 0.01               | 14     | \$84         | 100%              | 66%               | 12%              | 37%             | 25%           | 62.1%             | 37.6%             | 16.6%            | 0.9       |
| 48        | Appliances | Smart/CEE Tier3 Clothes Washer (Electric WH/Dryer) | Home Energy Products     | MF            | MO               | 522                  | 40%            | 209                   | 0.03               | 14     | \$141        | 66%               | 66%               | 14%              | 22%             | 25%           | 43.2%             | 37.6%             | 17.2%            | 1.1       |
| 49        | Appliances | Smart/CEE Tier3 Clothes Washer (NG WH/E Dryer)     | Home Energy Products     | MF            | MO               | 384                  | 26%            | 101                   | 0.01               | 14     | \$141        | 100%              | 66%               | 14%              | 37%             | 25%           | 62.1%             | 37.6%             | 17.2%            | 0.5       |
| 50        | Appliances | ENERGY STAR Dishwasher (E WH)                      | Home Energy Products     | MF            | MO               | 307                  | 12%            | 37                    | 0.00               | 11     | \$76         | 100%              | 66%               | 66%              | 25%             | 83%           | 62.1%             | 37.6%             | 37.6%            | 0.3       |
| 51        | Appliances | ENERGY STAR Dishwasher (NG WH)                     | Home Energy Products     | MF            | MO               | 135                  | 12%            | 16                    | 0.00               | 11     | \$79         | 100%              | 66%               | 66%              | 42%             | 83%           | 62.1%             | 37.6%             | 37.6%            | 0.1       |
| 52        | Appliances | Smart Dishwasher (E WH)                            | Home Energy Products     | MF            | MO               | 307                  | 15%            | 45                    | 0.00               | 11     | \$395        | 100%              | 66%               | 66%              | 25%             | 83%           | 62.1%             | 37.6%             | 37.6%            | 0.1       |
| 53        | Appliances | Smart Dishwasher (NG WH)                           | Home Energy Products     | MF            | MO               | 135                  | 15%            | 20                    | 0.00               | 11     | \$395        | 100%              | 66%               | 66%              | 42%             | 83%           | 62.1%             | 37.6%             | 37.6%            | 0.0       |
| 54        | Appliances | ENERGY STAR Dehumidifier                           | Home Energy Products     | MF            | MO               | 1,005                | 19%            | 195                   | 0.04               | 12     | \$45         | 100%              | 56%               | 56%              | 2%              | 92%           | 62.1%             | 33.1%             | 33.1%            | 4.0       |
| 55        | Appliances | ENERGY STAR Most Efficient Dehumidifier            | Home Energy Products     | MF            | MO               | 1,005                | 30%            | 306                   | 0.07               | 12     | \$75         | 100%              | 66%               | 66%              | 2%              | 92%           | 62.1%             | 37.6%             | 37.6%            | 3.3       |
| 56        | Appliances | ENERGY STAR Freezer                                | Home Energy Products     | MF            | MO               | 349                  | 10%            | 35                    | 0.01               | 22     | \$35         | 66%               | 66%               | 57%              | 57%             | 15%           | 43.2%             | 37.6%             | 33.8%            | 1.1       |
| 57        | Appliances | Freezer Recycling                                  | Home Appliance Recycling | MF            | Recycle          | 758                  | 100%           | 758                   | 0.09               | 8      | \$78         | 100%              | 100%              | 32%              | 57%             | 0%            | 62.1%             | 54.0%             | 22.9%            | 3.0       |
| 58        | Appliances | ENERGY STAR Clothes Dryer (Electric)               | Home Energy Products     | MF            | MO               | 769                  | 21%            | 160                   | 0.02               | 16     | \$152        | 100%              | 66%               | 13%              | 55%             | 10%           | 62.1%             | 37.6%             | 17.0%            | 0.9       |
| 59        | Appliances | Smart Clothes Dryer (Electric)                     | Home Energy Products     | MF            | MO               | 769                  | 26%            | 203                   | 0.03               | 16     | \$236        | 100%              | 66%               | 42%              | 55%             | 10%           | 62.1%             | 37.6%             | 27.2%            | 0.7       |
| 60        | Appliances | Heat Pump Dryer                                    | Home Energy Products     | MF            | MO               | 769                  | 49%            | 378                   | 0.14               | 16     | \$412        | 66%               | 66%               | 24%              | 55%             | 10%           | 43.2%             | 37.6%             | 20.1%            | 1.1       |
| 61        | Appliances | ENERGY STAR Air Purifier                           | Home Energy Products     | MF            | NC               | 733                  | 67%            | 488                   | 0.08               | 9      | \$70         | 100%              | 66%               | 36%              | 10%             | 0%            | 62.1%             | 37.6%             | 24.3%            | 4.0       |
| 62        | Appliances | ENERGY STAR Refrigerator                           | Home Energy Products     | MF            | NC               | 534                  | 9%             | 50                    | 0.01               | 17     | \$40         | 66%               | 66%               | 13%              | 133%            | 0%            | 43.2%             | 37.6%             | 16.8%            | 1.1       |
| 63        | Appliances | CEE Tier 2 Refrigerator                            | Home Energy Products     | MF            | NC               | 534                  | 25%            | 134                   | 0.02               | 17     | \$140        | 100%              | 66%               | 18%              | 133%            | 0%            | 62.1%             | 37.6%             | 18.2%            | 0.9       |
| 64        | Appliances | Smart Refrigerator                                 | Home Energy Products     | MF            | NC               | 534                  | 12%            | 66                    | 0.01               | 17     | \$680        | 100%              | 66%               | 4%               | 133%            | 0%            | 62.1%             | 37.6%             | 14.7%            | 0.1       |
| 65        | Appliances | ENERGY STAR Clothes Washer (Electric WH/Dryer)     | Home Energy Products     | MF            | NC               | 522                  | 22%            | 112                   | 0.01               | 14     | \$84         | 66%               | 66%               | 12%              | 22%             | 0%            | 43.2%             | 37.6%             | 16.6%            | 1.0       |
| 66        | Appliances | ENERGY STAR Clothes Washer (NG WH/E Dryer)         | Home Energy Products     | MF            | NC               | 384                  | 27%            | 102                   | 0.01               | 14     | \$84         | 100%              | 66%               | 12%              | 37%             | 0%            | 62.1%             | 37.6%             | 16.6%            | 0.9       |
| 67        | Appliances | Smart/CEE Tier3 Clothes Washer (Electric WH/Dryer) | Home Energy Products     | MF            | NC               | 522                  | 40%            | 209                   | 0.03               | 14     | \$141        | 66%               | 66%               | 14%              | 22%             | 0%            | 43.2%             | 37.6%             | 17.2%            | 1.1       |

Appendix B: Residential Energy Efficiency Detail

| Measure # | End-Use        | Measure Name  | Program                      | Building Type | Replacement Type | Base Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|----------------|---|------------------------------|---------------|------------------|----------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 68        | Appliances     | Smart/CEE Tier3 Clothes Washer (NG WH/E Dryer)                      | Home Energy Products         | MF            | NC               | 384                  | 26%            | 101                   | 0.01               | 14     | \$141        | 100%              | 66%               | 14%              | 37%             | 0%            | 62.1%             | 37.6%             | 17.2%            | 0.5       |
| 69        | Appliances     | ENERGY STAR Dishwasher (E WH)                                       | Home Energy Products         | MF            | NC               | 307                  | 12%            | 37                    | 0.00               | 11     | \$76         | 100%              | 66%               | 25%              | 0%              | 62.1%         | 37.6%             | 37.6%             | 0.3              |           |
| 70        | Appliances     | ENERGY STAR Dishwasher (NG WH)                                      | Home Energy Products         | MF            | NC               | 135                  | 12%            | 16                    | 0.00               | 11     | \$79         | 100%              | 66%               | 66%              | 42%             | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.1       |
| 71        | Appliances     | Smart Dishwasher (E WH)   | Home Energy Products         | MF            | NC               | 307                  | 15%            | 45                    | 0.00               | 11     | \$395        | 100%              | 66%               | 66%              | 25%             | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.1       |
| 72        | Appliances     | Smart Dishwasher (NG WH)  | Home Energy Products         | MF            | NC               | 135                  | 15%            | 20                    | 0.00               | 11     | \$395        | 100%              | 66%               | 66%              | 42%             | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.0       |
| 73        | Appliances     | ENERGY STAR Dehumidifier  | Home Energy Products         | MF            | NC               | 1,005                | 19%            | 195                   | 0.04               | 12     | \$45         | 100%              | 56%               | 56%              | 2%              | 0%            | 62.1%             | 33.1%             | 33.1%            | 4.0       |
| 74        | Appliances     | ENERGY STAR Most Efficient Dehumidifier                             | Home Energy Products         | MF            | NC               | 1,005                | 30%            | 306                   | 0.07               | 12     | \$75         | 100%              | 66%               | 66%              | 2%              | 0%            | 62.1%             | 37.6%             | 37.6%            | 3.3       |
| 75        | Appliances     | ENERGY STAR Freezer   | Home Energy Products         | MF            | NC               | 349                  | 10%            | 35                    | 0.01               | 22     | \$35         | 66%               | 66%               | 57%              | 57%             | 0%            | 43.2%             | 37.6%             | 33.8%            | 1.1       |
| 76        | Appliances     | ENERGY STAR Clothes Dryer (Electric)                                | Home Energy Products         | MF            | NC               | 769                  | 21%            | 160                   | 0.02               | 16     | \$152        | 100%              | 66%               | 13%              | 55%             | 0%            | 62.1%             | 37.6%             | 17.0%            | 0.9       |
| 77        | Appliances     | Smart Clothes Dryer (Electric)                                      | Home Energy Products         | MF            | NC               | 769                  | 26%            | 203                   | 0.03               | 16     | \$236        | 100%              | 66%               | 42%              | 55%             | 0%            | 62.1%             | 37.6%             | 27.2%            | 0.7       |
| 78        | Appliances     | Heat Pump Dryer   | Home Energy Products         | MF            | NC               | 769                  | 49%            | 378                   | 0.14               | 16     | \$412        | 66%               | 66%               | 24%              | 55%             | 0%            | 43.2%             | 37.6%             | 20.1%            | 1.1       |
| 79        | Behavioral     | Home Energy Reports   | Home Energy Reports          | SF            | Retrofit         | 12,775               | 1%             | 126                   | 0.01               | 1      | \$1          | 100%              | 100%              | 100%             | 100%            | 50%           | 100.0%            | 100.0%            | 100.0%           | 4.7       |
| 80        | Behavioral     | Customer Education  | Home Weatherproofing         | SF            | Retrofit         | 12,775               | 1%             | 115                   | 0.01               | 1      | \$0          | 100%              | 35%               | 35%              | 100%            | 0%            | 100.0%            | 100.0%            | 100.0%           | 1.0       |
| 81        | Behavioral     | Home Energy Reports   | ow Income Home Energy Report | SF            | Retrofit         | 12,775               | 1%             | 68                    | 0.01               | 1      | \$1          | 100%              | 100%              | 100%             | 100%            | 3%            | 100.0%            | 100.0%            | 100.0%           | 2.5       |
| 82        | Behavioral     | Customer Education  | IQ Weatherproofing           | SF            | Retrofit         | 12,775               | 1%             | 115                   | 0.01               | 1      | \$0          | 100%              | 35%               | 35%              | 100%            | 0%            | 100.0%            | 100.0%            | 100.0%           | 1.0       |
| 83        | Behavioral     | Orchestrated Energy   | Home Energy Engagement       | SF            | Retrofit         | 12,775               | 2%             | 203                   | 0.24               | 15     | \$0          | 100%              | 35%               | 35%              | 100%            | 8%            | 81.4%             | 35.2%             | 35.2%            | 1.0       |
| 84        | Behavioral     | AMI Data Portal   | Home Energy Engagement       | SF            | Retrofit         | 12,775               | 2%             | 256                   | 0.03               | 1      | \$0          | 100%              | 100%              | 100%             | 100%            | 0%            | 100.0%            | 100.0%            | 100.0%           | 29.1      |
| 85        | Behavioral     | Home Energy Reports   | Home Energy Reports          | SF            | NC               | 12,775               | 1%             | 126                   | 0.01               | 1      | \$1          | 100%              | 100%              | 100%             | 100%            | 0%            | 100.0%            | 100.0%            | 100.0%           | 4.7       |
| 86        | Behavioral     | Orchestrated Energy   | Home Energy Engagement       | SF            | NC               | 12,775               | 2%             | 203                   | 0.24               | 15     | \$0          | 100%              | 35%               | 35%              | 100%            | 0%            | 81.4%             | 35.2%             | 35.2%            | 1.0       |
| 87        | Behavioral     | AMI Data Portal   | Home Energy Engagement       | SF            | NC               | 12,775               | 2%             | 256                   | 0.03               | 1      | \$0          | 100%              | 100%              | 100%             | 100%            | 0%            | 100.0%            | 100.0%            | 100.0%           | 29.1      |
| 88        | Behavioral     | Home Energy Reports   | Home Energy Reports          | MF            | Retrofit         | 12,775               | 1%             | 126                   | 0.01               | 1      | \$1          | 100%              | 100%              | 100%             | 100%            | 50%           | 100.0%            | 100.0%            | 100.0%           | 4.7       |
| 89        | Behavioral     | Customer Education  | Home Weatherproofing         | MF            | Retrofit         | 12,775               | 1%             | 115                   | 0.01               | 1      | \$0          | 100%              | 35%               | 35%              | 100%            | 0%            | 100.0%            | 100.0%            | 100.0%           | 1.0       |
| 90        | Behavioral     | Home Energy Reports   | ow Income Home Energy Report | MF            | Retrofit         | 12,775               | 1%             | 68                    | 0.01               | 1      | \$1          | 100%              | 100%              | 100%             | 100%            | 3%            | 100.0%            | 100.0%            | 100.0%           | 2.5       |
| 91        | Behavioral     | Customer Education  | IQ Weatherproofing           | MF            | Retrofit         | 12,775               | 1%             | 115                   | 0.01               | 1      | \$0          | 100%              | 35%               | 35%              | 100%            | 0%            | 100.0%            | 100.0%            | 100.0%           | 1.0       |
| 92        | Behavioral     | Orchestrated Energy   | Home Energy Engagement       | MF            | Retrofit         | 12,775               | 2%             | 203                   | 0.24               | 15     | \$0          | 100%              | 35%               | 35%              | 100%            | 8%            | 81.4%             | 35.2%             | 35.2%            | 1.0       |
| 93        | Behavioral     | AMI Data Portal   | Home Energy Engagement       | MF            | Retrofit         | 12,775               | 2%             | 256                   | 0.03               | 1      | \$0          | 100%              | 100%              | 100%             | 100%            | 0%            | 100.0%            | 100.0%            | 100.0%           | 29.1      |
| 94        | Behavioral     | Home Energy Reports   | Home Energy Reports          | MF            | NC               | 12,775               | 1%             | 126                   | 0.01               | 1      | \$1          | 100%              | 100%              | 100%             | 100%            | 0%            | 100.0%            | 100.0%            | 100.0%           | 4.7       |
| 95        | Behavioral     | Orchestrated Energy   | Home Energy Engagement       | MF            | NC               | 12,775               | 2%             | 203                   | 0.24               | 15     | \$0          | 100%              | 35%               | 35%              | 100%            | 0%            | 81.4%             | 35.2%             | 35.2%            | 1.0       |
| 96        | Behavioral     | AMI Data Portal   | Home Energy Engagement       | MF            | NC               | 12,775               | 2%             | 256                   | 0.03               | 1      | \$0          | 100%              | 100%              | 100%             | 100%            | 0%            | 100.0%            | 100.0%            | 100.0%           | 29.1      |
| 97        | HVAC Equipment | ASHP Tune Up  | Home Weatherproofing         | SF            | Retrofit         | 7,507                | 4%             | 338                   | 0.13               | 5      | \$64         | 100%              | 66%               | 25%              | 6%              | 70%           | 81.4%             | 46.2%             | 31.9%            | 2.4       |
| 98        | HVAC Equipment | Air Source Heat Pump 16 SEER - Heat pump baseline                   | HVAC Midstream               | SF            | MO               | 6,506                | 4%             | 243                   | 0.28               | 18     | \$384        | 100%              | 78%               | 78%              | 6%              | 27%           | 81.4%             | 50.7%             | 50.7%            | 1.5       |
| 99        | HVAC Equipment | Air Source Heat Pump 17 SEER - Heat pump baseline                   | HVAC Midstream               | SF            | MO               | 6,506                | 9%             | 578                   | 0.40               | 18     | \$572        | 100%              | 70%               | 70%              | 6%              | 27%           | 81.4%             | 47.6%             | 47.6%            | 1.9       |
| 100       | HVAC Equipment | Air Source Heat Pump 18 SEER - Heat pump baseline                   | HVAC Midstream               | SF            | MO               | 6,506                | 14%            | 879                   | 0.50               | 18     | \$811        | 100%              | 62%               | 62%              | 6%              | 27%           | 81.4%             | 44.6%             | 44.6%            | 2.0       |
| 101       | HVAC Equipment | Air Source Heat Pump 21 SEER - Heat pump baseline                   | HVAC Midstream               | SF            | MO               | 6,506                | 25%            | 1,622                 | 0.75               | 18     | \$811        | 100%              | 74%               | 74%              | 6%              | 27%           | 81.4%             | 49.1%             | 49.1%            | 2.7       |
| 102       | HVAC Equipment | Ground Source Heat Pump 20 SEER - Heat pump baseline                | HVAC Midstream               | SF            | MO               | 6,506                | 27%            | 1,767                 | 0.68               | 18     | \$391        | 100%              | 92%               | 92%              | 6%              | 27%           | 81.4%             | 56.6%             | 56.6%            | 4.4       |
| 103       | HVAC Equipment | Ground Source Heat Pump 21.5 SEER - Heat pump baseline              | HVAC Midstream               | SF            | MO               | 6,506                | 32%            | 2,098                 | 0.79               | 18     | \$391        | 100%              | 100%              | 100%             | 6%              | 27%           | 81.4%             | 60.2%             | 60.2%            | 4.8       |
| 104       | HVAC Equipment | Ground Source Heat Pump 23.5 SEER - Heat pump baseline              | HVAC Midstream               | SF            | MO               | 6,506                | 39%            | 2,521                 | 0.89               | 18     | \$891        | 100%              | 67%               | 67%              | 6%              | 27%           | 81.4%             | 46.7%             | 46.7%            | 3.6       |
| 105       | HVAC Equipment | Ground Source Heat Pump 29 SEER - Heat pump baseline                | HVAC Midstream               | SF            | MO               | 6,506                | 41%            | 2,653                 | 1.20               | 18     | \$1,291      | 100%              | 56%               | 56%              | 6%              | 27%           | 81.4%             | 42.7%             | 42.7%            | 3.7       |
| 106       | HVAC Equipment | Ductless Heat Pump 17 SEER 9.5 HSPF - Heat pump baseline            | HVAC Midstream               | SF            | MO               | 6,506                | 8%             | 530                   | 0.37               | 18     | \$2,087      | 13%               | 13%               | 13%              | 6%              | 27%           | 38.0%             | 28.1%             | 28.1%            | 2.5       |
| 107       | HVAC Equipment | Ductless Heat Pump 19 SEER 9.5 HSPF - Heat pump baseline            | HVAC Midstream               | SF            | MO               | 6,506                | 9%             | 606                   | 0.55               | 18     | \$2,087      | 16%               | 16%               | 16%              | 6%              | 27%           | 39.1%             | 28.9%             | 28.9%            | 2.8       |
| 108       | HVAC Equipment | Ductless Heat Pump 21 SEER 10.0 HSPF - Heat pump baseline           | HVAC Midstream               | SF            | MO               | 6,506                | 14%            | 903                   | 0.69               | 18     | \$2,087      | 50%               | 18%               | 18%              | 6%              | 27%           | 55.1%             | 29.6%             | 29.6%            | 3.4       |
| 109       | HVAC Equipment | Ductless Heat Pump 23 SEER 10.0 HSPF - Heat pump baseline           | HVAC Midstream               | SF            | MO               | 6,506                | 15%            | 954                   | 0.81               | 18     | \$2,087      | 50%               | 20%               | 20%              | 6%              | 27%           | 55.1%             | 30.2%             | 30.2%            | 3.4       |
| 110       | HVAC Equipment | Air Source Heat Pump 16 SEER - Furnace baseline                     | HVAC Midstream               | SF            | MO               | 15,262               | 59%            | 8,999                 | 0.28               | 18     | \$384        | 100%              | 78%               | 78%              | 8%              | 0%            | 81.4%             | 50.7%             | 50.7%            | 13.9      |
| 111       | HVAC Equipment | Air Source Heat Pump 17 SEER - Furnace baseline                     | HVAC Midstream               | SF            | MO               | 15,262               | 61%            | 9,334                 | 0.28               | 18     | \$572        | 100%              | 70%               | 70%              | 8%              | 0%            | 81.4%             | 47.6%             | 47.6%            | 10.8      |
| 112       | HVAC Equipment | Air Source Heat Pump 18 SEER - Furnace baseline                     | HVAC Midstream               | SF            | MO               | 15,262               | 63%            | 9,635                 | 0.28               | 18     | \$811        | 100%              | 62%               | 62%              | 8%              | 0%            | 81.4%             | 44.6%             | 44.6%            | 8.9       |
| 113       | HVAC Equipment | Air Source Heat Pump 21 SEER - Furnace baseline                     | HVAC Midstream               | SF            | MO               | 15,262               | 68%            | 10,378                | 0.28               | 18     | \$811        | 100%              | 74%               | 74%              | 8%              | 0%            | 81.4%             | 49.1%             | 49.1%            | 7.9       |
| 114       | HVAC Equipment | Ductless Heat Pump 17 SEER 9.5 HSPF - Electric resistance baseline  | HVAC Midstream               | SF            | MO               | 15,262               | 31%            | 4,667                 | 0.20               | 18     | \$2,087      | 100%              | 13%               | 13%              | 11%             | 0%            | 81.4%             | 28.1%             | 28.1%            | 8.1       |
| 115       | HVAC Equipment | Ductless Heat Pump 19 SEER 9.5 HSPF - Electric resistance baseline  | HVAC Midstream               | SF            | MO               | 15,262               | 31%            | 4,708                 | 0.30               | 18     | \$2,087      | 100%              | 16%               | 16%              | 11%             | 0%            | 81.4%             | 28.9%             | 28.9%            | 7.2       |
| 116       | HVAC Equipment | Ductless Heat Pump 21 SEER 10.0 HSPF - Electric resistance baseline | HVAC Midstream               | SF            | MO               | 15,262               | 32%            | 4,871                 | 0.38               | 18     | \$2,087      | 100%              | 18%               | 18%              | 11%             | 0%            | 81.4%             | 29.6%             | 29.6%            | 6.8       |
| 117       | HVAC Equipment | Ductless Heat Pump 23 SEER 10.0 HSPF - Electric resistance baseline | HVAC Midstream               | SF            | MO               | 15,262               | 32%            | 4,898                 | 0.44               | 18     | \$2,087      | 100%              | 20%               | 20%              | 11%             | 0%            | 81.4%             | 30.2%             | 30.2%            | 6.4       |
| 118       | HVAC Equipment | AC Tune Up  | Home Weatherproofing         | SF            | Retrofit         | 1,168                | 4%             | 49                    | 0.13               | 5      | \$64         | 100%              | 66%               | 25%              | 74%             | 70%           | 81.4%             | 46.2%             | 31.9%            | 1.5       |
| 119       | HVAC Equipment | Central Air Conditioner 15 SEER                                     | HVAC Midstream               | SF            | MO               | 959                  | 7%             | 64                    | 0.15               | 18     | \$150        | 100%              | 100%              | 100%             | 74%             | 17%           | 81.4%             | 60.2%             | 60.2%            | 1.5       |
| 120       | HVAC Equipment | Central Air Conditioner 16 SEER                                     | HVAC Midstream               | SF            | MO               | 959                  | 13%            | 120                   | 0.28               | 18     | \$267        | 100%              | 100%              | 100%             | 74%             | 17%           | 81.4%             | 60.2%             | 60.2%            | 1.5       |
| 121       | HVAC Equipment | Central Air Conditioner 17 SEER                                     | HVAC Midstream               | SF            | MO               | 959                  | 18%            | 169                   | 0.40               | 18     | \$664        | 75%               | 45%               | 45%              | 74%             | 17%           | 66.9%             | 38.9%             | 38.9%            | 1.9       |
| 122       | HVAC Equipment | Central Air Conditioner 18 SEER                                     | HVAC Midstream               | SF            | MO               | 959                  | 22%            | 213                   | 0.50               | 18     | \$664        | 100%              | 45%               | 45%              | 74%             | 17%           | 81.4%             | 38.9%             | 38.9%            | 2.4       |
| 123       | HVAC Equipment | Smart Thermostat - Heat pump baseline                               | Home Energy Management       | SF            | Retrofit         | 5,005                | 9%             | 436                   | 0.00               | 15     | \$250        | 56%               | 56%               | 56%              | 9%              | 8%            | 57.7%             | 42.7%             | 42.7%            | 1.2       |
| 124       | HVAC Equipment | WiFi Thermostat - Heat pump baseline                                | HVAC Midstream               | SF            | Retrofit         | 5,005                | 9%             | 442                   | 0.00               | 15     | \$140        | 100%              | 54%               | 54%              | 9%              | 8%            | 81.4%             | 41.9%             | 41.9%            | 2.2       |
| 125       | HVAC Equipment | Programmable Thermostat - Heat pump baseline                        | Online Energy Check-Up       | SF            | Retrofit         | 5,005                | 3%             | 127                   | 0.00               | 15     | \$30         | 100%              | 66%               | 66%              | 9%              | 8%            | 81.4%             | 46.2%             | 46.2%            | 2.4       |
| 126       | HVAC Equipment | Smart Thermostat - Furnace baseline                                 | Home Energy Management       | SF            | Retrofit         | 10,314               | 9%             | 898                   | 0.00               | 15     | \$250        | 100%              | 56%               | 56%              | 12%             | 8%            | 81.4%             | 42.7%             | 42.7%            | 2.4       |
| 127       | HVAC Equipment | WiFi Thermostat - Furnace baseline                                  | HVAC Midstream               | SF            | Retrofit         | 10,314               | 9%             | 909                   | 0.00               | 15     | \$140        | 100%              | 54%               | 54%              | 12%             | 8%            | 81.4%             | 41.9%             | 41.9%            | 4.5       |
| 128       | HVAC Equipment | Programmable Thermostat - Furnace baseline                          | Online Energy Check-Up       | SF            | Retrofit         | 10,314               | 3%             | 265                   | 0.00               | 15     | \$30         | 100%              | 66%               | 66%              | 12%             | 8%            | 81.4%             | 46.2%             | 46.2%            | 5.0       |
| 129       | HVAC Equipment | Smart Thermostat - Gas/CAC baseline                                 | Home Energy Management       | SF            | Retrofit         | 778                  | 9%             | 69                    | 0.00               | 15     | \$250        | 100%              | 56%               | 56%              | 102%            | 8%            | 81.4%             | 42.7%             | 42.7%            | 0.2       |
| 130       | HVAC Equipment | WiFi Thermostat - Gas/CAC baseline                                  | HVAC Midstream               | SF            | Retrofit         | 778                  | 9%             | 70                    | 0.00               | 15     | \$140        | 100%              | 54%               | 54%              | 102%            | 8%            | 81.4%             | 41.9%             | 41.9%            | 0.4       |
| 131       | HVAC Equipment | Programmable Thermostat - Gas/CAC baseline                          | Online Energy Check-Up       | SF            | Retrofit         | 778                  | 2%             | 17                    | 0.00               | 15     | \$30         | 100%              | 66%               | 66%              | 102%            | 8%            | 81.4%             | 46.2%             | 46.2%            | 0.4       |



Appendix B: Residential Energy Efficiency Detail

| Measure # | End-Use        | Measure Name   | Program                  | Building Type | Replacement Type | Base Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|----------------|--|--------------------------|---------------|------------------|----------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 132       | HVAC Equipment | PTHP Variable Speed SEER 17 11.9 HPSF Upgrade from PTHP Baseline SEER 10.5 HPSF 7.7        | HVAC Midstream           | SF            | Retrofit         | 1,172                | 50%            | 586                   | 0.43               | 18     | \$100        | 100%              | 100%              | 100%             | 4%              | 27%           | 81.4%             | 60.2%             | 60.2%            | 7.9       |
| 133       | HVAC Equipment | PTHP Variable Speed SEER 17 11.9 HPSF Upgrade from PTAC SEER 10.5 Electric Resistance Heat | HVAC Midstream           | SF            | Retrofit         | 5,182                | 50%            | 2,591                 | 0.43               | 18     | \$100        | 100%              | 100%              | 100%             | 11%             | 27%           | 81.4%             | 60.2%             | 60.2%            | 16.3      |
| 134       | HVAC Equipment | ASHP Tune Up   | IQ Weatherproofing       | SF            | DI               | 7,507                | 4%             | 338                   | 0.13               | 5      | \$64         | 100%              | 100%              | 100%             | 6%              | 70%           | 66.2%             | 57.6%             | 57.6%            | 1.6       |
| 135       | HVAC Equipment | Air Source Heat Pump 15 SEER - Heat pump baseline  | IQ Weatherproofing       | SF            | DI               | 6,506                | 1%             | 64                    | 0.15               | 18     | \$384        | 100%              | 78%               | 78%              | 6%              | 27%           | 66.2%             | 45.2%             | 45.2%            | 0.7       |
| 136       | HVAC Equipment | Air Source Heat Pump 16 SEER - Heat pump baseline  | IQ Weatherproofing       | SF            | DI               | 6,506                | 4%             | 243                   | 0.28               | 18     | \$384        | 100%              | 78%               | 78%              | 6%              | 27%           | 66.2%             | 45.2%             | 45.2%            | 1.5       |
| 137       | HVAC Equipment | Air Source Heat Pump 17 SEER - Heat pump baseline  | IQ Weatherproofing       | SF            | DI               | 6,506                | 9%             | 578                   | 0.40               | 18     | \$572        | 100%              | 70%               | 70%              | 6%              | 27%           | 66.2%             | 41.4%             | 41.4%            | 1.9       |
| 138       | HVAC Equipment | Air Source Heat Pump 18 SEER - Heat pump baseline  | IQ Weatherproofing       | SF            | DI               | 6,506                | 14%            | 879                   | 0.50               | 18     | \$811        | 100%              | 62%               | 62%              | 6%              | 27%           | 66.2%             | 37.9%             | 37.9%            | 2.0       |
| 139       | HVAC Equipment | Air Source Heat Pump 21 SEER - Heat pump baseline  | IQ Weatherproofing       | SF            | DI               | 6,506                | 25%            | 1,622                 | 0.75               | 18     | \$811        | 100%              | 74%               | 74%              | 6%              | 27%           | 66.2%             | 43.2%             | 43.2%            | 2.7       |
| 140       | HVAC Equipment | Ground Source Heat Pump 20 SEER - Heat pump baseline                                       | IQ Weatherproofing       | SF            | DI               | 6,506                | 27%            | 1,767                 | 0.68               | 18     | \$391        | 100%              | 100%              | 100%             | 6%              | 27%           | 66.2%             | 57.6%             | 57.6%            | 4.1       |
| 141       | HVAC Equipment | Ground Source Heat Pump 21.5 SEER - Heat pump baseline                                     | IQ Weatherproofing       | SF            | DI               | 6,506                | 32%            | 2,098                 | 0.79               | 18     | \$391        | 100%              | 100%              | 100%             | 6%              | 27%           | 66.2%             | 57.6%             | 57.6%            | 4.8       |
| 142       | HVAC Equipment | Ground Source Heat Pump 23.5 SEER - Heat pump baseline                                     | IQ Weatherproofing       | SF            | DI               | 6,506                | 39%            | 2,521                 | 0.89               | 18     | \$891        | 100%              | 100%              | 100%             | 6%              | 27%           | 66.2%             | 57.6%             | 57.6%            | 2.4       |
| 143       | HVAC Equipment | Ground Source Heat Pump 29 SEER - Heat pump baseline                                       | IQ Weatherproofing       | SF            | DI               | 6,506                | 41%            | 2,653                 | 1.20               | 18     | \$1,291      | 100%              | 100%              | 100%             | 6%              | 27%           | 66.2%             | 57.6%             | 57.6%            | 2.0       |
| 144       | HVAC Equipment | Ductless Heat Pump 17 SEER 9.5 HSPF - Heat pump baseline                                   | IQ Weatherproofing       | SF            | MO               | 6,506                | 8%             | 530                   | 0.37               | 18     | \$2,087      | 50%               | 13%               | 13%              | 6%              | 27%           | 38.6%             | 19.6%             | 19.6%            | 2.5       |
| 145       | HVAC Equipment | Ductless Heat Pump 19 SEER 9.5 HSPF - Heat pump baseline                                   | IQ Weatherproofing       | SF            | MO               | 6,506                | 9%             | 606                   | 0.55               | 18     | \$2,087      | 75%               | 16%               | 16%              | 6%              | 27%           | 50.1%             | 20.5%             | 20.5%            | 2.8       |
| 146       | HVAC Equipment | Ductless Heat Pump 21 SEER 10.0 HSPF - Heat pump baseline                                  | IQ Weatherproofing       | SF            | MO               | 6,506                | 14%            | 903                   | 0.69               | 18     | \$2,087      | 100%              | 18%               | 18%              | 6%              | 27%           | 66.2%             | 21.1%             | 21.1%            | 3.4       |
| 147       | HVAC Equipment | Ductless Heat Pump 23 SEER 10.0 HSPF - Heat pump baseline                                  | IQ Weatherproofing       | SF            | MO               | 6,506                | 15%            | 954                   | 0.81               | 18     | \$2,087      | 100%              | 20%               | 20%              | 6%              | 27%           | 66.2%             | 21.7%             | 21.7%            | 3.4       |
| 148       | HVAC Equipment | Air Source Heat Pump 15 SEER - Furnace baseline  | IQ Weatherproofing       | SF            | DI               | 15,262               | 58%            | 8,820                 | 0.15               | 18     | \$384        | 100%              | 78%               | 78%              | 8%              | 0%            | 66.2%             | 45.2%             | 45.2%            | 13.1      |
| 149       | HVAC Equipment | Air Source Heat Pump 16 SEER - Furnace baseline  | IQ Weatherproofing       | SF            | DI               | 15,262               | 59%            | 8,999                 | 0.28               | 18     | \$384        | 100%              | 78%               | 78%              | 8%              | 0%            | 66.2%             | 45.2%             | 45.2%            | 13.9      |
| 150       | HVAC Equipment | Air Source Heat Pump 17 SEER - Furnace baseline  | IQ Weatherproofing       | SF            | DI               | 15,262               | 61%            | 9,334                 | 0.28               | 18     | \$572        | 100%              | 70%               | 70%              | 8%              | 0%            | 66.2%             | 41.4%             | 41.4%            | 10.8      |
| 151       | HVAC Equipment | Air Source Heat Pump 18 SEER - Furnace baseline  | IQ Weatherproofing       | SF            | DI               | 15,262               | 63%            | 9,635                 | 0.28               | 18     | \$811        | 100%              | 62%               | 62%              | 8%              | 0%            | 66.2%             | 37.9%             | 37.9%            | 8.9       |
| 152       | HVAC Equipment | Air Source Heat Pump 21 SEER - Furnace baseline  | IQ Weatherproofing       | SF            | DI               | 15,262               | 68%            | 10,378                | 0.28               | 18     | \$811        | 100%              | 74%               | 74%              | 8%              | 0%            | 66.2%             | 43.2%             | 43.2%            | 7.9       |
| 153       | HVAC Equipment | Ductless Heat Pump 17 SEER 9.5 HSPF - Electric resistance baseline                         | IQ Weatherproofing       | SF            | MO               | 15,262               | 31%            | 4,667                 | 0.20               | 18     | \$2,087      | 100%              | 13%               | 13%              | 11%             | 0%            | 66.2%             | 19.6%             | 19.6%            | 8.1       |
| 154       | HVAC Equipment | Ductless Heat Pump 19 SEER 9.5 HSPF - Electric resistance baseline                         | IQ Weatherproofing       | SF            | MO               | 15,262               | 31%            | 4,708                 | 0.30               | 18     | \$2,087      | 100%              | 16%               | 16%              | 11%             | 0%            | 66.2%             | 20.5%             | 20.5%            | 7.2       |
| 155       | HVAC Equipment | Ductless Heat Pump 21 SEER 10.0 HSPF - Electric resistance baseline                        | IQ Weatherproofing       | SF            | MO               | 15,262               | 32%            | 4,871                 | 0.38               | 18     | \$2,087      | 100%              | 18%               | 18%              | 11%             | 0%            | 66.2%             | 21.1%             | 21.1%            | 6.8       |
| 156       | HVAC Equipment | Ductless Heat Pump 23 SEER 10.0 HSPF - Electric resistance baseline                        | IQ Weatherproofing       | SF            | MO               | 15,262               | 32%            | 4,898                 | 0.44               | 18     | \$2,087      | 100%              | 20%               | 20%              | 11%             | 0%            | 66.2%             | 21.7%             | 21.7%            | 6.4       |
| 157       | HVAC Equipment | AC Tune Up   | IQ Weatherproofing       | SF            | DI               | 1,168                | 4%             | 49                    | 0.13               | 5      | \$64         | 100%              | 100%              | 100%             | 74%             | 70%           | 66.2%             | 57.6%             | 57.6%            | 1.0       |
| 158       | HVAC Equipment | Central Air Conditioner 15 SEER  | IQ Weatherproofing       | SF            | MO               | 959                  | 7%             | 64                    | 0.15               | 18     | \$150        | 100%              | 100%              | 100%             | 74%             | 17%           | 66.2%             | 57.6%             | 57.6%            | 1.5       |
| 159       | HVAC Equipment | Central Air Conditioner 16 SEER  | IQ Weatherproofing       | SF            | MO               | 959                  | 13%            | 120                   | 0.28               | 18     | \$267        | 100%              | 100%              | 100%             | 74%             | 17%           | 66.2%             | 57.6%             | 57.6%            | 1.5       |
| 160       | HVAC Equipment | Central Air Conditioner 17 SEER  | IQ Weatherproofing       | SF            | MO               | 959                  | 18%            | 169                   | 0.40               | 18     | \$664        | 100%              | 45%               | 45%              | 74%             | 17%           | 66.2%             | 31.4%             | 31.4%            | 1.9       |
| 161       | HVAC Equipment | Central Air Conditioner 18 SEER  | IQ Weatherproofing       | SF            | MO               | 959                  | 22%            | 213                   | 0.50               | 18     | \$664        | 100%              | 45%               | 45%              | 74%             | 17%           | 66.2%             | 31.4%             | 31.4%            | 2.4       |
| 162       | HVAC Equipment | Smart Thermostat - Heat pump baseline  | Home Energy Management   | SF            | DI               | 5,005                | 9%             | 436                   | 0.00               | 15     | \$250        | 100%              | 56%               | 56%              | 9%              | 8%            | 66.2%             | 35.8%             | 35.8%            | 1.2       |
| 163       | HVAC Equipment | WiFi Thermostat - Heat pump baseline   | IQ Weatherproofing       | SF            | DI               | 5,005                | 9%             | 442                   | 0.00               | 15     | \$140        | 100%              | 100%              | 100%             | 9%              | 8%            | 66.2%             | 57.6%             | 57.6%            | 1.2       |
| 164       | HVAC Equipment | Programmable Thermostat - Heat pump baseline   | Online Energy Check-Up   | SF            | DI               | 5,005                | 3%             | 127                   | 0.00               | 15     | \$30         | 100%              | 66%               | 66%              | 9%              | 8%            | 66.2%             | 39.7%             | 39.7%            | 2.4       |
| 165       | HVAC Equipment | Smart Thermostat - Furnace baseline  | Home Energy Management   | SF            | DI               | 10,314               | 9%             | 898                   | 0.00               | 15     | \$250        | 100%              | 56%               | 56%              | 12%             | 8%            | 66.2%             | 35.8%             | 35.8%            | 2.4       |
| 166       | HVAC Equipment | WiFi Thermostat - Furnace baseline   | IQ Weatherproofing       | SF            | DI               | 10,314               | 9%             | 909                   | 0.00               | 15     | \$140        | 100%              | 100%              | 100%             | 12%             | 8%            | 66.2%             | 57.6%             | 57.6%            | 2.4       |
| 167       | HVAC Equipment | Programmable Thermostat - Furnace baseline   | Online Energy Check-Up   | SF            | DI               | 10,314               | 3%             | 265                   | 0.00               | 15     | \$30         | 100%              | 66%               | 66%              | 12%             | 8%            | 66.2%             | 39.7%             | 39.7%            | 5.0       |
| 168       | HVAC Equipment | Smart Thermostat - Gas/CAC baseline  | Home Energy Management   | SF            | DI               | 778                  | 9%             | 69                    | 0.00               | 15     | \$250        | 100%              | 56%               | 56%              | 102%            | 8%            | 66.2%             | 35.8%             | 35.8%            | 0.2       |
| 169       | HVAC Equipment | WiFi Thermostat - Gas/CAC baseline   | IQ Weatherproofing       | SF            | DI               | 778                  | 9%             | 70                    | 0.00               | 15     | \$140        | 100%              | 100%              | 100%             | 102%            | 8%            | 66.2%             | 57.6%             | 57.6%            | 0.2       |
| 170       | HVAC Equipment | Programmable Thermostat - Gas/CAC baseline   | Online Energy Check-Up   | SF            | DI               | 778                  | 2%             | 17                    | 0.00               | 15     | \$30         | 100%              | 66%               | 66%              | 102%            | 8%            | 66.2%             | 39.7%             | 39.7%            | 0.4       |
| 171       | HVAC Equipment | PTHP Variable Speed SEER 17 11.9 HPSF Upgrade from PTHP Baseline SEER 10.5 HPSF 7.7        | HVAC Midstream           | SF            | Retrofit         | 1,172                | 50%            | 586                   | 0.43               | 18     | \$100        | 100%              | 100%              | 100%             | 4%              | 27%           | 66.2%             | 57.6%             | 57.6%            | 7.9       |
| 172       | HVAC Equipment | PTHP Variable Speed SEER 17 11.9 HPSF Upgrade from PTAC SEER 10.5 Electric Resistance Heat | HVAC Midstream           | SF            | Retrofit         | 5,182                | 50%            | 2,591                 | 0.43               | 18     | \$100        | 100%              | 100%              | 100%             | 11%             | 27%           | 66.2%             | 57.6%             | 57.6%            | 16.3      |
| 173       | HVAC Equipment | Air Filter Alarm   | School Education         | SF            | Retrofit         | 1,032                | 2%             | 19                    | 0.05               | 14     | \$1          | 100%              | 100%              | 100%             | 74%             | 70%           | 81.4%             | 60.2%             | 60.2%            | 43.3      |
| 174       | HVAC Equipment | ECM HVAC Motor   | HVAC Midstream           | SF            | Retrofit         | 1,383                | 30%            | 415                   | 0.07               | 10     | \$280        | 50%               | 36%               | 36%              | 85%             | 32%           | 55.1%             | 35.5%             | 35.5%            | 1.7       |
| 175       | HVAC Equipment | ENERGY STAR Room Air Conditioner   | HVAC Midstream           | SF            | MO               | 411                  | 9%             | 38                    | 0.09               | 12     | \$40         | 100%              | 66%               | 25%              | 13%             | 41%           | 81.4%             | 46.2%             | 31.9%            | 3.7       |
| 176       | HVAC Equipment | Smart Room AC  | HVAC Midstream           | SF            | MO               | 411                  | 3%             | 12                    | 0.03               | 12     | \$40         | 75%               | 66%               | 50%              | 13%             | 41%           | 66.9%             | 46.2%             | 40.8%            | 1.2       |
| 177       | HVAC Equipment | Smart Room AC - controls retrofit  | HVAC Midstream           | SF            | Retrofit         | 411                  | 3%             | 12                    | 0.03               | 12     | \$80         | 100%              | 66%               | 25%              | 13%             | 41%           | 81.4%             | 46.2%             | 31.9%            | 0.6       |
| 178       | HVAC Equipment | Room Air Conditioner Recycling   | Home Appliance Recycling | SF            | Recycle          | 581                  | 100%           | 581                   | 1.37               | 3      | \$129        | 100%              | 66%               | 19%              | 13%             | 0%            | 81.4%             | 46.2%             | 30.1%            | 5.0       |
| 179       | HVAC Equipment | Smart Vents/Sensors - Gas/CAC baseline   | Home Weatherproofing     | SF            | Retrofit         | 1,168                | 5%             | 58                    | 0.14               | 15     | \$1,625      | 100%              | 66%               | 25%              | 68%             | 0%            | 81.4%             | 46.2%             | 31.9%            | 0.2       |
| 180       | HVAC Equipment | Smart Vents/Sensors - Heat pump baseline   | Home Weatherproofing     | SF            | Retrofit         | 7,507                | 5%             | 375                   | 0.14               | 15     | \$1,625      | 100%              | 66%               | 25%              | 6%              | 0%            | 81.4%             | 46.2%             | 31.9%            | 0.3       |
| 181       | HVAC Equipment | Smart Vents/Sensors - Furnace baseline   | Home Weatherproofing     | SF            | Retrofit         | 15,471               | 5%             | 774                   | 0.14               | 15     | \$1,625      | 100%              | 66%               | 25%              | 8%              | 0%            | 81.4%             | 46.2%             | 31.9%            | 0.4       |
| 182       | HVAC Equipment | Whole House Attic Fan  | Home Weatherproofing     | SF            | Retrofit         | 1,168                | 15%            | 171                   | 0.00               | 20     | \$1,500      | 100%              | 66%               | 25%              | 74%             | 13%           | 81.4%             | 46.2%             | 31.9%            | 0.1       |
| 183       | HVAC Equipment | Attic Fan  | Home Weatherproofing     | SF            | Retrofit         | 1,168                | 9%             | 105                   | 0.22               | 10     | \$600        | 100%              | 66%               | 25%              | 74%             | 13%           | 81.4%             | 46.2%             | 31.9%            | 0.5       |
| 184       | HVAC Equipment | Efficient ceramic space heater   | HVAC Midstream           | SF            | Retrofit         | 1,406                | 13%            | 178                   | 0.00               | 18     | \$26         | 100%              | 66%               | 66%              | 20%             | 27%           | 81.4%             | 46.2%             | 46.2%            | 4.5       |
| 185       | HVAC Equipment | Air Source Heat Pump 16 SEER - Heat pump baseline  | HVAC Midstream           | SF            | NC               | 6,506                | 4%             | 243                   | 0.28               | 18     | \$384        | 100%              | 78%               | 78%              | 6%              | 0%            | 81.4%             | 50.7%             | 50.7%            | 1.5       |
| 186       | HVAC Equipment | Air Source Heat Pump 17 SEER - Heat pump baseline  | HVAC Midstream           | SF            | NC               | 6,506                | 9%             | 578                   | 0.40               | 18     | \$572        | 100%              | 70%               | 70%              | 6%              | 0%            | 81.4%             | 47.6%             | 47.6%            | 1.9       |
| 187       | HVAC Equipment | Air Source Heat Pump 18 SEER - Heat pump baseline  | HVAC Midstream           | SF            | NC               | 6,506                | 14%            | 879                   | 0.50               | 18     | \$811        | 100%              | 62%               | 62%              | 6%              | 0%            | 81.4%             | 44.6%             | 44.6%            | 2.0       |
| 188       | HVAC Equipment | Air Source Heat Pump 21 SEER - Heat pump baseline  | HVAC Midstream           | SF            | NC               | 6,506                | 25%            | 1,622                 | 0.75               | 18     | \$811        | 100%              | 74%               | 74%              | 6%              | 0%            | 81.4%             | 49.1%             | 49.1%            | 2.7       |
| 189       | HVAC Equipment | Ground Source Heat Pump 20 SEER - Heat pump baseline                                       | HVAC Midstream           | SF            | NC               | 6,506                | 27%            | 1,767                 | 0.68               | 18     | \$391        | 100%              | 92%               | 92%              | 6%              | 0%            | 81.4%             | 56.6%             | 56.6%            | 4.4       |
| 190       | HVAC Equipment | Ground Source Heat Pump 21.5 SEER - Heat pump baseline                                     | HVAC Midstream           | SF            | NC               | 6,506                | 32%            | 2,098                 | 0.79               | 18     | \$391        | 100%              | 100%              | 100%             | 6%              | 0%            | 81.4%             | 60.2%             | 60.2%            | 4.8       |
| 191       | HVAC Equipment | Ground Source Heat Pump 23.5 SEER - Heat pump baseline                                     | HVAC Midstream           | SF            | NC               | 6,506                | 39%            | 2,521                 | 0.89               | 18     | \$891        | 100%              | 67%               | 67%              | 6%              | 0%</          |                   |                   |                  |           |

Appendix B: Residential Energy Efficiency Detail

| Measure # | End-Use        | Measure Name   | Program                | Building Type | Replacement Type | Base Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|----------------|--|------------------------|---------------|------------------|----------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 193       | HVAC Equipment | Ductless Heat Pump 17 SEER 9.5 HSPF - Heat pump baseline                                   | HVAC Midstream         | SF            | NC               | 6,506                | 8%             | 530                   | 0.37               | 18     | \$2,087      | 13%               | 13%               | 13%              | 6%              | 0%            | 38.0%             | 28.1%             | 28.1%            | 2.5       |
| 194       | HVAC Equipment | Ductless Heat Pump 19 SEER 9.5 HSPF - Heat pump baseline                                   | HVAC Midstream         | SF            | NC               | 6,506                | 9%             | 606                   | 0.55               | 18     | \$2,087      | 16%               | 16%               | 16%              | 6%              | 0%            | 39.1%             | 28.9%             | 28.9%            | 2.8       |
| 195       | HVAC Equipment | Ductless Heat Pump 21 SEER 10.0 HSPF - Heat pump baseline                                  | HVAC Midstream         | SF            | NC               | 6,506                | 14%            | 903                   | 0.69               | 18     | \$2,087      | 50%               | 18%               | 18%              | 6%              | 0%            | 55.1%             | 29.6%             | 29.6%            | 3.4       |
| 196       | HVAC Equipment | Ductless Heat Pump 23 SEER 10.0 HSPF - Heat pump baseline                                  | HVAC Midstream         | SF            | NC               | 6,506                | 15%            | 954                   | 0.81               | 18     | \$2,087      | 50%               | 20%               | 20%              | 6%              | 0%            | 55.1%             | 30.2%             | 30.2%            | 3.4       |
| 197       | HVAC Equipment | Central Air Conditioner 15 SEER  | HVAC Midstream         | SF            | NC               | 959                  | 7%             | 64                    | 0.15               | 18     | \$150        | 100%              | 100%              | 100%             | 74%             | 0%            | 81.4%             | 60.2%             | 60.2%            | 1.5       |
| 198       | HVAC Equipment | Central Air Conditioner 16 SEER  | HVAC Midstream         | SF            | NC               | 959                  | 13%            | 120                   | 0.28               | 18     | \$267        | 100%              | 100%              | 100%             | 74%             | 0%            | 81.4%             | 60.2%             | 60.2%            | 1.5       |
| 199       | HVAC Equipment | Central Air Conditioner 17 SEER  | HVAC Midstream         | SF            | NC               | 959                  | 18%            | 169                   | 0.40               | 18     | \$664        | 75%               | 45%               | 45%              | 74%             | 0%            | 66.9%             | 38.9%             | 38.9%            | 1.9       |
| 200       | HVAC Equipment | Central Air Conditioner 18 SEER  | HVAC Midstream         | SF            | NC               | 959                  | 22%            | 213                   | 0.50               | 18     | \$664        | 100%              | 45%               | 45%              | 74%             | 0%            | 81.4%             | 38.9%             | 38.9%            | 2.4       |
| 201       | HVAC Equipment | ENERGY STAR Room Air Conditioner   | HVAC Midstream         | SF            | NC               | 411                  | 9%             | 38                    | 0.09               | 12     | \$40         | 100%              | 66%               | 25%              | 13%             | 0%            | 81.4%             | 46.2%             | 31.9%            | 3.7       |
| 202       | HVAC Equipment | Smart Room AC  | HVAC Midstream         | SF            | NC               | 411                  | 3%             | 12                    | 0.03               | 12     | \$40         | 75%               | 66%               | 50%              | 13%             | 0%            | 66.9%             | 46.2%             | 40.8%            | 1.2       |
| 203       | HVAC Equipment | Smart Thermostat - Heat pump baseline  | Home Energy Management | SF            | NC               | 4,338                | 9%             | 378                   | 0.00               | 15     | \$250        | 56%               | 56%               | 56%              | 9%              | 0%            | 57.7%             | 42.7%             | 42.7%            | 1.0       |
| 204       | HVAC Equipment | WiFi Thermostat - Heat pump baseline   | HVAC Midstream         | SF            | NC               | 4,338                | 9%             | 383                   | 0.00               | 15     | \$140        | 100%              | 54%               | 54%              | 9%              | 0%            | 81.4%             | 41.9%             | 41.9%            | 1.9       |
| 205       | HVAC Equipment | Programmable Thermostat - Heat pump baseline   | Online Energy Check-Up | SF            | NC               | 4,338                | 3%             | 110                   | 0.00               | 15     | \$30         | 100%              | 66%               | 66%              | 9%              | 0%            | 81.4%             | 46.2%             | 46.2%            | 2.1       |
| 206       | HVAC Equipment | Smart Thermostat - Gas/CAC baseline  | Home Energy Management | SF            | NC               | 639                  | 9%             | 56                    | 0.00               | 15     | \$250        | 100%              | 56%               | 56%              | 102%            | 0%            | 81.4%             | 42.7%             | 42.7%            | 0.2       |
| 207       | HVAC Equipment | WiFi Thermostat - Gas/CAC baseline   | HVAC Midstream         | SF            | NC               | 639                  | 9%             | 58                    | 0.00               | 15     | \$140        | 100%              | 54%               | 54%              | 102%            | 0%            | 81.4%             | 41.9%             | 41.9%            | 0.3       |
| 208       | HVAC Equipment | Programmable Thermostat - Gas/CAC baseline   | Online Energy Check-Up | SF            | NC               | 639                  | 2%             | 14                    | 0.00               | 15     | \$30         | 100%              | 66%               | 66%              | 102%            | 0%            | 81.4%             | 46.2%             | 46.2%            | 0.3       |
| 209       | HVAC Equipment | Smart Vents/Sensors - Gas/CAC baseline   | Home Weatherproofing   | SF            | NC               | 1,033                | 5%             | 52                    | 0.14               | 15     | \$1,625      | 100%              | 66%               | 25%              | 68%             | 0%            | 81.4%             | 46.2%             | 31.9%            | 0.2       |
| 210       | HVAC Equipment | Smart Vents/Sensors - Heat pump baseline   | Home Weatherproofing   | SF            | NC               | 6,506                | 5%             | 325                   | 0.14               | 15     | \$1,625      | 100%              | 66%               | 25%              | 68%             | 0%            | 81.4%             | 46.2%             | 31.9%            | 0.2       |
| 211       | HVAC Equipment | ASHP Tune Up   | Home Weatherproofing   | MF            | Retrofit         | 5,005                | 7%             | 338                   | 0.13               | 5      | \$64         | 100%              | 66%               | 25%              | 6%              | 70%           | 81.4%             | 46.2%             | 31.9%            | 2.4       |
| 212       | HVAC Equipment | Air Source Heat Pump 16 SEER - Heat pump baseline  | HVAC Midstream         | MF            | MO               | 4,338                | 4%             | 162                   | 0.19               | 18     | \$384        | 78%               | 78%               | 78%              | 6%              | 27%           | 68.6%             | 50.7%             | 50.7%            | 1.0       |
| 213       | HVAC Equipment | Air Source Heat Pump 17 SEER - Heat pump baseline  | HVAC Midstream         | MF            | MO               | 4,338                | 9%             | 385                   | 0.27               | 18     | \$572        | 75%               | 70%               | 70%              | 6%              | 27%           | 66.9%             | 47.6%             | 47.6%            | 1.2       |
| 214       | HVAC Equipment | Air Source Heat Pump 18 SEER - Heat pump baseline  | HVAC Midstream         | MF            | MO               | 4,338                | 14%            | 586                   | 0.34               | 18     | \$811        | 75%               | 62%               | 62%              | 6%              | 27%           | 66.9%             | 44.6%             | 44.6%            | 1.3       |
| 215       | HVAC Equipment | Air Source Heat Pump 21 SEER - Heat pump baseline  | HVAC Midstream         | MF            | MO               | 4,338                | 25%            | 1,081                 | 0.50               | 18     | \$811        | 100%              | 74%               | 74%              | 6%              | 27%           | 81.4%             | 49.1%             | 49.1%            | 1.8       |
| 216       | HVAC Equipment | Ground Source Heat Pump 20 SEER - Heat pump baseline                                       | HVAC Midstream         | MF            | MO               | 4,338                | 27%            | 1,178                 | 0.45               | 18     | \$391        | 100%              | 92%               | 92%              | 6%              | 27%           | 81.4%             | 56.6%             | 56.6%            | 3.0       |
| 217       | HVAC Equipment | Ground Source Heat Pump 21.5 SEER - Heat pump baseline                                     | HVAC Midstream         | MF            | MO               | 4,338                | 32%            | 1,398                 | 0.53               | 18     | \$391        | 100%              | 100%              | 100%             | 6%              | 27%           | 81.4%             | 60.2%             | 60.2%            | 3.2       |
| 218       | HVAC Equipment | Ground Source Heat Pump 23.5 SEER - Heat pump baseline                                     | HVAC Midstream         | MF            | MO               | 4,338                | 39%            | 1,681                 | 0.59               | 18     | \$891        | 100%              | 67%               | 67%              | 6%              | 27%           | 81.4%             | 46.7%             | 46.7%            | 2.4       |
| 219       | HVAC Equipment | Ground Source Heat Pump 29 SEER - Heat pump baseline                                       | HVAC Midstream         | MF            | MO               | 4,338                | 41%            | 1,769                 | 0.80               | 18     | \$1,291      | 100%              | 56%               | 56%              | 6%              | 27%           | 81.4%             | 42.7%             | 42.7%            | 2.4       |
| 220       | HVAC Equipment | Ductless Heat Pump 17 SEER 9.5 HSPF - Heat pump baseline                                   | HVAC Midstream         | MF            | MO               | 4,338                | 8%             | 353                   | 0.24               | 18     | \$2,087      | 13%               | 13%               | 13%              | 6%              | 27%           | 38.0%             | 28.1%             | 28.1%            | 1.7       |
| 221       | HVAC Equipment | Ductless Heat Pump 19 SEER 9.5 HSPF - Heat pump baseline                                   | HVAC Midstream         | MF            | MO               | 4,338                | 9%             | 404                   | 0.36               | 18     | \$2,087      | 16%               | 16%               | 16%              | 6%              | 27%           | 39.1%             | 28.9%             | 28.9%            | 1.9       |
| 222       | HVAC Equipment | Ductless Heat Pump 21 SEER 10.0 HSPF - Heat pump baseline                                  | HVAC Midstream         | MF            | MO               | 4,338                | 14%            | 602                   | 0.46               | 18     | \$2,087      | 18%               | 18%               | 18%              | 6%              | 27%           | 39.9%             | 29.6%             | 29.6%            | 2.2       |
| 223       | HVAC Equipment | Ductless Heat Pump 23 SEER 10.0 HSPF - Heat pump baseline                                  | HVAC Midstream         | MF            | MO               | 4,338                | 15%            | 636                   | 0.54               | 18     | \$2,087      | 20%               | 20%               | 20%              | 6%              | 27%           | 40.8%             | 30.2%             | 30.2%            | 2.3       |
| 224       | HVAC Equipment | Air Source Heat Pump 16 SEER - Furnace baseline  | HVAC Midstream         | MF            | MO               | 10,175               | 59%            | 5,999                 | 0.19               | 18     | \$384        | 100%              | 78%               | 78%              | 8%              | 0%            | 81.4%             | 50.7%             | 50.7%            | 9.2       |
| 225       | HVAC Equipment | Air Source Heat Pump 17 SEER - Furnace baseline  | HVAC Midstream         | MF            | MO               | 10,175               | 61%            | 6,222                 | 0.19               | 18     | \$572        | 100%              | 70%               | 70%              | 8%              | 0%            | 81.4%             | 47.6%             | 47.6%            | 7.2       |
| 226       | HVAC Equipment | Air Source Heat Pump 18 SEER - Furnace baseline  | HVAC Midstream         | MF            | MO               | 10,175               | 63%            | 6,423                 | 0.19               | 18     | \$811        | 100%              | 62%               | 62%              | 8%              | 0%            | 81.4%             | 44.6%             | 44.6%            | 5.9       |
| 227       | HVAC Equipment | Air Source Heat Pump 21 SEER - Furnace baseline  | HVAC Midstream         | MF            | MO               | 10,175               | 68%            | 6,919                 | 0.19               | 18     | \$811        | 100%              | 74%               | 74%              | 8%              | 0%            | 81.4%             | 49.1%             | 49.1%            | 5.3       |
| 228       | HVAC Equipment | Ductless Heat Pump 17 SEER 9.5 HSPF - Electric resistance baseline                         | HVAC Midstream         | MF            | MO               | 10,175               | 31%            | 3,111                 | 0.13               | 18     | \$2,087      | 50%               | 13%               | 13%              | 11%             | 0%            | 55.1%             | 28.1%             | 28.1%            | 5.4       |
| 229       | HVAC Equipment | Ductless Heat Pump 19 SEER 9.5 HSPF - Electric resistance baseline                         | HVAC Midstream         | MF            | MO               | 10,175               | 31%            | 3,139                 | 0.20               | 18     | \$2,087      | 75%               | 16%               | 16%              | 11%             | 0%            | 66.9%             | 28.9%             | 28.9%            | 4.8       |
| 230       | HVAC Equipment | Ductless Heat Pump 21 SEER 10.0 HSPF - Electric resistance baseline                        | HVAC Midstream         | MF            | MO               | 10,175               | 32%            | 3,247                 | 0.25               | 18     | \$2,087      | 75%               | 18%               | 18%              | 11%             | 0%            | 66.9%             | 29.6%             | 29.6%            | 4.5       |
| 231       | HVAC Equipment | Ductless Heat Pump 23 SEER 10.0 HSPF - Electric resistance baseline                        | HVAC Midstream         | MF            | MO               | 10,175               | 32%            | 3,266                 | 0.30               | 18     | \$2,087      | 75%               | 20%               | 20%              | 11%             | 0%            | 66.9%             | 30.2%             | 30.2%            | 4.2       |
| 232       | HVAC Equipment | AC Tune Up   | Home Weatherproofing   | MF            | Retrofit         | 778                  | 6%             | 49                    | 0.13               | 5      | \$64         | 100%              | 66%               | 25%              | 74%             | 70%           | 81.4%             | 46.2%             | 31.9%            | 1.5       |
| 233       | HVAC Equipment | Central Air Conditioner 15 SEER  | HVAC Midstream         | MF            | MO               | 639                  | 7%             | 43                    | 0.10               | 18     | \$150        | 100%              | 100%              | 100%             | 74%             | 17%           | 81.4%             | 60.2%             | 60.2%            | 1.0       |
| 234       | HVAC Equipment | Central Air Conditioner 16 SEER  | HVAC Midstream         | MF            | MO               | 639                  | 13%            | 80                    | 0.19               | 18     | \$267        | 100%              | 100%              | 100%             | 74%             | 17%           | 81.4%             | 60.2%             | 60.2%            | 1.0       |
| 235       | HVAC Equipment | Central Air Conditioner 17 SEER  | HVAC Midstream         | MF            | MO               | 639                  | 18%            | 113                   | 0.27               | 18     | \$664        | 50%               | 45%               | 45%              | 74%             | 17%           | 55.1%             | 38.9%             | 38.9%            | 1.3       |
| 236       | HVAC Equipment | Central Air Conditioner 18 SEER  | HVAC Midstream         | MF            | MO               | 639                  | 33%            | 213                   | 0.34               | 18     | \$664        | 75%               | 45%               | 45%              | 74%             | 17%           | 66.9%             | 38.9%             | 38.9%            | 1.7       |
| 237       | HVAC Equipment | Smart Thermostat - Heat pump baseline  | Home Energy Management | MF            | Retrofit         | 3,850                | 9%             | 336                   | 0.00               | 15     | \$250        | 100%              | 56%               | 56%              | 6%              | 8%            | 81.4%             | 42.7%             | 42.7%            | 0.9       |
| 238       | HVAC Equipment | WiFi Thermostat - Heat pump baseline   | HVAC Midstream         | MF            | Retrofit         | 3,850                | 9%             | 340                   | 0.00               | 15     | \$140        | 75%               | 54%               | 54%              | 6%              | 8%            | 66.9%             | 41.9%             | 41.9%            | 1.7       |
| 239       | HVAC Equipment | Programmable Thermostat - Heat pump baseline   | Online Energy Check-Up | MF            | Retrofit         | 3,850                | 3%             | 98                    | 0.00               | 15     | \$30         | 100%              | 66%               | 66%              | 6%              | 8%            | 81.4%             | 46.2%             | 46.2%            | 1.8       |
| 240       | HVAC Equipment | Smart Thermostat - Furnace baseline  | Home Energy Management | MF            | Retrofit         | 7,934                | 9%             | 691                   | 0.00               | 15     | \$250        | 100%              | 56%               | 56%              | 11%             | 8%            | 81.4%             | 42.7%             | 42.7%            | 1.8       |
| 241       | HVAC Equipment | WiFi Thermostat - Furnace baseline   | HVAC Midstream         | MF            | Retrofit         | 7,934                | 9%             | 699                   | 0.00               | 15     | \$140        | 100%              | 54%               | 54%              | 11%             | 8%            | 81.4%             | 41.9%             | 41.9%            | 3.4       |
| 242       | HVAC Equipment | Programmable Thermostat - Furnace baseline   | Online Energy Check-Up | MF            | Retrofit         | 7,934                | 3%             | 204                   | 0.00               | 15     | \$30         | 100%              | 66%               | 66%              | 11%             | 8%            | 81.4%             | 46.2%             | 46.2%            | 3.8       |
| 243       | HVAC Equipment | Smart Thermostat - Gas/CAC baseline  | Home Energy Management | MF            | Retrofit         | 599                  | 9%             | 53                    | 0.00               | 15     | \$250        | 100%              | 56%               | 56%              | 89%             | 8%            | 81.4%             | 42.7%             | 42.7%            | 0.2       |
| 244       | HVAC Equipment | WiFi Thermostat - Gas/CAC baseline   | HVAC Midstream         | MF            | Retrofit         | 599                  | 9%             | 54                    | 0.00               | 15     | \$140        | 100%              | 54%               | 54%              | 89%             | 8%            | 81.4%             | 41.9%             | 41.9%            | 0.3       |
| 245       | HVAC Equipment | Programmable Thermostat - Gas/CAC baseline   | Online Energy Check-Up | MF            | Retrofit         | 599                  | 2%             | 13                    | 0.00               | 15     | \$30         | 100%              | 66%               | 66%              | 89%             | 8%            | 81.4%             | 46.2%             | 46.2%            | 0.3       |
| 246       | HVAC Equipment | PTHP Variable Speed SEER 17 11.9 HPSF Upgrade from PTHP Baseline SEER 10.5 HPSF 7.7        | IQ Weatherproofing     | MF            | Retrofit         | 1,172                | 50%            | 586                   | 0.43               | 18     | \$100        | 100%              | 100%              | 100%             | 4%              | 27%           | 81.4%             | 60.2%             | 60.2%            | 7.9       |
| 247       | HVAC Equipment | PTHP Variable Speed SEER 17 11.9 HPSF Upgrade from PTAC SEER 10.5 Electric Resistance Heat | IQ Weatherproofing     | MF            | Retrofit         | 5,182                | 50%            | 2,591                 | 0.43               | 18     | \$100        | 100%              | 100%              | 100%             | 11%             | 27%           | 81.4%             | 60.2%             | 60.2%            | 16.3      |
| 248       | HVAC Equipment | ASHP Tune Up   | IQ Weatherproofing     | MF            | DI               | 5,005                | 7%             | 338                   | 0.13               | 5      | \$64         | 100%              | 100%              | 100%             | 6%              | 70%           | 66.2%             | 57.6%             | 57.6%            | 1.6       |
| 249       | HVAC Equipment | Air Source Heat Pump 15 SEER - Heat pump baseline  | IQ Weatherproofing     | MF            | DI               | 4,338                | 1%             | 43                    | 0.10               | 18     | \$384        | 100%              | 78%               | 78%              | 6%              | 27%           | 66.2%             | 45.2%             | 45.2%            | 0.5       |
| 250       | HVAC Equipment | Air Source Heat Pump 16 SEER - Heat pump baseline  | IQ Weatherproofing     | MF            | DI               | 4,338                | 4%             | 162                   | 0.19               | 18     | \$384        | 100%              | 78%               | 78%              | 6%              | 27%           | 66.2%             | 45.2%             | 45.2%            | 1.0       |
| 251       | HVAC Equipment | Air Source Heat Pump 17 SEER - Heat pump baseline  | IQ Weatherproofing     | MF            | DI               | 4,338                | 9%             | 385                   | 0.27               | 18     | \$572        | 100%              | 70%               | 70%              | 6%              | 27%           | 66.2%             | 41.4%             | 41.4%            | 1.2       |
| 252       | HVAC Equipment | Air Source Heat Pump 18 SEER - Heat pump baseline  | IQ Weatherproofing     | MF            | DI               | 4,338                | 14%            | 586                   | 0.34               | 18     | \$811        | 100%              | 62%               | 62%              | 6%              | 27%           | 66.2%             | 37.9%             | 37.9%            | 1.3       |
| 253       | HVAC Equipment | Air Source Heat Pump 21 SEER - Heat pump baseline  | IQ Weatherproofing     | MF            | DI               | 4,338                | 25%            | 1,081                 | 0.50               | 18     | \$811        | 100%              | 74%               | 74%              | 6%              | 27%           | 66.2%             | 43.2%             | 43.2%            | 1.8       |
| 254       | HVAC Equipment | Ground Source Heat Pump 20 SEER - Heat pump baseline                                       | IQ Weatherproofing     | MF            | DI               | 4,338                | 27%            | 1,178                 | 0.45               | 18     | \$391        | 100%              | 92%               | 92%              | 6%              | 27%           | 66.2%             | 52.7%             | 52.7%            | 3.0       |
| 255       | HVAC Equipment | Ground Source Heat Pump 21.5 SEER - Heat pump baseline                                     | IQ Weatherproofing     | MF            | DI               | 4,338                | 32%            | 1,398                 | 0.53               | 18     | \$391        | 100%              | 100%              | 100%             | 6%              | 27%           | 66.2%             | 57.6%             | 57.6%            | 3.2       |

Appendix B: Residential Energy Efficiency Detail

| Measure # | End-Use        | Measure Name   | Program                  | Building Type | Replacement Type | Base Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|----------------|--|--------------------------|---------------|------------------|----------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 256       | HVAC Equipment | Ground Source Heat Pump 23.5 SEER - Heat pump baseline                                     | IQ Weatherproofing       | MF            | DI               | 4,338                | 39%            | 1,681                 | 0.59               | 18     | \$891        | 100%              | 67%               | 67%              | 6%              | 27%           | 66.2%             | 40.3%             | 40.3%            | 2.4       |
| 257       | HVAC Equipment | Ground Source Heat Pump 29 SEER - Heat pump baseline                                       | IQ Weatherproofing       | MF            | DI               | 4,338                | 41%            | 1,769                 | 0.80               | 18     | \$1,291      | 100%              | 56%               | 56%              | 6%              | 27%           | 66.2%             | 35.7%             | 35.7%            | 2.4       |
| 258       | HVAC Equipment | Ductless Heat Pump 17 SEER 9.5 HSPF - Heat pump baseline                                   | IQ Weatherproofing       | MF            | MO               | 4,338                | 8%             | 353                   | 0.24               | 18     | \$2,087      | 13%               | 13%               | 13%              | 6%              | 27%           | 22.6%             | 19.6%             | 19.6%            | 1.7       |
| 259       | HVAC Equipment | Ductless Heat Pump 19 SEER 9.5 HSPF - Heat pump baseline                                   | IQ Weatherproofing       | MF            | MO               | 4,338                | 9%             | 404                   | 0.36               | 18     | \$2,087      | 50%               | 16%               | 16%              | 6%              | 27%           | 38.6%             | 20.5%             | 20.5%            | 1.9       |
| 260       | HVAC Equipment | Ductless Heat Pump 21 SEER 10.0 HSPF - Heat pump baseline                                  | IQ Weatherproofing       | MF            | MO               | 4,338                | 14%            | 602                   | 0.46               | 18     | \$2,087      | 75%               | 18%               | 18%              | 6%              | 27%           | 50.1%             | 21.1%             | 21.1%            | 2.2       |
| 261       | HVAC Equipment | Ductless Heat Pump 23 SEER 10.0 HSPF - Heat pump baseline                                  | IQ Weatherproofing       | MF            | MO               | 4,338                | 15%            | 636                   | 0.54               | 18     | \$2,087      | 75%               | 20%               | 20%              | 6%              | 27%           | 50.1%             | 21.7%             | 21.7%            | 2.3       |
| 262       | HVAC Equipment | Air Source Heat Pump 15 SEER - Furnace baseline  | IQ Weatherproofing       | MF            | DI               | 10,175               | 58%            | 5,880                 | 0.10               | 18     | \$384        | 100%              | 78%               | 78%              | 8%              | 0%            | 66.2%             | 45.2%             | 45.2%            | 8.7       |
| 263       | HVAC Equipment | Air Source Heat Pump 16 SEER - Furnace baseline  | IQ Weatherproofing       | MF            | DI               | 10,175               | 59%            | 5,999                 | 0.19               | 18     | \$384        | 100%              | 78%               | 78%              | 8%              | 0%            | 66.2%             | 45.2%             | 45.2%            | 9.2       |
| 264       | HVAC Equipment | Air Source Heat Pump 17 SEER - Furnace baseline  | IQ Weatherproofing       | MF            | DI               | 10,175               | 61%            | 6,222                 | 0.19               | 18     | \$572        | 100%              | 70%               | 70%              | 8%              | 0%            | 66.2%             | 41.4%             | 41.4%            | 7.2       |
| 265       | HVAC Equipment | Air Source Heat Pump 18 SEER - Furnace baseline  | IQ Weatherproofing       | MF            | DI               | 10,175               | 63%            | 6,423                 | 0.19               | 18     | \$811        | 100%              | 62%               | 62%              | 8%              | 0%            | 66.2%             | 37.9%             | 37.9%            | 5.9       |
| 266       | HVAC Equipment | Air Source Heat Pump 21 SEER - Furnace baseline  | IQ Weatherproofing       | MF            | DI               | 10,175               | 68%            | 6,919                 | 0.19               | 18     | \$811        | 100%              | 74%               | 74%              | 8%              | 0%            | 66.2%             | 43.2%             | 43.2%            | 5.3       |
| 267       | HVAC Equipment | Ductless Heat Pump 17 SEER 9.5 HSPF - Electric resistance baseline                         | IQ Weatherproofing       | MF            | MO               | 10,175               | 31%            | 3,111                 | 0.13               | 18     | \$2,087      | 100%              | 13%               | 13%              | 11%             | 0%            | 66.2%             | 19.6%             | 19.6%            | 5.4       |
| 268       | HVAC Equipment | Ductless Heat Pump 19 SEER 9.5 HSPF - Electric resistance baseline                         | IQ Weatherproofing       | MF            | MO               | 10,175               | 31%            | 3,139                 | 0.20               | 18     | \$2,087      | 100%              | 16%               | 16%              | 11%             | 0%            | 66.2%             | 20.5%             | 20.5%            | 4.8       |
| 269       | HVAC Equipment | Ductless Heat Pump 21 SEER 10.0 HSPF - Electric resistance baseline                        | IQ Weatherproofing       | MF            | MO               | 10,175               | 32%            | 3,247                 | 0.25               | 18     | \$2,087      | 100%              | 18%               | 18%              | 11%             | 0%            | 66.2%             | 21.1%             | 21.1%            | 4.5       |
| 270       | HVAC Equipment | Ductless Heat Pump 23 SEER 10.0 HSPF - Electric resistance baseline                        | IQ Weatherproofing       | MF            | MO               | 10,175               | 32%            | 3,266                 | 0.30               | 18     | \$2,087      | 100%              | 20%               | 20%              | 11%             | 0%            | 66.2%             | 21.7%             | 21.7%            | 4.2       |
| 271       | HVAC Equipment | AC Tune Up   | IQ Weatherproofing       | MF            | DI               | 778                  | 6%             | 49                    | 0.13               | 5      | \$64         | 100%              | 100%              | 100%             | 74%             | 70%           | 66.2%             | 57.6%             | 57.6%            | 1.0       |
| 272       | HVAC Equipment | Central Air Conditioner 15 SEER  | IQ Weatherproofing       | MF            | MO               | 639                  | 7%             | 43                    | 0.10               | 18     | \$150        | 100%              | 100%              | 100%             | 74%             | 17%           | 66.2%             | 57.6%             | 57.6%            | 1.0       |
| 273       | HVAC Equipment | Central Air Conditioner 16 SEER  | IQ Weatherproofing       | MF            | MO               | 639                  | 13%            | 80                    | 0.19               | 18     | \$267        | 100%              | 100%              | 100%             | 74%             | 17%           | 66.2%             | 57.6%             | 57.6%            | 1.0       |
| 274       | HVAC Equipment | Central Air Conditioner 17 SEER  | IQ Weatherproofing       | MF            | MO               | 639                  | 18%            | 113                   | 0.27               | 18     | \$664        | 100%              | 45%               | 45%              | 74%             | 17%           | 66.2%             | 31.4%             | 31.4%            | 1.3       |
| 275       | HVAC Equipment | Central Air Conditioner 18 SEER  | IQ Weatherproofing       | MF            | MO               | 639                  | 33%            | 213                   | 0.34               | 18     | \$664        | 100%              | 45%               | 45%              | 74%             | 17%           | 66.2%             | 31.4%             | 31.4%            | 1.7       |
| 276       | HVAC Equipment | Smart Thermostat - Heat pump baseline  | Home Energy Management   | MF            | DI               | 3,850                | 9%             | 336                   | 0.00               | 15     | \$250        | 100%              | 56%               | 56%              | 6%              | 8%            | 66.2%             | 35.8%             | 35.8%            | 0.9       |
| 277       | HVAC Equipment | WiFi Thermostat - Heat pump baseline   | IQ Weatherproofing       | MF            | DI               | 3,850                | 9%             | 340                   | 0.00               | 15     | \$140        | 100%              | 100%              | 100%             | 6%              | 8%            | 66.2%             | 57.6%             | 57.6%            | 0.9       |
| 278       | HVAC Equipment | Programmable Thermostat - Heat pump baseline   | Online Energy Check-Up   | MF            | DI               | 3,850                | 3%             | 98                    | 0.00               | 15     | \$30         | 100%              | 66%               | 66%              | 6%              | 8%            | 66.2%             | 39.7%             | 39.7%            | 1.8       |
| 279       | HVAC Equipment | Smart Thermostat - Furnace baseline  | Home Energy Management   | MF            | DI               | 7,934                | 9%             | 691                   | 0.00               | 15     | \$250        | 100%              | 56%               | 56%              | 11%             | 8%            | 66.2%             | 35.8%             | 35.8%            | 1.8       |
| 280       | HVAC Equipment | WiFi Thermostat - Furnace baseline   | IQ Weatherproofing       | MF            | DI               | 7,934                | 9%             | 699                   | 0.00               | 15     | \$140        | 100%              | 100%              | 100%             | 11%             | 8%            | 66.2%             | 57.6%             | 57.6%            | 1.8       |
| 281       | HVAC Equipment | Programmable Thermostat - Furnace baseline   | Online Energy Check-Up   | MF            | DI               | 7,934                | 3%             | 204                   | 0.00               | 15     | \$30         | 100%              | 66%               | 66%              | 11%             | 8%            | 66.2%             | 39.7%             | 39.7%            | 3.8       |
| 282       | HVAC Equipment | Smart Thermostat - Gas/CAC baseline  | Home Energy Management   | MF            | DI               | 599                  | 9%             | 53                    | 0.00               | 15     | \$250        | 100%              | 56%               | 56%              | 8%              | 8%            | 66.2%             | 35.8%             | 35.8%            | 0.2       |
| 283       | HVAC Equipment | WiFi Thermostat - Gas/CAC baseline   | IQ Weatherproofing       | MF            | DI               | 599                  | 9%             | 54                    | 0.00               | 15     | \$140        | 100%              | 100%              | 100%             | 8%              | 8%            | 66.2%             | 57.6%             | 57.6%            | 0.2       |
| 284       | HVAC Equipment | Programmable Thermostat - Gas/CAC baseline   | Online Energy Check-Up   | MF            | DI               | 599                  | 2%             | 13                    | 0.00               | 15     | \$30         | 100%              | 66%               | 66%              | 8%              | 8%            | 66.2%             | 39.7%             | 39.7%            | 0.3       |
| 285       | HVAC Equipment | PTHP Variable Speed SEER 17 11.9 HPSF Upgrade from PTHP Baseline SEER 10.5 HPSF 7.7        | IQ Weatherproofing       | MF            | Retrofit         | 1,172                | 50%            | 586                   | 0.43               | 18     | \$100        | 100%              | 100%              | 100%             | 4%              | 27%           | 66.2%             | 57.6%             | 57.6%            | 7.9       |
| 286       | HVAC Equipment | PTHP Variable Speed SEER 17 11.9 HPSF Upgrade from PTAC SEER 10.5 Electric Resistance Heat | IQ Weatherproofing       | MF            | Retrofit         | 5,182                | 50%            | 2,591                 | 0.43               | 18     | \$100        | 100%              | 100%              | 100%             | 11%             | 27%           | 66.2%             | 57.6%             | 57.6%            | 16.3      |
| 287       | HVAC Equipment | Air Filter Alarm   | School Education         | MF            | Retrofit         | 1,032                | 2%             | 19                    | 0.05               | 14     | \$1          | 100%              | 100%              | 100%             | 74%             | 70%           | 81.4%             | 60.2%             | 60.2%            | 43.3      |
| 288       | HVAC Equipment | ECM HVAC Motor   | HVAC Midstream           | MF            | Retrofit         | 1,383                | 30%            | 415                   | 0.07               | 10     | \$280        | 50%               | 36%               | 36%              | 85%             | 32%           | 55.1%             | 35.5%             | 35.5%            | 1.7       |
| 289       | HVAC Equipment | ENERGY STAR Room Air Conditioner   | HVAC Midstream           | MF            | MO               | 411                  | 9%             | 38                    | 0.09               | 12     | \$40         | 100%              | 66%               | 25%              | 13%             | 41%           | 81.4%             | 46.2%             | 31.9%            | 3.7       |
| 290       | HVAC Equipment | Smart Room AC  | HVAC Midstream           | MF            | MO               | 411                  | 3%             | 12                    | 0.03               | 12     | \$40         | 75%               | 66%               | 50%              | 13%             | 41%           | 66.9%             | 46.2%             | 40.8%            | 1.2       |
| 291       | HVAC Equipment | Smart Room AC - controls retrofit  | HVAC Midstream           | MF            | Retrofit         | 411                  | 3%             | 12                    | 0.03               | 12     | \$80         | 100%              | 66%               | 25%              | 13%             | 41%           | 81.4%             | 46.2%             | 31.9%            | 0.6       |
| 292       | HVAC Equipment | Room Air Conditioner Recycling   | Home Appliance Recycling | MF            | Recycle          | 581                  | 100%           | 581                   | 1.37               | 3      | \$129        | 100%              | 66%               | 19%              | 13%             | 0%            | 81.4%             | 46.2%             | 30.1%            | 5.0       |
| 293       | HVAC Equipment | Smart Vents/Sensors - Gas/CAC baseline   | Home Weatherproofing     | MF            | Retrofit         | 778                  | 5%             | 39                    | 0.09               | 15     | \$1,219      | 100%              | 66%               | 25%              | 68%             | 0%            | 81.4%             | 46.2%             | 31.9%            | 0.1       |
| 294       | HVAC Equipment | Smart Vents/Sensors - Heat pump baseline   | Home Weatherproofing     | MF            | Retrofit         | 5,005                | 5%             | 250                   | 0.09               | 15     | \$1,219      | 100%              | 66%               | 25%              | 6%              | 0%            | 81.4%             | 46.2%             | 31.9%            | 0.2       |
| 295       | HVAC Equipment | Smart Vents/Sensors - Furnace baseline   | Home Weatherproofing     | MF            | Retrofit         | 10,314               | 5%             | 516                   | 0.09               | 15     | \$1,219      | 100%              | 66%               | 25%              | 8%              | 0%            | 81.4%             | 46.2%             | 31.9%            | 0.4       |
| 296       | HVAC Equipment | Whole House Attic Fan  | Home Weatherproofing     | MF            | Retrofit         | 778                  | 22%            | 171                   | 0.00               | 20     | \$1,500      | 100%              | 66%               | 25%              | 74%             | 13%           | 81.4%             | 46.2%             | 31.9%            | 0.1       |
| 297       | HVAC Equipment | Attic Fan  | Home Weatherproofing     | MF            | Retrofit         | 778                  | 13%            | 105                   | 0.22               | 10     | \$600        | 100%              | 66%               | 25%              | 74%             | 13%           | 81.4%             | 46.2%             | 31.9%            | 0.5       |
| 298       | HVAC Equipment | Efficient ceramic space heater   | HVAC Midstream           | MF            | Retrofit         | 1,406                | 13%            | 178                   | 0.00               | 18     | \$26         | 100%              | 66%               | 66%              | 20%             | 27%           | 81.4%             | 46.2%             | 46.2%            | 4.5       |
| 299       | HVAC Equipment | Air Source Heat Pump 16 SEER - Heat pump baseline  | HVAC Midstream           | MF            | NC               | 4,338                | 4%             | 162                   | 0.19               | 18     | \$384        | 78%               | 78%               | 78%              | 6%              | 0%            | 66.9%             | 50.7%             | 50.7%            | 1.0       |
| 300       | HVAC Equipment | Air Source Heat Pump 17 SEER - Heat pump baseline  | HVAC Midstream           | MF            | NC               | 4,338                | 9%             | 385                   | 0.27               | 18     | \$572        | 75%               | 70%               | 70%              | 6%              | 0%            | 66.9%             | 47.6%             | 47.6%            | 1.2       |
| 301       | HVAC Equipment | Air Source Heat Pump 18 SEER - Heat pump baseline  | HVAC Midstream           | MF            | NC               | 4,338                | 14%            | 586                   | 0.34               | 18     | \$811        | 75%               | 62%               | 62%              | 6%              | 0%            | 66.9%             | 44.6%             | 44.6%            | 1.3       |
| 302       | HVAC Equipment | Air Source Heat Pump 21 SEER - Heat pump baseline  | HVAC Midstream           | MF            | NC               | 4,338                | 25%            | 1,081                 | 0.50               | 18     | \$811        | 100%              | 74%               | 74%              | 6%              | 0%            | 81.4%             | 49.1%             | 49.1%            | 1.8       |
| 303       | HVAC Equipment | Ground Source Heat Pump 20 SEER - Heat pump baseline                                       | HVAC Midstream           | MF            | NC               | 4,338                | 27%            | 1,178                 | 0.45               | 18     | \$391        | 100%              | 92%               | 92%              | 6%              | 0%            | 81.4%             | 56.6%             | 56.6%            | 3.0       |
| 304       | HVAC Equipment | Ground Source Heat Pump 21.5 SEER - Heat pump baseline                                     | HVAC Midstream           | MF            | NC               | 4,338                | 32%            | 1,398                 | 0.53               | 18     | \$391        | 100%              | 100%              | 100%             | 6%              | 0%            | 81.4%             | 60.2%             | 60.2%            | 3.2       |
| 305       | HVAC Equipment | Ground Source Heat Pump 23.5 SEER - Heat pump baseline                                     | HVAC Midstream           | MF            | NC               | 4,338                | 39%            | 1,681                 | 0.59               | 18     | \$891        | 100%              | 67%               | 67%              | 6%              | 0%            | 81.4%             | 46.7%             | 46.7%            | 2.4       |
| 306       | HVAC Equipment | Ground Source Heat Pump 29 SEER - Heat pump baseline                                       | HVAC Midstream           | MF            | NC               | 4,338                | 41%            | 1,769                 | 0.80               | 18     | \$1,291      | 100%              | 56%               | 56%              | 6%              | 0%            | 81.4%             | 42.7%             | 42.7%            | 2.4       |
| 307       | HVAC Equipment | Ductless Heat Pump 17 SEER 9.5 HSPF - Heat pump baseline                                   | HVAC Midstream           | MF            | NC               | 4,338                | 8%             | 353                   | 0.24               | 18     | \$2,087      | 13%               | 13%               | 13%              | 6%              | 0%            | 38.0%             | 28.1%             | 28.1%            | 1.7       |
| 308       | HVAC Equipment | Ductless Heat Pump 19 SEER 9.5 HSPF - Heat pump baseline                                   | HVAC Midstream           | MF            | NC               | 4,338                | 9%             | 404                   | 0.36               | 18     | \$2,087      | 16%               | 16%               | 16%              | 6%              | 0%            | 39.1%             | 28.9%             | 28.9%            | 1.9       |
| 309       | HVAC Equipment | Ductless Heat Pump 21 SEER 10.0 HSPF - Heat pump baseline                                  | HVAC Midstream           | MF            | NC               | 4,338                | 14%            | 602                   | 0.46               | 18     | \$2,087      | 18%               | 18%               | 18%              | 6%              | 0%            | 39.9%             | 29.6%             | 29.6%            | 2.2       |
| 310       | HVAC Equipment | Ductless Heat Pump 23 SEER 10.0 HSPF - Heat pump baseline                                  | HVAC Midstream           | MF            | NC               | 4,338                | 15%            | 636                   | 0.54               | 18     | \$2,087      | 20%               | 20%               | 20%              | 6%              | 0%            | 40.8%             | 30.2%             | 30.2%            | 2.3       |
| 311       | HVAC Equipment | Central Air Conditioner 15 SEER  | HVAC Midstream           | MF            | NC               | 639                  | 7%             | 43                    | 0.10               | 18     | \$150        | 100%              | 100%              | 100%             | 74%             | 0%            | 81.4%             | 60.2%             | 60.2%            | 1.0       |
| 312       | HVAC Equipment | Central Air Conditioner 16 SEER  | HVAC Midstream           | MF            | NC               | 639                  | 13%            | 80                    | 0.19               | 18     | \$267        | 100%              | 100%              | 100%             | 74%             | 0%            | 81.4%             | 60.2%             | 60.2%            | 1.0       |
| 313       | HVAC Equipment | Central Air Conditioner 17 SEER  | HVAC Midstream           | MF            | NC               | 639                  | 18%            | 113                   | 0.27               | 18     | \$664        | 50%               | 45%               | 45%              | 74%             | 0%            | 55.1%             | 38.9%             | 38.9%            | 1.3       |
| 314       | HVAC Equipment | Central Air Conditioner 18 SEER  | HVAC Midstream           | MF            | NC               | 639                  | 33%            | 213                   | 0.34               | 18     | \$664        | 75%               | 45%               | 45%              | 74%             | 0%            | 66.9%             | 38.9%             | 38.9%            | 1.7       |
| 315       | HVAC Equipment | ENERGY STAR Room Air Conditioner   | HVAC Midstream           | MF            | NC               | 411                  | 9%             | 38                    | 0.09               | 12     | \$40         | 100%              | 66%               | 25%              | 13%             | 0%            | 81.4%             | 46.2%             | 31.9%            | 3.7       |
| 316       | HVAC Equipment | Smart Room AC  | HVAC Midstream           | MF            | NC               | 411                  | 3%             | 12                    | 0.03               | 12     | \$40         | 75%               | 66%               | 50%              | 13%             | 0%            | 66.9%             | 46.2%             | 40.8%            | 1.2       |
| 317       | HVAC Equipment | Smart Thermostat - Heat pump baseline  | Home Energy Management   | MF            | NC               | 3,337                | 9%             | 291                   | 0.00               | 15     | \$250        | 100%              | 56%               | 56%              | 6%              | 0%            | 81.4%             | 42.7%             | 42.7%            | 0.8       |
| 318       | HVAC Equipment | WiFi Thermostat - Heat pump baseline   | HVAC Midstream           | MF            | NC               | 3,337                | 9%             | 295                   | 0.00               | 15     | \$140        | 75%               | 54%               | 54%              | 6%              | 0%            | 66.9%             | 41.9%             | 41.9%            | 1.5       |

Appendix B: Residential Energy Efficiency Detail

| Measure # | End-Use        | Measure Name                                 | Program                | Building Type | Replacement Type | Base Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|----------------|--|------------------------|---------------|------------------|----------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 319       | HVAC Equipment | Programmable Thermostat - Heat pump baseline | Online Energy Check-Up | MF            | NC               | 3,337                | 3%             | 85                    | 0.00               | 15     | \$30         | 100%              | 66%               | 66%              | 6%              | 0%            | 81.4%             | 46.2%             | 46.2%            | 1.6       |
| 320       | HVAC Equipment | Smart Thermostat - Gas/CAC baseline          | Home Energy Management | MF            | NC               | 492                  | 9%             | 43                    | 0.00               | 15     | \$250        | 100%              | 56%               | 56%              | 89%             | 0%            | 81.4%             | 42.7%             | 42.7%            | 0.1       |
| 321       | HVAC Equipment | WiFi Thermostat - Gas/CAC baseline           | HVAC Midstream         | MF            | NC               | 492                  | 9%             | 44                    | 0.00               | 15     | \$140        | 100%              | 54%               | 54%              | 89%             | 0%            | 81.4%             | 41.9%             | 41.9%            | 0.2       |
| 322       | HVAC Equipment | Programmable Thermostat - Gas/CAC baseline   | Online Energy Check-Up | MF            | NC               | 492                  | 3%             | 14                    | 0.00               | 15     | \$30         | 100%              | 66%               | 66%              | 89%             | 0%            | 81.4%             | 46.2%             | 46.2%            | 0.3       |
| 323       | HVAC Equipment | Smart Vents/Sensors - Gas/CAC baseline       | Home Weatherproofing   | MF            | NC               | 689                  | 5%             | 34                    | 0.09               | 15     | \$1,219      | 100%              | 66%               | 25%              | 68%             | 0%            | 81.4%             | 46.2%             | 31.9%            | 0.1       |
| 324       | HVAC Equipment | Smart Vents/Sensors - Heat pump baseline     | Home Weatherproofing   | MF            | NC               | 4,338                | 5%             | 217                   | 0.09               | 15     | \$1,219      | 100%              | 66%               | 25%              | 6%              | 0%            | 81.4%             | 46.2%             | 31.9%            | 0.2       |
| 325       | Lighting       | 9W LED                                       | Home Energy Products   | SF            | MO               | 32                   | 9%             | 3                     | 0.00               | 2      | \$1          | 15%               | 15%               | 15%              | 2041%           | 59%           | 20.2%             | 17.6%             | 17.6%            | 1.3       |
| 326       | Lighting       | 9W LED                                       | Home Weatherproofing   | SF            | DI               | 32                   | 9%             | 3                     | 0.00               | 2      | \$1          | 15%               | 15%               | 25%              | 2041%           | 59%           | 20.2%             | 17.6%             | 20.3%            | 1.3       |
| 327       | Lighting       | 9W LED                                       | Online Energy Check-Up | SF            | DI               | 32                   | 9%             | 3                     | 0.00               | 2      | \$1          | 15%               | 15%               | 15%              | 2041%           | 59%           | 20.2%             | 17.6%             | 17.6%            | 1.3       |
| 328       | Lighting       | 9W LED                                       | School Education       | SF            | DI               | 32                   | 9%             | 3                     | 0.00               | 2      | \$1          | 15%               | 15%               | 15%              | 2041%           | 59%           | 20.2%             | 17.6%             | 17.6%            | 1.3       |
| 329       | Lighting       | 13W LED                                      | Home Energy Products   | SF            | MO               | 38                   | 13%            | 5                     | 0.00               | 2      | \$5          | 100%              | 44%               | 44%              | 2041%           | 59%           | 62.1%             | 28.0%             | 28.0%            | 0.2       |
| 330       | Lighting       | 13W LED                                      | Home Weatherproofing   | SF            | DI               | 38                   | 13%            | 5                     | 0.00               | 2      | \$5          | 100%              | 44%               | 25%              | 2041%           | 59%           | 62.1%             | 28.0%             | 20.3%            | 0.2       |
| 331       | Lighting       | 9W LED                                       | IQ Weatherproofing     | SF            | DI               | 75                   | 9%             | 7                     | 0.00               | 2      | \$2          | 100%              | 100%              | 100%             | 2041%           | 59%           | 60.5%             | 52.7%             | 52.7%            | 0.3       |
| 332       | Lighting       | 13W LED                                      | IQ Weatherproofing     | SF            | DI               | 38                   | 13%            | 5                     | 0.00               | 2      | \$5          | 100%              | 100%              | 100%             | 2041%           | 59%           | 60.5%             | 52.7%             | 52.7%            | 0.1       |
| 333       | Lighting       | LED 5W Globe                                 | Home Energy Products   | SF            | MO               | 5                    | 20%            | 1                     | 0.00               | 2      | \$3          | 100%              | 69%               | 69%              | 587%            | 59%           | 62.1%             | 39.0%             | 39.0%            | 0.0       |
| 334       | Lighting       | LED R30 Dimmable                             | Home Energy Products   | SF            | MO               | 43                   | 26%            | 11                    | 0.00               | 2      | \$4          | 100%              | 88%               | 88%              | 547%            | 59%           | 62.1%             | 47.9%             | 47.9%            | 0.3       |
| 335       | Lighting       | LED Nightlights                              | Home Energy Products   | SF            | MO               | 15                   | 93%            | 14                    | 0.00               | 3      | \$1          | 100%              | 100%              | 100%             | 34%             | 59%           | 62.1%             | 54.0%             | 54.0%            | 1.4       |
| 336       | Lighting       | LED Nightlights                              | Online Energy Check-Up | SF            | DI               | 15                   | 93%            | 14                    | 0.00               | 3      | \$1          | 100%              | 100%              | 100%             | 34%             | 59%           | 62.1%             | 54.0%             | 54.0%            | 1.4       |
| 337       | Lighting       | LED Nightlights                              | School Education       | SF            | DI               | 15                   | 93%            | 14                    | 0.00               | 3      | \$1          | 100%              | 100%              | 100%             | 34%             | 59%           | 62.1%             | 54.0%             | 54.0%            | 1.4       |
| 338       | Lighting       | Exterior LED Lamp                            | Home Energy Products   | SF            | MO               | 108                  | 26%            | 28                    | 0.00               | 6      | \$4          | 100%              | 88%               | 88%              | 500%            | 59%           | 62.1%             | 47.9%             | 47.9%            | 1.4       |
| 339       | Lighting       | Linear LED                                   | Home Energy Products   | SF            | MO               | 24                   | 53%            | 13                    | 0.00               | 18     | \$16         | 100%              | 66%               | 66%              | 427%            | 59%           | 62.1%             | 37.6%             | 37.6%            | 0.7       |
| 340       | Lighting       | Smart LED                                    | Home Energy Products   | SF            | MO               | 19                   | 10%            | 2                     | 0.00               | 3      | \$2          | 100%              | 100%              | 100%             | 2041%           | 59%           | 62.1%             | 54.0%             | 54.0%            | 0.1       |
| 341       | Lighting       | LED Fixture                                  | Home Energy Products   | SF            | MO               | 16                   | 82%            | 13                    | 0.00               | 15     | \$13         | 100%              | 66%               | 66%              | 2041%           | 59%           | 62.1%             | 37.6%             | 37.6%            | 0.8       |
| 342       | Lighting       | Occupancy Sensor                             | Home Energy Products   | SF            | Retrofit         | 164                  | 40%            | 66                    | 0.00               | 10     | \$40         | 100%              | 66%               | 66%              | 100%            | 42%           | 62.1%             | 37.6%             | 37.6%            | 0.7       |
| 343       | Lighting       | Smart Lighting Switch                        | Home Energy Products   | SF            | Retrofit         | 19                   | 10%            | 2                     | 0.00               | 3      | \$2          | 100%              | 66%               | 66%              | 2041%           | 42%           | 62.1%             | 37.6%             | 37.6%            | 0.2       |
| 344       | Lighting       | Exterior Lighting Controls                   | Home Energy Products   | SF            | Retrofit         | 108                  | 40%            | 43                    | 0.00               | 10     | \$100        | 100%              | 66%               | 66%              | 500%            | 42%           | 62.1%             | 37.6%             | 37.6%            | 0.2       |
| 345       | Lighting       | 9W LED                                       | Home Energy Products   | SF            | NC               | 32                   | 9%             | 3                     | 0.00               | 2      | \$1          | 15%               | 15%               | 15%              | 2041%           | 0%            | 20.2%             | 17.6%             | 17.6%            | 1.3       |
| 346       | Lighting       | 13W LED                                      | Home Energy Products   | SF            | NC               | 38                   | 13%            | 5                     | 0.00               | 2      | \$5          | 100%              | 44%               | 44%              | 2041%           | 0%            | 62.1%             | 28.0%             | 28.0%            | 0.2       |
| 347       | Lighting       | LED 5W Globe                                 | Home Energy Products   | SF            | NC               | 5                    | 20%            | 1                     | 0.00               | 2      | \$3          | 100%              | 69%               | 69%              | 587%            | 0%            | 62.1%             | 39.0%             | 39.0%            | 0.0       |
| 348       | Lighting       | LED R30 Dimmable                             | Home Energy Products   | SF            | NC               | 43                   | 26%            | 11                    | 0.00               | 2      | \$4          | 100%              | 88%               | 88%              | 547%            | 0%            | 62.1%             | 47.9%             | 47.9%            | 0.3       |
| 349       | Lighting       | LED Nightlights                              | Home Energy Products   | SF            | NC               | 15                   | 93%            | 14                    | 0.00               | 3      | \$1          | 100%              | 100%              | 100%             | 34%             | 0%            | 62.1%             | 54.0%             | 54.0%            | 1.4       |
| 350       | Lighting       | Exterior LED Lamp                            | Home Energy Products   | SF            | NC               | 108                  | 26%            | 28                    | 0.00               | 6      | \$4          | 100%              | 88%               | 88%              | 500%            | 0%            | 62.1%             | 47.9%             | 47.9%            | 1.4       |
| 351       | Lighting       | Linear LED                                   | Home Energy Products   | SF            | NC               | 24                   | 53%            | 13                    | 0.00               | 18     | \$16         | 100%              | 66%               | 66%              | 427%            | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.7       |
| 352       | Lighting       | Smart LED                                    | Home Energy Products   | SF            | NC               | 19                   | 10%            | 2                     | 0.00               | 3      | \$2          | 100%              | 100%              | 100%             | 2041%           | 0%            | 62.1%             | 54.0%             | 54.0%            | 0.1       |
| 353       | Lighting       | LED Fixture                                  | Home Energy Products   | SF            | NC               | 16                   | 82%            | 13                    | 0.00               | 15     | \$13         | 100%              | 66%               | 66%              | 2041%           | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.8       |
| 354       | Lighting       | Occupancy Sensor                             | Home Energy Products   | SF            | NC               | 164                  | 40%            | 66                    | 0.00               | 10     | \$40         | 100%              | 66%               | 66%              | 100%            | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.7       |
| 355       | Lighting       | Smart Lighting Switch                        | Home Energy Products   | SF            | NC               | 19                   | 10%            | 2                     | 0.00               | 3      | \$2          | 100%              | 66%               | 66%              | 2041%           | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.2       |
| 356       | Lighting       | Exterior Lighting Controls                   | Home Energy Products   | SF            | NC               | 108                  | 40%            | 43                    | 0.00               | 10     | \$100        | 100%              | 66%               | 66%              | 500%            | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.2       |
| 357       | Lighting       | 9W LED                                       | Home Energy Products   | MF            | MO               | 32                   | 9%             | 3                     | 0.00               | 2      | \$1          | 15%               | 15%               | 15%              | 1021%           | 59%           | 20.2%             | 17.6%             | 17.6%            | 1.3       |
| 358       | Lighting       | 9W LED                                       | Home Weatherproofing   | MF            | DI               | 32                   | 9%             | 3                     | 0.00               | 2      | \$1          | 15%               | 15%               | 25%              | 1021%           | 59%           | 20.2%             | 17.6%             | 20.3%            | 1.3       |
| 359       | Lighting       | 9W LED                                       | Online Energy Check-Up | MF            | DI               | 32                   | 9%             | 3                     | 0.00               | 2      | \$1          | 15%               | 15%               | 15%              | 1021%           | 59%           | 20.2%             | 17.6%             | 17.6%            | 1.3       |
| 360       | Lighting       | 9W LED                                       | School Education       | MF            | DI               | 32                   | 9%             | 3                     | 0.00               | 2      | \$1          | 15%               | 15%               | 15%              | 1021%           | 59%           | 20.2%             | 17.6%             | 17.6%            | 1.3       |
| 361       | Lighting       | 13W LED                                      | Home Energy Products   | MF            | MO               | 38                   | 13%            | 5                     | 0.00               | 2      | \$5          | 100%              | 44%               | 44%              | 1021%           | 59%           | 62.1%             | 28.0%             | 28.0%            | 0.2       |
| 362       | Lighting       | 13W LED                                      | Home Weatherproofing   | MF            | DI               | 38                   | 13%            | 5                     | 0.00               | 2      | \$5          | 100%              | 44%               | 25%              | 1021%           | 59%           | 62.1%             | 28.0%             | 20.3%            | 0.2       |
| 363       | Lighting       | 9W LED                                       | IQ Weatherproofing     | MF            | DI               | 32                   | 9%             | 3                     | 0.00               | 2      | \$2          | 100%              | 100%              | 100%             | 1021%           | 59%           | 60.5%             | 52.7%             | 52.7%            | 0.2       |
| 364       | Lighting       | 13W LED                                      | IQ Weatherproofing     | MF            | DI               | 38                   | 13%            | 5                     | 0.00               | 2      | \$5          | 100%              | 100%              | 100%             | 1021%           | 59%           | 60.5%             | 52.7%             | 52.7%            | 0.1       |
| 365       | Lighting       | LED 5W Globe                                 | Home Energy Products   | MF            | MO               | 5                    | 20%            | 1                     | 0.00               | 2      | \$3          | 100%              | 69%               | 69%              | 293%            | 59%           | 62.1%             | 39.0%             | 39.0%            | 0.0       |
| 366       | Lighting       | LED R30 Dimmable                             | Home Energy Products   | MF            | MO               | 43                   | 26%            | 11                    | 0.00               | 2      | \$4          | 100%              | 88%               | 88%              | 274%            | 59%           | 62.1%             | 47.9%             | 47.9%            | 0.3       |
| 367       | Lighting       | LED Nightlights                              | Home Energy Products   | MF            | MO               | 15                   | 93%            | 14                    | 0.00               | 3      | \$1          | 100%              | 100%              | 100%             | 34%             | 59%           | 62.1%             | 54.0%             | 54.0%            | 1.4       |
| 368       | Lighting       | LED Nightlights                              | Online Energy Check-Up | MF            | DI               | 15                   | 93%            | 14                    | 0.00               | 3      | \$1          | 100%              | 100%              | 100%             | 34%             | 59%           | 62.1%             | 54.0%             | 54.0%            | 1.4       |
| 369       | Lighting       | LED Nightlights                              | School Education       | MF            | DI               | 15                   | 93%            | 14                    | 0.00               | 3      | \$1          | 100%              | 100%              | 100%             | 34%             | 59%           | 62.1%             | 54.0%             | 54.0%            | 1.4       |
| 370       | Lighting       | Exterior LED Lamp                            | Home Energy Products   | MF            | MO               | 108                  | 26%            | 28                    | 0.00               | 6      | \$4          | 100%              | 88%               | 88%              | 500%            | 59%           | 62.1%             | 47.9%             | 47.9%            | 1.4       |
| 371       | Lighting       | Linear LED                                   | Home Energy Products   | MF            | MO               | 24                   | 53%            | 13                    | 0.00               | 18     | \$16         | 100%              | 66%               | 66%              | 427%            | 59%           | 62.1%             | 37.6%             | 37.6%            | 0.7       |
| 372       | Lighting       | Smart LED                                    | Home Energy Products   | MF            | MO               | 19                   | 10%            | 2                     | 0.00               | 3      | \$2          | 100%              | 100%              | 100%             | 1021%           | 59%           | 62.1%             | 54.0%             | 54.0%            | 0.1       |
| 373       | Lighting       | LED Fixture                                  | Home Energy Products   | MF            | MO               | 16                   | 82%            | 13                    | 0.00               | 15     | \$13         | 100%              | 66%               | 66%              | 1021%           | 59%           | 62.1%             | 37.6%             | 37.6%            | 0.8       |
| 374       | Lighting       | Occupancy Sensor                             | Home Energy Products   | MF            | Retrofit         | 164                  | 40%            | 66                    | 0.00               | 10     | \$40         | 100%              | 66%               | 66%              | 100%            | 57%           | 62.1%             | 37.6%             | 37.6%            | 0.7       |
| 375       | Lighting       | Smart Lighting Switch                        | Home Energy Products   | MF            | Retrofit         | 19                   | 10%            | 2                     | 0.00               | 3      | \$2          | 100%              | 66%               | 66%              | 1021%           | 57%           | 62.1%             | 37.6%             | 37.6%            | 0.2       |
| 376       | Lighting       | Exterior Lighting Controls                   | Home Energy Products   | MF            | Retrofit         | 108                  | 40%            | 43                    | 0.00               | 10     | \$100        | 100%              | 66%               | 66%              | 500%            | 57%           | 62.1%             | 37.6%             | 37.6%            | 0.2       |
| 377       | Lighting       | 9W LED                                       | Home Energy Products   | MF            | NC               | 32                   | 9%             | 3                     | 0.00               | 2      | \$1          | 15%               | 15%               | 15%              | 1021%           | 0%            | 20.2%             | 17.6%             | 17.6%            | 1.3       |
| 378       | Lighting       | 13W LED                                      | Home Energy Products   | MF            | NC               | 38                   | 13%            | 5                     | 0.00               | 2      | \$5          | 100%              | 44%               | 44%              | 1021%           | 0%            | 62.1%             | 28.0%             | 28.0%            | 0.2       |
| 379       | Lighting       | LED 5W Globe                                 | Home Energy Products   | MF            | NC               | 5                    | 20%            | 1                     | 0.00               | 2      | \$3          | 100%              | 69%               | 69%              | 293%            | 0%            | 62.1%             | 39.0%             | 39.0%            | 0.0       |
| 380       | Lighting       | LED R30 Dimmable                             | Home Energy Products   | MF            | NC               | 43                   | 26%            | 11                    | 0.00               | 2      | \$4          | 100%              | 88%               | 88%              | 274%            | 0%            | 62.1%             | 47.9%             | 47.9%            | 0.3       |
| 381       | Lighting       | LED Nightlights                              | Home Energy Products   | MF            | NC               | 15                   | 93%            | 14                    | 0.00               | 3      | \$1          | 100%              | 100%              | 100%             | 34%             | 0%            | 62.1%             | 54.0%             | 54.0%            | 1.4       |
| 382       | Lighting       | Exterior LED Lamp                            | Home Energy Products   | MF            | NC               | 108                  | 26%            | 28                    | 0.00               | 6      | \$4          | 100%              | 88%               | 88%              | 500%            | 0%            | 62.1%             | 47.9%             | 47.9%            | 1.4       |
| 383       | Lighting       | Linear LED                                   | Home Energy Products   | MF            | NC               | 24                   | 53%            | 13                    | 0.00               | 18     | \$16         | 100%              | 66%               | 66%              | 427%            | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.7       |
| 384       | Lighting       | Smart LED                                    | Home Energy Products   | MF            | NC               | 19                   | 10%            | 2                     | 0.00               | 3      | \$2          | 100%              | 100%              | 100%             | 1021%           | 0%            | 62.1%             | 54.0%             | 54.0%            | 0.1       |
| 385       | Lighting       | LED Fixture                                  | Home Energy Products   | MF            | NC               | 16                   | 82%            | 13                    | 0.00               | 15     | \$13         | 100%              | 66%               | 66%              | 1021%           | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.8       |

Appendix B: Residential Energy Efficiency Detail

| Measure # | End-Use          | Measure Name  | Program                      | Building Type | Replacement Type | Base Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|------------------|---|------------------------------|---------------|------------------|----------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 386       | Lighting         | Occupancy Sensor  | Home Energy Products         | MF            | NC               | 164                  | 40%            | 66                    | 0.00               | 10     | \$40         | 100%              | 66%               | 66%              | 100%            | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.7       |
| 387       | Lighting         | Smart Lighting Switch                                       | Home Energy Products         | MF            | NC               | 19                   | 10%            | 2                     | 0.00               | 3      | \$2          | 100%              | 66%               | 66%              | 1021%           | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.2       |
| 388       | Lighting         | Exterior Lighting Controls                                  | Home Energy Products         | MF            | NC               | 108                  | 40%            | 43                    | 0.00               | 10     | \$100        | 100%              | 66%               | 66%              | 500%            | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.2       |
| 389       | Miscellaneous    | Pool Heater   | Online Energy Check-Up       | SF            | MO               | 2,260                | 20%            | 452                   | 0.00               | 10     | \$640        | 100%              | 66%               | 66%              | 5%              | 21%           | 62.1%             | 37.6%             | 37.6%            | 0.3       |
| 390       | Miscellaneous    | Hot Tub/Spa   | Online Energy Check-Up       | SF            | MO               | 2,738                | 15%            | 417                   | 0.05               | 15     | \$350        | 100%              | 66%               | 66%              | 5%              | 21%           | 62.1%             | 37.6%             | 37.6%            | 0.9       |
| 391       | Miscellaneous    | Variable Speed Pool Pump                                    | Home Energy Products         | SF            | MO               | 487                  | 21%            | 104                   | 0.05               | 10     | \$324        | 100%              | 62%               | 62%              | 6%              | 21%           | 62.1%             | 35.7%             | 35.7%            | 0.4       |
| 392       | Miscellaneous    | Pool Timer  | Online Energy Check-Up       | SF            | Retrofit         | 2,098                | 20%            | 420                   | 0.06               | 25     | \$115        | 100%              | 66%               | 66%              | 6%              | 21%           | 62.1%             | 37.6%             | 37.6%            | 4.1       |
| 393       | Miscellaneous    | Well Pump   | Online Energy Check-Up       | SF            | MO               | 561                  | 33%            | 187                   | 0.02               | 20     | \$110        | 50%               | 66%               | 66%              | 16%             | 21%           | 35.5%             | 37.6%             | 37.6%            | 1.6       |
| 394       | Miscellaneous    | Pool Heater   | Online Energy Check-Up       | SF            | NC               | 2,260                | 20%            | 452                   | 0.00               | 10     | \$640        | 100%              | 66%               | 66%              | 5%              | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.3       |
| 395       | Miscellaneous    | Hot Tub/Spa   | Online Energy Check-Up       | SF            | NC               | 2,738                | 15%            | 417                   | 0.05               | 15     | \$350        | 100%              | 66%               | 66%              | 5%              | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.9       |
| 396       | Miscellaneous    | Variable Speed Pool Pump                                    | Home Energy Products         | SF            | NC               | 487                  | 21%            | 104                   | 0.05               | 10     | \$324        | 100%              | 62%               | 62%              | 6%              | 0%            | 62.1%             | 35.7%             | 35.7%            | 0.4       |
| 397       | Miscellaneous    | Pool Timer  | Online Energy Check-Up       | SF            | NC               | 2,098                | 20%            | 420                   | 0.06               | 25     | \$115        | 100%              | 66%               | 66%              | 6%              | 0%            | 62.1%             | 37.6%             | 37.6%            | 4.1       |
| 398       | Miscellaneous    | Well Pump   | Online Energy Check-Up       | SF            | NC               | 561                  | 33%            | 187                   | 0.02               | 20     | \$110        | 50%               | 66%               | 66%              | 16%             | 0%            | 35.5%             | 37.6%             | 37.6%            | 1.6       |
| 399       | New Construction | Gold Star HERS 67- All Electric                             | Residential New Construction | SF            | NC               | 24,479               | 33%            | 8,078                 | 1.34               | 25     | \$3,319      | 100%              | 39%               | 39%              | 25%             | 0%            | 68.7%             | 28.2%             | 28.2%            | 4.8       |
| 400       | New Construction | Gold Star HERS 67- Gas & Electric                           | Residential New Construction | SF            | NC               | 5,030                | 33%            | 1,660                 | 1.25               | 25     | \$3,319      | 75%               | 39%               | 39%              | 68%             | 0%            | 50.2%             | 28.2%             | 28.2%            | 2.1       |
| 401       | New Construction | Platinum Star HERS 60 Gas & Electric                        | Residential New Construction | SF            | NC               | 4,125                | 40%            | 1,650                 | 1.23               | 25     | \$3,049      | 75%               | 26%               | 26%              | 68%             | 0%            | 50.2%             | 23.1%             | 23.1%            | 3.4       |
| 402       | New Construction | Silver Star HERS 75 - Gas & Electric                        | Residential New Construction | SF            | NC               | 5,724                | 25%            | 1,431                 | 0.79               | 25     | \$3,049      | 50%               | 26%               | 26%              | 68%             | 0%            | 38.3%             | 23.1%             | 23.1%            | 2.4       |
| 403       | New Construction | Gold Star HERS 67- All Electric                             | Residential New Construction | MF            | NC               | 24,479               | 33%            | 8,078                 | 1.34               | 25     | \$3,319      | 100%              | 39%               | 39%              | 25%             | 0%            | 68.7%             | 28.2%             | 28.2%            | 4.8       |
| 404       | New Construction | Gold Star HERS 67- Gas & Electric                           | Residential New Construction | MF            | NC               | 5,030                | 33%            | 1,660                 | 1.25               | 25     | \$3,319      | 75%               | 39%               | 39%              | 68%             | 0%            | 50.2%             | 28.2%             | 28.2%            | 2.1       |
| 405       | New Construction | Platinum Star HERS 60 Gas & Electric                        | Residential New Construction | MF            | NC               | 4,125                | 40%            | 1,650                 | 1.23               | 25     | \$3,049      | 75%               | 26%               | 26%              | 68%             | 0%            | 50.2%             | 23.1%             | 23.1%            | 3.4       |
| 406       | New Construction | Silver Star HERS 75 - Gas & Electric                        | Residential New Construction | MF            | NC               | 5,724                | 25%            | 1,431                 | 0.79               | 25     | \$3,049      | 50%               | 26%               | 26%              | 68%             | 0%            | 38.3%             | 23.1%             | 23.1%            | 2.4       |
| 407       | Plug Load        | Smart Power Strips - Tier 1                                 | Home Energy Products         | SF            | Retrofit         | 197                  | 12%            | 23                    | 0.00               | 4      | \$16         | 100%              | 66%               | 66%              | 198%            | 44%           | 62.1%             | 37.6%             | 37.6%            | 0.3       |
| 408       | Plug Load        | Smart Power Strips - Tier 2                                 | Home Energy Products         | SF            | Retrofit         | 432                  | 38%            | 162                   | 0.02               | 8      | \$60         | 75%               | 17%               | 17%              | 227%            | 44%           | 48.3%             | 17.9%             | 17.9%            | 4.7       |
| 409       | Plug Load        | Smart Outlets   | Home Energy Products         | SF            | Retrofit         | 432                  | 6%             | 28                    | 0.00               | 5      | \$50         | 100%              | 66%               | 66%              | 227%            | 44%           | 62.1%             | 37.6%             | 37.6%            | 0.2       |
| 410       | Plug Load        | Smart Television  | Home Energy Products         | SF            | MO               | 208                  | 67%            | 139                   | 0.11               | 6      | \$10         | 100%              | 100%              | 100%             | 227%            | 62%           | 62.1%             | 54.0%             | 54.0%            | 8.0       |
| 411       | Plug Load        | Smart Power Strips - Tier 1                                 | Home Energy Products         | SF            | NC               | 197                  | 12%            | 23                    | 0.00               | 4      | \$16         | 100%              | 66%               | 66%              | 198%            | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.3       |
| 412       | Plug Load        | Smart Power Strips - Tier 2                                 | Home Energy Products         | SF            | NC               | 432                  | 38%            | 162                   | 0.02               | 8      | \$60         | 75%               | 17%               | 17%              | 227%            | 0%            | 48.3%             | 17.9%             | 17.9%            | 4.7       |
| 413       | Plug Load        | Smart Outlets   | Home Energy Products         | SF            | NC               | 432                  | 6%             | 28                    | 0.00               | 5      | \$50         | 100%              | 66%               | 66%              | 227%            | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.2       |
| 414       | Plug Load        | Smart Television  | Home Energy Products         | SF            | NC               | 208                  | 67%            | 139                   | 0.11               | 6      | \$10         | 100%              | 100%              | 100%             | 227%            | 0%            | 62.1%             | 54.0%             | 54.0%            | 8.0       |
| 415       | Plug Load        | Smart Power Strips - Tier 1                                 | Home Energy Products         | MF            | Retrofit         | 197                  | 12%            | 23                    | 0.00               | 4      | \$16         | 100%              | 66%               | 66%              | 198%            | 46%           | 62.1%             | 37.6%             | 37.6%            | 0.3       |
| 416       | Plug Load        | Smart Power Strips - Tier 2                                 | Home Energy Products         | MF            | Retrofit         | 432                  | 38%            | 162                   | 0.02               | 8      | \$60         | 75%               | 17%               | 17%              | 227%            | 46%           | 48.3%             | 17.9%             | 17.9%            | 4.7       |
| 417       | Plug Load        | Smart Outlets   | Home Energy Products         | MF            | Retrofit         | 432                  | 6%             | 28                    | 0.00               | 5      | \$50         | 100%              | 66%               | 66%              | 227%            | 46%           | 62.1%             | 37.6%             | 37.6%            | 0.2       |
| 418       | Plug Load        | Smart Television  | Home Energy Products         | MF            | MO               | 208                  | 67%            | 139                   | 0.11               | 6      | \$10         | 100%              | 100%              | 100%             | 227%            | 62%           | 62.1%             | 54.0%             | 54.0%            | 8.0       |
| 419       | Plug Load        | Smart Power Strips - Tier 1                                 | Home Energy Products         | MF            | NC               | 197                  | 12%            | 23                    | 0.00               | 4      | \$16         | 100%              | 66%               | 66%              | 198%            | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.3       |
| 420       | Plug Load        | Smart Power Strips - Tier 2                                 | Home Energy Products         | MF            | NC               | 432                  | 38%            | 162                   | 0.02               | 8      | \$60         | 75%               | 17%               | 17%              | 227%            | 0%            | 48.3%             | 17.9%             | 17.9%            | 4.7       |
| 421       | Plug Load        | Smart Outlets   | Home Energy Products         | MF            | NC               | 432                  | 6%             | 28                    | 0.00               | 5      | \$50         | 100%              | 66%               | 66%              | 227%            | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.2       |
| 422       | Plug Load        | Smart Television  | Home Energy Products         | MF            | NC               | 208                  | 67%            | 139                   | 0.11               | 6      | \$10         | 100%              | 100%              | 100%             | 227%            | 0%            | 62.1%             | 54.0%             | 54.0%            | 8.0       |
| 423       | Shell            | Duct Sealing - Average Sealing - Heat pump                  | Home Weatherproofing         | SF            | Retrofit         | 7,507                | 3%             | 248                   | 0.10               | 20     | \$400        | 100%              | 100%              | 25%              | 6%              | 89%           | 68.7%             | 59.8%             | 22.7%            | 0.6       |
| 424       | Shell            | Duct Sealing - Inadequate Sealing - Heat pump               | Home Weatherproofing         | SF            | Retrofit         | 7,507                | 7%             | 537                   | 0.23               | 20     | \$400        | 100%              | 100%              | 25%              | 6%              | 82%           | 68.7%             | 59.8%             | 22.7%            | 1.4       |
| 425       | Shell            | Duct Sealing/Insulation - Poor Sealing - Heat pump          | Home Weatherproofing         | SF            | Retrofit         | 7,507                | 9%             | 663                   | 0.28               | 20     | \$400        | 100%              | 100%              | 25%              | 6%              | 97%           | 68.7%             | 59.8%             | 22.7%            | 1.7       |
| 426       | Shell            | Wall Insulation - Heat pump                                 | Home Weatherproofing         | SF            | Retrofit         | 7,507                | 8%             | 625                   | 0.03               | 25     | \$741        | 50%               | 50%               | 25%              | 6%              | 97%           | 38.3%             | 33.4%             | 22.7%            | 1.0       |
| 427       | Shell            | Air Sealing Average Sealing - Heat pump                     | Home Weatherproofing         | SF            | Retrofit         | 7,507                | 13%            | 947                   | 0.05               | 15     | \$1,077      | 100%              | 50%               | 25%              | 6%              | 89%           | 68.7%             | 33.4%             | 22.7%            | 0.8       |
| 428       | Shell            | Air Sealing Inadequate Sealing - Heat pump                  | Home Weatherproofing         | SF            | Retrofit         | 7,507                | 26%            | 1,368                 | 0.07               | 15     | \$1,077      | 50%               | 50%               | 25%              | 6%              | 82%           | 38.3%             | 33.4%             | 22.7%            | 1.1       |
| 429       | Shell            | Air Sealing Poor Sealing - Heat pump                        | Home Weatherproofing         | SF            | Retrofit         | 7,507                | 34%            | 2,526                 | 0.12               | 15     | \$1,077      | 100%              | 50%               | 25%              | 6%              | 97%           | 68.7%             | 33.4%             | 22.7%            | 2.0       |
| 430       | Shell            | Attic Insulation - Average Insulation - Heat pump           | Home Weatherproofing         | SF            | Retrofit         | 7,507                | 5%             | 343                   | 0.02               | 25     | \$1,482      | 100%              | 49%               | 25%              | 6%              | 89%           | 68.7%             | 33.0%             | 22.7%            | 0.3       |
| 431       | Shell            | Attic Insulation - Inadequate Insulation - Heat pump        | Home Weatherproofing         | SF            | Retrofit         | 7,507                | 9%             | 665                   | 0.02               | 25     | \$1,482      | 100%              | 49%               | 25%              | 6%              | 82%           | 68.7%             | 33.0%             | 22.7%            | 0.5       |
| 432       | Shell            | Attic Insulation - Poor Insulation - Heat pump              | Home Weatherproofing         | SF            | Retrofit         | 7,507                | 20%            | 1,499                 | 0.06               | 25     | \$1,482      | 50%               | 49%               | 25%              | 6%              | 97%           | 38.3%             | 33.0%             | 22.7%            | 1.2       |
| 433       | Shell            | Duct Sealing - Average Sealing - Electric furnace           | Home Weatherproofing         | SF            | Retrofit         | 15,471               | 3%             | 511                   | 0.10               | 20     | \$400        | 100%              | 100%              | 25%              | 8%              | 89%           | 68.7%             | 59.8%             | 22.7%            | 0.9       |
| 434       | Shell            | Duct Sealing - Inadequate Sealing - Electric furnace        | Home Weatherproofing         | SF            | Retrofit         | 15,471               | 7%             | 1,107                 | 0.23               | 20     | \$400        | 100%              | 100%              | 25%              | 8%              | 82%           | 68.7%             | 59.8%             | 22.7%            | 2.0       |
| 435       | Shell            | Duct Sealing/Insulation - Poor Sealing - Electric furnace   | Home Weatherproofing         | SF            | Retrofit         | 15,471               | 9%             | 1,367                 | 0.28               | 20     | \$400        | 100%              | 100%              | 25%              | 8%              | 97%           | 68.7%             | 59.8%             | 22.7%            | 2.5       |
| 436       | Shell            | Wall Insulation - Electric furnace                          | Home Weatherproofing         | SF            | Retrofit         | 15,471               | 7%             | 1,020                 | 0.03               | 25     | \$741        | 75%               | 50%               | 25%              | 19%             | 97%           | 50.2%             | 33.4%             | 22.7%            | 1.6       |
| 437       | Shell            | Air Sealing Average Sealing - Electric furnace              | Home Weatherproofing         | SF            | Retrofit         | 15,471               | 9%             | 1,424                 | 0.02               | 15     | \$1,077      | 50%               | 50%               | 25%              | 19%             | 89%           | 38.3%             | 33.4%             | 22.7%            | 1.0       |
| 438       | Shell            | Air Sealing Inadequate Sealing - Electric furnace           | Home Weatherproofing         | SF            | Retrofit         | 15,471               | 13%            | 2,056                 | 0.03               | 15     | \$1,077      | 50%               | 50%               | 25%              | 19%             | 82%           | 38.3%             | 33.4%             | 22.7%            | 1.5       |
| 439       | Shell            | Air Sealing Poor Sealing - Electric furnace                 | Home Weatherproofing         | SF            | Retrofit         | 15,471               | 25%            | 3,796                 | 0.06               | 15     | \$1,077      | 100%              | 50%               | 25%              | 19%             | 97%           | 68.7%             | 33.4%             | 22.7%            | 2.7       |
| 440       | Shell            | Attic Insulation - Average Insulation - Electric furnace    | Home Weatherproofing         | SF            | Retrofit         | 15,471               | 4%             | 551                   | 0.02               | 25     | \$1,482      | 100%              | 49%               | 25%              | 19%             | 89%           | 68.7%             | 33.0%             | 22.7%            | 0.4       |
| 441       | Shell            | Attic Insulation - Inadequate Insulation - Electric furnace | Home Weatherproofing         | SF            | Retrofit         | 15,471               | 7%             | 1,038                 | 0.04               | 25     | \$1,482      | 100%              | 49%               | 25%              | 19%             | 82%           | 68.7%             | 33.0%             | 22.7%            | 0.8       |
| 442       | Shell            | Attic Insulation - Poor Insulation - Electric furnace       | Home Weatherproofing         | SF            | Retrofit         | 15,471               | 15%            | 2,314                 | 0.09               | 25     | \$1,482      | 75%               | 49%               | 25%              | 19%             | 97%           | 50.2%             | 33.0%             | 22.7%            | 1.8       |
| 443       | Shell            | Duct Sealing - Average Sealing - Gas Heating                | Home Weatherproofing         | SF            | Retrofit         | 1,168                | 3%             | 39                    | 0.10               | 20     | \$400        | 100%              | 100%              | 25%              | 68%             | 89%           | 68.7%             | 59.8%             | 22.7%            | 0.4       |
| 444       | Shell            | Duct Sealing - Inadequate Sealing - Gas Heating             | Home Weatherproofing         | SF            | Retrofit         | 1,168                | 7%             | 85                    | 0.23               | 20     | \$400        | 100%              | 100%              | 25%              | 68%             | 82%           | 68.7%             | 59.8%             | 22.7%            | 0.8       |
| 445       | Shell            | Duct Sealing/Insulation - Poor Sealing - Gas Heating        | Home Weatherproofing         | SF            | Retrofit         | 1,168                | 9%             | 105                   | 0.28               | 20     | \$400        | 100%              | 100%              | 25%              | 68%             | 97%           | 68.7%             | 59.8%             | 22.7%            | 1.0       |
| 446       | Shell            | Wall Insulation - Gas Heating                               | Home Weatherproofing         | SF            | Retrofit         | 1,168                | 4%             | 43                    | 0.03               | 25     | \$741        | 100%              | 50%               | 25%              | 68%             | 97%           | 68.7%             | 33.4%             | 22.7%            | 0.2       |
| 447       | Shell            | Air Sealing - Average Sealing - Gas Heating                 | Home Weatherproofing         | SF            | Retrofit         | 1,168                | 5%             | 55                    | 0.02               | 15     | \$1,077      | 100%              | 50%               | 25%              | 68%             | 89%           | 68.7%             | 33.4%             | 22.7%            | 0.1       |
| 448       | Shell            | Air Sealing - Inadequate Sealing - Gas Heating              | Home Weatherproofing         | SF            | Retrofit         | 1,168                | 7%             | 80                    | 0.03               | 15     | \$1,077      | 100%              | 50%               | 25%              | 68%             | 82%           | 68.7%             | 33.4%             | 22.7%            | 0.1       |
| 449       | Shell            | Air Sealing - Poor Sealing - Gas Heating                    | Home Weatherproofing         | SF            | Retrofit         | 1,168                | 13%            | 147                   | 0.06               | 15     | \$1,077      | 100%              | 50%               | 25%              | 68%             | 97%           | 68.7%             | 33.4%             | 22.7%            | 0.2       |
| 450       | Shell            | Attic Insulation - Average Insulation - Gas Heating         | Home Weatherproofing         | SF            | Retrofit         | 1,168                | 2%             | 25                    | 0.02               | 25     | \$1,482      | 100%              | 49%               | 25%              | 68%             | 89%           | 68.7%             | 33.0%             | 22.7%            | 0.1       |
| 451       | Shell            | Attic Insulation - Inadequate Insulation - Gas Heating      | Home Weatherproofing         | SF            | Retrofit         | 1,168                | 4%             | 44                    | 0.04               | 25     | \$1,482      | 100%              | 49%               | 25%              | 68%             | 82%           | 68.7%             | 33.0%             | 22.7%            | 0.1       |
| 452       | Shell            | Attic Insulation - Poor Insulation - Gas Heating            | Home Weatherproofing         | SF            | Retrofit         | 1,168                | 9%             | 100                   | 0.09               | 25     | \$1,482      | 100%              | 49%               | 25%              | 68%             | 97%           | 68.7%             | 33.0%             | 22.7%            | 0.2       |

Appendix B: Residential Energy Efficiency Detail

| Measure # | End-Use | Measure Name   | Program              | Building Type | Replacement Type | Base Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|---------|--|----------------------|---------------|------------------|----------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 453       | Shell   | Duct Sealing - Average Sealing - Heat pump                   | IQ Weatherproofing   | SF            | DI               | 7,507                | 3%             | 248                   | 0.10               | 15     | \$400        | 100%              | 100%              | 100%             | 6%              | 89%           | 66.5%             | 57.9%             | 57.9%            | 0.5       |
| 454       | Shell   | Duct Sealing - Inadequate Sealing - Heat pump                | IQ Weatherproofing   | SF            | DI               | 7,507                | 7%             | 537                   | 0.23               | 15     | \$400        | 100%              | 100%              | 100%             | 6%              | 82%           | 66.5%             | 57.9%             | 57.9%            | 1.1       |
| 455       | Shell   | Duct Sealing/Insulation - Poor Sealing - Heat pump           | IQ Weatherproofing   | SF            | DI               | 7,507                | 9%             | 663                   | 0.28               | 15     | \$400        | 100%              | 100%              | 100%             | 6%              | 97%           | 66.5%             | 57.9%             | 57.9%            | 1.4       |
| 456       | Shell   | Wall Insulation - Heat pump                                  | IQ Weatherproofing   | SF            | DI               | 7,507                | 2%             | 178                   | 0.01               | 25     | \$77         | 100%              | 100%              | 100%             | 6%              | 97%           | 66.5%             | 57.9%             | 57.9%            | 1.4       |
| 457       | Shell   | Air Sealing Average Sealing - Heat pump                      | IQ Weatherproofing   | SF            | DI               | 7,507                | 13%            | 947                   | 0.05               | 15     | \$620        | 100%              | 100%              | 100%             | 6%              | 89%           | 66.5%             | 57.9%             | 57.9%            | 0.7       |
| 458       | Shell   | Air Sealing Inadequate Sealing - Heat pump                   | IQ Weatherproofing   | SF            | DI               | 7,507                | 18%            | 1,368                 | 0.07               | 15     | \$620        | 100%              | 100%              | 100%             | 6%              | 82%           | 66.5%             | 57.9%             | 57.9%            | 0.9       |
| 459       | Shell   | Air Sealing Poor Sealing - Heat pump                         | IQ Weatherproofing   | SF            | DI               | 7,507                | 34%            | 2,526                 | 0.12               | 15     | \$620        | 100%              | 100%              | 100%             | 6%              | 97%           | 66.5%             | 57.9%             | 57.9%            | 1.7       |
| 460       | Shell   | Attic Insulation - Average Insulation - Heat pump            | IQ Weatherproofing   | SF            | DI               | 7,507                | 4%             | 278                   | 0.02               | 25     | \$1,225      | 100%              | 100%              | 100%             | 6%              | 89%           | 66.5%             | 57.9%             | 57.9%            | 0.1       |
| 461       | Shell   | Attic Insulation - Inadequate Insulation - Heat pump         | IQ Weatherproofing   | SF            | DI               | 7,507                | 7%             | 537                   | 0.02               | 25     | \$1,225      | 100%              | 100%              | 100%             | 6%              | 82%           | 66.5%             | 57.9%             | 57.9%            | 0.3       |
| 462       | Shell   | Attic Insulation - Poor Insulation - Heat pump               | IQ Weatherproofing   | SF            | DI               | 7,507                | 16%            | 1,212                 | 0.05               | 25     | \$1,225      | 100%              | 100%              | 100%             | 6%              | 97%           | 66.5%             | 57.9%             | 57.9%            | 0.6       |
| 463       | Shell   | Duct Sealing - Average Sealing - Electric furnace            | IQ Weatherproofing   | SF            | Retrofit         | 15,471               | 3%             | 511                   | 0.10               | 15     | \$400        | 100%              | 100%              | 100%             | 8%              | 89%           | 66.5%             | 57.9%             | 57.9%            | 0.8       |
| 464       | Shell   | Duct Sealing - Inadequate Sealing - Electric furnace         | IQ Weatherproofing   | SF            | Retrofit         | 15,471               | 7%             | 1,107                 | 0.23               | 15     | \$400        | 100%              | 100%              | 100%             | 8%              | 82%           | 66.5%             | 57.9%             | 57.9%            | 1.7       |
| 465       | Shell   | Duct Sealing/Insulation - Poor Sealing - Electric furnace    | IQ Weatherproofing   | SF            | Retrofit         | 15,471               | 9%             | 1,367                 | 0.28               | 15     | \$400        | 100%              | 100%              | 100%             | 8%              | 97%           | 66.5%             | 57.9%             | 57.9%            | 2.0       |
| 466       | Shell   | Wall Insulation - Electric furnace                           | IQ Weatherproofing   | SF            | Retrofit         | 15,471               | 2%             | 290                   | 0.01               | 25     | \$77         | 100%              | 100%              | 100%             | 19%             | 97%           | 66.5%             | 57.9%             | 57.9%            | 2.1       |
| 467       | Shell   | Air Sealing Average Sealing - Electric furnace               | IQ Weatherproofing   | SF            | Retrofit         | 15,471               | 9%             | 1,424                 | 0.02               | 15     | \$620        | 100%              | 100%              | 100%             | 19%             | 89%           | 66.5%             | 57.9%             | 57.9%            | 0.9       |
| 468       | Shell   | Air Sealing Inadequate Sealing - Electric furnace            | IQ Weatherproofing   | SF            | Retrofit         | 15,471               | 13%            | 2,056                 | 0.03               | 15     | \$620        | 100%              | 100%              | 100%             | 19%             | 82%           | 66.5%             | 57.9%             | 57.9%            | 1.3       |
| 469       | Shell   | Air Sealing Poor Sealing - Electric furnace                  | IQ Weatherproofing   | SF            | DI               | 15,471               | 25%            | 3,796                 | 0.06               | 15     | \$620        | 100%              | 100%              | 100%             | 19%             | 97%           | 66.5%             | 57.9%             | 57.9%            | 2.4       |
| 470       | Shell   | Attic Insulation - Average Insulation - Electric furnace     | IQ Weatherproofing   | SF            | DI               | 15,471               | 3%             | 445                   | 0.02               | 25     | \$1,225      | 100%              | 100%              | 100%             | 19%             | 89%           | 66.5%             | 57.9%             | 57.9%            | 0.2       |
| 471       | Shell   | Attic Insulation - Inadequate Insulation - Electric furnace  | IQ Weatherproofing   | SF            | DI               | 15,471               | 5%             | 839                   | 0.03               | 25     | \$1,225      | 100%              | 100%              | 100%             | 19%             | 82%           | 66.5%             | 57.9%             | 57.9%            | 0.4       |
| 472       | Shell   | Attic Insulation - Poor Insulation - Electric furnace        | IQ Weatherproofing   | SF            | DI               | 15,471               | 12%            | 1,871                 | 0.07               | 25     | \$1,225      | 100%              | 100%              | 100%             | 19%             | 97%           | 66.5%             | 57.9%             | 57.9%            | 0.9       |
| 473       | Shell   | Duct Sealing - Average Sealing - Gas Heating                 | IQ Weatherproofing   | SF            | DI               | 1,168                | 3%             | 39                    | 0.10               | 15     | \$400        | 100%              | 100%              | 100%             | 68%             | 89%           | 66.5%             | 57.9%             | 57.9%            | 0.3       |
| 474       | Shell   | Duct Sealing - Inadequate Sealing - Gas Heating              | IQ Weatherproofing   | SF            | DI               | 1,168                | 7%             | 85                    | 0.23               | 15     | \$400        | 100%              | 100%              | 100%             | 68%             | 82%           | 66.5%             | 57.9%             | 57.9%            | 0.7       |
| 475       | Shell   | Duct Sealing/Insulation - Poor Sealing - Gas Heating         | IQ Weatherproofing   | SF            | DI               | 1,168                | 9%             | 105                   | 0.28               | 15     | \$400        | 100%              | 100%              | 100%             | 68%             | 97%           | 66.5%             | 57.9%             | 57.9%            | 0.9       |
| 476       | Shell   | Wall Insulation - Gas Heating                                | IQ Weatherproofing   | SF            | DI               | 1,168                | 1%             | 12                    | 0.01               | 25     | \$77         | 100%              | 100%              | 100%             | 68%             | 97%           | 66.5%             | 57.9%             | 57.9%            | 0.2       |
| 477       | Shell   | Air Sealing - Average Sealing - Gas Heating                  | IQ Weatherproofing   | SF            | DI               | 1,168                | 5%             | 55                    | 0.02               | 15     | \$620        | 100%              | 100%              | 100%             | 68%             | 89%           | 66.5%             | 57.9%             | 57.9%            | 0.1       |
| 478       | Shell   | Air Sealing - Inadequate Sealing - Gas Heating               | IQ Weatherproofing   | SF            | DI               | 1,168                | 7%             | 80                    | 0.03               | 15     | \$620        | 100%              | 100%              | 100%             | 68%             | 82%           | 66.5%             | 57.9%             | 57.9%            | 0.1       |
| 479       | Shell   | Air Sealing - Poor Sealing - Gas Heating                     | IQ Weatherproofing   | SF            | DI               | 1,168                | 13%            | 147                   | 0.06               | 15     | \$620        | 100%              | 100%              | 100%             | 68%             | 97%           | 66.5%             | 57.9%             | 57.9%            | 0.2       |
| 480       | Shell   | Attic Insulation - Average Insulation - Gas Heating          | IQ Weatherproofing   | SF            | DI               | 1,168                | 2%             | 20                    | 0.02               | 25     | \$1,225      | 100%              | 100%              | 100%             | 68%             | 89%           | 66.5%             | 57.9%             | 57.9%            | 0.0       |
| 481       | Shell   | Attic Insulation - Inadequate Insulation - Gas Heating       | IQ Weatherproofing   | SF            | DI               | 1,168                | 3%             | 35                    | 0.03               | 25     | \$1,225      | 100%              | 100%              | 100%             | 68%             | 82%           | 66.5%             | 57.9%             | 57.9%            | 0.1       |
| 482       | Shell   | Attic Insulation - Poor Insulation - Gas Heating             | IQ Weatherproofing   | SF            | DI               | 1,168                | 7%             | 81                    | 0.07               | 25     | \$1,225      | 100%              | 100%              | 100%             | 68%             | 97%           | 66.5%             | 57.9%             | 57.9%            | 0.1       |
| 483       | Shell   | Attic Hatch Scuttle  | Home Weatherproofing | SF            | Retrofit         | 15,471               | 1%             | 88                    | 0.01               | 20     | \$7          | 100%              | 100%              | 25%              | 19%             | 97%           | 68.7%             | 59.8%             | 22.7%            | 6.9       |
| 484       | Shell   | Radiant Barrier - Heat pump                                  | Home Weatherproofing | SF            | Retrofit         | 7,507                | 5%             | 375                   | 0.34               | 20     | \$1,700      | 35%               | 27%               | 25%              | 6%              | 89%           | 30.4%             | 23.4%             | 22.7%            | 1.4       |
| 485       | Shell   | Cool Roof - Heat pump  | Home Weatherproofing | SF            | Retrofit         | 7,507                | 0%             | -19                   | 0.01               | 20     | \$765        | 100%              | 27%               | 25%              | 6%              | 40%           | 68.7%             | 23.4%             | 22.7%            | 0.0       |
| 486       | Shell   | ENERGY STAR Windows - Heat pump                              | Home Weatherproofing | SF            | Retrofit         | 7,507                | 22%            | 1,652                 | 0.69               | 25     | \$17,100     | 100%              | 27%               | 25%              | 6%              | 72%           | 68.7%             | 23.4%             | 22.7%            | 0.4       |
| 487       | Shell   | ENERGY STAR Windows - Heat pump                              | Home Weatherproofing | SF            | MO               | 7,507                | 9%             | 676                   | 0.28               | 25     | \$7,200      | 100%              | 27%               | 25%              | 6%              | 72%           | 68.7%             | 23.4%             | 22.7%            | 0.4       |
| 488       | Shell   | Basement Sidewall Insulation - Heat pump                     | Home Weatherproofing | SF            | Retrofit         | 7,507                | 10%            | 753                   | -0.03              | 25     | \$690        | 50%               | 27%               | 25%              | 6%              | 76%           | 38.3%             | 23.4%             | 22.7%            | 1.9       |
| 489       | Shell   | Floor Insulation Above Crawlspace - Heat pump                | Home Weatherproofing | SF            | Retrofit         | 7,507                | 8%             | 585                   | -0.03              | 25     | \$690        | 35%               | 27%               | 25%              | 6%              | 69%           | 30.4%             | 23.4%             | 22.7%            | 1.4       |
| 490       | Shell   | ENERGY STAR Door - Heat pump                                 | Home Weatherproofing | SF            | Retrofit         | 7,507                | 4%             | 264                   | 0.01               | 25     | \$2,325      | 100%              | 27%               | 25%              | 6%              | 89%           | 68.7%             | 23.4%             | 22.7%            | 0.2       |
| 491       | Shell   | Smart Window Coverings - Film/Transformer - Heat pump        | Home Weatherproofing | SF            | Retrofit         | 7,507                | 16%            | 1,164                 | 0.49               | 7      | \$8,100      | 100%              | 27%               | 25%              | 6%              | 72%           | 68.7%             | 23.4%             | 22.7%            | 0.2       |
| 492       | Shell   | Radiant Barrier - Electric furnace                           | Home Weatherproofing | SF            | Retrofit         | 15,471               | 5%             | 774                   | 0.60               | 20     | \$1,700      | 75%               | 27%               | 25%              | 19%             | 89%           | 50.2%             | 23.4%             | 22.7%            | 2.5       |
| 493       | Shell   | Cool Roof - Electric furnace                                 | Home Weatherproofing | SF            | Retrofit         | 15,471               | 0%             | -47                   | 0.01               | 20     | \$765        | 100%              | 27%               | 25%              | 19%             | 40%           | 68.7%             | 23.4%             | 22.7%            | 0.0       |
| 494       | Shell   | ENERGY STAR Windows - Electric furnace                       | Home Weatherproofing | SF            | Retrofit         | 15,471               | 22%            | 3,404                 | 0.69               | 25     | \$17,100     | 100%              | 27%               | 25%              | 19%             | 72%           | 68.7%             | 23.4%             | 22.7%            | 0.6       |
| 495       | Shell   | ENERGY STAR Windows - Electric furnace                       | Home Weatherproofing | SF            | MO               | 15,471               | 9%             | 1,392                 | 0.28               | 25     | \$7,200      | 100%              | 27%               | 25%              | 19%             | 72%           | 68.7%             | 23.4%             | 22.7%            | 0.6       |
| 496       | Shell   | Basement Sidewall Insulation - Electric furnace              | Home Weatherproofing | SF            | Retrofit         | 15,471               | 7%             | 1,136                 | -0.04              | 25     | \$690        | 100%              | 27%               | 25%              | 19%             | 76%           | 68.7%             | 23.4%             | 22.7%            | 2.9       |
| 497       | Shell   | Floor Insulation Above Crawlspace - Electric furnace         | Home Weatherproofing | SF            | Retrofit         | 15,471               | 5%             | 848                   | -0.03              | 25     | \$690        | 75%               | 27%               | 25%              | 19%             | 69%           | 50.2%             | 23.4%             | 22.7%            | 2.2       |
| 498       | Shell   | ENERGY STAR Door - Electric furnace                          | Home Weatherproofing | SF            | Retrofit         | 15,471               | 2%             | 367                   | 0.02               | 25     | \$2,325      | 100%              | 27%               | 25%              | 19%             | 89%           | 68.7%             | 23.4%             | 22.7%            | 0.3       |
| 499       | Shell   | Smart Window Coverings - Film/Transformer - Electric furnace | Home Weatherproofing | SF            | Retrofit         | 15,471               | 16%            | 2,398                 | 0.49               | 7      | \$8,100      | 100%              | 27%               | 25%              | 19%             | 72%           | 68.7%             | 23.4%             | 22.7%            | 0.3       |
| 500       | Shell   | ENERGY STAR Windows - Gas Heating                            | Home Weatherproofing | SF            | Retrofit         | 1,168                | 22%            | 257                   | 0.69               | 25     | \$17,100     | 100%              | 27%               | 25%              | 68%             | 72%           | 68.7%             | 23.4%             | 22.7%            | 0.3       |
| 501       | Shell   | ENERGY STAR Windows - Gas Heating                            | Home Weatherproofing | SF            | MO               | 1,168                | 9%             | 105                   | 0.28               | 25     | \$7,200      | 100%              | 27%               | 25%              | 68%             | 72%           | 68.7%             | 23.4%             | 22.7%            | 0.2       |
| 502       | Shell   | Basement Sidewall Insulation - Gas Heating                   | Home Weatherproofing | SF            | Retrofit         | 1,168                | -1%            | -12                   | -0.03              | 25     | \$690        | 100%              | 27%               | 25%              | 68%             | 76%           | 68.7%             | 23.4%             | 22.7%            | 0.0       |
| 503       | Shell   | Floor Insulation Above Crawlspace - Gas Heating              | Home Weatherproofing | SF            | Retrofit         | 1,168                | -3%            | -38                   | -0.03              | 25     | \$690        | 100%              | 27%               | 25%              | 68%             | 69%           | 68.7%             | 23.4%             | 22.7%            | 0.0       |
| 504       | Shell   | ENERGY STAR Door - Gas Heating                               | Home Weatherproofing | SF            | Retrofit         | 1,168                | 2%             | 18                    | 0.02               | 25     | \$2,325      | 100%              | 27%               | 25%              | 68%             | 89%           | 68.7%             | 23.4%             | 22.7%            | 0.1       |
| 505       | Shell   | Smart Window Coverings - Film/Transformer - Gas Heating      | Home Weatherproofing | SF            | Retrofit         | 1,168                | 16%            | 181                   | 0.49               | 7      | \$8,100      | 100%              | 27%               | 25%              | 68%             | 72%           | 68.7%             | 23.4%             | 22.7%            | 0.2       |
| 506       | Shell   | Duct Sealing - Average Sealing - Heat pump                   | Home Weatherproofing | MF            | Retrofit         | 5,005                | 3%             | 165                   | 0.07               | 20     | \$400        | 100%              | 100%              | 25%              | 6%              | 55%           | 68.7%             | 59.8%             | 22.7%            | 0.4       |
| 507       | Shell   | Duct Sealing - Inadequate Sealing - Heat pump                | Home Weatherproofing | MF            | Retrofit         | 5,005                | 7%             | 358                   | 0.15               | 20     | \$400        | 100%              | 100%              | 25%              | 6%              | 89%           | 68.7%             | 59.8%             | 22.7%            | 0.9       |
| 508       | Shell   | Duct Sealing/Insulation - Poor Sealing - Heat pump           | Home Weatherproofing | MF            | Retrofit         | 5,005                | 9%             | 442                   | 0.19               | 20     | \$400        | 100%              | 100%              | 25%              | 6%              | 94%           | 68.7%             | 59.8%             | 22.7%            | 1.1       |
| 509       | Shell   | Wall Insulation - Heat pump                                  | Home Weatherproofing | MF            | Retrofit         | 5,005                | 12%            | 625                   | 0.03               | 25     | \$741        | 50%               | 50%               | 25%              | 6%              | 87%           | 38.3%             | 33.4%             | 22.7%            | 1.0       |
| 510       | Shell   | Air Sealing Average Sealing - Heat pump                      | Home Weatherproofing | MF            | Retrofit         | 5,005                | 13%            | 632                   | 0.03               | 15     | \$1,077      | 100%              | 50%               | 25%              | 6%              | 55%           | 68.7%             | 33.4%             | 22.7%            | 0.5       |
| 511       | Shell   | Air Sealing Inadequate Sealing - Heat pump                   | Home Weatherproofing | MF            | Retrofit         | 5,005                | 18%            | 912                   | 0.04               | 15     | \$1,077      | 100%              | 50%               | 25%              | 6%              | 89%           | 68.7%             | 33.4%             | 22.7%            | 0.7       |
| 512       | Shell   | Air Sealing Poor Sealing - Heat pump                         | Home Weatherproofing | MF            | Retrofit         | 5,005                | 34%            | 1,684                 | 0.08               | 15     | \$1,077      | 50%               | 50%               | 25%              | 6%              | 94%           | 38.3%             | 33.4%             | 22.7%            | 1.3       |
| 513       | Shell   | Attic Insulation - Average Insulation - Heat pump            | Home Weatherproofing | MF            | Retrofit         | 5,005                | 5%             | 229                   | 0.01               | 25     | \$1,482      | 100%              | 49%               | 25%              | 6%              | 55%           | 68.7%             | 33.0%             | 22.7%            | 0.2       |
| 514       | Shell   | Attic Insulation - Inadequate Insulation - Heat pump         | Home Weatherproofing | MF            | Retrofit         | 5,005                | 9%             | 443                   | 0.01               | 25     | \$1,482      | 100%              | 49%               | 25%              | 6%              | 89%           | 68.7%             | 33.0%             | 22.7%            | 0.3       |
| 515       | Shell   | Attic Insulation - Poor Insulation - Heat pump               | Home Weatherproofing | MF            | Retrofit         | 5,005                | 20%            | 999                   | 0.04               | 25     | \$1,482      | 100%              | 49%               | 25%              | 6%              | 94%           | 68.7%             | 33.0%             | 22.7%            | 0.8       |
| 516       | Shell   | Duct Sealing - Average Sealing - Electric furnace            | Home Weatherproofing | MF            | Retrofit         | 10,314               | 3%             | 341                   | 0.07               | 20     | \$400        | 100%              | 100%              | 25%              | 8%              | 55%           | 68.7%             | 59.8%             | 22.7%            | 0.6       |
| 517       | Shell   | Duct Sealing - Inadequate Sealing - Electric furnace         | Home Weatherproofing | MF            | Retrofit         | 10,314               | 7%             | 738                   | 0.15               | 20     | \$400        | 100%              | 100%              | 25%              | 8%              | 89%           | 68.7%             | 59.8%             | 22.7%            | 1.3       |
| 518       | Shell   | Duct Sealing/Insulation - Poor Sealing - Electric furnace    | Home Weatherproofing | MF            | Retrofit         | 10,314               | 9%             | 911                   | 0.19               | 20     | \$400        | 100%              | 100%              | 25%              | 8%              | 94%           | 68.7%             | 59.8%             | 22.7%            | 1.7       |
| 519       | Shell   | Wall Insulation - Electric furnace                           | Home Weatherproofing | MF            | Retrofit         | 10,314               | 10%            | 1,020                 | 0.03               | 25     | \$741        | 75%               | 50%               | 25%              | 19%             | 87%           | 50.2%             | 33.4%             | 22.7%            | 1.6       |

Appendix B: Residential Energy Efficiency Detail

| Measure # | End-Use       | Measure Name   | Program              | Building Type | Replacement Type | Base Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|---------------|--|----------------------|---------------|------------------|----------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 520       | Shell         | Air Sealing Average Sealing - Electric furnace               | Home Weatherproofing | MF            | Retrofit         | 10,314               | 9%             | 949                   | 0.02               | 15     | \$1,077      | 100%              | 50%               | 25%              | 19%             | 55%           | 68.7%             | 33.4%             | 22.7%            | 0.7       |
| 521       | Shell         | Air Sealing Inadequate Sealing - Electric furnace            | Home Weatherproofing | MF            | Retrofit         | 10,314               | 13%            | 1,371                 | 0.02               | 15     | \$1,077      | 100%              | 50%               | 25%              | 19%             | 89%           | 68.7%             | 33.4%             | 22.7%            | 1.0       |
| 522       | Shell         | Air Sealing Poor Sealing - Electric furnace                  | Home Weatherproofing | MF            | Retrofit         | 10,314               | 25%            | 2,531                 | 0.04               | 15     | \$1,077      | 75%               | 50%               | 25%              | 19%             | 94%           | 50.2%             | 33.4%             | 22.7%            | 1.8       |
| 523       | Shell         | Attic Insulation - Average Insulation - Electric furnace     | Home Weatherproofing | MF            | Retrofit         | 10,314               | 4%             | 367                   | 0.01               | 25     | \$1,482      | 100%              | 49%               | 25%              | 19%             | 55%           | 68.7%             | 33.0%             | 22.7%            | 0.3       |
| 524       | Shell         | Attic Insulation - Inadequate Insulation - Electric furnace  | Home Weatherproofing | MF            | Retrofit         | 10,314               | 7%             | 692                   | 0.03               | 25     | \$1,482      | 100%              | 49%               | 25%              | 19%             | 89%           | 68.7%             | 33.0%             | 22.7%            | 0.6       |
| 525       | Shell         | Attic Insulation - Poor Insulation - Electric furnace        | Home Weatherproofing | MF            | Retrofit         | 10,314               | 15%            | 1,543                 | 0.06               | 25     | \$1,482      | 50%               | 49%               | 25%              | 19%             | 94%           | 38.3%             | 33.0%             | 22.7%            | 1.2       |
| 526       | Shell         | Duct Sealing - Average Sealing - Gas Heating                 | Home Weatherproofing | MF            | Retrofit         | 778                  | 3%             | 26                    | 0.07               | 20     | \$400        | 100%              | 100%              | 25%              | 68%             | 55%           | 68.7%             | 59.8%             | 22.7%            | 0.3       |
| 527       | Shell         | Duct Sealing - Inadequate Sealing - Gas Heating              | Home Weatherproofing | MF            | Retrofit         | 778                  | 7%             | 57                    | 0.15               | 20     | \$400        | 100%              | 100%              | 25%              | 68%             | 89%           | 68.7%             | 59.8%             | 22.7%            | 0.6       |
| 528       | Shell         | Duct Sealing/Insulation - Poor Sealing - Gas Heating         | Home Weatherproofing | MF            | Retrofit         | 778                  | 9%             | 70                    | 0.19               | 20     | \$400        | 100%              | 100%              | 25%              | 68%             | 94%           | 68.7%             | 59.8%             | 22.7%            | 0.7       |
| 529       | Shell         | Wall Insulation - Gas Heating                                | Home Weatherproofing | MF            | Retrofit         | 778                  | 5%             | 43                    | 0.03               | 25     | \$741        | 100%              | 50%               | 25%              | 68%             | 87%           | 68.7%             | 33.4%             | 22.7%            | 0.2       |
| 530       | Shell         | Air Sealing - Average Sealing - Gas Heating                  | Home Weatherproofing | MF            | Retrofit         | 778                  | 5%             | 37                    | 0.02               | 15     | \$1,077      | 100%              | 50%               | 25%              | 68%             | 55%           | 68.7%             | 33.4%             | 22.7%            | 0.1       |
| 531       | Shell         | Air Sealing - Inadequate Sealing - Gas Heating               | Home Weatherproofing | MF            | Retrofit         | 778                  | 7%             | 53                    | 0.02               | 15     | \$1,077      | 100%              | 50%               | 25%              | 68%             | 89%           | 68.7%             | 33.4%             | 22.7%            | 0.1       |
| 532       | Shell         | Air Sealing - Poor Sealing - Gas Heating                     | Home Weatherproofing | MF            | Retrofit         | 778                  | 13%            | 98                    | 0.04               | 15     | \$1,077      | 100%              | 50%               | 25%              | 68%             | 94%           | 68.7%             | 33.4%             | 22.7%            | 0.2       |
| 533       | Shell         | Attic Insulation - Average Insulation - Gas Heating          | Home Weatherproofing | MF            | Retrofit         | 778                  | 2%             | 17                    | 0.01               | 25     | \$1,482      | 100%              | 49%               | 25%              | 68%             | 55%           | 68.7%             | 33.0%             | 22.7%            | 0.0       |
| 534       | Shell         | Attic Insulation - Inadequate Insulation - Gas Heating       | Home Weatherproofing | MF            | Retrofit         | 778                  | 4%             | 29                    | 0.03               | 25     | \$1,482      | 100%              | 49%               | 25%              | 68%             | 89%           | 68.7%             | 33.0%             | 22.7%            | 0.1       |
| 535       | Shell         | Attic Insulation - Poor Insulation - Gas Heating             | Home Weatherproofing | MF            | Retrofit         | 778                  | 9%             | 67                    | 0.06               | 25     | \$1,482      | 100%              | 49%               | 25%              | 68%             | 94%           | 68.7%             | 33.0%             | 22.7%            | 0.2       |
| 536       | Shell         | Duct Sealing - Average Sealing - Heat pump                   | IQ Weatherproofing   | MF            | DI               | 5,005                | 3%             | 165                   | 0.07               | 15     | \$400        | 100%              | 100%              | 100%             | 6%              | 55%           | 66.5%             | 57.9%             | 57.9%            | 0.3       |
| 537       | Shell         | Duct Sealing - Inadequate Sealing - Heat pump                | IQ Weatherproofing   | MF            | DI               | 5,005                | 7%             | 358                   | 0.15               | 15     | \$400        | 100%              | 100%              | 100%             | 6%              | 89%           | 66.5%             | 57.9%             | 57.9%            | 0.8       |
| 538       | Shell         | Duct Sealing/Insulation - Poor Sealing - Heat pump           | IQ Weatherproofing   | MF            | DI               | 5,005                | 9%             | 442                   | 0.19               | 15     | \$400        | 100%              | 100%              | 100%             | 6%              | 94%           | 66.5%             | 57.9%             | 57.9%            | 0.9       |
| 539       | Shell         | Wall Insulation - Heat pump                                  | IQ Weatherproofing   | MF            | DI               | 5,005                | 4%             | 178                   | 0.01               | 25     | \$77         | 100%              | 100%              | 100%             | 6%              | 87%           | 66.5%             | 57.9%             | 57.9%            | 1.4       |
| 540       | Shell         | Air Sealing Average Sealing - Heat pump                      | IQ Weatherproofing   | MF            | DI               | 5,005                | 13%            | 632                   | 0.03               | 15     | \$1,077      | 50%               | 50%               | 50%              | 6%              | 55%           | 28.9%             | 25.2%             | 25.2%            | 0.5       |
| 541       | Shell         | Air Sealing Inadequate Sealing - Heat pump                   | IQ Weatherproofing   | MF            | DI               | 5,005                | 18%            | 912                   | 0.04               | 15     | \$620        | 100%              | 100%              | 100%             | 6%              | 89%           | 66.5%             | 57.9%             | 57.9%            | 0.6       |
| 542       | Shell         | Air Sealing Poor Sealing - Heat pump                         | IQ Weatherproofing   | MF            | DI               | 5,005                | 34%            | 1,684                 | 0.08               | 15     | \$620        | 100%              | 100%              | 100%             | 6%              | 94%           | 66.5%             | 57.9%             | 57.9%            | 1.2       |
| 543       | Shell         | Attic Insulation - Average Insulation - Heat pump            | IQ Weatherproofing   | MF            | DI               | 5,005                | 4%             | 185                   | 0.01               | 25     | \$1,225      | 100%              | 100%              | 100%             | 6%              | 55%           | 66.5%             | 57.9%             | 57.9%            | 0.1       |
| 544       | Shell         | Attic Insulation - Inadequate Insulation - Heat pump         | IQ Weatherproofing   | MF            | DI               | 5,005                | 7%             | 358                   | 0.01               | 25     | \$1,225      | 100%              | 100%              | 100%             | 6%              | 89%           | 66.5%             | 57.9%             | 57.9%            | 0.2       |
| 545       | Shell         | Attic Insulation - Poor Insulation - Heat pump               | IQ Weatherproofing   | MF            | DI               | 5,005                | 16%            | 808                   | 0.03               | 25     | \$1,225      | 100%              | 100%              | 100%             | 6%              | 94%           | 66.5%             | 57.9%             | 57.9%            | 0.4       |
| 546       | Shell         | Duct Sealing - Average Sealing - Electric furnace            | IQ Weatherproofing   | MF            | DI               | 10,314               | 3%             | 341                   | 0.07               | 15     | \$400        | 100%              | 100%              | 100%             | 8%              | 55%           | 66.5%             | 57.9%             | 57.9%            | 0.5       |
| 547       | Shell         | Duct Sealing - Inadequate Sealing - Electric furnace         | IQ Weatherproofing   | MF            | DI               | 10,314               | 7%             | 738                   | 0.15               | 15     | \$400        | 100%              | 100%              | 100%             | 8%              | 89%           | 66.5%             | 57.9%             | 57.9%            | 1.1       |
| 548       | Shell         | Duct Sealing/Insulation - Poor Sealing - Electric furnace    | IQ Weatherproofing   | MF            | DI               | 10,314               | 9%             | 911                   | 0.19               | 15     | \$400        | 100%              | 100%              | 100%             | 8%              | 94%           | 66.5%             | 57.9%             | 57.9%            | 1.4       |
| 549       | Shell         | Wall Insulation - Electric furnace                           | IQ Weatherproofing   | MF            | DI               | 10,314               | 3%             | 290                   | 0.01               | 25     | \$77         | 100%              | 100%              | 100%             | 19%             | 87%           | 66.5%             | 57.9%             | 57.9%            | 2.1       |
| 550       | Shell         | Air Sealing Average Sealing - Electric furnace               | IQ Weatherproofing   | MF            | DI               | 10,314               | 9%             | 949                   | 0.02               | 15     | \$620        | 100%              | 100%              | 100%             | 19%             | 55%           | 66.5%             | 57.9%             | 57.9%            | 0.6       |
| 551       | Shell         | Air Sealing Inadequate Sealing - Electric furnace            | IQ Weatherproofing   | MF            | DI               | 10,314               | 13%            | 1,371                 | 0.02               | 15     | \$620        | 100%              | 100%              | 100%             | 19%             | 89%           | 66.5%             | 57.9%             | 57.9%            | 0.9       |
| 552       | Shell         | Air Sealing Poor Sealing - Electric furnace                  | IQ Weatherproofing   | MF            | DI               | 10,314               | 25%            | 2,531                 | 0.04               | 15     | \$620        | 100%              | 100%              | 100%             | 19%             | 94%           | 66.5%             | 57.9%             | 57.9%            | 1.6       |
| 553       | Shell         | Attic Insulation - Average Insulation - Electric furnace     | IQ Weatherproofing   | MF            | DI               | 10,314               | 3%             | 297                   | 0.01               | 25     | \$1,225      | 100%              | 100%              | 100%             | 19%             | 55%           | 66.5%             | 57.9%             | 57.9%            | 0.1       |
| 554       | Shell         | Attic Insulation - Inadequate Insulation - Electric furnace  | IQ Weatherproofing   | MF            | DI               | 10,314               | 5%             | 559                   | 0.02               | 25     | \$1,225      | 100%              | 100%              | 100%             | 19%             | 89%           | 66.5%             | 57.9%             | 57.9%            | 0.3       |
| 555       | Shell         | Attic Insulation - Poor Insulation - Electric furnace        | IQ Weatherproofing   | MF            | DI               | 10,314               | 12%            | 1,247                 | 0.05               | 25     | \$1,225      | 100%              | 100%              | 100%             | 19%             | 94%           | 66.5%             | 57.9%             | 57.9%            | 0.6       |
| 556       | Shell         | Duct Sealing - Average Sealing - Gas Heating                 | IQ Weatherproofing   | MF            | DI               | 778                  | 3%             | 26                    | 0.07               | 15     | \$400        | 100%              | 100%              | 100%             | 68%             | 55%           | 66.5%             | 57.9%             | 57.9%            | 0.2       |
| 557       | Shell         | Duct Sealing - Inadequate Sealing - Gas Heating              | IQ Weatherproofing   | MF            | DI               | 778                  | 7%             | 57                    | 0.15               | 15     | \$400        | 100%              | 100%              | 100%             | 68%             | 89%           | 66.5%             | 57.9%             | 57.9%            | 0.5       |
| 558       | Shell         | Duct Sealing/Insulation - Poor Sealing - Gas Heating         | IQ Weatherproofing   | MF            | DI               | 778                  | 9%             | 70                    | 0.19               | 15     | \$400        | 100%              | 100%              | 100%             | 68%             | 94%           | 66.5%             | 57.9%             | 57.9%            | 0.6       |
| 559       | Shell         | Wall Insulation - Gas Heating                                | IQ Weatherproofing   | MF            | DI               | 778                  | 2%             | 12                    | 0.01               | 25     | \$77         | 100%              | 100%              | 100%             | 68%             | 87%           | 66.5%             | 57.9%             | 57.9%            | 0.2       |
| 560       | Shell         | Air Sealing - Average Sealing - Gas Heating                  | IQ Weatherproofing   | MF            | DI               | 778                  | 5%             | 37                    | 0.02               | 15     | \$620        | 100%              | 100%              | 100%             | 68%             | 55%           | 66.5%             | 57.9%             | 57.9%            | 0.0       |
| 561       | Shell         | Air Sealing - Inadequate Sealing - Gas Heating               | IQ Weatherproofing   | MF            | DI               | 778                  | 7%             | 53                    | 0.02               | 15     | \$620        | 100%              | 100%              | 100%             | 68%             | 89%           | 66.5%             | 57.9%             | 57.9%            | 0.1       |
| 562       | Shell         | Air Sealing - Poor Sealing - Gas Heating                     | IQ Weatherproofing   | MF            | DI               | 778                  | 13%            | 98                    | 0.04               | 15     | \$620        | 100%              | 100%              | 100%             | 68%             | 94%           | 66.5%             | 57.9%             | 57.9%            | 0.1       |
| 563       | Shell         | Attic Insulation - Average Insulation - Gas Heating          | IQ Weatherproofing   | MF            | DI               | 778                  | 2%             | 14                    | 0.01               | 25     | \$1,225      | 100%              | 100%              | 100%             | 68%             | 55%           | 66.5%             | 57.9%             | 57.9%            | 0.0       |
| 564       | Shell         | Attic Insulation - Inadequate Insulation - Gas Heating       | IQ Weatherproofing   | MF            | DI               | 778                  | 3%             | 24                    | 0.02               | 25     | \$1,225      | 100%              | 100%              | 100%             | 68%             | 89%           | 66.5%             | 57.9%             | 57.9%            | 0.0       |
| 565       | Shell         | Attic Insulation - Poor Insulation - Gas Heating             | IQ Weatherproofing   | MF            | DI               | 778                  | 7%             | 54                    | 0.05               | 25     | \$1,225      | 100%              | 100%              | 100%             | 68%             | 94%           | 66.5%             | 57.9%             | 57.9%            | 0.1       |
| 566       | Shell         | Attic Hatch Scuttle  | Home Weatherproofing | MF            | Retrofit         | 10,314               | 0%             | 44                    | 0.00               | 20     | \$7          | 100%              | 100%              | 25%              | 19%             | 94%           | 68.7%             | 59.8%             | 22.7%            | 3.5       |
| 567       | Shell         | Radiant Barrier - Heat pump                                  | Home Weatherproofing | MF            | Retrofit         | 5,005                | 5%             | 250                   | 0.23               | 20     | \$1,700      | 100%              | 27%               | 25%              | 6%              | 55%           | 68.7%             | 23.4%             | 22.7%            | 0.9       |
| 568       | Shell         | Cool Roof - Heat pump  | Home Weatherproofing | MF            | Retrofit         | 5,005                | -1%            | -47                   | 0.01               | 20     | \$765        | 100%              | 27%               | 25%              | 6%              | 33%           | 68.7%             | 23.4%             | 22.7%            | 0.0       |
| 569       | Shell         | ENERGY STAR Windows - Heat pump                              | Home Weatherproofing | MF            | Retrofit         | 5,005                | 22%            | 1,101                 | 0.69               | 25     | \$8,550      | 100%              | 27%               | 25%              | 6%              | 39%           | 68.7%             | 23.4%             | 22.7%            | 0.7       |
| 570       | Shell         | ENERGY STAR Windows - Heat pump                              | Home Weatherproofing | MF            | MO               | 5,005                | 9%             | 450                   | 0.28               | 25     | \$3,600      | 100%              | 27%               | 25%              | 6%              | 39%           | 68.7%             | 23.4%             | 22.7%            | 0.7       |
| 571       | Shell         | Basement Sidewall Insulation - Heat pump                     | Home Weatherproofing | MF            | Retrofit         | 5,005                | 15%            | 753                   | -0.03              | 25     | \$690        | 50%               | 27%               | 25%              | 6%              | 85%           | 38.3%             | 23.4%             | 22.7%            | 1.9       |
| 572       | Shell         | Floor Insulation Above Crawlspace - Heat pump                | Home Weatherproofing | MF            | Retrofit         | 5,005                | 12%            | 585                   | -0.03              | 25     | \$690        | 35%               | 27%               | 25%              | 6%              | 88%           | 30.4%             | 23.4%             | 22.7%            | 1.4       |
| 573       | Shell         | Smart Window Coverings - Film/Transformer - Heat pump        | Home Weatherproofing | MF            | Retrofit         | 5,005                | 16%            | 776                   | 0.49               | 7      | \$4,050      | 100%              | 27%               | 25%              | 6%              | 39%           | 68.7%             | 23.4%             | 22.7%            | 0.4       |
| 574       | Shell         | Radiant Barrier - Electric furnace                           | Home Weatherproofing | MF            | Retrofit         | 10,314               | 5%             | 516                   | 0.40               | 20     | \$1,700      | 50%               | 27%               | 25%              | 19%             | 55%           | 38.3%             | 23.4%             | 22.7%            | 1.7       |
| 575       | Shell         | Cool Roof - Electric furnace                                 | Home Weatherproofing | MF            | Retrofit         | 10,314               | 0%             | -47                   | 0.01               | 20     | \$765        | 100%              | 27%               | 25%              | 19%             | 33%           | 68.7%             | 23.4%             | 22.7%            | 0.0       |
| 576       | Shell         | ENERGY STAR Windows - Electric furnace                       | Home Weatherproofing | MF            | Retrofit         | 10,314               | 22%            | 2,269                 | 0.69               | 25     | \$8,550      | 100%              | 27%               | 25%              | 19%             | 39%           | 68.7%             | 23.4%             | 22.7%            | 1.0       |
| 577       | Shell         | ENERGY STAR Windows - Electric furnace                       | Home Weatherproofing | MF            | MO               | 10,314               | 9%             | 928                   | 0.28               | 25     | \$3,600      | 100%              | 27%               | 25%              | 19%             | 39%           | 68.7%             | 23.4%             | 22.7%            | 0.9       |
| 578       | Shell         | Basement Sidewall Insulation - Electric furnace              | Home Weatherproofing | MF            | Retrofit         | 10,314               | 11%            | 1,136                 | -0.04              | 25     | \$690        | 100%              | 27%               | 25%              | 19%             | 85%           | 68.7%             | 23.4%             | 22.7%            | 2.9       |
| 579       | Shell         | Floor Insulation Above Crawlspace - Electric furnace         | Home Weatherproofing | MF            | Retrofit         | 10,314               | 8%             | 848                   | -0.03              | 25     | \$690        | 75%               | 27%               | 25%              | 19%             | 88%           | 50.2%             | 23.4%             | 22.7%            | 2.2       |
| 580       | Shell         | Smart Window Coverings - Film/Transformer - Electric furnace | Home Weatherproofing | MF            | Retrofit         | 10,314               | 16%            | 1,599                 | 0.49               | 7      | \$4,050      | 100%              | 27%               | 25%              | 19%             | 39%           | 68.7%             | 23.4%             | 22.7%            | 0.6       |
| 581       | Shell         | ENERGY STAR Windows - Gas Heating                            | Home Weatherproofing | MF            | Retrofit         | 778                  | 22%            | 171                   | 0.69               | 25     | \$8,550      | 100%              | 27%               | 25%              | 68%             | 39%           | 68.7%             | 23.4%             | 22.7%            | 0.5       |
| 582       | Shell         | ENERGY STAR Windows - Gas Heating                            | Home Weatherproofing | MF            | MO               | 778                  | 9%             | 70                    | 0.28               | 25     | \$3,600      | 100%              | 27%               | 25%              | 68%             | 39%           | 68.7%             | 23.4%             | 22.7%            | 0.5       |
| 583       | Shell         | Basement Sidewall Insulation - Gas Heating                   | Home Weatherproofing | MF            | Retrofit         | 778                  | -2%            | -12                   | -0.03              | 25     | \$690        | 100%              | 27%               | 25%              | 68%             | 85%           | 68.7%             | 23.4%             | 22.7%            | 0.0       |
| 584       | Shell         | Floor Insulation Above Crawlspace - Gas Heating              | Home Weatherproofing | MF            | Retrofit         | 778                  | -5%            | -38                   | -0.03              | 25     | \$690        | 100%              | 27%               | 25%              | 68%             | 88%           | 68.7%             | 23.4%             | 22.7%            | 0.0       |
| 585       | Shell         | Smart Window Coverings - Film/Transformer - Gas Heating      | Home Weatherproofing | MF            | Retrofit         | 778                  | 16%            | 121                   | 0.49               | 7      | \$4,050      | 100%              | 27%               | 25%              | 68%             | 39%           | 68.7%             | 23.4%             | 22.7%            | 0.3       |
| 586       | Water Heating | Water Heater Temperature Setback                             | Home Weatherproofing | SF            | Retrofit         | 3,460                | 2%             | 82                    | 0.01               | 2      | \$5          | 50%               | 66%               | 25%              | 33%             | 54%           | 35.6%             | 36.9%             | 21.0%            | 1.9       |

Appendix B: Residential Energy Efficiency Detail

| Measure # | End-Use       | Measure Name                                    | Program                | Building Type | Replacement Type | Base Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|---------------|---|------------------------|---------------|------------------|----------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 587       | Water Heating | Pipe Wrap                                       | Home Weatherproofing   | SF            | Retrofit         | 3,460                | 1%             | 37                    | 0.00               | 15     | \$1          | 100%              | 100%              | 25%              | 33%             | 17%           | 63.0%             | 54.8%             | 21.0%            | 12.9      |
| 588       | Water Heating | Bathroom Aerator 1.0 gpm                        | Home Weatherproofing   | SF            | Retrofit         | 3,460                | 1%             | 36                    | 0.00               | 10     | \$2          | 100%              | 100%              | 25%              | 123%            | 49%           | 63.0%             | 54.8%             | 21.0%            | 7.5       |
| 589       | Water Heating | Bathroom Aerator 1.0 gpm                        | Online Energy Check-Up | SF            | Retrofit         | 3,460                | 1%             | 36                    | 0.00               | 10     | \$2          | 100%              | 100%              | 100%             | 123%            | 49%           | 63.0%             | 54.8%             | 54.8%            | 7.5       |
| 590       | Water Heating | Bathroom Aerator 1.0 gpm                        | School Education       | SF            | Retrofit         | 3,460                | 1%             | 36                    | 0.00               | 10     | \$2          | 100%              | 100%              | 100%             | 123%            | 49%           | 63.0%             | 54.8%             | 54.8%            | 7.5       |
| 591       | Water Heating | Kitchen Flip Aerator 1.5 gpm                    | Home Weatherproofing   | SF            | Retrofit         | 3,460                | 5%             | 189                   | 0.01               | 10     | \$2          | 100%              | 100%              | 25%              | 33%             | 49%           | 63.0%             | 54.8%             | 21.0%            | 36.8      |
| 592       | Water Heating | Kitchen Flip Aerator 1.5 gpm                    | Online Energy Check-Up | SF            | Retrofit         | 3,460                | 5%             | 189                   | 0.01               | 10     | \$2          | 100%              | 100%              | 100%             | 33%             | 49%           | 63.0%             | 54.8%             | 54.8%            | 36.8      |
| 593       | Water Heating | Kitchen Flip Aerator 1.5 gpm                    | School Education       | SF            | Retrofit         | 3,460                | 5%             | 189                   | 0.01               | 10     | \$2          | 100%              | 100%              | 100%             | 33%             | 49%           | 63.0%             | 54.8%             | 54.8%            | 36.8      |
| 594       | Water Heating | Low Flow Showerhead 1.5 gpm                     | Home Weatherproofing   | SF            | Retrofit         | 3,460                | 10%            | 360                   | 0.02               | 5      | \$4          | 100%              | 100%              | 25%              | 53%             | 61%           | 63.0%             | 54.8%             | 21.0%            | 15.3      |
| 595       | Water Heating | Low Flow Showerhead 1.5 gpm                     | Online Energy Check-Up | SF            | Retrofit         | 3,460                | 10%            | 360                   | 0.02               | 5      | \$4          | 100%              | 100%              | 100%             | 53%             | 61%           | 63.0%             | 54.8%             | 54.8%            | 15.3      |
| 596       | Water Heating | Low Flow Showerhead 1.5 gpm                     | School Education       | SF            | Retrofit         | 3,460                | 10%            | 360                   | 0.02               | 5      | \$4          | 100%              | 100%              | 100%             | 53%             | 61%           | 63.0%             | 54.8%             | 54.8%            | 15.3      |
| 597       | Water Heating | Thermostatic Restrictor Shower Valve            | Home Weatherproofing   | SF            | Retrofit         | 3,460                | 2%             | 78                    | 0.01               | 10     | \$41         | 61%               | 61%               | 25%              | 53%             | 61%           | 40.1%             | 34.9%             | 21.0%            | 1.0       |
| 598       | Water Heating | Heat Pump Water Heater-electric resistance heat | Home Energy Products   | SF            | MO               | 3,460                | 14%            | 499                   | 0.07               | 10     | \$700        | 100%              | 50%               | 50%              | 33%             | 7%            | 63.0%             | 30.9%             | 30.9%            | 0.5       |
| 599       | Water Heating | Heat Pump Water Heater-heat pump heat           | Home Energy Products   | SF            | MO               | 3,460                | 60%            | 2,076                 | 0.28               | 10     | \$700        | 100%              | 50%               | 50%              | 33%             | 7%            | 63.0%             | 30.9%             | 30.9%            | 2.3       |
| 600       | Water Heating | Heat Pump Water Heater-gas heat                 | Home Energy Products   | SF            | MO               | 3,460                | 37%            | 1,297                 | 0.18               | 10     | \$700        | 50%               | 50%               | 50%              | 33%             | 7%            | 35.6%             | 30.9%             | 30.9%            | 1.4       |
| 601       | Water Heating | Water Heater Temperature Setback                | IQ Weatherproofing     | SF            | DI               | 3,460                | 1%             | 25                    | 0.00               | 2      | \$5          | 35%               | 66%               | 66%              | 33%             | 54%           | 25.6%             | 32.9%             | 32.9%            | 0.6       |
| 602       | Water Heating | Pipe Wrap                                       | IQ Weatherproofing     | SF            | DI               | 3,460                | 1%             | 48                    | 0.01               | 15     | \$2          | 100%              | 100%              | 100%             | 33%             | 17%           | 62.1%             | 54.1%             | 54.1%            | 12.8      |
| 603       | Water Heating | Bathroom Aerator 1.0 gpm                        | IQ Weatherproofing     | SF            | DI               | 3,460                | 1%             | 36                    | 0.00               | 10     | \$2          | 100%              | 100%              | 100%             | 123%            | 49%           | 62.1%             | 54.1%             | 54.1%            | 7.5       |
| 604       | Water Heating | Kitchen Flip Aerator 1.5 gpm                    | IQ Weatherproofing     | SF            | DI               | 3,460                | 5%             | 189                   | 0.01               | 10     | \$2          | 100%              | 100%              | 100%             | 33%             | 49%           | 62.1%             | 54.1%             | 54.1%            | 36.8      |
| 605       | Water Heating | Low Flow Showerhead 1.5 gpm                     | IQ Weatherproofing     | SF            | DI               | 3,460                | 10%            | 360                   | 0.02               | 5      | \$4          | 100%              | 100%              | 100%             | 53%             | 61%           | 62.1%             | 54.1%             | 54.1%            | 15.3      |
| 606       | Water Heating | Thermostatic Restrictor Shower Valve            | IQ Weatherproofing     | SF            | DI               | 3,460                | 3%             | 87                    | 0.01               | 10     | \$41         | 100%              | 61%               | 61%              | 53%             | 61%           | 62.1%             | 31.1%             | 31.1%            | 1.1       |
| 607       | Water Heating | Heat Pump Water Heater-electric resistance heat | IQ Weatherproofing     | SF            | MO               | 3,460                | 14%            | 499                   | 0.07               | 10     | \$1,500      | 100%              | 100%              | 100%             | 33%             | 7%            | 62.1%             | 54.1%             | 54.1%            | 0.1       |
| 608       | Water Heating | Heat Pump Water Heater-heat pump heat           | IQ Weatherproofing     | SF            | MO               | 3,460                | 60%            | 2,076                 | 0.28               | 10     | \$1,500      | 100%              | 100%              | 100%             | 33%             | 7%            | 62.1%             | 54.1%             | 54.1%            | 0.5       |
| 609       | Water Heating | Heat Pump Water Heater-gas heat                 | IQ Weatherproofing     | SF            | MO               | 3,460                | 37%            | 1,297                 | 0.18               | 10     | \$1,000      | 100%              | 100%              | 100%             | 33%             | 7%            | 62.1%             | 54.1%             | 54.1%            | 0.5       |
| 610       | Water Heating | Tankless Water Heater                           | HVAC Midstream         | SF            | MO               | 3,460                | 5%             | 166                   | 0.00               | 20     | \$1,080      | 100%              | 66%               | 66%              | 33%             | 7%            | 63.0%             | 36.9%             | 36.9%            | 0.1       |
| 611       | Water Heating | Smart Water Heater - Tank Controls and Sensors  | HVAC Midstream         | SF            | Retrofit         | 3,460                | 15%            | 530                   | 0.21               | 10     | \$120        | 100%              | 66%               | 66%              | 33%             | 7%            | 63.0%             | 36.9%             | 36.9%            | 4.0       |
| 612       | Water Heating | Water Heater Timer                              | Home Weatherproofing   | SF            | Retrofit         | 3,460                | 9%             | 318                   | 0.04               | 15     | \$60         | 100%              | 66%               | 25%              | 33%             | 8%            | 63.0%             | 36.9%             | 21.0%            | 4.0       |
| 613       | Water Heating | Water Heater Wrap                               | IQ Weatherproofing     | SF            | Retrofit         | 3,460                | 2%             | 80                    | 0.01               | 5      | \$20         | 35%               | 66%               | 66%              | 33%             | 7%            | 28.1%             | 36.9%             | 36.9%            | 1.1       |
| 614       | Water Heating | Drain water Heat Recovery                       | Home Weatherproofing   | SF            | Retrofit         | 3,460                | 26%            | 884                   | 0.10               | 20     | \$742        | 35%               | 66%               | 25%              | 33%             | 1%            | 28.1%             | 36.9%             | 21.0%            | 1.1       |
| 615       | Water Heating | Shower Timer                                    | Home Weatherproofing   | SF            | Retrofit         | 3,460                | 2%             | 54                    | 0.01               | 2      | \$5          | 35%               | 66%               | 66%              | 53%             | 8%            | 28.1%             | 36.9%             | 36.9%            | 1.2       |
| 616       | Water Heating | Water Heater Temperature Setback                | Home Weatherproofing   | SF            | NC               | 3,460                | 2%             | 82                    | 0.01               | 2      | \$5          | 50%               | 66%               | 25%              | 33%             | 0%            | 35.6%             | 36.9%             | 21.0%            | 1.9       |
| 617       | Water Heating | Pipe Wrap                                       | Home Weatherproofing   | SF            | NC               | 3,460                | 1%             | 37                    | 0.00               | 15     | \$1          | 100%              | 66%               | 25%              | 33%             | 0%            | 63.0%             | 36.9%             | 21.0%            | 19.6      |
| 618       | Water Heating | Bathroom Aerator 1.0 gpm                        | Online Energy Check-Up | SF            | NC               | 3,460                | 1%             | 36                    | 0.00               | 10     | \$2          | 100%              | 100%              | 100%             | 123%            | 0%            | 63.0%             | 54.8%             | 54.8%            | 7.5       |
| 619       | Water Heating | Kitchen Flip Aerator 1.5 gpm                    | Online Energy Check-Up | SF            | NC               | 3,460                | 5%             | 189                   | 0.01               | 10     | \$2          | 100%              | 100%              | 100%             | 33%             | 0%            | 63.0%             | 54.8%             | 54.8%            | 36.8      |
| 620       | Water Heating | Low Flow Showerhead 1.5 gpm                     | Online Energy Check-Up | SF            | NC               | 3,460                | 10%            | 360                   | 0.02               | 5      | \$4          | 100%              | 100%              | 100%             | 53%             | 0%            | 63.0%             | 54.8%             | 54.8%            | 15.3      |
| 621       | Water Heating | Thermostatic Restrictor Shower Valve            | Online Energy Check-Up | SF            | NC               | 3,460                | 2%             | 78                    | 0.01               | 10     | \$41         | 61%               | 61%               | 25%              | 53%             | 0%            | 40.1%             | 34.9%             | 34.9%            | 1.0       |
| 622       | Water Heating | Heat Pump Water Heater-heat pump heat           | Home Energy Products   | SF            | NC               | 3,460                | 60%            | 2,076                 | 0.28               | 10     | \$700        | 100%              | 50%               | 50%              | 33%             | 0%            | 63.0%             | 30.9%             | 30.9%            | 2.3       |
| 623       | Water Heating | Heat Pump Water Heater-gas heat                 | Home Energy Products   | SF            | NC               | 3,460                | 37%            | 1,297                 | 0.18               | 10     | \$700        | 50%               | 50%               | 50%              | 33%             | 0%            | 35.6%             | 30.9%             | 30.9%            | 1.4       |
| 624       | Water Heating | Tankless Water Heater                           | HVAC Midstream         | SF            | NC               | 3,460                | 5%             | 166                   | 0.00               | 20     | \$1,080      | 100%              | 66%               | 66%              | 33%             | 0%            | 63.0%             | 36.9%             | 36.9%            | 0.1       |
| 625       | Water Heating | Smart Water Heater - Tank Controls and Sensors  | HVAC Midstream         | SF            | NC               | 3,460                | 15%            | 530                   | 0.21               | 10     | \$120        | 100%              | 66%               | 66%              | 33%             | 0%            | 63.0%             | 36.9%             | 36.9%            | 4.0       |
| 626       | Water Heating | Water Heater Timer                              | Home Weatherproofing   | SF            | NC               | 3,460                | 9%             | 318                   | 0.04               | 15     | \$60         | 100%              | 66%               | 25%              | 33%             | 0%            | 63.0%             | 36.9%             | 21.0%            | 4.0       |
| 627       | Water Heating | Drain water Heat Recovery                       | Home Weatherproofing   | SF            | NC               | 3,460                | 26%            | 884                   | 0.10               | 20     | \$742        | 35%               | 66%               | 25%              | 33%             | 0%            | 28.1%             | 36.9%             | 21.0%            | 1.1       |
| 628       | Water Heating | Shower Timer                                    | Home Weatherproofing   | SF            | NC               | 3,460                | 2%             | 54                    | 0.01               | 2      | \$5          | 35%               | 66%               | 66%              | 53%             | 0%            | 28.1%             | 36.9%             | 36.9%            | 1.2       |
| 629       | Water Heating | Water Heater Temperature Setback                | Home Weatherproofing   | MF            | Retrofit         | 2,595                | 3%             | 82                    | 0.01               | 2      | \$5          | 50%               | 66%               | 25%              | 56%             | 54%           | 35.6%             | 36.9%             | 21.0%            | 1.9       |
| 630       | Water Heating | Pipe Wrap                                       | Home Weatherproofing   | MF            | Retrofit         | 2,595                | 1%             | 37                    | 0.00               | 15     | \$1          | 100%              | 100%              | 25%              | 56%             | 17%           | 63.0%             | 54.8%             | 21.0%            | 12.9      |
| 631       | Water Heating | Bathroom Aerator 1.0 gpm                        | Home Weatherproofing   | MF            | Retrofit         | 2,595                | 1%             | 36                    | 0.00               | 10     | \$2          | 100%              | 100%              | 25%              | 160%            | 38%           | 63.0%             | 54.8%             | 21.0%            | 7.5       |
| 632       | Water Heating | Bathroom Aerator 1.0 gpm                        | Online Energy Check-Up | MF            | Retrofit         | 2,595                | 1%             | 36                    | 0.00               | 10     | \$2          | 100%              | 100%              | 100%             | 160%            | 38%           | 63.0%             | 54.8%             | 54.8%            | 7.5       |
| 633       | Water Heating | Bathroom Aerator 1.0 gpm                        | School Education       | MF            | Retrofit         | 2,595                | 1%             | 36                    | 0.00               | 10     | \$2          | 100%              | 100%              | 100%             | 160%            | 38%           | 63.0%             | 54.8%             | 54.8%            | 7.5       |
| 634       | Water Heating | Kitchen Flip Aerator 1.5 gpm                    | Home Weatherproofing   | MF            | Retrofit         | 2,595                | 7%             | 189                   | 0.01               | 10     | \$2          | 100%              | 100%              | 25%              | 56%             | 38%           | 63.0%             | 54.8%             | 21.0%            | 36.8      |
| 635       | Water Heating | Kitchen Flip Aerator 1.5 gpm                    | Online Energy Check-Up | MF            | Retrofit         | 2,595                | 7%             | 189                   | 0.01               | 10     | \$2          | 100%              | 100%              | 100%             | 56%             | 38%           | 63.0%             | 54.8%             | 54.8%            | 36.8      |
| 636       | Water Heating | Kitchen Flip Aerator 1.5 gpm                    | School Education       | MF            | Retrofit         | 2,595                | 7%             | 189                   | 0.01               | 10     | \$2          | 100%              | 100%              | 100%             | 56%             | 38%           | 63.0%             | 54.8%             | 54.8%            | 36.8      |
| 637       | Water Heating | Low Flow Showerhead 1.5 gpm                     | Home Weatherproofing   | MF            | Retrofit         | 2,595                | 14%            | 360                   | 0.02               | 5      | \$4          | 100%              | 100%              | 25%              | 74%             | 51%           | 63.0%             | 54.8%             | 21.0%            | 15.3      |
| 638       | Water Heating | Low Flow Showerhead 1.5 gpm                     | Online Energy Check-Up | MF            | Retrofit         | 2,595                | 14%            | 360                   | 0.02               | 5      | \$4          | 100%              | 100%              | 100%             | 74%             | 51%           | 63.0%             | 54.8%             | 54.8%            | 15.3      |
| 639       | Water Heating | Low Flow Showerhead 1.5 gpm                     | School Education       | MF            | Retrofit         | 2,595                | 14%            | 360                   | 0.02               | 5      | \$4          | 100%              | 100%              | 100%             | 74%             | 51%           | 63.0%             | 54.8%             | 54.8%            | 15.3      |
| 640       | Water Heating | Thermostatic Restrictor Shower Valve            | Home Weatherproofing   | MF            | Retrofit         | 2,595                | 3%             | 78                    | 0.01               | 10     | \$41         | 61%               | 61%               | 25%              | 74%             | 51%           | 40.1%             | 34.9%             | 21.0%            | 1.0       |
| 641       | Water Heating | Heat Pump Water Heater-electric resistance heat | Home Energy Products   | MF            | MO               | 2,595                | 19%            | 499                   | 0.07               | 10     | \$700        | 100%              | 50%               | 50%              | 56%             | 7%            | 63.0%             | 30.9%             | 30.9%            | 0.5       |
| 642       | Water Heating | Heat Pump Water Heater-heat pump heat           | Home Energy Products   | MF            | MO               | 2,595                | 80%            | 2,076                 | 0.28               | 10     | \$700        | 100%              | 50%               | 50%              | 56%             | 7%            | 63.0%             | 30.9%             | 30.9%            | 2.3       |
| 643       | Water Heating | Heat Pump Water Heater-gas heat                 | Home Energy Products   | MF            | MO               | 2,595                | 50%            | 1,297                 | 0.18               | 10     | \$700        | 50%               | 50%               | 50%              | 56%             | 7%            | 35.6%             | 30.9%             | 30.9%            | 1.4       |
| 644       | Water Heating | Water Heater Temperature Setback                | IQ Weatherproofing     | MF            | DI               | 2,595                | 1%             | 25                    | 0.00               | 2      | \$5          | 35%               | 66%               | 66%              | 56%             | 54%           | 25.6%             | 32.9%             | 32.9%            | 0.6       |
| 645       | Water Heating | Pipe Wrap                                       | IQ Weatherproofing     | MF            | DI               | 2,595                | 2%             | 48                    | 0.01               | 15     | \$2          | 100%              | 100%              | 100%             | 56%             | 17%           | 62.1%             | 54.1%             | 54.1%            | 12.8      |
| 646       | Water Heating | Bathroom Aerator 1.0 gpm                        | IQ Weatherproofing     | MF            | DI               | 2,595                | 1%             | 36                    | 0.00               | 10     | \$2          | 100%              | 100%              | 100%             | 160%            | 38%           | 62.1%             | 54.1%             | 54.1%            | 7.5       |
| 647       | Water Heating | Kitchen Flip Aerator 1.5 gpm                    | IQ Weatherproofing     | MF            | DI               | 2,595                | 7%             | 189                   | 0.01               | 10     | \$2          | 100%              | 100%              | 100%             | 56%             | 38%           | 62.1%             | 54.1%             | 54.1%            | 36.8      |
| 648       | Water Heating | Low Flow Showerhead 1.5 gpm                     | IQ Weatherproofing     | MF            | DI               | 2,595                | 14%            | 360                   | 0.02               | 5      | \$4          | 100%              | 100%              | 100%             | 74%             | 51%           | 62.1%             | 54.1%             | 54.1%            | 15.3      |
| 649       | Water Heating | Thermostatic Restrictor Shower Valve            | IQ Weatherproofing     | MF            | DI               | 2,595                | 3%             | 87                    | 0.01               | 10     | \$41         | 100%              | 61%               | 61%              | 74%             | 51%           | 62.1%             | 31.1%             | 31.1%            | 1.1       |
| 650       | Water Heating | Heat Pump Water Heater-electric resistance heat | IQ Weatherproofing     | MF            | MO               | 2,595                | 19%            | 499                   | 0.07               | 10     | \$1,500      | 100%              | 100%              | 100%             | 56%             | 7%            | 62.1%             | 54.1%             | 54.1%            | 0.1       |
| 651       | Water Heating | Heat Pump Water Heater-heat pump heat           | IQ Weatherproofing     | MF            | MO               | 2,595                | 80%            | 2,076                 | 0.28               | 10     | \$1,500      | 100%              | 100%              | 100%             | 56%             | 7%            | 62.1%             | 54.1%             | 54.1%            | 0.5       |
| 652       | Water Heating | Heat Pump Water Heater-gas heat                 | IQ Weatherproofing     | MF            | MO               | 2,595                | 50%            | 1,297                 | 0.18               | 10     | \$1,000      | 100%              | 100%              | 100%             | 56%             | 7%            | 62.1%             | 54.1%             | 54.1%            | 0.5       |
| 653       | Water Heating | Tankless Water Heater                           | HVAC Midstream         | MF            | MO               | 2,595                | 5%             | 125                   | 0.00               | 20     | \$1,080      | 100%              | 66%               | 66%              | 56%             | 7%            | 63.0%             | 36.9%             | 36.9%            | 0.1       |



Appendix B: Residential Energy Efficiency Detail

| Measure # | End-Use                   | Measure Name                                   | Program                | Building Type | Replacement Type | Base Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|---------------------------|--|------------------------|---------------|------------------|----------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 654       | Water Heating             | Smart Water Heater - Tank Controls and Sensors | HVAC Midstream         | MF            | Retrofit         | 2,595                | 15%            | 399                   | 0.16               | 10     | \$120        | 100%              | 66%               | 66%              | 56%             | 7%            | 63.0%             | 36.9%             | 36.9%            | 3.0       |
| 655       | Water Heating             | Water Heater Timer                             | Home Weatherproofing   | MF            | Retrofit         | 2,595                | 9%             | 240                   | 0.03               | 15     | \$60         | 100%              | 66%               | 25%              | 56%             | 8%            | 63.0%             | 36.9%             | 21.0%            | 3.0       |
| 656       | Water Heating             | Water Heater Wrap                              | IQ Weatherproofing     | MF            | Retrofit         | 2,595                | 2%             | 61                    | 0.01               | 5      | \$20         | 100%              | 66%               | 66%              | 56%             | 7%            | 63.0%             | 36.9%             | 36.9%            | 0.8       |
| 657       | Water Heating             | Drain water Heat Recovery                      | Home Weatherproofing   | MF            | Retrofit         | 2,595                | 26%            | 666                   | 0.08               | 20     | \$742        | 100%              | 66%               | 25%              | 56%             | 1%            | 63.0%             | 36.9%             | 21.0%            | 0.8       |
| 658       | Water Heating             | Shower Timer                                   | Home Weatherproofing   | MF            | Retrofit         | 2,595                | 2%             | 57                    | 0.01               | 2      | \$5          | 35%               | 66%               | 66%              | 79%             | 8%            | 28.1%             | 36.9%             | 36.9%            | 1.3       |
| 659       | Water Heating             | Water Heater Temperature Setback               | Home Weatherproofing   | MF            | NC               | 2,595                | 3%             | 82                    | 0.01               | 2      | \$5          | 50%               | 66%               | 25%              | 56%             | 0%            | 35.6%             | 36.9%             | 21.0%            | 1.9       |
| 660       | Water Heating             | Pipe Wrap                                      | Home Weatherproofing   | MF            | NC               | 2,595                | 1%             | 37                    | 0.00               | 15     | \$1          | 100%              | 66%               | 25%              | 56%             | 0%            | 63.0%             | 36.9%             | 21.0%            | 19.6      |
| 661       | Water Heating             | Bathroom Aerator 1.0 gpm                       | Online Energy Check-Up | MF            | NC               | 2,595                | 1%             | 36                    | 0.00               | 10     | \$2          | 100%              | 100%              | 100%             | 160%            | 0%            | 63.0%             | 54.8%             | 54.8%            | 7.5       |
| 662       | Water Heating             | Kitchen Flip Aerator 1.5 gpm                   | Online Energy Check-Up | MF            | NC               | 2,595                | 7%             | 189                   | 0.01               | 10     | \$2          | 100%              | 100%              | 100%             | 56%             | 0%            | 63.0%             | 54.8%             | 54.8%            | 36.8      |
| 663       | Water Heating             | Low Flow Showerhead 1.5 gpm                    | Online Energy Check-Up | MF            | NC               | 2,595                | 14%            | 360                   | 0.02               | 5      | \$4          | 100%              | 100%              | 100%             | 74%             | 0%            | 63.0%             | 54.8%             | 54.8%            | 15.3      |
| 664       | Water Heating             | Thermostatic Restrictor Shower Valve           | Online Energy Check-Up | MF            | NC               | 2,595                | 3%             | 78                    | 0.01               | 10     | \$41         | 61%               | 61%               | 61%              | 74%             | 0%            | 40.1%             | 34.9%             | 34.9%            | 1.0       |
| 665       | Water Heating             | Heat Pump Water Heater-heat pump heat          | Home Energy Products   | MF            | NC               | 2,595                | 80%            | 2,076                 | 0.28               | 10     | \$700        | 100%              | 50%               | 50%              | 56%             | 0%            | 63.0%             | 30.9%             | 30.9%            | 2.3       |
| 666       | Water Heating             | Heat Pump Water Heater-gas heat                | Home Energy Products   | MF            | NC               | 2,595                | 50%            | 1,297                 | 0.18               | 10     | \$700        | 50%               | 50%               | 50%              | 56%             | 0%            | 35.6%             | 30.9%             | 30.9%            | 1.4       |
| 667       | Water Heating             | Tankless Water Heater                          | HVAC Midstream         | MF            | NC               | 2,595                | 5%             | 125                   | 0.00               | 20     | \$1,080      | 100%              | 66%               | 66%              | 56%             | 0%            | 63.0%             | 36.9%             | 36.9%            | 0.1       |
| 668       | Water Heating             | Smart Water Heater - Tank Controls and Sensors | HVAC Midstream         | MF            | NC               | 2,595                | 15%            | 399                   | 0.16               | 10     | \$120        | 100%              | 66%               | 66%              | 56%             | 0%            | 63.0%             | 36.9%             | 36.9%            | 3.0       |
| 669       | Water Heating             | Water Heater Timer                             | Home Weatherproofing   | MF            | NC               | 2,595                | 9%             | 240                   | 0.03               | 15     | \$60         | 100%              | 66%               | 25%              | 56%             | 0%            | 63.0%             | 36.9%             | 21.0%            | 3.0       |
| 670       | Water Heating             | Drain water Heat Recovery                      | Home Weatherproofing   | MF            | NC               | 2,595                | 26%            | 666                   | 0.08               | 20     | \$742        | 100%              | 66%               | 25%              | 56%             | 0%            | 63.0%             | 36.9%             | 21.0%            | 0.8       |
| 671       | Water Heating             | Shower Timer                                   | Home Weatherproofing   | MF            | NC               | 2,595                | 2%             | 57                    | 0.01               | 2      | \$5          | 35%               | 66%               | 66%              | 79%             | 0%            | 28.1%             | 36.9%             | 36.9%            | 1.3       |
| 672       | Electric Vehicle Charging | L2 ESVE  | No program             | SF            | Retrofit         | 2,733                | 31%            | 836                   | 0.00               | 10     | \$900        | 100%              | 66%               | 66%              | 2%              | 20%           | 62.1%             | 37.6%             | 37.6%            | 0.4       |
| 673       | Electric Vehicle Charging | L2 ESVE  | No program             | SF            | NC               | 2,733                | 31%            | 836                   | 0.00               | 10     | \$900        | 100%              | 66%               | 66%              | 2%              | 0%            | 62.1%             | 37.6%             | 37.6%            | 0.4       |

## APPENDIX C: COMMERCIAL & INDUSTRIAL ENERGY EFFICIENCY DETAIL

Appendix C: C&I Measure Assumptions

| Measure # | End-Use              | Measure Name  | Program                | Building Type | Replacement Type | Base (Existing) Annual Electric | Base (Standard) Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | End Use Measure Group | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|----------------------|---|------------------------|---------------|------------------|---------------------------------|---------------------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 1         | Cooking              | Commercial Combination Oven (Electric)                          | Biz-Prescriptive       | Education     | ROB              | 38,561                          | 38,561                          | 48%            | 18,432                | 0.00               | 12     | \$16,884     | 50%               | 6%                | 3%               | 1                     | 17%             | 53%           | 62.4%             | 62.4%             | 62.4%            | 9.8       |
| 2         | Cooking              | Commercial Electric Convection Oven                             | Biz-Prescriptive       | Education     | ROB              | 12,193                          | 12,193                          | 15%            | 1,879                 | 0.00               | 12     | \$1,706      | 50%               | 15%               | 11%              | 1                     | 17%             | 53%           | 62.4%             | 62.4%             | 62.4%            | 4.1       |
| 3         | Cooking              | Commercial Electric Griddle                                     | Biz-Prescriptive       | Education     | ROB              | 17,056                          | 17,056                          | 15%            | 2,596                 | 0.00               | 12     | \$3,604      | 25%               | 7%                | 7%               | 2                     | 14%             | 53%           | 62.4%             | 62.4%             | 62.4%            | 4.3       |
| 4         | Cooking              | Commercial Electric Steam Cooker                                | Biz-Prescriptive       | Education     | ROB              | 19,549                          | 19,549                          | 67%            | 13,162                | 0.00               | 12     | \$3,500      | 100%              | 12%               | 14%              | 3                     | 6%              | 42%           | 68.6%             | 53.6%             | 53.6%            | 16.4      |
| 5         | Cooking              | Dishwasher Low Temp Door (Energy Star)                          | Biz-Prescriptive       | Education     | ROB              | 39,279                          | 39,279                          | 41%            | 16,153                | 0.00               | 15     | \$770        | 100%              | 49%               | 65%              | 4                     | 26%             | 61%           | 68.8%             | 68.8%             | 68.8%            | 19.7      |
| 6         | Cooking              | Dishwasher High Temp Door (Energy Star)                         | Biz-Prescriptive       | Education     | ROB              | 39,825                          | 39,825                          | 30%            | 11,853                | 0.00               | 15     | \$770        | 100%              | 49%               | 65%              | 4                     | 26%             | 61%           | 68.8%             | 68.8%             | 68.8%            | 14.5      |
| 7         | Cooking              | Energy efficient electric fryer                                 | Biz-Prescriptive       | Education     | ROB              | 18,182                          | 18,182                          | 14%            | 2,572                 | 0.00               | 12     | \$1,706      | 50%               | 1%                | 15%              | 5                     | 27%             | 23%           | 55.0%             | 39.3%             | 40.7%            | 99.9      |
| 8         | Cooking              | Insulated Holding Cabinets (Full Size)                          | Biz-Prescriptive       | Education     | ROB              | 7,665                           | 7,665                           | 69%            | 5,278                 | 0.00               | 12     | \$1,200      | 100%              | 6%                | 42%              | 6                     | 3%              | 23%           | 68.6%             | 52.4%             | 54.9%            | 33.1      |
| 9         | Cooking              | Insulated Holding Cabinets (Half-Size)                          | Biz-Prescriptive       | Education     | ROB              | 3,066                           | 3,066                           | 58%            | 1,788                 | 0.00               | 12     | \$1,500      | 50%               | 8%                | 12%              | 6                     | 3%              | 23%           | 52.9%             | 38.7%             | 39.1%            | 7.0       |
| 10        | HotWater             | Faucet Aerator  | Biz-Custom             | Education     | Retro            | 1,624                           | 1,624                           | 66%            | 1,070                 | 0.00               | 10     | \$3          | 100%              | 26%               | 100%             | 4                     | 25%             | 80%           | 84.0%             | 84.0%             | 84.0%            | 606.3     |
| 11        | HotWater             | Heat Pump Water Heater  | Biz-Custom             | Education     | ROB              | 5,415                           | 5,415                           | 35%            | 1,871                 | 0.00               | 10     | \$1,574      | 25%               | 6%                | 5%               | 1                     | 100%            | 9%            | 52.5%             | 43.4%             | 43.2%            | 6.3       |
| 12        | HotWater             | Hot Water Pipe Insulation                                       | Biz-Custom             | Education     | ROB              | 5,415                           | 5,415                           | 2%             | 108                   | 0.00               | 20     | \$60         | 100%              | 9%                | 7%               | 2                     | 100%            | 80%           | 84.0%             | 84.0%             | 84.0%            | 11.7      |
| 13        | HotWater             | Low Flow Pre-Rinse Sprayers                                     | Biz-Custom             | Education     | ROB              | 2,991                           | 2,991                           | 26%            | 764                   | 0.00               | 5      | \$35         | 100%              | 71%               | 87%              | 3                     | 25%             | 80%           | 84.0%             | 84.0%             | 84.0%            | 6.8       |
| 14        | HotWater             | ENERGY STAR Commercial Washing Machines                         | Biz-Custom             | Education     | ROB              | 1,552                           | 1,552                           | 43%            | 671                   | 0.00               | 7      | \$250        | 50%               | 14%               | 11%              | 5                     | 25%             | 35%           | 66.5%             | 53.7%             | 53.3%            | 4.1       |
| 15        | HotWater             | Ozone Commercial Laundry  | Biz-Custom             | Education     | Retro            | 2,984                           | 2,984                           | 25%            | 746                   | 0.00               | 10     | \$20,310     | 0%                | 0%                | 0%               | 6                     | 0%              | 50%           | 60.0%             | 60.0%             | 60.0%            | 5.3       |
| 16        | InteriorLighting     | LED T8 Tube Replacement   | Biz-Prescriptive Light | Education     | Retro            | 138                             | 138                             | 59%            | 82                    | 0.00               | 15     | \$7          | 100%              | 49%               | 49%              | 1                     | 85%             | 32%           | 71.1%             | 60.5%             | 60.5%            | 12.8      |
| 17        | InteriorLighting     | LED troffer retrofit kit, 2'X2' and 2'X4'                       | Biz-Prescriptive Light | Education     | Retro            | 310                             | 310                             | 50%            | 155                   | 0.00               | 18     | \$67         | 100%              | 26%               | 9%               | 1                     | 85%             | 32%           | 71.1%             | 52.9%             | 50.8%            | 5.8       |
| 18        | InteriorLighting     | LED troffer, 2'X2' and 2'X4'                                    | Biz-Prescriptive Light | Education     | Retro            | 223                             | 223                             | 50%            | 112                   | 0.00               | 18     | \$67         | 100%              | 26%               | 7%               | 1                     | 85%             | 32%           | 71.1%             | 49.3%             | 45.8%            | 4.2       |
| 19        | InteriorLighting     | LED high bay fixture  | Biz-Prescriptive Light | Education     | Retro            | 1,080                           | 1,080                           | 76%            | 821                   | 0.00               | 12     | \$323        | 100%              | 12%               | 10%              | 2                     | 1%              | 16%           | 71.1%             | 52.5%             | 52.2%            | 10.8      |
| 20        | InteriorLighting     | LED Mogul-base HID Lamp Replacing High Bay HID                  | Biz-Prescriptive Light | Education     | Retro            | 1,080                           | 1,080                           | 79%            | 855                   | 0.00               | 12     | \$110        | 100%              | 21%               | 31%              | 2                     | 1%              | 16%           | 71.1%             | 58.8%             | 59.2%            | 19.6      |
| 21        | InteriorLighting     | LED low bay fixture   | Biz-Prescriptive Light | Education     | Retro            | 1,080                           | 1,080                           | 76%            | 821                   | 0.00               | 12     | \$196        | 100%              | 20%               | 17%              | 3                     | 1%              | 16%           | 71.1%             | 56.5%             | 56.2%            | 10.8      |
| 22        | InteriorLighting     | LED Mogul-base HID Lamp Replacing Low Bay HID                   | Biz-Prescriptive Light | Education     | Retro            | 1,080                           | 1,080                           | 79%            | 855                   | 0.00               | 12     | \$60         | 100%              | 38%               | 57%              | 3                     | 1%              | 16%           | 71.1%             | 60.6%             | 61.0%            | 19.6      |
| 23        | InteriorLighting     | LED downlight, screw-in lamp, 1-3W, interior Average 2 Watts    | Biz-Prescriptive Light | Education     | ROB              | 67                              | 67                              | 88%            | 59                    | 0.00               | 4      | \$4          | 100%              | 25%               | 59%              | 4                     | 2%              | 32%           | 71.1%             | 60.3%             | 61.0%            | 10.4      |
| 24        | InteriorLighting     | LED downlight fixture   | Biz-Prescriptive Light | Education     | Retro            | 174                             | 174                             | 82%            | 142                   | 0.00               | 4      | \$13         | 100%              | 39%               | 44%              | 5                     | 11%             | 32%           | 71.1%             | 60.2%             | 60.3%            | 5.0       |
| 25        | InteriorLighting     | LED downlight, screw-in lamp, 4-20W, interior Average 11 Watts  | Biz-Prescriptive Light | Education     | ROB              | 134                             | 134                             | 84%            | 113                   | 0.00               | 4      | \$2          | 100%              | 61%               | 100%             | 5                     | 11%             | 32%           | 71.1%             | 61.7%             | 61.9%            | 20.0      |
| 26        | InteriorLighting     | DeLamp Fluorescent Fixture Average Lamp Wattage 28W             | Biz-Custom Light       | Education     | Retro            | 53                              | 53                              | 100%           | 53                    | 0.00               | 15     | \$4          | 100%              | 69%               | 53%              | 6                     | 85%             | 0%            | 71.1%             | 61.1%             | 60.8%            | 11.2      |
| 27        | Daylighting Controls | Daylighting Controls  | Biz-Custom Light       | Education     | Retro            | 8,810                           | 8,810                           | 30%            | 2,643                 | 0.00               | 12     | \$3,000      | 25%               | 5%                | 4%               | 7                     | 85%             | 8%            | 48.3%             | 39.1%             | 39.0%            | 10.0      |
| 28        | InteriorLighting     | Occupancy Sensors   | Biz-Prescriptive Light | Education     | Retro            | 1,523                           | 1,523                           | 30%            | 457                   | 0.00               | 8      | \$54         | 100%              | 37%               | 34%              | 7                     | 85%             | 8%            | 71.1%             | 59.3%             | 59.2%            | 5.9       |
| 29        | InteriorLighting     | Central Lighting Monitoring & Controls (non-networked)          | Biz-Custom Light       | Education     | Retro            | 41,703                          | 41,703                          | 20%            | 8,341                 | 0.00               | 12     | \$3,700      | 100%              | 12%               | 17%              | 7                     | 85%             | 8%            | 71.1%             | 50.8%             | 51.5%            | 9.5       |
| 30        | InteriorLighting     | Network Lighting Controls - Wireless (WiFi)                     | Biz-Custom Light       | Education     | Retro            | 16,277                          | 16,277                          | 47%            | 7,650                 | 0.00               | 8      | \$1,683      | 100%              | 24%               | 34%              | 7                     | 85%             | 8%            | 71.1%             | 56.9%             | 57.6%            | 6.8       |
| 31        | InteriorLighting     | Bi-Level Lighting Fixture - Stairwells, Hallways, and Garages   | Biz-Custom Light       | Education     | Retro            | 1,034                           | 1,034                           | 50%            | 517                   | 0.00               | 10     | \$274        | 50%               | 10%               | 8%               | 8                     | 15%             | 8%            | 62.0%             | 47.4%             | 47.1%            | 7.2       |
| 32        | InteriorLighting     | LED Exit Sign - 4 Watt Fixture (2 lamp)                         | Biz-Prescriptive Light | Education     | Retro            | 236                             | 236                             | 85%            | 201                   | 0.00               | 15     | \$60         | 100%              | 8%                | 13%              | 9                     | 1%              | 75%           | 80.0%             | 80.0%             | 80.0%            | 20.4      |
| 33        | ExteriorLighting     | LED wallpack (existing W<250)                                   | Biz-Prescriptive Light | Education     | Retro            | 856                             | 856                             | 66%            | 567                   | 0.00               | 12     | \$248        | 50%               | 10%               | 9%               | 1                     | 13%             | 46%           | 62.7%             | 56.8%             | 56.8%            | 6.6       |
| 34        | ExteriorLighting     | LED parking lot fixture (existing W<250)                        | Biz-Prescriptive Light | Education     | Retro            | 1,589                           | 1,589                           | 60%            | 959                   | 0.00               | 12     | \$756        | 25%               | 3%                | 5%               | 2                     | 13%             | 41%           | 52.8%             | 52.8%             | 52.8%            | 11.2      |
| 35        | ExteriorLighting     | LED parking lot fixture (existing W<250)                        | Biz-Prescriptive Light | Education     | Retro            | 856                             | 856                             | 66%            | 567                   | 0.00               | 12     | \$248        | 50%               | 10%               | 9%               | 3                     | 13%             | 41%           | 62.7%             | 52.8%             | 52.8%            | 6.6       |
| 36        | ExteriorLighting     | LED fuel pump canopy fixture (existing W<250)                   | Biz-Prescriptive Light | Education     | ROB              | 0                               | 0                               | 0%             | 0                     | 0.00               | 12     | \$0          | 0%                | 0%                | 0%               | 4                     | 0%              | 41%           | 71.1%             | 61.9%             | 61.9%            | 0.0       |
| 37        | ExteriorLighting     | LED fuel pump canopy fixture (existing W<250)                   | Biz-Prescriptive Light | Education     | Retro            | 0                               | 0                               | 0%             | 0                     | 0.00               | 12     | \$0          | 0%                | 0%                | 0%               | 5                     | 0%              | 41%           | 71.1%             | 61.9%             | 61.9%            | 0.0       |
| 38        | ExteriorLighting     | LED outdoor pole decorative fixture (existing W<250)            | Biz-Prescriptive Light | Education     | Retro            | 1,589                           | 1,589                           | 60%            | 959                   | 0.00               | 12     | \$756        | 25%               | 3%                | 5%               | 6                     | 13%             | 41%           | 52.8%             | 52.8%             | 52.8%            | 11.2      |
| 39        | ExteriorLighting     | LED parking garage fixture (existing W<250)                     | Biz-Prescriptive Light | Education     | Retro            | 3,235                           | 3,235                           | 60%            | 1,953                 | 0.00               | 6      | \$756        | 25%               | 3%                | 10%              | 7                     | 13%             | 41%           | 60.2%             | 52.8%             | 52.8%            | 11.8      |
| 40        | ExteriorLighting     | LED parking garage fixture (existing W<250)                     | Biz-Prescriptive Light | Education     | Retro            | 1,742                           | 1,742                           | 66%            | 1,154                 | 0.00               | 6      | \$248        | 50%               | 10%               | 19%              | 8                     | 13%             | 41%           | 66.7%             | 55.4%             | 56.0%            | 7.0       |
| 41        | ExteriorLighting     | LED Mogul-base HID Lamp Replacing Exterior HID (existing W<250) | Biz-Prescriptive Light | Education     | Retro            | 1,589                           | 1,589                           | 60%            | 959                   | 0.00               | 12     | \$756        | 25%               | 3%                | 5%               | 9                     | 13%             | 41%           | 52.8%             | 52.8%             | 52.8%            | 11.2      |
| 42        | ExteriorLighting     | LED Mogul-base HID Lamp Replacing Exterior HID (existing W<250) | Biz-Prescriptive Light | Education     | Retro            | 856                             | 856                             | 66%            | 567                   | 0.00               | 12     | \$248        | 50%               | 10%               | 9%               | 10                    | 13%             | 41%           | 62.7%             | 52.8%             | 52.8%            | 6.6       |
| 43        | Cooling              | Air Conditioner - 16 SEER (5-20 Tons)                           | Biz-Prescriptive       | Education     | ROB              | 5,057                           | 5,057                           | 13%            | 632                   | 0.00               | 15     | \$3,570      | 25%               | 5%                | 2%               | 1                     | 23%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 7.6       |
| 44        | Cooling              | Air Conditioner - 17 SEER (5-20 Tons)                           | Biz-Prescriptive       | Education     | ROB              | 5,057                           | 5,057                           | 13%            | 632                   | 0.00               | 15     | \$4,760      | 25%               | 5%                | 1%               | 1                     | 23%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 5.7       |
| 45        | Cooling              | Air Conditioner - 18 SEER (5-20 Tons)                           | Biz-Prescriptive       | Education     | ROB              | 5,057                           | 5,057                           | 19%            | 953                   | 0.00               | 15     | \$5,960      | 25%               | 5%                | 2%               | 1                     | 23%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 6.9       |
| 46        | Cooling              | Air Conditioner - 21 SEER (5-20 Tons)                           | Biz-Prescriptive       | Education     | ROB              | 5,057                           | 5,057                           | 24%            | 1,230                 | 0.00               | 15     | \$9,080      | 25%               | 5%                | 1%               | 1                     | 23%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 5.8       |
| 47        | Cooling              | Air Conditioner - 16 SEER (20+ Tons)                            | Biz-Prescriptive       | Education     | ROB              | 10,298                          | 10,298                          | 8%             | 858                   | 0.00               | 15     | \$7,140      | 25%               | 5%                | 1%               | 2                     | 23%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 5.2       |
| 48        | Cooling              | Air Conditioner - 17 SEER (20+ Tons)                            | Biz-Prescriptive       | Education     | ROB              | 10,298                          | 10,298                          | 8%             | 858                   | 0.00               | 15     | \$9,520      | 5%                | 5%                | 1%               | 2                     | 23%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 3.9       |
| 49        | Cooling              | Air Conditioner - 18 SEER (20+ Tons)                            | Biz-Prescriptive       | Education     | ROB              | 10,298                          | 10,298                          | 15%            | 1,584                 | 0.00               | 15     | \$11,920     | 25%               | 5%                | 1%               | 2                     | 23%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 5.7       |
| 50        | Cooling              | Air Conditioner - 21 SEER (20+ Tons)                            | Biz-Prescriptive       | Education     | ROB              | 10,298                          | 10,298                          | 21%            | 2,207                 | 0.00               | 15     | \$18,160     | 25%               | 5%                | 1%               | 2                     | 23%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 5.2       |
| 51        | Cooling              | Comprehensive Rooftop Unit Quality Maintenance (AC Tune-up)     | Biz-Custom             | Education     | Retro            | 27,878                          | 27,878                          | 6%             | 1,762                 | 0.00               | 3      | \$500        | 100%              | 18%               | 26%              | 3                     | 47%             | 50%           | 63.2%             | 60.0%             | 60.0%            | 7.3       |
| 52        | Cooling              | Air Side Economizer   | Biz-Custom             | Education     | Retro            | 2,832                           | 2,832                           | 3%             | 82                    | 0.00               | 5      | \$170        | 3%                | 3%                | 4%               | 4                     | 47%             | 33%           | 46.4%             | 44.8%             | 44.8%            | 3.4       |
| 53        | Cooling              | Advanced Rooftop Controls                                       | Biz-Custom             | Education     | Retro            | 2,360                           | 2,360                           | 39%            | 925                   | 0.00               | 10     | \$3,412      | 25%               | 1%                | 2%               | 5                     | 47%             | 3%            | 22.0%             | 19.7%             | 19.7%            | 22.1      |
| 54        | Cooling              | Air Conditioner - 16 SEER (<5 Tons)                             | Biz-Prescriptive       | Education     | ROB              | 2,178                           | 2,178                           | 19%            | 408                   | 0.00               | 15     | \$1,785      | 25%               | 5%                | 2%               | 6                     | 2%              | 20%           | 36.0%             | 34.1%             | 34.1%            | 9.8       |
| 55        | Cooling              | Air Conditioner - 17 SEER (<5 Tons)                             | Biz-Prescriptive       | Education     | ROB              | 2,178                           | 2,178                           | 24%            | 513                   | 0.00               | 15     | \$2,380      | 25%               | 5%                | 2%               | 6                     | 2%              | 20%           | 36.0%             | 34.1%             | 34.1%            | 9.2       |
| 56        | Cooling              | Air Conditioner - 18 SEER (<5 Tons)                             | Biz-Prescriptive       | Education     | ROB              | 2,178                           | 2,178                           | 28%            | 605                   | 0.00               | 15     | \$2,980      | 25%               | 5%                | 2%               | 6                     | 2%              | 20%           | 36.0%             | 34.1%             | 34.1%            | 8.7       |
| 57        | Cooling              | Air Conditioner - 21 SEER (<5 Tons)                             | Biz-Prescriptive       | Education     | ROB              | 2,178                           | 2,178                           | 38%            | 830                   | 0.00               | 15     | \$4,540      | 25%               | 5%                | 2%               | 6                     | 2%              | 20%           | 36.0%             | 34.1%             | 34.1%            | 7.8       |
| 58        | Cooling              | Centrifugal Chiller - Average kW/Ton = 0.626                    | Biz-Custom             | Education     | ROB              | 17,005                          | 17,005                          | 26%            | 4,460                 | 0.00               | 20     | \$10,067     | 25%               | 2%                | 3%               | 7                     | 27%             | 20%           | 36.0%             | 34.7%             | 34.8%            | 21.7      |
| 59        | Cooling              | Reciprocating Chiller - Average kW/Ton = 0.99                   | Biz-Custom             | Education     | ROB              | 20,908                          | 20,908                          | 27%            | 5,576                 | 0.00               | 20     | \$8,071      | 100%              | 4%                | 5%               | 8                     | 23%             | 20%           | 63.2%             | 36.0%             | 36.0%            | 35.0      |
| 60        | Cooling              | Screw Chiller - Average kW/Ton = 0.675                          | Biz-Custom             | Education     | ROB              | 24,418                          | 24,418                          | 23%            | 5,601                 | 0.00               | 20     | \$8,055      | 100%              | 4%                | 5%               | 9                     | 0%              | 20%           | 63.2%             | 36.0%             | 36.0%            | 34.5      |
| 61        | Cooling              | HVAC/Chiller Custom   | Biz-Custom             | Education     | Retro            | 5                               | 5                               | 20%            | 1                     | 0.00               | 12     | \$1          | 50%               | 6%                | 9%               | 10                    | 50%             | 20%           | 42.7%             | 36.0%             | 36.0%            | 8.3       |
| 62        | Cooling              | Chiller Tune-up   | Biz-Custom             | Education     | Retro            | 33,450                          | 33,450                          | 8%             | 2,676                 | 0.00               | 5      | \$836        | 100%              | 17%               | 24%              | 11                    | 50%             | 50%           | 63.2%             | 60.0%             | 60.0%            | 8.8       |
| 63        | Cooling              | PTAC - <7,000 Btuh - lodging                                    | Biz-Prescriptive       | Education     | ROB              | 238                             | 238                             | 9%             | 22                    | 0.00               | 15     | \$22         | 100%              | 50%               |                  |                       |                 |               |                   |                   |                  |           |

Appendix C: C&I Measure Assumptions

| Measure # | End-Use          | Measure Name   | Program          | Building Type | Replacement Type | Base (Existing) Annual Electric | Base (Standard) Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | End Use Measure Group | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|------------------|--|------------------|---------------|------------------|---------------------------------|---------------------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 76        | Heating          | Geothermal HP - SEER 23.1 (<5 Tons)                            | Biz-Prescriptive | Education     | ROB              | 12,230                          | 12,230                          | 46%            | 5,627                 | 0.00               | 15     | \$7,300      | 50%               | 7%                | 7%               | 1                     | 2%              | 20%           | 38.5%             | 36.0%             | 36.0%            | 7.6       |
| 77        | Heating          | Geothermal HP - SEER 29.3 (<5 Tons)                            | Biz-Prescriptive | Education     | ROB              | 12,230                          | 12,230                          | 48%            | 5,909                 | 0.00               | 15     | \$9,200      | 25%               | 8%                | 5%               | 1                     | 2%              | 20%           | 36.0%             | 36.0%             | 36.0%            | 5.2       |
| 78        | Heating          | Heat Pump - 16 SEER (5-20 Tons)                                | Biz-Prescriptive | Education     | ROB              | 51,966                          | 51,966                          | 9%             | 4,648                 | 0.00               | 15     | \$4,110      | 50%               | 20%               | 11%              | 2                     | 42%             | 20%           | 44.5%             | 36.0%             | 36.0%            | 3.5       |
| 79        | Heating          | Heat Pump - 17 SEER (5-20 Tons)                                | Biz-Prescriptive | Education     | ROB              | 51,966                          | 51,966                          | 13%            | 6,901                 | 0.00               | 15     | \$5,480      | 50%               | 20%               | 9%               | 2                     | 42%             | 20%           | 45.3%             | 36.0%             | 36.0%            | 3.4       |
| 80        | Heating          | Heat Pump - 18 SEER (5-20 Tons)                                | Biz-Prescriptive | Education     | ROB              | 51,966                          | 51,966                          | 19%            | 10,124                | 0.00               | 15     | \$6,850      | 75%               | 20%               | 7%               | 2                     | 42%             | 20%           | 54.7%             | 36.0%             | 36.0%            | 4.0       |
| 81        | Heating          | Heat Pump - 21 SEER (5-20 Tons)                                | Biz-Prescriptive | Education     | ROB              | 51,966                          | 51,966                          | 25%            | 12,917                | 0.00               | 15     | \$9,000      | 75%               | 20%               | 6%               | 2                     | 42%             | 20%           | 54.5%             | 36.0%             | 36.0%            | 3.9       |
| 82        | Heating          | Geothermal HP - SEER 20.3 (5-20 Tons)                          | Biz-Prescriptive | Education     | ROB              | 18,897                          | 18,897                          | 17%            | 3,205                 | 0.00               | 15     | \$7,700      | 50%               | 6%                | 4%               | 2                     | 42%             | 20%           | 37.2%             | 36.0%             | 36.0%            | 10.2      |
| 83        | Heating          | Geothermal HP - SEER 21.5 (5-20 Tons)                          | Biz-Prescriptive | Education     | ROB              | 18,897                          | 18,897                          | 23%            | 4,273                 | 0.00               | 15     | \$10,300     | 50%               | 5%                | 4%               | 2                     | 42%             | 20%           | 36.1%             | 36.0%             | 36.0%            | 11.6      |
| 84        | Heating          | Geothermal HP - SEER 23.1 (5-20 Tons)                          | Biz-Prescriptive | Education     | ROB              | 18,897                          | 18,897                          | 30%            | 5,643                 | 0.00               | 15     | \$12,800     | 50%               | 4%                | 4%               | 2                     | 42%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 13.4      |
| 85        | Heating          | Geothermal HP - SEER 29.3 (5-20 Tons)                          | Biz-Prescriptive | Education     | ROB              | 18,897                          | 18,897                          | 33%            | 6,215                 | 0.00               | 15     | \$17,700     | 25%               | 4%                | 3%               | 2                     | 42%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 10.4      |
| 86        | Heating          | Heat Pump - 16 SEER (20+ Tons)                                 | Biz-Prescriptive | Education     | ROB              | 107,048                         | 107,048                         | 11%            | 11,823                | 0.00               | 15     | \$8,220      | 50%               | 20%               | 6%               | 3                     | 42%             | 20%           | 47.0%             | 36.0%             | 36.0%            | 3.6       |
| 87        | Heating          | Heat Pump - 17 SEER (20+ Tons)                                 | Biz-Prescriptive | Education     | ROB              | 107,048                         | 107,048                         | 15%            | 16,327                | 0.00               | 15     | \$10,960     | 50%               | 20%               | 5%               | 3                     | 42%             | 20%           | 47.1%             | 36.0%             | 36.0%            | 3.5       |
| 88        | Heating          | Heat Pump - 18 SEER (20+ Tons)                                 | Biz-Prescriptive | Education     | ROB              | 107,048                         | 107,048                         | 21%            | 22,859                | 0.00               | 15     | \$13,700     | 75%               | 20%               | 4%               | 3                     | 42%             | 20%           | 55.3%             | 36.2%             | 36.0%            | 4.2       |
| 89        | Heating          | Heat Pump - 21 SEER (20+ Tons)                                 | Biz-Prescriptive | Education     | ROB              | 107,048                         | 107,048                         | 27%            | 28,513                | 0.00               | 15     | \$18,000     | 75%               | 20%               | 3%               | 3                     | 42%             | 20%           | 55.1%             | 36.0%             | 36.0%            | 4.1       |
| 90        | Heating          | Geothermal HP - SEER 20.3 (20+ Tons)                           | Biz-Prescriptive | Education     | ROB              | 38,650                          | 38,650                          | 19%            | 7,266                 | 0.00               | 15     | \$10,700     | 75%               | 9%                | 5%               | 3                     | 42%             | 20%           | 52.6%             | 36.0%             | 36.0%            | 10.6      |
| 91        | Heating          | Geothermal HP - SEER 21.5 (20+ Tons)                           | Biz-Prescriptive | Education     | ROB              | 38,650                          | 38,650                          | 24%            | 9,403                 | 0.00               | 15     | \$13,300     | 75%               | 8%                | 4%               | 3                     | 42%             | 20%           | 52.2%             | 36.0%             | 36.0%            | 11.9      |
| 92        | Heating          | Geothermal HP - SEER 23.1 (20+ Tons)                           | Biz-Prescriptive | Education     | ROB              | 38,650                          | 38,650                          | 31%            | 12,142                | 0.00               | 15     | \$18,300     | 75%               | 5%                | 3%               | 3                     | 42%             | 20%           | 50.8%             | 36.0%             | 36.0%            | 13.7      |
| 93        | Heating          | Geothermal HP - SEER 29.3 (20+ Tons)                           | Biz-Prescriptive | Education     | ROB              | 38,650                          | 38,650                          | 34%            | 13,287                | 0.00               | 15     | \$26,200     | 50%               | 4%                | 2%               | 3                     | 42%             | 20%           | 37.4%             | 36.0%             | 36.0%            | 15.9      |
| 94        | Heating          | PTHP - <7,000 Btuh - lodging                                   | Biz-Prescriptive | Education     | ROB              | 2,583                           | 2,583                           | 8%             | 217                   | 0.00               | 15     | \$13         | 100%              | 100%              | 100%             | 4                     | 0%              | 20%           | 63.2%             | 55.0%             | 55.0%            | 9.5       |
| 95        | Heating          | PTHP - 7,000 to 15,000 Btuh - lodging                          | Biz-Prescriptive | Education     | ROB              | 5,523                           | 5,523                           | 11%            | 620                   | 0.00               | 15     | \$45         | 100%              | 100%              | 100%             | 5                     | 0%              | 20%           | 63.2%             | 55.0%             | 55.0%            | 7.1       |
| 96        | Heating          | PTHP - >15,000 Btuh - lodging                                  | Biz-Prescriptive | Education     | ROB              | 8,901                           | 8,901                           | 14%            | 1,263                 | 0.00               | 15     | \$35         | 100%              | 100%              | 100%             | 6                     | 0%              | 20%           | 63.2%             | 55.0%             | 55.0%            | 17.7      |
| 97        | Heating          | Mini Split Ductless Heat Pump Cold Climate (Tiers & sizes TBD) | Biz-Prescriptive | Education     | ROB              | 4                               | 4                               | 25%            | 1                     | 0.00               | 12     | \$0          | 100%              | 35%               | 67%              | 7                     | 2%              | 20%           | 63.2%             | 52.8%             | 53.9%            | 33.8      |
| 98        | Heating          | Variable Refrigerant Flow Heat Pump                            | Biz-Custom       | Education     | NC               | 11                              | 11                              | 25%            | 3                     | 0.00               | 20     | \$3          | 100%              | 5%                | 3%               | 2                     | 42%             | 0%            | 63.2%             | 36.6%             | 36.4%            | 47.8      |
| 99        | Ventilation      | Kitchen Exhaust Hood Demand Ventilation Control System         | Biz-Custom       | Education     | ROB              | 5                               | 5                               | 50%            | 3                     | 0.00               | 20     | \$2          | 75%               | 8%                | 11%              | 1                     | 16%             | 24%           | 54.6%             | 39.2%             | 39.2%            | 11.1      |
| 100       | Ventilation      | Demand Controlled Ventilation                                  | Biz-Custom       | Education     | Retro            | 2,041                           | 2,041                           | 20%            | 408                   | 0.00               | 15     | \$227        | 100%              | 9%                | 14%              | 2                     | 84%             | 5%            | 63.2%             | 36.4%             | 37.1%            | 11.3      |
| 101       | Ventilation      | Pump and Fan Variable Frequency Drive Controls (Fans)          | Biz-Prescriptive | Education     | Retro            | 2,258                           | 2,258                           | 41%            | 923                   | 0.00               | 15     | \$375        | 100%              | 16%               | 18%              | 2                     | 84%             | 25%           | 63.2%             | 42.0%             | 42.4%            | 9.5       |
| 102       | Refrigeration    | Strip Curtains   | Biz-Custom       | Education     | Retro            | 334                             | 334                             | 81%            | 270                   | 0.00               | 4      | \$9          | 100%              | 100%              | 100%             | 1                     | 12%             | 26%           | 60.2%             | 52.4%             | 52.4%            | 4.1       |
| 103       | Refrigeration    | Bare Suction Line  | Biz-Custom       | Education     | Retro            | 23                              | 23                              | 93%            | 21                    | 0.00               | 15     | \$4          | 100%              | 27%               | 39%              | 2                     | 0%              | 25%           | 60.2%             | 45.7%             | 46.7%            | 9.1       |
| 104       | Refrigeration    | Floating Head Pressure Controls                                | Biz-Prescriptive | Education     | Retro            | 2,653                           | 2,653                           | 50%            | 1,327                 | 0.00               | 15     | \$80         | 100%              | 25%               | 8%               | 3                     | 8%              | 20%           | 60.2%             | 50.1%             | 49.6%            | 31.2      |
| 105       | Refrigeration    | Saturated Suction Controls                                     | Biz-Custom       | Education     | Retro            | 831                             | 831                             | 50%            | 416                   | 0.00               | 15     | \$559        | 50%               | 4%                | 6%               | 4                     | 2%              | 20%           | 36.0%             | 36.0%             | 36.0%            | 15.6      |
| 106       | Refrigeration    | Compressor Retrofit  | Biz-Custom       | Education     | Retro            | 813                             | 813                             | 20%            | 163                   | 0.00               | 15     | \$477        | 25%               | 2%                | 3%               | 5                     | 27%             | 15%           | 32.0%             | 27.4%             | 27.4%            | 15.7      |
| 107       | Refrigeration    | Electrically Commutated (EC) Walk-In Evaporator Fan Motor      | Biz-Prescriptive | Education     | Retro            | 1,268                           | 1,268                           | 65%            | 824                   | 0.00               | 15     | \$78         | 100%              | 45%               | 42%              | 6                     | 8%              | 33%           | 60.2%             | 49.8%             | 49.7%            | 11.1      |
| 108       | Refrigeration    | Evaporator Fan Motor Controls                                  | Biz-Prescriptive | Education     | Retro            | 1,912                           | 1,912                           | 25%            | 478                   | 0.00               | 13     | \$291        | 50%               | 15%               | 7%               | 7                     | 8%              | 10%           | 44.5%             | 30.1%             | 28.3%            | 4.7       |
| 109       | Refrigeration    | Variable Speed Condenser Fan                                   | Biz-Custom       | Education     | Retro            | 2,960                           | 2,960                           | 50%            | 1,480                 | 0.00               | 15     | \$1,170      | 25%               | 7%                | 9%               | 8                     | 10%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 6.8       |
| 110       | Refrigeration    | Refrigeration Economizer                                       | Biz-Custom       | Education     | Retro            | 67,850                          | 67,850                          | 2%             | 1,357                 | 0.00               | 15     | \$258        | 3%                | 3%                | 4%               | 9                     | 38%             | 0%            | 20.0%             | 15.7%             | 15.9%            | 6.8       |
| 111       | Refrigeration    | Anti-Sweat Heater Controls MT                                  | Biz-Prescriptive | Education     | Retro            | 1,313                           | 1,313                           | 55%            | 722                   | 0.00               | 12     | \$250        | 75%               | 10%               | 12%              | 10                    | 13%             | 36%           | 54.7%             | 48.8%             | 48.8%            | 8.6       |
| 112       | Refrigeration    | Auto Door Closer, Cooler                                       | Biz-Prescriptive | Education     | Retro            | 471,500                         | 471,500                         | 0%             | 943                   | 0.00               | 8      | \$157        | 100%              | 16%               | 24%              | 11                    | 9%              | 98%           | 66.4%             | 66.4%             | 66.4%            | 11.5      |
| 113       | Refrigeration    | Display Case Door Retrofit, Medium Temp                        | Biz-Prescriptive | Education     | Retro            | 1,584                           | 1,584                           | 36%            | 578                   | 0.00               | 12     | \$686        | 25%               | 22%               | 3%               | 12                    | 4%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 1.7       |
| 114       | Refrigeration    | Electrically Commutated (EC) Reach-In Evaporator Fan Motor     | Biz-Prescriptive | Education     | Retro            | 1,268                           | 1,268                           | 65%            | 824                   | 0.00               | 15     | \$78         | 100%              | 45%               | 42%              | 6                     | 8%              | 33%           | 60.2%             | 49.8%             | 49.7%            | 11.1      |
| 115       | Refrigeration    | Q-Sync Motor for Walk-In and Reach-In Evaporator Fan Motor     | Biz-Prescriptive | Education     | Retro            | 993                             | 993                             | 51%            | 504                   | 0.00               | 10     | \$96         | 100%              | 36%               | 21%              | 13                    | 2%              | 33%           | 60.2%             | 46.4%             | 46.4%            | 5.0       |
| 116       | Refrigeration    | Energy Star Reach-In Refrigerator, Glass Doors                 | Biz-Prescriptive | Education     | ROB              | 1,546                           | 1,546                           | 27%            | 410                   | 0.00               | 12     | \$600        | 25%               | 5%                | 3%               | 14                    | 12%             | 10%           | 28.0%             | 27.9%             | 27.9%            | 5.1       |
| 117       | Refrigeration    | Energy Star Reach-In Refrigerator, Solid Doors                 | Biz-Prescriptive | Education     | ROB              | 1,112                           | 1,112                           | 25%            | 283                   | 0.00               | 12     | \$600        | 5%                | 5%                | 2%               | 15                    | 12%             | 55%           | 64.0%             | 62.1%             | 61.9%            | 3.5       |
| 118       | Refrigeration    | Anti-Sweat Heater Controls LT                                  | Biz-Prescriptive | Education     | Retro            | 3,147                           | 3,147                           | 55%            | 1,731                 | 0.00               | 12     | \$250        | 100%              | 10%               | 28%              | 16                    | 4%              | 36%           | 60.2%             | 48.8%             | 48.8%            | 27.5      |
| 119       | Refrigeration    | Auto Door Closer, Freezer                                      | Biz-Prescriptive | Education     | Retro            | 419,455                         | 419,455                         | 1%             | 2,307                 | 0.00               | 8      | \$157        | 100%              | 16%               | 59%              | 17                    | 4%              | 58%           | 66.4%             | 66.4%             | 66.4%            | 27.4      |
| 120       | Refrigeration    | Display Case Door Retrofit, Low Temp                           | Biz-Prescriptive | Education     | Retro            | 2,922                           | 2,922                           | 50%            | 1,453                 | 0.00               | 12     | \$686        | 75%               | 22%               | 8%               | 17                    | 4%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 4.3       |
| 121       | Refrigeration    | Energy Star Reach-In Freezer, Glass Doors                      | Biz-Prescriptive | Education     | ROB              | 3,234                           | 3,234                           | 15%            | 488                   | 0.00               | 12     | \$450        | 25%               | 15%               | 4%               | 18                    | 4%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 2.8       |
| 122       | Refrigeration    | Energy Star Reach-In Freezer, Solid Doors                      | Biz-Prescriptive | Education     | ROB              | 4,676                           | 4,676                           | 20%            | 935                   | 0.00               | 12     | \$450        | 75%               | 15%               | 8%               | 19                    | 4%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 5.5       |
| 123       | Refrigeration    | Refrigerator - Custom  | Biz-Custom       | Education     | ROB              | 7                               | 7                               | 15%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 72%              | 20                    | 90%             | 20%           | 60.2%             | 50.0%             | 51.0%            | 9.0       |
| 124       | Refrigeration    | Retro-commissioning_Refrigerator Optimization                  | Biz-Custom RCx   | Education     | Retro            | 33                              | 33                              | 3%             | 1                     | 0.00               | 3      | \$0          | 100%              | 67%               | 22%              | 21                    | 90%             | 10%           | 60.2%             | 51.0%             | 49.0%            | 1.9       |
| 125       | Refrigeration    | Energy Star Ice Machine  | Biz-Prescriptive | Education     | ROB              | 6,993                           | 6,993                           | 10%            | 721                   | 0.00               | 15     | \$1,426      | 3%                | 3%                | 2%               | 22                    | 4%              | 49%           | 59.2%             | 57.3%             | 57.2%            | 8.8       |
| 126       | Refrigeration    | LED Refrigerated Display Case Lighting Average 6W/LF           | Biz-Prescriptive | Education     | Retro            | 1,573                           | 1,573                           | 37%            | 574                   | 0.00               | 12     | \$1,010      | 34%               | 34%               | 2%               | 23                    | 8%              | 30%           | 44.0%             | 43.1%             | 43.1%            | 0.9       |
| 127       | PlugLoads_Office | ENERGY STAR Uninterrupted Power Supply                         | Biz-Custom       | Education     | ROB              | 3,096                           | 3,096                           | 3%             | 85                    | 0.00               | 15     | \$59         | 75%               | 7%                | 11%              | 1                     | 0%              | 70%           | 76.0%             | 76.0%             | 76.0%            | 10.7      |
| 128       | PlugLoads_Office | Smart Power Strip - Commercial Use                             | Biz-Custom       | Education     | Retro            | 64                              | 64                              | 100%           | 64                    | 0.00               | 5      | \$50         | 7%                | 7%                | 10%              | 2                     | 50%             | 10%           | 44.3%             | 38.5%             | 38.9%            | 3.3       |
| 129       | PlugLoads_Office | Plug Load Occupancy Sensor                                     | Biz-Custom       | Education     | Retro            | 1,126                           | 1,126                           | 15%            | 169                   | 0.00               | 8      | \$70         | 50%               | 13%               | 18%              | 2                     | 50%             | 10%           | 59.4%             | 46.1%             | 47.0%            | 4.3       |
| 130       | PlugLoads_Office | Electrically Commutated Plug Fans in data centers              | Biz-Custom       | Education     | Retro            | 86,783                          | 86,783                          | 18%            | 15,778                | 0.00               | 15     | \$480        | 100%              | 100%              | 100%             | 3                     | 5%              | 33%           | 68.6%             | 59.7%             | 59.7%            | 16.3      |
| 131       | PlugLoads_Office | High Efficiency CRAC unit                                      | Biz-Custom       | Education     | ROB              | 541                             | 541                             | 30%            | 162                   | 0.00               | 15     | \$63         | 100%              | 14%               | 19%              | 3                     | 5%              | 33%           | 68.6%             | 48.5%             | 49.2%            | 9.9       |
| 132       | PlugLoads_Office | Computer Room Air Conditioner Economizer                       | Biz-Custom       | Education     | Retro            | 418                             | 418                             | 86%            | 358                   | 0.00               | 15     | \$82         | 100%              | 23%               | 33%              | 3                     | 5%              | 33%           | 68.6%             | 52.8%             | 53.6%            | 7.2       |
| 133       | PlugLoads_Office | Energy Star Laptop   | Biz-Custom       | Education     | ROB              | 126                             | 126                             | 33%            | 41                    | 0.00               | 4      | \$0          | 0%                | 0%                | 4                | 17%                   | 85%             | 88.0%         | 88.0%             | 88.0%             | 0.0              |           |
| 134       | PlugLoads_Office | Energy Star Monitor  | Biz-Custom       | Education     | ROB              | 72                              | 72                              | 21%            | 15                    | 0.00               | 4      | \$0          | 0%                | 0%                | 5                | 17%                   | 95%             | 96.0%         | 96.0%             | 96.0%             | 0.0              |           |
| 135       | PlugLoads_Office | Energy Star Printer/Copier/Fax                                 | Biz-Custom       | Education     | ROB              | 551                             | 551                             | 40%            | 223                   | 0.00               | 6      | \$0          | 0%                | 0%                | 6                | 17%                   | 95%             | 96.0%         | 96.0%             | 96.0%             | 0.0              |           |
| 136       | PlugLoads_Office | Energy Star Server   | Biz-Custom       | Education     | ROB              | 691                             | 691                             | 13%            | 90                    | 0.00               | 15     | \$156        | 25%               | 3%                | 4%               | 7                     | 15%             | 20%           | 36.3%             | 36.0%             | 36.0%            | 9.6       |
| 137       | PlugLoads_Office | Server Virtualization  | Biz-Custom       | Education     | Retro            | 691                             | 691                             | 13%            | 90                    | 0.00               | 15     | \$156        | 25%               | 3%                | 4%               | 7                     | 15%             | 20%           | 36.3%             | 36.0%             | 36.0%            | 9.6       |
| 138       | PlugLoads_Office | Data Center Hot/Cold Aisle Configuration                       | Biz-Custom       | Education     | Retro            | 691                             | 691                             | 13%            | 90                    | 0.00               | 15     | \$156        | 25%               | 3%                | 4%               | 7                     | 15%             | 20%           |                   |                   |                  |           |

Appendix C: C&I Measure Assumptions

| Measure # | End-Use             | Measure Name  | Program                | Building Type | Replacement Type | Base (Existing) Annual Electric | Base (Standard) Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | End Use Measure Group | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|---------------------|---|------------------------|---------------|------------------|---------------------------------|---------------------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 151       | Whole Building HVAC | Retro-commissioning_Bld Optimization                            | Biz-Custom RCx         | Education     | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 3      | \$0          | 100%              | 67%               | 22%              | 3                     | 100%            | 10%           | 63.2%             | 53.6%             | 51.6%            | 2.3       |
| 152       | WholeBld            | WholeBld - Com RET  | Biz-NC                 | Education     | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 19%              | 4                     | 40%             | 0%            | 68.6%             | 57.7%             | 56.5%            | 9.7       |
| 153       | Whole Building_NC   | WholeBld - Com NC   | Biz-NC                 | Education     | NC               | 4                               | 4                               | 25%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 72%              | 5                     | 100%            | 60%           | 68.6%             | 68.0%             | 68.0%            | 9.7       |
| 154       | Behavioral          | AMI Data Presentation & Engagement                              | Biz-Behavior           | Education     | Retro            | 100                             | 100                             | 1%             | 1                     | 0.00               | 1      | \$0          | 100%              | 100%              | 87%              | 1                     | 100%            | 10%           | 50.0%             | 50.0%             | 50.0%            | 1.3       |
| 155       | Behavioral          | BIEMS   | Biz-Behavior           | Education     | Retro            | 36                              | 36                              | 3%             | 1                     | 0.00               | 3      | \$0          | 12%               | 12%               | 5%               | 1                     | 100%            | 5%            | 42.5%             | 50.0%             | 50.0%            | 1.7       |
| 156       | Behavioral          | Building Operator Certification                                 | Biz-Behavior           | Education     | Retro            | 11,000                          | 11,000                          | 1%             | 88                    | 0.00               | 3      | \$15         | 50%               | 30%               | 12%              | 1                     | 100%            | 5%            | 42.5%             | 50.0%             | 50.0%            | 2.2       |
| 157       | Cooking             | Commercial Combination Oven (Electric)                          | Biz-Prescriptive       | Food Sales    | ROB              | 38,561                          | 38,561                          | 48%            | 18,432                | 0.00               | 12     | \$16,884     | 50%               | 6%                | 3%               | 1                     | 17%             | 53%           | 62.4%             | 62.4%             | 62.4%            | 9.3       |
| 158       | Cooking             | Commercial Electric Convection Oven                             | Biz-Prescriptive       | Food Sales    | ROB              | 12,193                          | 12,193                          | 15%            | 1,879                 | 0.00               | 12     | \$1,706      | 50%               | 15%               | 11%              | 1                     | 17%             | 53%           | 62.4%             | 62.4%             | 62.4%            | 3.9       |
| 159       | Cooking             | Commercial Electric Griddle                                     | Biz-Prescriptive       | Food Sales    | ROB              | 17,056                          | 17,056                          | 15%            | 2,596                 | 0.00               | 12     | \$3,604      | 25%               | 14%               | 7%               | 2                     | 14%             | 17%           | 39.3%             | 33.6%             | 33.6%            | 2.0       |
| 160       | Cooking             | Commercial Electric Steam Cooker                                | Biz-Prescriptive       | Food Sales    | ROB              | 19,549                          | 19,549                          | 67%            | 13,162                | 0.00               | 12     | \$3,500      | 100%              | 12%               | 14%              | 3                     | 6%              | 42%           | 68.6%             | 53.6%             | 53.6%            | 15.6      |
| 161       | Cooking             | Dishwasher Low Temp Door (Energy Star)                          | Biz-Prescriptive       | Food Sales    | ROB              | 39,279                          | 39,279                          | 41%            | 16,153                | 0.00               | 15     | \$770        | 100%              | 49%               | 65%              | 4                     | 26%             | 61%           | 68.8%             | 68.8%             | 68.8%            | 18.5      |
| 162       | Cooking             | Dishwasher High Temp Door (Energy Star)                         | Biz-Prescriptive       | Food Sales    | ROB              | 39,825                          | 39,825                          | 30%            | 11,853                | 0.00               | 15     | \$770        | 100%              | 49%               | 65%              | 4                     | 26%             | 61%           | 68.8%             | 68.8%             | 68.8%            | 13.6      |
| 163       | Cooking             | Energy efficient electric fryer                                 | Biz-Prescriptive       | Food Sales    | ROB              | 18,182                          | 18,182                          | 14%            | 2,572                 | 0.00               | 12     | \$1,706      | 50%               | 1%                | 15%              | 5                     | 27%             | 23%           | 55.0%             | 39.3%             | 40.7%            | 93.3      |
| 164       | Cooking             | Insulated Holding Cabinets (Full Size)                          | Biz-Prescriptive       | Food Sales    | ROB              | 7,665                           | 7,665                           | 69%            | 5,278                 | 0.00               | 12     | \$1,200      | 100%              | 6%                | 42%              | 6                     | 3%              | 23%           | 68.6%             | 52.4%             | 54.9%            | 31.3      |
| 165       | Cooking             | Insulated Holding Cabinets (Half-Size)                          | Biz-Prescriptive       | Food Sales    | ROB              | 3,066                           | 3,066                           | 58%            | 1,788                 | 0.00               | 12     | \$1,500      | 50%               | 8%                | 12%              | 6                     | 3%              | 23%           | 52.9%             | 38.7%             | 39.1%            | 6.6       |
| 166       | HotWater            | Faucet Aerator  | Biz-Custom             | Food Sales    | Retro            | 2,162                           | 2,162                           | 66%            | 1,425                 | 0.00               | 10     | \$3          | 100%              | 26%               | 100%             | 4                     | 25%             | 80%           | 84.0%             | 84.0%             | 84.0%            | 777.8     |
| 167       | HotWater            | Heat Pump Water Heater  | Biz-Custom             | Food Sales    | ROB              | 10,967                          | 10,967                          | 35%            | 3,788                 | 0.00               | 10     | \$1,574      | 75%               | 13%               | 10%              | 1                     | 100%            | 30%           | 69.5%             | 52.6%             | 52.2%            | 6.0       |
| 168       | HotWater            | Hot Water Pipe Insulation                                       | Biz-Custom             | Food Sales    | Retro            | 10,967                          | 10,967                          | 2%             | 219                   | 0.00               | 20     | \$60         | 100%              | 19%               | 15%              | 2                     | 100%            | 80%           | 84.0%             | 84.0%             | 84.0%            | 11.4      |
| 169       | HotWater            | Low Flow Pre-Rinse Sprayers                                     | Biz-Custom             | Food Sales    | ROB              | 2,991                           | 2,991                           | 26%            | 764                   | 0.00               | 5      | \$35         | 100%              | 71%               | 87%              | 3                     | 25%             | 80%           | 84.0%             | 84.0%             | 84.0%            | 6.6       |
| 170       | HotWater            | ENERGY STAR Commercial Washing Machines                         | Biz-Custom             | Food Sales    | ROB              | 1,552                           | 1,552                           | 43%            | 671                   | 0.00               | 7      | \$250        | 50%               | 14%               | 11%              | 5                     | 25%             | 35%           | 66.5%             | 53.7%             | 53.3%            | 3.9       |
| 171       | HotWater            | Ozone Commercial Laundry  | Biz-Custom             | Food Sales    | Retro            | 2,984                           | 2,984                           | 25%            | 746                   | 0.00               | 10     | \$20,310     | 0%                | 0%                | 0%               | 6                     | 0%              | 50%           | 60.0%             | 60.0%             | 60.0%            | 5.1       |
| 172       | InteriorLighting    | LED T8 Tube Replacement   | Biz-Prescriptive Light | Food Sales    | Retro            | 138                             | 138                             | 59%            | 82                    | 0.00               | 15     | \$7          | 100%              | 49%               | 49%              | 1                     | 89%             | 32%           | 71.1%             | 60.5%             | 60.5%            | 12.1      |
| 173       | InteriorLighting    | LED troffer retrofit kit, 2'X2' and 2'X4'                       | Biz-Prescriptive Light | Food Sales    | Retro            | 310                             | 310                             | 50%            | 155                   | 0.00               | 18     | \$67         | 100%              | 26%               | 9%               | 1                     | 89%             | 32%           | 71.1%             | 52.9%             | 50.8%            | 5.6       |
| 174       | InteriorLighting    | LED troffer, 2'X2' and 2'X4'                                    | Biz-Prescriptive Light | Food Sales    | Retro            | 223                             | 223                             | 50%            | 112                   | 0.00               | 18     | \$67         | 100%              | 26%               | 7%               | 1                     | 89%             | 32%           | 71.1%             | 49.3%             | 45.8%            | 4.0       |
| 175       | InteriorLighting    | LED high bay fixture  | Biz-Prescriptive Light | Food Sales    | Retro            | 1,080                           | 1,080                           | 76%            | 821                   | 0.00               | 12     | \$323        | 100%              | 12%               | 10%              | 2                     | 0%              | 16%           | 71.1%             | 52.5%             | 52.2%            | 10.3      |
| 176       | InteriorLighting    | LED Mogul-base HID Lamp Replacing High Bay HID                  | Biz-Prescriptive Light | Food Sales    | Retro            | 1,080                           | 1,080                           | 79%            | 855                   | 0.00               | 12     | \$110        | 100%              | 21%               | 31%              | 2                     | 0%              | 16%           | 71.1%             | 58.8%             | 59.2%            | 18.7      |
| 177       | InteriorLighting    | LED low bay fixture   | Biz-Prescriptive Light | Food Sales    | Retro            | 1,080                           | 1,080                           | 76%            | 821                   | 0.00               | 12     | \$196        | 100%              | 20%               | 17%              | 3                     | 0%              | 16%           | 71.1%             | 56.5%             | 56.2%            | 10.3      |
| 178       | InteriorLighting    | LED Mogul-base HID Lamp Replacing Low Bay HID                   | Biz-Prescriptive Light | Food Sales    | Retro            | 1,080                           | 1,080                           | 79%            | 855                   | 0.00               | 12     | \$60         | 100%              | 38%               | 57%              | 3                     | 0%              | 16%           | 71.1%             | 60.6%             | 61.0%            | 18.7      |
| 179       | InteriorLighting    | LED downlight, screw-in lamp, 1-3W, interior Average 2 Watts    | Biz-Prescriptive Light | Food Sales    | ROB              | 67                              | 67                              | 88%            | 59                    | 0.00               | 4      | \$4          | 100%              | 25%               | 59%              | 4                     | 2%              | 32%           | 71.1%             | 60.3%             | 61.0%            | 9.8       |
| 180       | InteriorLighting    | LED downlight fixture   | Biz-Prescriptive Light | Food Sales    | Retro            | 174                             | 174                             | 82%            | 142                   | 0.00               | 4      | \$13         | 100%              | 39%               | 44%              | 5                     | 9%              | 32%           | 71.1%             | 60.2%             | 60.3%            | 4.7       |
| 181       | InteriorLighting    | LED downlight, screw-in lamp, 4-20W, interior Average 11 Watts  | Biz-Prescriptive Light | Food Sales    | ROB              | 134                             | 134                             | 84%            | 113                   | 0.00               | 4      | \$2          | 100%              | 61%               | 100%             | 5                     | 9%              | 32%           | 71.1%             | 61.7%             | 61.9%            | 18.8      |
| 182       | InteriorLighting    | Delamp Fluorescent Fixture Average Lamp Wattage 28W             | Biz-Custom Light       | Food Sales    | Retro            | 53                              | 53                              | 100%           | 53                    | 0.00               | 15     | \$4          | 100%              | 69%               | 53%              | 6                     | 89%             | 0%            | 71.1%             | 61.1%             | 60.8%            | 10.7      |
| 183       | InteriorLighting    | Daylighting Controls  | Biz-Custom Light       | Food Sales    | Retro            | 8,810                           | 8,810                           | 30%            | 2,643                 | 0.00               | 12     | \$9,000      | 25%               | 5%                | 4%               | 7                     | 99%             | 8%            | 48.3%             | 39.1%             | 39.0%            | 9.6       |
| 184       | InteriorLighting    | Occupancy Sensors   | Biz-Prescriptive Light | Food Sales    | Retro            | 1,523                           | 1,523                           | 30%            | 457                   | 0.00               | 8      | \$54         | 100%              | 37%               | 34%              | 7                     | 99%             | 8%            | 71.1%             | 59.3%             | 59.2%            | 5.4       |
| 185       | InteriorLighting    | Central Lighting Monitoring & Controls (non-networked)          | Biz-Custom Light       | Food Sales    | Retro            | 41,703                          | 41,703                          | 20%            | 8,341                 | 0.00               | 12     | \$3,700      | 100%              | 12%               | 17%              | 7                     | 99%             | 8%            | 71.1%             | 50.8%             | 51.5%            | 9.0       |
| 186       | InteriorLighting    | Network Lighting Controls - Wireless (WiFi)                     | Biz-Custom Light       | Food Sales    | Retro            | 16,277                          | 16,277                          | 47%            | 7,650                 | 0.00               | 8      | \$1,683      | 100%              | 24%               | 34%              | 7                     | 99%             | 8%            | 71.1%             | 56.9%             | 57.6%            | 6.4       |
| 187       | InteriorLighting    | Bi-Level Lighting Fixture - Stairwells, Hallways, and Garages   | Biz-Custom Light       | Food Sales    | Retro            | 1,034                           | 1,034                           | 50%            | 517                   | 0.00               | 10     | \$274        | 50%               | 10%               | 8%               | 8                     | 5%              | 8%            | 62.0%             | 47.4%             | 47.1%            | 6.7       |
| 188       | InteriorLighting    | LED Exit Sign - 4 Watt Fixture (2 lamp)                         | Biz-Prescriptive Light | Food Sales    | Retro            | 236                             | 236                             | 85%            | 201                   | 0.00               | 15     | \$60         | 100%              | 8%                | 13%              | 9                     | 1%              | 75%           | 80.0%             | 80.0%             | 80.0%            | 19.3      |
| 189       | ExteriorLighting    | LED wallpack (existing W<250)                                   | Biz-Prescriptive Light | Food Sales    | Retro            | 856                             | 856                             | 66%            | 567                   | 0.00               | 12     | \$248        | 50%               | 10%               | 9%               | 1                     | 13%             | 46%           | 62.7%             | 56.8%             | 56.8%            | 6.6       |
| 190       | ExteriorLighting    | LED parking lot fixture (existing W<250)                        | Biz-Prescriptive Light | Food Sales    | Retro            | 1,589                           | 1,589                           | 60%            | 959                   | 0.00               | 12     | \$756        | 25%               | 3%                | 5%               | 2                     | 13%             | 41%           | 52.8%             | 52.8%             | 52.8%            | 11.1      |
| 191       | ExteriorLighting    | LED parking lot fixture (existing W<250)                        | Biz-Prescriptive Light | Food Sales    | Retro            | 856                             | 856                             | 66%            | 567                   | 0.00               | 12     | \$248        | 50%               | 10%               | 9%               | 3                     | 13%             | 41%           | 62.7%             | 52.8%             | 52.8%            | 6.6       |
| 192       | ExteriorLighting    | LED fuel pump canopy fixture (existing W<250)                   | Biz-Prescriptive Light | Food Sales    | Retro            | 0                               | 0                               | 0%             | 0                     | 0.00               | 12     | \$0          | 0%                | 0%                | 0%               | 4                     | 0%              | 41%           | 71.1%             | 61.9%             | 61.9%            | 0.0       |
| 193       | ExteriorLighting    | LED fuel pump canopy fixture (existing W<250)                   | Biz-Prescriptive Light | Food Sales    | Retro            | 0                               | 0                               | 0%             | 0                     | 0.00               | 12     | \$0          | 0%                | 0%                | 0%               | 5                     | 0%              | 41%           | 71.1%             | 61.9%             | 61.9%            | 0.0       |
| 194       | ExteriorLighting    | LED outdoor pole decorative fixture (existing W<250)            | Biz-Prescriptive Light | Food Sales    | Retro            | 1,589                           | 1,589                           | 60%            | 959                   | 0.00               | 12     | \$756        | 25%               | 3%                | 5%               | 6                     | 13%             | 41%           | 52.8%             | 52.8%             | 52.8%            | 11.1      |
| 195       | ExteriorLighting    | LED parking garage fixture (existing W<250)                     | Biz-Prescriptive Light | Food Sales    | Retro            | 3,235                           | 3,235                           | 60%            | 1,953                 | 0.00               | 6      | \$756        | 25%               | 3%                | 10%              | 7                     | 13%             | 41%           | 60.2%             | 52.8%             | 52.8%            | 11.7      |
| 196       | ExteriorLighting    | LED parking garage fixture (existing W<250)                     | Biz-Prescriptive Light | Food Sales    | Retro            | 1,742                           | 1,742                           | 66%            | 1,154                 | 0.00               | 6      | \$248        | 50%               | 10%               | 19%              | 8                     | 13%             | 41%           | 66.7%             | 55.4%             | 56.0%            | 6.9       |
| 197       | ExteriorLighting    | LED Mogul-base HID Lamp Replacing Exterior HID (existing W<250) | Biz-Prescriptive Light | Food Sales    | Retro            | 1,589                           | 1,589                           | 60%            | 959                   | 0.00               | 12     | \$756        | 25%               | 3%                | 5%               | 9                     | 13%             | 41%           | 52.8%             | 52.8%             | 52.8%            | 11.1      |
| 198       | ExteriorLighting    | LED Mogul-base HID Lamp Replacing Exterior HID (existing W<250) | Biz-Prescriptive Light | Food Sales    | Retro            | 856                             | 856                             | 66%            | 567                   | 0.00               | 12     | \$248        | 50%               | 10%               | 9%               | 10                    | 13%             | 41%           | 62.7%             | 52.8%             | 52.8%            | 6.6       |
| 199       | Cooling             | Air Conditioner - 16 SEER (5-20 Tons)                           | Biz-Prescriptive       | Food Sales    | ROB              | 11,421                          | 11,421                          | 13%            | 1,428                 | 0.00               | 15     | \$3,570      | 25%               | 5%                | 4%               | 1                     | 18%             | 20%           | 36.0%             | 35.0%             | 34.9%            | 9.2       |
| 200       | Cooling             | Air Conditioner - 17 SEER (5-20 Tons)                           | Biz-Prescriptive       | Food Sales    | ROB              | 11,421                          | 11,421                          | 13%            | 1,428                 | 0.00               | 15     | \$4,760      | 25%               | 5%                | 3%               | 1                     | 18%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 6.9       |
| 201       | Cooling             | Air Conditioner - 18 SEER (5-20 Tons)                           | Biz-Prescriptive       | Food Sales    | ROB              | 11,421                          | 11,421                          | 19%            | 2,152                 | 0.00               | 15     | \$5,960      | 25%               | 5%                | 4%               | 1                     | 18%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 8.4       |
| 202       | Cooling             | Air Conditioner - 21 SEER (5-20 Tons)                           | Biz-Prescriptive       | Food Sales    | ROB              | 11,421                          | 11,421                          | 24%            | 2,778                 | 0.00               | 15     | \$9,080      | 25%               | 5%                | 3%               | 1                     | 18%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 7.1       |
| 203       | Cooling             | Air Conditioner - 16 SEER (20+ Tons)                            | Biz-Prescriptive       | Food Sales    | ROB              | 23,258                          | 23,258                          | 8%             | 1,938                 | 0.00               | 15     | \$7,140      | 25%               | 5%                | 3%               | 2                     | 18%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 6.3       |
| 204       | Cooling             | Air Conditioner - 17 SEER (20+ Tons)                            | Biz-Prescriptive       | Food Sales    | ROB              | 23,258                          | 23,258                          | 8%             | 1,938                 | 0.00               | 15     | \$9,520      | 25%               | 5%                | 2%               | 2                     | 18%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 4.7       |
| 205       | Cooling             | Air Conditioner - 18 SEER (20+ Tons)                            | Biz-Prescriptive       | Food Sales    | ROB              | 23,258                          | 23,258                          | 15%            | 3,578                 | 0.00               | 15     | \$11,920     | 25%               | 5%                | 3%               | 2                     | 18%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 7.0       |
| 206       | Cooling             | Air Conditioner - 21 SEER (20+ Tons)                            | Biz-Prescriptive       | Food Sales    | ROB              | 23,258                          | 23,258                          | 21%            | 4,984                 | 0.00               | 15     | \$18,160     | 25%               | 5%                | 3%               | 2                     | 18%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 6.4       |
| 207       | Cooling             | Comprehensive Rooftop Unit Quality Maintenance (AC Tune-up)     | Biz-Custom             | Food Sales    | Retro            | 11,353                          | 11,353                          | 6%             | 718                   | 0.00               | 3      | \$500        | 25%               | 7%                | 11%              | 3                     | 36%             | 50%           | 60.0%             | 60.0%             | 60.0%            | 4.1       |
| 208       | Cooling             | Air Side Economizer   | Biz-Custom             | Food Sales    | Retro            | 6,396                           | 6,396                           | 3%             | 186                   | 0.00               | 5      | \$170        | 6%                | 6%                | 8%               | 4                     | 36%             | 33%           | 46.4%             | 46.4%             | 46.4%            | 3.0       |
| 209       | Cooling             | Advanced Rooftop Controls                                       | Biz-Custom             | Food Sales    | Retro            | 5,330                           | 5,330                           | 28%            | 1,493                 | 0.00               | 10     | \$3,412      | 25%               | 2%                | 3%               | 5                     | 36%             | 3%            | 25.8%             | 20.5%             | 20.7%            | 12.7      |
| 210       | Cooling             | Air Conditioner - 16 SEER (<5 Tons)                             | Biz-Prescriptive       | Food Sales    | ROB              | 4,920                           | 4,920                           | 19%            | 923                   | 0.00               | 15     | \$1,785      | 50%               | 5%                | 5%               | 6                     | 29%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 12.0      |
| 211       | Cooling             | Air Conditioner - 17 SEER (<5 Tons)                             | Biz-Prescriptive       | Food Sales    | ROB              | 4,920                           | 4,920                           | 24%            | 1,158                 | 0.00               | 15     | \$2,380      | 50%               | 5%                | 5%               | 6                     | 29%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 11.3      |
| 212       | Cooling             | Air Conditioner - 18 SEER (<5 Tons)                             | Biz-Prescriptive       | Food Sales    | ROB              | 4,920                           | 4,920                           | 28%            | 1,367                 | 0.00               | 15     | \$2,980      | 50%               | 5%                | 5%               | 6                     | 29%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 10.6      |
| 213       | Cooling             | Air Conditioner - 21 SEER (<5 Tons)                             | Biz-Prescriptive       | Food Sales    | ROB              | 4,9                             |                                 |                |                       |                    |        |              |                   |                   |                  |                       |                 |               |                   |                   |                  |           |

Appendix C: C&I Measure Assumptions

| Measure # | End-Use          | Measure Name   | Program          | Building Type | Replacement Type | Base (Existing) Annual Electric | Base (Standard) Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | End Use Measure Group | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|------------------|--|------------------|---------------|------------------|---------------------------------|---------------------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 226       | Heating          | Heat Pump - 16 SEER (<5 Tons)                                  | Biz-Prescriptive | Food Sales    | ROB              | 9,338                           | 9,338                           | 19%            | 1,760                 | 0.00               | 15     | \$2,055      | 50%               | 20%               | 9%               | 1                     | 20%             | 20%           | 41.4%             | 36.0%             | 36.0%            | 3.2       |
| 227       | Heating          | Heat Pump - 17 SEER (<5 Tons)                                  | Biz-Prescriptive | Food Sales    | ROB              | 9,338                           | 9,338                           | 22%            | 2,069                 | 0.00               | 15     | \$2,740      | 50%               | 20%               | 8%               | 1                     | 20%             | 20%           | 39.1%             | 36.0%             | 36.0%            | 2.9       |
| 228       | Heating          | Heat Pump - 18 SEER (<5 Tons)                                  | Biz-Prescriptive | Food Sales    | ROB              | 9,338                           | 9,338                           | 26%            | 2,383                 | 0.00               | 15     | \$3,425      | 50%               | 20%               | 7%               | 1                     | 20%             | 20%           | 38.4%             | 36.0%             | 36.0%            | 2.7       |
| 229       | Heating          | Heat Pump - 21 SEER (<5 Tons)                                  | Biz-Prescriptive | Food Sales    | ROB              | 9,338                           | 9,338                           | 32%            | 2,957                 | 0.00               | 15     | \$4,500      | 50%               | 20%               | 7%               | 1                     | 20%             | 20%           | 38.1%             | 36.0%             | 36.0%            | 2.7       |
| 230       | Heating          | Geothermal HP - SEER 20.3 (<5 Tons)                            | Biz-Prescriptive | Food Sales    | ROB              | 9,338                           | 9,338                           | 36%            | 3,371                 | 0.00               | 15     | \$4,700      | 50%               | 11%               | 7%               | 1                     | 20%             | 20%           | 38.5%             | 36.0%             | 36.0%            | 5.1       |
| 231       | Heating          | Geothermal HP - SEER 21.5 (<5 Tons)                            | Biz-Prescriptive | Food Sales    | ROB              | 9,338                           | 9,338                           | 40%            | 3,742                 | 0.00               | 15     | \$7,300      | 25%               | 7%                | 5%               | 1                     | 20%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 5.6       |
| 232       | Heating          | Geothermal HP - SEER 23.1 (<5 Tons)                            | Biz-Prescriptive | Food Sales    | ROB              | 9,338                           | 9,338                           | 46%            | 4,250                 | 0.00               | 15     | \$7,300      | 25%               | 7%                | 6%               | 1                     | 20%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 6.4       |
| 233       | Heating          | Geothermal HP - SEER 29.3 (<5 Tons)                            | Biz-Prescriptive | Food Sales    | ROB              | 9,338                           | 9,338                           | 52%            | 4,838                 | 0.00               | 15     | \$9,200      | 25%               | 8%                | 5%               | 1                     | 20%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 4.5       |
| 234       | Heating          | Heat Pump - 16 SEER (5-20 Tons)                                | Biz-Prescriptive | Food Sales    | ROB              | 32,040                          | 32,040                          | 10%            | 3,193                 | 0.00               | 15     | \$4,110      | 50%               | 20%               | 8%               | 2                     | 25%             | 20%           | 38.8%             | 36.0%             | 36.0%            | 2.7       |
| 235       | Heating          | Heat Pump - 17 SEER (5-20 Tons)                                | Biz-Prescriptive | Food Sales    | ROB              | 32,040                          | 32,040                          | 13%            | 4,183                 | 0.00               | 15     | \$5,480      | 25%               | 20%               | 8%               | 2                     | 25%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 2.4       |
| 236       | Heating          | Heat Pump - 18 SEER (5-20 Tons)                                | Biz-Prescriptive | Food Sales    | ROB              | 32,040                          | 32,040                          | 19%            | 6,183                 | 0.00               | 15     | \$6,850      | 50%               | 20%               | 7%               | 2                     | 25%             | 20%           | 40.7%             | 36.0%             | 36.0%            | 2.8       |
| 237       | Heating          | Heat Pump - 21 SEER (5-20 Tons)                                | Biz-Prescriptive | Food Sales    | ROB              | 32,040                          | 32,040                          | 25%            | 7,915                 | 0.00               | 15     | \$9,000      | 50%               | 20%               | 6%               | 2                     | 25%             | 20%           | 40.2%             | 36.0%             | 36.0%            | 2.7       |
| 238       | Heating          | Geothermal HP - SEER 20.3 (5-20 Tons)                          | Biz-Prescriptive | Food Sales    | ROB              | 17,672                          | 17,672                          | 32%            | 5,610                 | 0.00               | 15     | \$7,700      | 75%               | 6%                | 6%               | 2                     | 25%             | 20%           | 51.5%             | 36.0%             | 36.0%            | 11.8      |
| 239       | Heating          | Geothermal HP - SEER 21.5 (5-20 Tons)                          | Biz-Prescriptive | Food Sales    | ROB              | 17,672                          | 17,672                          | 36%            | 6,361                 | 0.00               | 15     | \$10,300     | 50%               | 5%                | 5%               | 2                     | 25%             | 20%           | 38.5%             | 36.0%             | 36.0%            | 12.9      |
| 240       | Heating          | Geothermal HP - SEER 23.1 (5-20 Tons)                          | Biz-Prescriptive | Food Sales    | ROB              | 17,672                          | 17,672                          | 42%            | 7,386                 | 0.00               | 15     | \$12,800     | 50%               | 4%                | 4%               | 2                     | 25%             | 20%           | 37.7%             | 36.0%             | 36.0%            | 14.4      |
| 241       | Heating          | Geothermal HP - SEER 29.3 (5-20 Tons)                          | Biz-Prescriptive | Food Sales    | ROB              | 17,672                          | 17,672                          | 49%            | 8,586                 | 0.00               | 15     | \$17,700     | 25%               | 4%                | 3%               | 2                     | 25%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 11.4      |
| 242       | Heating          | Heat Pump - 16 SEER (20+ Tons)                                 | Biz-Prescriptive | Food Sales    | ROB              | 65,783                          | 65,783                          | 10%            | 6,757                 | 0.00               | 15     | \$8,220      | 25%               | 20%               | 6%               | 3                     | 25%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 2.4       |
| 243       | Heating          | Heat Pump - 17 SEER (20+ Tons)                                 | Biz-Prescriptive | Food Sales    | ROB              | 65,783                          | 65,783                          | 13%            | 8,737                 | 0.00               | 15     | \$10,960     | 25%               | 20%               | 5%               | 3                     | 25%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 2.1       |
| 244       | Heating          | Heat Pump - 18 SEER (20+ Tons)                                 | Biz-Prescriptive | Food Sales    | ROB              | 65,783                          | 65,783                          | 20%            | 12,929                | 0.00               | 15     | \$13,700     | 50%               | 20%               | 4%               | 3                     | 25%             | 20%           | 40.9%             | 36.0%             | 36.0%            | 2.7       |
| 245       | Heating          | Heat Pump - 21 SEER (20+ Tons)                                 | Biz-Prescriptive | Food Sales    | ROB              | 65,783                          | 65,783                          | 25%            | 16,546                | 0.00               | 15     | \$18,000     | 50%               | 20%               | 3%               | 3                     | 25%             | 20%           | 40.6%             | 36.0%             | 36.0%            | 2.7       |
| 246       | Heating          | Geothermal HP - SEER 20.3 (20+ Tons)                           | Biz-Prescriptive | Food Sales    | ROB              | 35,720                          | 35,720                          | 32%            | 11,597                | 0.00               | 15     | \$10,700     | 100%              | 9%                | 5%               | 3                     | 25%             | 20%           | 63.2%             | 36.0%             | 36.0%            | 12.0      |
| 247       | Heating          | Geothermal HP - SEER 21.5 (20+ Tons)                           | Biz-Prescriptive | Food Sales    | ROB              | 35,720                          | 35,720                          | 37%            | 13,099                | 0.00               | 15     | \$13,300     | 75%               | 8%                | 4%               | 3                     | 25%             | 20%           | 53.9%             | 36.0%             | 36.0%            | 13.0      |
| 248       | Heating          | Geothermal HP - SEER 23.1 (20+ Tons)                           | Biz-Prescriptive | Food Sales    | ROB              | 35,720                          | 35,720                          | 42%            | 15,148                | 0.00               | 15     | \$18,300     | 75%               | 5%                | 3%               | 3                     | 25%             | 20%           | 52.3%             | 36.0%             | 36.0%            | 14.6      |
| 249       | Heating          | Geothermal HP - SEER 29.3 (20+ Tons)                           | Biz-Prescriptive | Food Sales    | ROB              | 35,720                          | 35,720                          | 49%            | 17,549                | 0.00               | 15     | \$26,200     | 50%               | 4%                | 2%               | 3                     | 25%             | 20%           | 39.0%             | 36.0%             | 36.0%            | 17.2      |
| 250       | Heating          | PTHP - <7,000 Btuh - lodging                                   | Biz-Prescriptive | Food Sales    | ROB              | 1,568                           | 1,568                           | 9%             | 135                   | 0.00               | 15     | \$13         | 100%              | 100%              | 100%             | 4                     | 0%              | 20%           | 63.2%             | 55.0%             | 55.0%            | 6.8       |
| 251       | Heating          | PTHP - 7,000 to 15,000 Btuh - lodging                          | Biz-Prescriptive | Food Sales    | ROB              | 3,390                           | 3,390                           | 11%            | 362                   | 0.00               | 15     | \$45         | 100%              | 100%              | 100%             | 5                     | 0%              | 20%           | 63.2%             | 55.0%             | 53.9%            | 4.7       |
| 252       | Heating          | PTHP - >15,000 Btuh - lodging                                  | Biz-Prescriptive | Food Sales    | ROB              | 5,539                           | 5,539                           | 13%            | 710                   | 0.00               | 15     | \$35         | 100%              | 100%              | 100%             | 6                     | 0%              | 20%           | 63.2%             | 55.0%             | 55.0%            | 11.3      |
| 253       | Heating          | Mini Split Ductless Heat Pump Cold Climate (Tiers & sizes TBD) | Biz-Prescriptive | Food Sales    | ROB              | 4                               | 4                               | 25%            | 1                     | 0.00               | 12     | \$0          | 100%              | 35%               | 67%              | 7                     | 20%             | 20%           | 63.2%             | 51.8%             | 53.4%            | 18.1      |
| 254       | Heating          | Variable Refrigerant Flow Heat Pump                            | Biz-Custom       | Food Sales    | NC               | 11                              | 11                              | 25%            | 3                     | 0.00               | 20     | \$3          | 100%              | 5%                | 3%               | 2                     | 25%             | 0%            | 63.2%             | 32.0%             | 31.8%            | 25.7      |
| 255       | Ventilation      | Kitchen Exhaust Hood Demand Ventilation Control System         | Biz-Custom       | Food Sales    | ROB              | 5                               | 5                               | 50%            | 3                     | 0.00               | 20     | \$2          | 75%               | 8%                | 11%              | 1                     | 9%              | 24%           | 54.6%             | 39.2%             | 39.2%            | 10.6      |
| 256       | Ventilation      | Demand Controlled Ventilation                                  | Biz-Custom       | Food Sales    | Retro            | 2,523                           | 2,523                           | 20%            | 505                   | 0.00               | 15     | \$227        | 100%              | 12%               | 17%              | 2                     | 91%             | 5%            | 63.2%             | 41.5%             | 42.2%            | 14.4      |
| 257       | Ventilation      | Pump and Fan Variable Frequency Drive Controls (Fans)          | Biz-Prescriptive | Food Sales    | Retro            | 2,258                           | 2,258                           | 41%            | 923                   | 0.00               | 15     | \$375        | 100%              | 16%               | 18%              | 2                     | 91%             | 25%           | 63.2%             | 42.0%             | 42.4%            | 9.1       |
| 258       | Refrigeration    | Strip Curtains   | Biz-Custom       | Food Sales    | Retro            | 334                             | 334                             | 81%            | 270                   | 0.00               | 4      | \$9          | 100%              | 100%              | 100%             | 1                     | 16%             | 26%           | 60.2%             | 52.4%             | 52.4%            | 4.2       |
| 259       | Refrigeration    | Bare Suction Line  | Biz-Custom       | Food Sales    | Retro            | 23                              | 23                              | 93%            | 21                    | 0.00               | 15     | \$4          | 100%              | 27%               | 39%              | 2                     | 0%              | 25%           | 60.2%             | 45.6%             | 46.6%            | 9.2       |
| 260       | Refrigeration    | Floating Head Pressure Controls                                | Biz-Prescriptive | Food Sales    | Retro            | 2,653                           | 2,653                           | 50%            | 1,327                 | 0.00               | 15     | \$80         | 100%              | 25%               | 41%              | 3                     | 8%              | 45%           | 60.2%             | 56.0%             | 56.0%            | 31.6      |
| 261       | Refrigeration    | Saturated Suction Controls                                     | Biz-Custom       | Food Sales    | Retro            | 831                             | 831                             | 50%            | 416                   | 0.00               | 15     | \$559        | 50%               | 4%                | 6%               | 4                     | 2%              | 45%           | 56.0%             | 56.0%             | 56.0%            | 15.7      |
| 262       | Refrigeration    | Compressor Retrofit  | Biz-Custom       | Food Sales    | Retro            | 813                             | 813                             | 20%            | 163                   | 0.00               | 15     | \$477        | 25%               | 2%                | 3%               | 5                     | 20%             | 15%           | 32.0%             | 27.4%             | 27.4%            | 15.8      |
| 263       | Refrigeration    | Electronically Commutated (EC) Walk-In Evaporator Fan Motor    | Biz-Prescriptive | Food Sales    | Retro            | 1,268                           | 1,268                           | 65%            | 824                   | 0.00               | 15     | \$78         | 100%              | 45%               | 42%              | 6                     | 10%             | 33%           | 60.2%             | 49.8%             | 49.6%            | 11.2      |
| 264       | Refrigeration    | Evaporator Fan Motor Controls                                  | Biz-Prescriptive | Food Sales    | Retro            | 1,912                           | 1,912                           | 25%            | 478                   | 0.00               | 13     | \$291        | 50%               | 15%               | 7%               | 7                     | 20%             | 10%           | 44.4%             | 30.0%             | 28.3%            | 4.7       |
| 265       | Refrigeration    | Variable Speed Condenser Fan                                   | Biz-Custom       | Food Sales    | Retro            | 2,960                           | 2,960                           | 50%            | 1,480                 | 0.00               | 15     | \$1,170      | 25%               | 7%                | 9%               | 8                     | 14%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 6.9       |
| 266       | Refrigeration    | Refrigeration Economizer                                       | Biz-Custom       | Food Sales    | Retro            | 67,850                          | 67,850                          | 2%             | 1,357                 | 0.00               | 15     | \$2,558      | 3%                | 3%                | 4%               | 9                     | 52%             | 0%            | 20.0%             | 15.7%             | 15.9%            | 6.9       |
| 267       | Refrigeration    | Anti-Sweat Heater Controls MT                                  | Biz-Prescriptive | Food Sales    | Retro            | 1,313                           | 1,313                           | 55%            | 722                   | 0.00               | 12     | \$250        | 75%               | 10%               | 12%              | 10                    | 8%              | 36%           | 54.7%             | 48.8%             | 48.8%            | 8.7       |
| 268       | Refrigeration    | Auto Door Closer, Cooler                                       | Biz-Prescriptive | Food Sales    | Retro            | 471,500                         | 471,500                         | 0%             | 943                   | 0.00               | 8      | \$157        | 100%              | 16%               | 24%              | 11                    | 6%              | 32%           | 60.2%             | 45.7%             | 46.3%            | 11.6      |
| 269       | Refrigeration    | Display Case Door Retrofit, Medium Temp                        | Biz-Prescriptive | Food Sales    | Retro            | 1,584                           | 1,584                           | 36%            | 578                   | 0.00               | 12     | \$686        | 25%               | 22%               | 3%               | 12                    | 2%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 1.7       |
| 270       | Refrigeration    | Electronically Commutated (EC) Reach-In Evaporator Fan Motor   | Biz-Prescriptive | Food Sales    | Retro            | 1,268                           | 1,268                           | 65%            | 824                   | 0.00               | 15     | \$78         | 100%              | 45%               | 42%              | 13                    | 3%              | 33%           | 60.2%             | 49.8%             | 49.6%            | 11.3      |
| 271       | Refrigeration    | Q-Sync Motor for Walk-In and Reach-In Evaporator Fan Motor     | Biz-Prescriptive | Food Sales    | Retro            | 993                             | 993                             | 51%            | 504                   | 0.00               | 10     | \$96         | 100%              | 36%               | 21%              | 13                    | 1%              | 33%           | 60.2%             | 46.4%             | 46.4%            | 5.1       |
| 272       | Refrigeration    | Energy Star Reach-In Refrigerator, Glass Doors                 | Biz-Prescriptive | Food Sales    | ROB              | 1,546                           | 1,546                           | 27%            | 410                   | 0.00               | 12     | \$600        | 25%               | 5%                | 3%               | 14                    | 8%              | 55%           | 64.0%             | 64.0%             | 63.9%            | 5.1       |
| 273       | Refrigeration    | Energy Star Reach-In Refrigerator, Solid Doors                 | Biz-Prescriptive | Food Sales    | ROB              | 1,112                           | 1,112                           | 25%            | 283                   | 0.00               | 12     | \$600        | 5%                | 5%                | 2%               | 15                    | 8%              | 55%           | 64.0%             | 62.1%             | 61.9%            | 3.5       |
| 274       | Refrigeration    | Anti-Sweat Heater Controls LT                                  | Biz-Prescriptive | Food Sales    | Retro            | 3,147                           | 3,147                           | 55%            | 1,731                 | 0.00               | 12     | \$250        | 100%              | 10%               | 28%              | 16                    | 3%              | 36%           | 60.2%             | 48.8%             | 48.8%            | 27.7      |
| 275       | Refrigeration    | Auto Door Closer, Freezer                                      | Biz-Prescriptive | Food Sales    | Retro            | 419,455                         | 419,455                         | 1%             | 2,307                 | 0.00               | 8      | \$157        | 100%              | 16%               | 59%              | 17                    | 3%              | 32%           | 60.2%             | 49.6%             | 51.0%            | 27.7      |
| 276       | Refrigeration    | Display Case Door Retrofit, Low Temp                           | Biz-Prescriptive | Food Sales    | Retro            | 2,922                           | 2,922                           | 50%            | 1,453                 | 0.00               | 12     | \$686        | 75%               | 22%               | 8%               | 17                    | 3%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 4.3       |
| 277       | Refrigeration    | Energy Star Reach-In Freezer, Glass Doors                      | Biz-Prescriptive | Food Sales    | ROB              | 3,234                           | 3,234                           | 15%            | 488                   | 0.00               | 12     | \$450        | 25%               | 15%               | 4%               | 18                    | 3%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 2.9       |
| 278       | Refrigeration    | Energy Star Reach-In Freezer, Solid Doors                      | Biz-Prescriptive | Food Sales    | ROB              | 4,676                           | 4,676                           | 20%            | 935                   | 0.00               | 12     | \$450        | 75%               | 15%               | 8%               | 19                    | 3%              | 35%           | 64.0%             | 64.0%             | 64.0%            | 5.5       |
| 279       | Refrigeration    | Refrigeration - Custom   | Biz-Custom       | Food Sales    | ROB              | 7                               | 7                               | 15%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 72%              | 20                    | 90%             | 20%           | 60.2%             | 49.9%             | 51.0%            | 9.1       |
| 280       | Refrigeration    | Retro-commissioning Refrigerator Optimization                  | Biz-Custom RCX   | Food Sales    | Retro            | 33                              | 33                              | 3%             | 1                     | 0.00               | 3      | \$0          | 100%              | 67%               | 22%              | 21                    | 90%             | 10%           | 60.2%             | 50.9%             | 49.0%            | 2.0       |
| 281       | Refrigeration    | Energy Star Ice Machine  | Biz-Prescriptive | Food Sales    | ROB              | 6,993                           | 6,993                           | 10%            | 721                   | 0.00               | 15     | \$1,426      | 3%                | 3%                | 2%               | 22                    | 0%              | 49%           | 59.2%             | 57.2%             | 57.2%            | 8.9       |
| 282       | Refrigeration    | LED Refrigerated Display Case Lighting Average 6W/LF           | Biz-Prescriptive | Food Sales    | Retro            | 1,573                           | 1,573                           | 37%            | 574                   | 0.00               | 12     | \$1,010      | 34%               | 34%               | 2%               | 23                    | 5%              | 30%           | 44.0%             | 44.0%             | 43.1%            | 0.8       |
| 283       | PlugLoads_Office | ENERGY STAR Uninterrupted Power Supply                         | Biz-Custom       | Food Sales    | ROB              | 3,096                           | 3,096                           | 3%             | 85                    | 0.00               | 15     | \$59         | 75%               | 7%                | 11%              | 1                     | 0%              | 70%           | 76.0%             | 76.0%             | 76.0%            | 10.5      |
| 284       | PlugLoads_Office | Smart Power Strip - Commercial Use                             | Biz-Custom       | Food Sales    | Retro            | 64                              | 64                              | 100%           | 64                    | 0.00               | 5      | \$50         | 7%                | 7%                | 10%              | 2                     | 50%             | 10%           | 44.3%             | 38.5%             | 38.9%            | 3.2       |
| 285       | PlugLoads_Office | Plug Load Occupancy Sensor                                     | Biz-Custom       | Food Sales    | Retro            | 1,126                           | 1,126                           | 15%            | 169                   | 0.00               | 8      | \$70         | 50%               | 13%               | 18%              | 2                     | 50%             | 10%           | 59.4%             | 46.1%             | 47.0%            | 4.1       |
| 286       | PlugLoads_Office | Electrically Commutated Plug Fans in data centers              | Biz-Custom       | Food Sales    | Retro            | 86,783                          | 86,783                          | 18%            | 15,778                | 0.00               | 15     | \$480        | 100%              | 100%              | 100%             | 3                     | 0%              | 33%           | 68.6%             | 59.7%             | 59.7%            | 15.9      |
| 287       | PlugLoads_Office | High Efficiency CRAC unit                                      | Biz-Custom       | Food Sales    | ROB              | 541                             | 541                             | 30%            | 162                   |                    |        |              |                   |                   |                  |                       |                 |               |                   |                   |                  |           |

Appendix C: C&I Measure Assumptions

| Measure # | End-Use             | Measure Name  | Program                | Building Type | Replacement Type | Base (Existing) Annual Electric | Base (Standard) Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | End Use Measure Group | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|---------------------|---|------------------------|---------------|------------------|---------------------------------|---------------------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 301       | Miscellaneous       | Power Distribution Equipment Upgrades                           | Biz-Custom             | Food Sales    | Retro            | 1,150                           | 1,150                           | 1%             | 6                     | 0.00               | 30     | \$8          | 75%               | 4%                | 6%               | 1                     | 86%             | 20%           | 58.1%             | 36.0%             | 36.0%            | 18.1      |
| 302       | Miscellaneous       | Vending Machine Controller - Non-Refrigerated                   | Biz-Custom             | Food Sales    | Retro            | 745                             | 745                             | 46%            | 343                   | 0.00               | 5      | \$80         | 63%               | 63%               | 32%              | 2                     | 1%              | 66%           | 72.8%             | 72.8%             | 72.8%            | 0.9       |
| 303       | Miscellaneous       | Vending Machine Controller - Refrigerated                       | Biz-Custom             | Food Sales    | Retro            | 1,739                           | 1,739                           | 46%            | 800                   | 0.00               | 10     | \$216        | 100%              | 35%               | 28%              | 3                     | 2%              | 66%           | 72.8%             | 72.8%             | 72.8%            | 3.3       |
| 304       | Miscellaneous       | Miscellaneous Custom  | Biz-Custom             | Food Sales    | Retro            | 5                               | 5                               | 20%            | 1                     | 0.00               | 10     | \$0          | 100%              | 50%               | 72%              | 4                     | 14%             | 20%           | 68.6%             | 57.8%             | 58.7%            | 7.9       |
| 305       | Whole Building_HVAC | HVAC - Energy Management System                                 | Biz-Prescriptive       | Food Sales    | Retro            | 6,960                           | 6,960                           | 15%            | 1,044                 | 0.00               | 15     | \$4,000      | 3%                | 3%                | 2%               | 1                     | 100%            | 1%            | 20.8%             | 18.4%             | 18.4%            | 4.1       |
| 306       | Whole Building_HVAC | Guest room energy management system                             | Biz-Custom             | Food Sales    | Retro            | 0                               | 0                               | 0%             | 0                     | 0.00               | 8      | \$0          | 0%                | 0%                | 0%               | 2                     | 0%              | 0%            | 63.2%             | 55.0%             | 55.0%            | 0.0       |
| 307       | Whole Building_HVAC | Retro-commissioning_Bld Optimization                            | Biz-Custom RCx         | Food Sales    | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 3      | \$0          | 100%              | 67%               | 22%              | 3                     | 100%            | 10%           | 63.2%             | 53.6%             | 51.7%            | 2.1       |
| 308       | WholeBld            | WholeBld - Com RET  | Biz-NC                 | Food Sales    | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 19%              | 4                     | 40%             | 0%            | 68.6%             | 57.8%             | 56.6%            | 9.2       |
| 309       | Whole Building_NC   | WholeBld - Com NC   | Biz-NC                 | Food Sales    | NC               | 4                               | 4                               | 25%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 72%              | 5                     | 100%            | 60%           | 68.6%             | 68.0%             | 68.0%            | 9.2       |
| 310       | Behavioral          | AMI Data Presentation & Engagement                              | Biz-Behavior           | Food Sales    | Retro            | 100                             | 100                             | 1%             | 1                     | 0.00               | 1      | \$0          | 100%              | 100%              | 87%              | 1                     | 100%            | 10%           | 50.0%             | 50.0%             | 50.0%            | 1.2       |
| 311       | Behavioral          | BIEMS   | Biz-Behavior           | Food Sales    | Retro            | 88                              | 88                              | 1%             | 1                     | 0.00               | 3      | \$0          | 12%               | 12%               | 5%               | 1                     | 100%            | 5%            | 42.5%             | 50.0%             | 50.0%            | 1.5       |
| 312       | Behavioral          | Building Operator Certification                                 | Biz-Behavior           | Food Sales    | Retro            | 48,700                          | 48,700                          | 1%             | 390                   | 0.00               | 3      | \$67         | 50%               | 30%               | 12%              | 1                     | 100%            | 5%            | 42.5%             | 50.0%             | 50.0%            | 2.1       |
| 313       | Cooking             | Commercial Combination Oven (Electric)                          | Biz-Prescriptive       | Food Service  | ROB              | 38,561                          | 38,561                          | 48%            | 18,432                | 0.00               | 12     | \$16,884     | 50%               | 6%                | 3%               | 1                     | 17%             | 53%           | 62.4%             | 62.4%             | 62.4%            | 9.3       |
| 314       | Cooking             | Commercial Electric Convection Oven                             | Biz-Prescriptive       | Food Service  | ROB              | 12,193                          | 12,193                          | 15%            | 1,879                 | 0.00               | 12     | \$1,706      | 50%               | 15%               | 11%              | 1                     | 17%             | 53%           | 62.4%             | 62.4%             | 62.4%            | 3.9       |
| 315       | Cooking             | Commercial Electric Griddle                                     | Biz-Prescriptive       | Food Service  | ROB              | 17,056                          | 17,056                          | 15%            | 2,596                 | 0.00               | 12     | \$3,604      | 25%               | 14%               | 7%               | 2                     | 14%             | 17%           | 39.3%             | 33.6%             | 33.6%            | 2.0       |
| 316       | Cooking             | Commercial Electric Steam Cooker                                | Biz-Prescriptive       | Food Service  | ROB              | 19,549                          | 19,549                          | 67%            | 13,162                | 0.00               | 12     | \$3,500      | 100%              | 12%               | 14%              | 3                     | 6%              | 42%           | 68.6%             | 53.6%             | 53.6%            | 15.7      |
| 317       | Cooking             | Dishwasher - Low Temp Door (Energy Star)                        | Biz-Prescriptive       | Food Service  | ROB              | 39,279                          | 39,279                          | 41%            | 16,153                | 0.00               | 15     | \$770        | 100%              | 49%               | 65%              | 4                     | 26%             | 61%           | 68.8%             | 68.8%             | 68.8%            | 18.6      |
| 318       | Cooking             | Dishwasher High Temp Door (Energy Star)                         | Biz-Prescriptive       | Food Service  | ROB              | 39,825                          | 39,825                          | 30%            | 11,853                | 0.00               | 15     | \$770        | 100%              | 49%               | 65%              | 4                     | 26%             | 61%           | 68.8%             | 68.8%             | 68.8%            | 13.7      |
| 319       | Cooking             | Energy efficient electric fryer                                 | Biz-Prescriptive       | Food Service  | ROB              | 18,182                          | 18,182                          | 14%            | 2,572                 | 0.00               | 12     | \$1,706      | 50%               | 1%                | 15%              | 5                     | 27%             | 23%           | 55.0%             | 39.3%             | 40.7%            | 94.0      |
| 320       | Cooking             | Insulated Holding Cabinets (Full Size)                          | Biz-Prescriptive       | Food Service  | ROB              | 7,665                           | 7,665                           | 69%            | 5,278                 | 0.00               | 12     | \$1,200      | 100%              | 6%                | 42%              | 6                     | 3%              | 23%           | 68.6%             | 52.4%             | 54.9%            | 31.5      |
| 321       | Cooking             | Insulated Holding Cabinets (Half-Size)                          | Biz-Prescriptive       | Food Service  | ROB              | 3,066                           | 3,066                           | 58%            | 1,788                 | 0.00               | 12     | \$1,500      | 50%               | 8%                | 12%              | 6                     | 3%              | 23%           | 52.9%             | 38.7%             | 39.1%            | 6.6       |
| 322       | HotWater            | Faucet Aerator  | Biz-Custom             | Food Service  | Retro            | 2,162                           | 2,162                           | 66%            | 1,425                 | 0.00               | 10     | \$3          | 100%              | 26%               | 100%             | 4                     | 25%             | 80%           | 84.0%             | 84.0%             | 84.0%            | 772.3     |
| 323       | HotWater            | Heat Pump Water Heater  | Biz-Custom             | Food Service  | ROB              | 5,033                           | 5,033                           | 35%            | 1,738                 | 0.00               | 10     | \$1,574      | 25%               | 6%                | 4%               | 1                     | 100%            | 30%           | 51.7%             | 44.0%             | 44.0%            | 5.9       |
| 324       | HotWater            | Hot Water Pipe Insulation                                       | Biz-Custom             | Food Service  | ROB              | 5,033                           | 5,033                           | 2%             | 101                   | 0.00               | 20     | \$60         | 75%               | 9%                | 7%               | 2                     | 100%            | 80%           | 84.0%             | 84.0%             | 84.0%            | 11.3      |
| 325       | HotWater            | Low Flow Pre-Rinse Sprayers                                     | Biz-Custom             | Food Service  | ROB              | 2,991                           | 2,991                           | 26%            | 764                   | 0.00               | 5      | \$35         | 100%              | 71%               | 87%              | 3                     | 25%             | 80%           | 84.0%             | 84.0%             | 84.0%            | 6.6       |
| 326       | HotWater            | ENERGY STAR Commercial Washing Machines                         | Biz-Custom             | Food Service  | Retro            | 1,552                           | 1,552                           | 43%            | 671                   | 0.00               | 7      | \$250        | 50%               | 14%               | 11%              | 5                     | 25%             | 35%           | 66.5%             | 53.7%             | 53.3%            | 3.9       |
| 327       | HotWater            | Ozone Commercial Laundry  | Biz-Custom             | Food Service  | Retro            | 2,984                           | 2,984                           | 25%            | 746                   | 0.00               | 10     | \$20,310     | 0%                | 0%                | 0%               | 6                     | 25%             | 0%            | 60.0%             | 60.0%             | 60.0%            | 5.0       |
| 328       | InteriorLighting    | LED T8 Tube Replacement   | Biz-Prescriptive Light | Food Service  | Retro            | 138                             | 138                             | 59%            | 82                    | 0.00               | 15     | \$7          | 100%              | 49%               | 50%              | 1                     | 56%             | 32%           | 71.1%             | 60.5%             | 60.6%            | 12.3      |
| 329       | InteriorLighting    | LED troffer retrofit kit, 2'X2' and 2'X4'                       | Biz-Prescriptive Light | Food Service  | Retro            | 310                             | 310                             | 50%            | 155                   | 0.00               | 18     | \$67         | 100%              | 26%               | 50%              | 1                     | 56%             | 32%           | 71.1%             | 52.9%             | 55.7%            | 5.7       |
| 330       | InteriorLighting    | LED troffer, 2'X2' and 2'X4'                                    | Biz-Prescriptive Light | Food Service  | Retro            | 223                             | 223                             | 50%            | 112                   | 0.00               | 18     | \$67         | 100%              | 26%               | 50%              | 1                     | 56%             | 32%           | 71.1%             | 49.3%             | 53.4%            | 4.1       |
| 331       | InteriorLighting    | LED high bay fixture  | Biz-Prescriptive Light | Food Service  | Retro            | 1,080                           | 1,080                           | 76%            | 821                   | 0.00               | 12     | \$323        | 100%              | 12%               | 50%              | 2                     | 0%              | 16%           | 71.1%             | 52.5%             | 56.3%            | 10.5      |
| 332       | InteriorLighting    | LED Mogul-base HID Lamp Replacing High Bay HID                  | Biz-Prescriptive Light | Food Service  | Retro            | 1,080                           | 1,080                           | 79%            | 855                   | 0.00               | 12     | \$110        | 100%              | 21%               | 50%              | 2                     | 0%              | 16%           | 71.1%             | 58.8%             | 60.0%            | 19.0      |
| 333       | InteriorLighting    | LED low bay fixture   | Biz-Prescriptive Light | Food Service  | Retro            | 1,080                           | 1,080                           | 76%            | 821                   | 0.00               | 12     | \$196        | 100%              | 20%               | 50%              | 3                     | 0%              | 16%           | 71.1%             | 56.5%             | 58.3%            | 10.5      |
| 334       | InteriorLighting    | LED Mogul-base HID Lamp Replacing Low Bay HID                   | Biz-Prescriptive Light | Food Service  | Retro            | 1,080                           | 1,080                           | 79%            | 855                   | 0.00               | 12     | \$60         | 100%              | 38%               | 50%              | 3                     | 0%              | 16%           | 71.1%             | 60.6%             | 60.8%            | 19.0      |
| 335       | InteriorLighting    | LED downlight, screw-in lamp, 1-3W, interior Average 2 Watts    | Biz-Prescriptive Light | Food Service  | ROB              | 67                              | 67                              | 88%            | 59                    | 0.00               | 4      | \$4          | 100%              | 25%               | 50%              | 4                     | 4%              | 32%           | 71.1%             | 60.3%             | 60.8%            | 10.0      |
| 336       | InteriorLighting    | LED downlight fixture   | Biz-Prescriptive Light | Food Service  | Retro            | 174                             | 174                             | 82%            | 142                   | 0.00               | 4      | \$13         | 100%              | 39%               | 50%              | 5                     | 40%             | 32%           | 71.1%             | 60.2%             | 60.5%            | 4.8       |
| 337       | InteriorLighting    | LED downlight, screw-in lamp, 4-20W, interior Average 11 Watts  | Biz-Prescriptive Light | Food Service  | ROB              | 134                             | 134                             | 84%            | 113                   | 0.00               | 4      | \$2          | 100%              | 61%               | 50%              | 5                     | 40%             | 32%           | 71.1%             | 61.7%             | 61.6%            | 19.2      |
| 338       | InteriorLighting    | Delamp Fluorescent Fixture Average Lamp Wattage 28W             | Biz-Custom Light       | Food Service  | Retro            | 53                              | 53                              | 100%           | 53                    | 0.00               | 15     | \$4          | 100%              | 69%               | 50%              | 6                     | 56%             | 0%            | 71.1%             | 61.1%             | 60.7%            | 10.8      |
| 339       | InteriorLighting    | Daylighting Controls  | Biz-Custom Light       | Food Service  | Retro            | 8,810                           | 8,810                           | 30%            | 2,643                 | 0.00               | 12     | \$3,000      | 25%               | 5%                | 50%              | 7                     | 99%             | 8%            | 48.3%             | 39.1%             | 46.0%            | 9.7       |
| 340       | InteriorLighting    | Occupancy Sensors   | Biz-Prescriptive Light | Food Service  | Retro            | 1,523                           | 1,523                           | 30%            | 457                   | 0.00               | 8      | \$54         | 100%              | 37%               | 50%              | 7                     | 99%             | 8%            | 71.1%             | 59.3%             | 59.8%            | 5.6       |
| 341       | InteriorLighting    | Central Lighting Monitoring & Controls (non-networked)          | Biz-Custom Light       | Food Service  | Retro            | 41,703                          | 41,703                          | 20%            | 8,341                 | 0.00               | 12     | \$3,700      | 100%              | 12%               | 17%              | 7                     | 99%             | 8%            | 71.1%             | 50.8%             | 51.5%            | 9.2       |
| 342       | InteriorLighting    | Network Lighting Controls - Wireless (WiFi)                     | Biz-Custom Light       | Food Service  | Retro            | 16,277                          | 16,277                          | 47%            | 7,650                 | 0.00               | 8      | \$1,683      | 100%              | 24%               | 34%              | 7                     | 99%             | 8%            | 71.1%             | 56.9%             | 57.6%            | 6.5       |
| 343       | InteriorLighting    | Bi-Level Lighting Fixture - Stairwells, Hallways, and Garages   | Biz-Custom Light       | Food Service  | Retro            | 1,034                           | 1,034                           | 50%            | 517                   | 0.00               | 10     | \$274        | 50%               | 10%               | 50%              | 8                     | 5%              | 8%            | 62.0%             | 47.4%             | 53.9%            | 6.9       |
| 344       | InteriorLighting    | LED Exit Sign - 4 Watt Fixture (2 lamp)                         | Biz-Prescriptive Light | Food Service  | Retro            | 236                             | 236                             | 85%            | 201                   | 0.00               | 15     | \$60         | 100%              | 8%                | 50%              | 9                     | 1%              | 75%           | 80.0%             | 80.0%             | 80.0%            | 19.6      |
| 345       | ExteriorLighting    | LED wallpack (existing W<250)                                   | Biz-Prescriptive Light | Food Service  | Retro            | 856                             | 856                             | 66%            | 567                   | 0.00               | 12     | \$248        | 50%               | 10%               | 9%               | 1                     | 13%             | 46%           | 62.7%             | 56.8%             | 56.8%            | 6.6       |
| 346       | ExteriorLighting    | LED parking lot fixture (existing W250)                         | Biz-Prescriptive Light | Food Service  | Retro            | 1,589                           | 1,589                           | 60%            | 959                   | 0.00               | 12     | \$756        | 25%               | 3%                | 5%               | 2                     | 13%             | 41%           | 52.8%             | 52.8%             | 52.8%            | 11.1      |
| 347       | ExteriorLighting    | LED parking lot fixture (existing W<250)                        | Biz-Prescriptive Light | Food Service  | Retro            | 856                             | 856                             | 66%            | 567                   | 0.00               | 12     | \$248        | 50%               | 10%               | 9%               | 3                     | 13%             | 41%           | 62.7%             | 52.8%             | 52.8%            | 6.6       |
| 348       | ExteriorLighting    | LED fuel pump canopy fixture (existing W<250)                   | Biz-Prescriptive Light | Food Service  | Retro            | 0                               | 0                               | 0%             | 0                     | 0.00               | 12     | \$0          | 0%                | 0%                | 0%               | 4                     | 0%              | 41%           | 71.1%             | 61.9%             | 61.9%            | 0.0       |
| 349       | ExteriorLighting    | LED fuel pump canopy fixture (existing W250)                    | Biz-Prescriptive Light | Food Service  | Retro            | 0                               | 0                               | 0%             | 0                     | 0.00               | 12     | \$0          | 0%                | 0%                | 0%               | 5                     | 0%              | 41%           | 71.1%             | 61.9%             | 61.9%            | 0.0       |
| 350       | ExteriorLighting    | LED outdoor pole decorative fixture (existing W250)             | Biz-Prescriptive Light | Food Service  | Retro            | 1,589                           | 1,589                           | 60%            | 959                   | 0.00               | 12     | \$756        | 25%               | 3%                | 5%               | 6                     | 13%             | 41%           | 52.8%             | 52.8%             | 52.8%            | 11.1      |
| 351       | ExteriorLighting    | LED parking garage fixture (existing W250)                      | Biz-Prescriptive Light | Food Service  | Retro            | 3,235                           | 3,235                           | 60%            | 1,953                 | 0.00               | 6      | \$756        | 25%               | 3%                | 10%              | 7                     | 13%             | 41%           | 60.2%             | 52.8%             | 52.8%            | 11.7      |
| 352       | ExteriorLighting    | LED parking garage fixture (existing W<250)                     | Biz-Prescriptive Light | Food Service  | Retro            | 1,742                           | 1,742                           | 66%            | 1,154                 | 0.00               | 6      | \$248        | 50%               | 10%               | 19%              | 8                     | 13%             | 41%           | 66.7%             | 55.4%             | 56.0%            | 6.9       |
| 353       | ExteriorLighting    | LED Mogul-base HID Lamp Replacing Exterior HID (existing W250)  | Biz-Prescriptive Light | Food Service  | Retro            | 1,589                           | 1,589                           | 60%            | 959                   | 0.00               | 12     | \$756        | 25%               | 3%                | 5%               | 9                     | 13%             | 41%           | 52.8%             | 52.8%             | 52.8%            | 11.1      |
| 354       | ExteriorLighting    | LED Mogul-base HID Lamp Replacing Exterior HID (existing W<250) | Biz-Prescriptive Light | Food Service  | Retro            | 856                             | 856                             | 66%            | 567                   | 0.00               | 12     | \$248        | 50%               | 10%               | 9%               | 10                    | 13%             | 41%           | 62.7%             | 52.8%             | 52.8%            | 6.6       |
| 355       | Cooling             | Air Conditioner - 16 SEER (5-20 Tons)                           | Biz-Prescriptive       | Food Service  | ROB              | 7,484                           | 7,484                           | 12%            | 935                   | 0.00               | 15     | \$3,570      | 25%               | 5%                | 3%               | 1                     | 18%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 8.1       |
| 356       | Cooling             | Air Conditioner - 17 SEER (5-20 Tons)                           | Biz-Prescriptive       | Food Service  | ROB              | 7,484                           | 7,484                           | 12%            | 935                   | 0.00               | 15     | \$4,760      | 25%               | 5%                | 2%               | 1                     | 18%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 6.1       |
| 357       | Cooling             | Air Conditioner - 18 SEER (5-20 Tons)                           | Biz-Prescriptive       | Food Service  | ROB              | 7,484                           | 7,484                           | 19%            | 1,410                 | 0.00               | 15     | \$5,560      | 25%               | 5%                | 2%               | 1                     | 18%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 7.3       |
| 358       | Cooling             | Air Conditioner - 21 SEER (5-20 Tons)                           | Biz-Prescriptive       | Food Service  | ROB              | 7,484                           | 7,484                           | 24%            | 1,820                 | 0.00               | 15     | \$9,080      | 25%               | 5%                | 2%               | 1                     | 18%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 6.2       |
| 359       | Cooling             | Air Conditioner - 16 SEER (20+ Tons)                            | Biz-Prescriptive       | Food Service  | ROB              | 15,240                          | 15,240                          | 8%             | 1,270                 | 0.00               | 15     | \$7,140      | 25%               | 5%                | 2%               | 2                     | 18%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 5.5       |
| 360       | Cooling             | Air Conditioner - 17 SEER (20+ Tons)                            | Biz-Prescriptive       | Food Service  | ROB              | 15,240                          | 15,240                          | 8%             | 1,270                 | 0.00               | 15     | \$9,520      | 25%               | 5%                | 1%               | 2                     | 18%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 4.1       |
| 361       | Cooling             | Air Conditioner - 18 SEER (20+ Tons)                            | Biz-Prescriptive       | Food Service  | ROB              | 15,240                          | 15,240                          | 15%            | 2,345                 | 0.00               | 15     | \$11,920     | 25%               | 5%                | 2%               | 2                     | 18%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 6.1       |
| 362       | Cooling             | Air Conditioner - 21 SEER (20+ Tons)                            | Biz-Prescriptive       | Food Service  | ROB              | 15,240                          | 15,240                          | 21%            | 3,266                 | 0.00               | 15     | \$18,160     | 25%               | 5%                | 2%               | 2                     | 18%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 5.6       |
| 363       | Cooling             | Comprehensive Rooftop Unit Quality Maintenance (AC Tune-up)     | Biz-Custom             | Food Service  | Retro            | 5,029                           | 5,029                           | 6%             | 318                   | 0.00               | 3      | \$500        | 3%                | 3%                | 5%               | 3                     | 36%             | 50%           | 60.0%             | 60.0%             | 60.0%            | 5.3       |
| 3         |                     |   |                        |               |                  |                                 |                                 |                |                       |                    |        |              |                   |                   |                  |                       |                 |               |                   |                   |                  |           |

Appendix C: C&I Measure Assumptions

| Measure # | End-Use       | Measure Name   | Program          | Building Type | Replacement Type | Base (Existing) Annual Electric | Base (Standard) Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | End Use Measure Group | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|---------------|--|------------------|---------------|------------------|---------------------------------|---------------------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 376       | Cooling       | PTAC - 7,000 to 15,000 Btuh - lodging                          | Biz-Prescriptive | Food Service  | ROB              | 783                             | 783                             | 9%             | 73                    | 0.00               | 15     | \$41         | 100%              | 50%               | 18%              | 13                    | 0%              | 20%           | 63.2%             | 46.0%             | 41.1%            | 5.5       |
| 377       | Cooling       | PTAC - >15,000 Btuh - lodging                                  | Biz-Prescriptive | Food Service  | ROB              | 1,323                           | 1,323                           | 10%            | 126                   | 0.00               | 15     | \$56         | 100%              | 50%               | 22%              | 14                    | 0%              | 20%           | 63.2%             | 47.7%             | 44.3%            | 7.0       |
| 378       | Cooling       | HVAC Occupancy Controls  | Biz-Custom       | Food Service  | ROB              | 2,636                           | 2,636                           | 20%            | 527                   | 0.00               | 15     | \$538        | 75%               | 5%                | 0%               | 15                    | 36%             | 25%           | 51.4%             | 40.0%             | 40.0%            | 14.9      |
| 379       | Cooling       | Smart Thermostat   | Biz-Custom       | Food Service  | ROB              | 3,493                           | 3,493                           | 18%            | 618                   | 0.00               | 10     | \$128        | 100%              | 31%               | 24%              | 16                    | 57%             | 9%            | 63.2%             | 47.9%             | 47.3%            | 4.8       |
| 380       | Cooling       | Window Film  | Biz-Custom       | Food Service  | Retro            | 5,029                           | 0                               | 5%             | 256                   | 0.00               | 10     | \$213        | 75%               | 6%                | 5%               | 17                    | 100%            | 25%           | 53.8%             | 40.0%             | 40.0%            | 13.3      |
| 381       | Cooling       | Energy Recovery Ventilator                                     | Biz-Custom       | Food Service  | Retro            | 2                               | 2                               | 50%            | 1                     | 0.00               | 20     | \$1          | 75%               | 8%                | 12%              | 18                    | 100%            | 5%            | 54.9%             | 33.4%             | 33.7%            | 11.0      |
| 382       | Heating       | Heat Pump - 16 SEER (<5 Tons)                                  | Biz-Prescriptive | Food Service  | ROB              | 13,868                          | 13,868                          | 19%            | 2,621                 | 0.00               | 15     | \$2,055      | 75%               | 20%               | 13%              | 1                     | 19%             | 20%           | 54.2%             | 36.0%             | 36.0%            | 4.0       |
| 383       | Heating       | Heat Pump - 17 SEER (<5 Tons)                                  | Biz-Prescriptive | Food Service  | ROB              | 13,868                          | 13,868                          | 21%            | 2,953                 | 0.00               | 15     | \$2,740      | 50%               | 20%               | 11%              | 1                     | 19%             | 20%           | 44.4%             | 36.0%             | 36.0%            | 3.5       |
| 384       | Heating       | Heat Pump - 18 SEER (<5 Tons)                                  | Biz-Prescriptive | Food Service  | ROB              | 13,868                          | 13,868                          | 24%            | 3,344                 | 0.00               | 15     | \$3,425      | 50%               | 20%               | 10%              | 1                     | 19%             | 20%           | 42.8%             | 36.0%             | 36.0%            | 3.3       |
| 385       | Heating       | Heat Pump - 21 SEER (<5 Tons)                                  | Biz-Prescriptive | Food Service  | ROB              | 13,868                          | 13,868                          | 28%            | 3,837                 | 0.00               | 15     | \$4,500      | 50%               | 20%               | 9%               | 1                     | 19%             | 20%           | 41.0%             | 36.0%             | 36.0%            | 3.1       |
| 386       | Heating       | Geothermal HP - SEER 20.3 (<5 Tons)                            | Biz-Prescriptive | Food Service  | ROB              | 13,868                          | 13,868                          | 36%            | 5,003                 | 0.00               | 15     | \$4,700      | 50%               | 11%               | 11%              | 1                     | 19%             | 20%           | 43.9%             | 36.0%             | 36.0%            | 6.3       |
| 387       | Heating       | Geothermal HP - SEER 21.5 (<5 Tons)                            | Biz-Prescriptive | Food Service  | ROB              | 13,868                          | 13,868                          | 40%            | 5,599                 | 0.00               | 15     | \$7,300      | 25%               | 7%                | 7%               | 1                     | 19%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 7.0       |
| 388       | Heating       | Geothermal HP - SEER 23.1 (<5 Tons)                            | Biz-Prescriptive | Food Service  | ROB              | 13,868                          | 13,868                          | 46%            | 6,370                 | 0.00               | 15     | \$7,300      | 50%               | 7%                | 7%               | 1                     | 19%             | 20%           | 40.0%             | 36.0%             | 36.0%            | 7.9       |
| 389       | Heating       | Geothermal HP - SEER 29.3 (<5 Tons)                            | Biz-Prescriptive | Food Service  | ROB              | 13,868                          | 13,868                          | 49%            | 6,775                 | 0.00               | 15     | \$9,200      | 25%               | 8%                | 5%               | 1                     | 19%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 5.5       |
| 390       | Heating       | Heat Pump - 16 SEER (5-20 Tons)                                | Biz-Prescriptive | Food Service  | ROB              | 57,157                          | 57,157                          | 9%             | 5,188                 | 0.00               | 15     | \$4,110      | 50%               | 20%               | 12%              | 2                     | 25%             | 20%           | 46.0%             | 36.0%             | 36.0%            | 3.6       |
| 391       | Heating       | Heat Pump - 17 SEER (5-20 Tons)                                | Biz-Prescriptive | Food Service  | ROB              | 57,157                          | 57,157                          | 13%            | 7,573                 | 0.00               | 15     | \$5,480      | 50%               | 20%               | 9%               | 2                     | 25%             | 20%           | 46.6%             | 36.0%             | 36.0%            | 3.5       |
| 392       | Heating       | Heat Pump - 18 SEER (5-20 Tons)                                | Biz-Prescriptive | Food Service  | ROB              | 57,157                          | 57,157                          | 19%            | 11,122                | 0.00               | 15     | \$6,850      | 75%               | 20%               | 7%               | 2                     | 25%             | 20%           | 55.3%             | 36.1%             | 36.0%            | 4.1       |
| 393       | Heating       | Heat Pump - 21 SEER (5-20 Tons)                                | Biz-Prescriptive | Food Service  | ROB              | 57,157                          | 57,157                          | 25%            | 14,196                | 0.00               | 15     | \$9,000      | 75%               | 20%               | 6%               | 2                     | 25%             | 20%           | 55.1%             | 36.0%             | 36.0%            | 4.0       |
| 394       | Heating       | Geothermal HP - SEER 20.3 (5-20 Tons)                          | Biz-Prescriptive | Food Service  | ROB              | 22,178                          | 22,178                          | 20%            | 4,366                 | 0.00               | 15     | \$7,700      | 50%               | 6%                | 6%               | 2                     | 25%             | 20%           | 38.8%             | 36.0%             | 36.0%            | 10.9      |
| 395       | Heating       | Geothermal HP - SEER 21.5 (5-20 Tons)                          | Biz-Prescriptive | Food Service  | ROB              | 22,178                          | 22,178                          | 25%            | 5,563                 | 0.00               | 15     | \$10,300     | 50%               | 5%                | 5%               | 2                     | 25%             | 20%           | 37.7%             | 36.0%             | 36.0%            | 12.3      |
| 396       | Heating       | Geothermal HP - SEER 23.1 (5-20 Tons)                          | Biz-Prescriptive | Food Service  | ROB              | 22,178                          | 22,178                          | 32%            | 7,111                 | 0.00               | 15     | \$12,800     | 50%               | 4%                | 4%               | 2                     | 25%             | 20%           | 37.4%             | 36.0%             | 36.0%            | 14.3      |
| 397       | Heating       | Geothermal HP - SEER 29.3 (5-20 Tons)                          | Biz-Prescriptive | Food Service  | ROB              | 22,178                          | 22,178                          | 36%            | 7,936                 | 0.00               | 15     | \$17,700     | 25%               | 4%                | 3%               | 2                     | 25%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 11.1      |
| 398       | Heating       | Heat Pump - 16 SEER (20+ Tons)                                 | Biz-Prescriptive | Food Service  | ROB              | 117,690                         | 117,690                         | 11%            | 12,880                | 0.00               | 15     | \$8,220      | 50%               | 20%               | 6%               | 3                     | 25%             | 20%           | 48.0%             | 36.0%             | 36.0%            | 3.7       |
| 399       | Heating       | Heat Pump - 17 SEER (20+ Tons)                                 | Biz-Prescriptive | Food Service  | ROB              | 117,690                         | 117,690                         | 15%            | 17,650                | 0.00               | 15     | \$10,960     | 50%               | 20%               | 5%               | 3                     | 25%             | 20%           | 48.1%             | 36.0%             | 36.0%            | 3.6       |
| 400       | Heating       | Heat Pump - 18 SEER (20+ Tons)                                 | Biz-Prescriptive | Food Service  | ROB              | 117,690                         | 117,690                         | 21%            | 24,873                | 0.00               | 15     | \$13,700     | 75%               | 20%               | 4%               | 3                     | 25%             | 20%           | 55.8%             | 37.4%             | 36.0%            | 4.3       |
| 401       | Heating       | Heat Pump - 21 SEER (20+ Tons)                                 | Biz-Prescriptive | Food Service  | ROB              | 117,690                         | 117,690                         | 26%            | 31,122                | 0.00               | 15     | \$18,000     | 75%               | 20%               | 3%               | 3                     | 25%             | 20%           | 55.6%             | 36.8%             | 36.0%            | 4.2       |
| 402       | Heating       | Geothermal HP - SEER 20.3 (20+ Tons)                           | Biz-Prescriptive | Food Service  | ROB              | 45,262                          | 45,262                          | 21%            | 9,639                 | 0.00               | 15     | \$10,700     | 100%              | 9%                | 5%               | 3                     | 25%             | 20%           | 63.2%             | 36.0%             | 36.0%            | 11.3      |
| 403       | Heating       | Geothermal HP - SEER 21.5 (20+ Tons)                           | Biz-Prescriptive | Food Service  | ROB              | 45,262                          | 45,262                          | 27%            | 12,032                | 0.00               | 15     | \$13,300     | 75%               | 8%                | 4%               | 3                     | 25%             | 20%           | 53.5%             | 36.0%             | 36.0%            | 12.7      |
| 404       | Heating       | Geothermal HP - SEER 23.1 (20+ Tons)                           | Biz-Prescriptive | Food Service  | ROB              | 45,262                          | 45,262                          | 33%            | 15,128                | 0.00               | 15     | \$18,300     | 75%               | 5%                | 3%               | 3                     | 25%             | 20%           | 52.3%             | 36.0%             | 36.0%            | 14.6      |
| 405       | Heating       | Geothermal HP - SEER 29.3 (20+ Tons)                           | Biz-Prescriptive | Food Service  | ROB              | 45,262                          | 45,262                          | 37%            | 16,779                | 0.00               | 15     | \$26,200     | 50%               | 4%                | 2%               | 3                     | 25%             | 20%           | 38.8%             | 36.0%             | 36.0%            | 16.9      |
| 406       | Heating       | PTHP - <7,000 Btuh - lodging                                   | Biz-Prescriptive | Food Service  | ROB              | 2,836                           | 2,836                           | 8%             | 239                   | 0.00               | 15     | \$13         | 100%              | 100%              | 100%             | 4                     | 0%              | 20%           | 63.2%             | 55.0%             | 55.0%            | 9.8       |
| 407       | Heating       | PTHP - 7,000 to 15,000 Btuh - lodging                          | Biz-Prescriptive | Food Service  | ROB              | 6,071                           | 6,071                           | 11%            | 677                   | 0.00               | 15     | \$45         | 100%              | 100%              | 100%             | 5                     | 0%              | 20%           | 63.2%             | 55.0%             | 55.0%            | 7.3       |
| 408       | Heating       | PTHP - >15,000 Btuh - lodging                                  | Biz-Prescriptive | Food Service  | ROB              | 9,802                           | 9,802                           | 14%            | 1,373                 | 0.00               | 15     | \$35         | 100%              | 100%              | 100%             | 6                     | 0%              | 20%           | 63.2%             | 55.0%             | 55.0%            | 18.2      |
| 409       | Heating       | Mini Split Ductless Heat Pump Cold Climate (Tiers & sizes TBD) | Biz-Prescriptive | Food Service  | ROB              | 4                               | 4                               | 25%            | 1                     | 0.00               | 12     | \$0          | 100%              | 35%               | 67%              | 7                     | 19%             | 20%           | 63.2%             | 52.3%             | 53.7%            | 24.5      |
| 410       | Heating       | Variable Refrigerant Flow Heat Pump                            | Biz-Custom       | Food Service  | NC               | 11                              | 11                              | 25%            | 3                     | 0.00               | 20     | \$3          | 100%              | 5%                | 3%               | 2                     | 25%             | 0%            | 63.2%             | 33.5%             | 33.4%            | 34.8      |
| 411       | Ventilation   | Kitchen Exhaust Hood Demand Ventilation Control System         | Biz-Custom       | Food Service  | ROB              | 2                               | 2                               | 50%            | 1                     | 0.00               | 20     | \$2          | 25%               | 4%                | 5%               | 1                     | 8%              | 24%           | 39.2%             | 39.2%             | 39.2%            | 8.6       |
| 412       | Ventilation   | Demand Controlled Ventilation                                  | Biz-Custom       | Food Service  | Retro            | 2,442                           | 2,442                           | 20%            | 488                   | 0.00               | 15     | \$227        | 100%              | 11%               | 16%              | 2                     | 92%             | 5%            | 63.2%             | 38.6%             | 39.4%            | 9.4       |
| 413       | Ventilation   | Pump and Fan Variable Frequency Drive Controls (Fans)          | Biz-Prescriptive | Food Service  | Retro            | 2,258                           | 2,258                           | 41%            | 923                   | 0.00               | 15     | \$375        | 100%              | 16%               | 18%              | 2                     | 92%             | 25%           | 63.2%             | 42.0%             | 42.4%            | 9.1       |
| 414       | Refrigeration | Strip Curtains   | Biz-Custom       | Food Service  | Retro            | 334                             | 334                             | 81%            | 270                   | 0.00               | 4      | \$9          | 100%              | 100%              | 100%             | 1                     | 6%              | 26%           | 60.2%             | 52.4%             | 52.4%            | 4.2       |
| 415       | Refrigeration | Bare Suction Line  | Biz-Custom       | Food Service  | Retro            | 23                              | 23                              | 93%            | 21                    | 0.00               | 15     | \$4          | 100%              | 27%               | 39%              | 2                     | 0%              | 25%           | 60.2%             | 45.6%             | 46.6%            | 9.2       |
| 416       | Refrigeration | Floating Head Pressure Controls                                | Biz-Prescriptive | Food Service  | Retro            | 2,653                           | 2,653                           | 50%            | 1,327                 | 0.00               | 15     | \$80         | 100%              | 25%               | 41%              | 3                     | 8%              | 20%           | 60.2%             | 50.1%             | 50.6%            | 31.6      |
| 417       | Refrigeration | Saturated Suction Controls                                     | Biz-Custom       | Food Service  | Retro            | 831                             | 831                             | 50%            | 416                   | 0.00               | 15     | \$559        | 50%               | 4%                | 6%               | 4                     | 2%              | 20%           | 36.0%             | 36.0%             | 36.0%            | 15.7      |
| 418       | Refrigeration | Compressor Retrofit  | Biz-Custom       | Food Service  | Retro            | 813                             | 813                             | 20%            | 163                   | 0.00               | 15     | \$477        | 25%               | 2%                | 3%               | 5                     | 14%             | 15%           | 32.0%             | 27.4%             | 27.4%            | 15.8      |
| 419       | Refrigeration | Electronically Commutated (EC) Walk-In Evaporator Fan Motor    | Biz-Prescriptive | Food Service  | Retro            | 1,268                           | 1,268                           | 65%            | 824                   | 0.00               | 15     | \$78         | 100%              | 45%               | 42%              | 6                     | 4%              | 33%           | 60.2%             | 49.8%             | 49.6%            | 11.2      |
| 420       | Refrigeration | Evaporator Fan Motor Controls                                  | Biz-Prescriptive | Food Service  | Retro            | 1,912                           | 1,912                           | 25%            | 478                   | 0.00               | 13     | \$291        | 50%               | 15%               | 7%               | 4                     | 4%              | 10%           | 44.4%             | 30.0%             | 28.3%            | 4.7       |
| 421       | Refrigeration | Variable Speed Condenser Fan                                   | Biz-Custom       | Food Service  | Retro            | 2,960                           | 2,960                           | 50%            | 1,480                 | 0.00               | 15     | \$1,170      | 25%               | 7%                | 9%               | 8                     | 5%              | 20%           | 36.0%             | 36.0%             | 36.0%            | 6.9       |
| 422       | Refrigeration | Refrigeration Economizer                                       | Biz-Custom       | Food Service  | Retro            | 67,850                          | 67,850                          | 2%             | 1,357                 | 0.00               | 15     | \$2,558      | 3%                | 3%                | 4%               | 9                     | 19%             | 0%            | 20.0%             | 15.7%             | 15.9%            | 6.9       |
| 423       | Refrigeration | Anti-Sweat Heater Controls MT                                  | Biz-Prescriptive | Food Service  | Retro            | 1,313                           | 1,313                           | 55%            | 722                   | 0.00               | 12     | \$250        | 75%               | 10%               | 12%              | 10                    | 19%             | 36%           | 54.7%             | 48.8%             | 48.8%            | 8.7       |
| 424       | Refrigeration | Auto Door Closer, Cooler                                       | Biz-Prescriptive | Food Service  | Retro            | 471,500                         | 471,500                         | 0%             | 943                   | 0.00               | 8      | \$157        | 100%              | 16%               | 24%              | 11                    | 14%             | 54%           | 63.2%             | 63.2%             | 63.2%            | 11.6      |
| 425       | Refrigeration | Display Case Door Retrofit, Medium Temp                        | Biz-Prescriptive | Food Service  | Retro            | 1,584                           | 1,584                           | 36%            | 578                   | 0.00               | 12     | \$686        | 25%               | 22%               | 3%               | 12                    | 6%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 11.7      |
| 426       | Refrigeration | Electronically Commutated (EC) Reach-In Evaporator Fan Motor   | Biz-Prescriptive | Food Service  | Retro            | 1,268                           | 1,268                           | 65%            | 824                   | 0.00               | 15     | \$78         | 100%              | 45%               | 42%              | 13                    | 3%              | 33%           | 60.2%             | 49.8%             | 49.6%            | 11.2      |
| 427       | Refrigeration | Q-Sync Motor for Walk-In and Reach-In Evaporator Fan Motor     | Biz-Prescriptive | Food Service  | Retro            | 993                             | 993                             | 51%            | 504                   | 0.00               | 10     | \$96         | 100%              | 36%               | 21%              | 13                    | 3%              | 33%           | 60.2%             | 46.4%             | 46.4%            | 5.1       |
| 428       | Refrigeration | Energy Star Reach-In Refrigerator, Glass Doors                 | Biz-Prescriptive | Food Service  | ROB              | 1,546                           | 1,546                           | 27%            | 410                   | 0.00               | 12     | \$600        | 25%               | 5%                | 3%               | 14                    | 19%             | 55%           | 64.0%             | 64.0%             | 63.9%            | 5.1       |
| 429       | Refrigeration | Energy Star Reach-In Refrigerator, Solid Doors                 | Biz-Prescriptive | Food Service  | ROB              | 1,112                           | 1,112                           | 25%            | 283                   | 0.00               | 12     | \$600        | 5%                | 5%                | 2%               | 15                    | 19%             | 55%           | 64.0%             | 62.1%             | 61.9%            | 3.5       |
| 430       | Refrigeration | Anti-Sweat Heater Controls LT                                  | Biz-Prescriptive | Food Service  | Retro            | 3,147                           | 3,147                           | 55%            | 1,731                 | 0.00               | 12     | \$250        | 100%              | 10%               | 28%              | 16                    | 6%              | 36%           | 60.2%             | 48.8%             | 48.8%            | 27.9      |
| 431       | Refrigeration | Auto Door Closer, Freezer                                      | Biz-Prescriptive | Food Service  | Retro            | 419,455                         | 419,455                         | 1%             | 2,307                 | 0.00               | 8      | \$157        | 100%              | 16%               | 59%              | 17                    | 6%              | 54%           | 63.2%             | 63.2%             | 63.2%            | 27.7      |
| 432       | Refrigeration | Display Case Door Retrofit, Low Temp                           | Biz-Prescriptive | Food Service  | Retro            | 2,922                           | 2,922                           | 50%            | 1,453                 | 0.00               | 12     | \$686        | 75%               | 22%               | 8%               | 17                    | 6%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 4.3       |
| 433       | Refrigeration | Energy Star Reach-In Freezer, Glass Doors                      | Biz-Prescriptive | Food Service  | ROB              | 3,234                           | 3,234                           | 15%            | 488                   | 0.00               | 12     | \$450        | 25%               | 15%               | 4%               | 18                    | 6%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 2.9       |
| 434       | Refrigeration | Energy Star Reach-In Freezer, Solid Doors                      | Biz-Prescriptive | Food Service  | ROB              | 4,676                           | 4,676                           | 20%            | 935                   | 0.00               | 12     | \$450        | 75%               | 15%               | 8%               | 19                    | 6%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 5.5       |
| 435       | Refrigeration | Refrigeration - Custom   | Biz-Custom       | Food Service  | ROB              | 7                               | 7                               | 15%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 72%              | 20                    | 90%             | 20%           | 60.2%             | 49.9%             | 51.0%            | 9.1       |
| 436       | Refrigeration | Retro-commissioning_Refrigerator Optimization                  | Biz-Custom RCX   | Food Service  | Retro            | 33                              | 33                              | 3%             | 1                     | 0.00               | 3      | \$0          | 100%              | 67%               | 22%              | 21                    | 90%             | 10%           | 60.2%             | 50.9%             | 49.0%            | 2.0       |
| 437       | Refrigeration | Energy Star Ice Machine  | Biz-Prescriptive | Food Service  | ROB              | 6,993                           | 6,993                           | 10%            | 721                   |                    |        |              |                   |                   |                  |                       |                 |               |                   |                   |                  |           |



Appendix C: C&I Measure Assumptions

| Measure # | End-Use             | Measure Name  | Program                | Building Type | Replacement Type | Base (Existing) Annual Electric | Base (Standard) Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | End Use Measure Group | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|---------------------|---|------------------------|---------------|------------------|---------------------------------|---------------------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 451       | Motors              | Cogged V-Belt   | Biz-Custom             | Food Service  | Retro            | 17,237                          | 17,237                          | 3%             | 534                   | 0.00               | 15     | \$384        | 75%               | 7%                | 10%              | 1                     | 76%             | 10%           | 61.5%             | 40.1%             | 40.4%            | 10.7      |
| 452       | Motors              | Pump and Fan Variable Frequency Drive Controls (Pumps)          | Biz-Prescriptive       | Food Service  | Retro            | 1,902                           | 1,902                           | 38%            | 731                   | 0.00               | 15     | \$200        | 100%              | 30%               | 27%              | 2                     | 4%              | 25%           | 68.6%             | 53.3%             | 53.0%            | 7.0       |
| 453       | Motors              | Escalators Motor Efficiency Controllers                         | Biz-Custom             | Food Service  | Retro            | 7,500                           | 7,500                           | 20%            | 1,500                 | 0.00               | 10     | \$5,000      | 2%                | 2%                | 2%               | 3                     | 0%              | 10%           | 28.0%             | 28.0%             | 28.0%            | 8.6       |
| 454       | CompressedAir       | Efficient Air Compressors                                       | Biz-Custom             | Food Service  | ROB              | 4,004                           | 4,004                           | 31%            | 1,223                 | 0.00               | 15     | \$100        | 100%              | 64%               | 100%             | 1                     | 100%            | 33%           | 68.6%             | 58.6%             | 59.7%            | 10.5      |
| 455       | CompressedAir       | Retro-commissioning Compressed Air Optimization                 | Biz-Custom RCx         | Food Service  | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 5      | \$0          | 100%              | 67%               | 100%             | 2                     | 100%            | 33%           | 68.6%             | 58.8%             | 59.7%            | 4.1       |
| 456       | CompressedAir       | Compressed Air - Custom   | Biz-Custom             | Food Service  | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 8      | \$0          | 100%              | 50%               | 100%             | 3                     | 100%            | 33%           | 68.6%             | 57.5%             | 59.7%            | 4.2       |
| 457       | Miscellaneous       | Power Distribution Equipment Upgrades                           | Biz-Custom             | Food Service  | Retro            | 1,150                           | 1,150                           | 1%             | 6                     | 0.00               | 30     | \$8          | 75%               | 4%                | 6%               | 1                     | 78%             | 20%           | 58.1%             | 36.0%             | 36.0%            | 18.2      |
| 458       | Miscellaneous       | Vending Machine Controller - Non-Refrigerated                   | Biz-Custom             | Food Service  | Retro            | 745                             | 745                             | 46%            | 343                   | 0.00               | 5      | \$80         | 63%               | 63%               | 32%              | 2                     | 1%              | 66%           | 72.8%             | 72.8%             | 72.8%            | 0.9       |
| 459       | Miscellaneous       | Vending Machine Controller - Refrigerated                       | Biz-Custom             | Food Service  | Retro            | 1,739                           | 1,739                           | 46%            | 800                   | 0.00               | 10     | \$216        | 100%              | 35%               | 28%              | 3                     | 4%              | 66%           | 72.8%             | 72.8%             | 72.8%            | 3.3       |
| 460       | Miscellaneous       | Miscellaneous Custom  | Biz-Custom             | Food Service  | Retro            | 5                               | 5                               | 20%            | 1                     | 0.00               | 10     | \$0          | 100%              | 50%               | 72%              | 4                     | 22%             | 20%           | 68.6%             | 57.8%             | 58.7%            | 7.9       |
| 461       | Whole Building_HVAC | HVAC - Energy Management System                                 | Biz-Prescriptive       | Food Service  | Retro            | 6,960                           | 6,960                           | 15%            | 1,044                 | 0.00               | 15     | \$4,000      | 3%                | 3%                | 2%               | 1                     | 100%            | 1%            | 20.8%             | 18.4%             | 18.4%            | 4.2       |
| 462       | Whole Building_HVAC | Guest room energy management system                             | Biz-Custom             | Food Service  | Retro            | 0                               | 0                               | 0%             | 0                     | 0.00               | 8      | \$0          | 0%                | 0%                | 0%               | 2                     | 0%              | 0%            | 63.2%             | 55.0%             | 55.0%            | 0.0       |
| 463       | Whole Building_HVAC | Retro-commissioning_Bld Optimization                            | Biz-Custom RCx         | Food Service  | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 3      | \$0          | 100%              | 67%               | 22%              | 3                     | 100%            | 10%           | 63.2%             | 53.6%             | 51.7%            | 2.2       |
| 464       | WholeBldg - Com RET | WholeBldg - Com RET   | Biz-NC                 | Food Service  | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 19%              | 4                     | 40%             | 0%            | 68.6%             | 57.8%             | 56.6%            | 9.3       |
| 465       | Whole Building_NC   | WholeBldg - Com NC  | Biz-NC                 | Food Service  | NC               | 4                               | 4                               | 25%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 72%              | 5                     | 100%            | 60%           | 68.6%             | 68.0%             | 68.0%            | 9.3       |
| 466       | Behavioral          | AMI Data Presentation & Engagement                              | Biz-Behavior           | Food Service  | Retro            | 100                             | 100                             | 1%             | 1                     | 0.00               | 1      | \$0          | 100%              | 100%              | 87%              | 1                     | 100%            | 10%           | 50.0%             | 50.0%             | 50.0%            | 1.2       |
| 467       | Behavioral          | BIEMS   | Biz-Behavior           | Food Service  | Retro            | 59                              | 59                              | 2%             | 1                     | 0.00               | 3      | \$0          | 12%               | 12%               | 5%               | 1                     | 100%            | 5%            | 42.5%             | 50.0%             | 50.0%            | 1.6       |
| 468       | Behavioral          | Building Operator Certification                                 | Biz-Behavior           | Food Service  | Retro            | 44,900                          | 44,900                          | 1%             | 359                   | 0.00               | 3      | \$61         | 50%               | 30%               | 12%              | 1                     | 100%            | 5%            | 42.5%             | 50.0%             | 50.0%            | 2.1       |
| 469       | Cooking             | Commercial Combination Oven (Electric)                          | Biz-Prescriptive       | Health        | ROB              | 38,561                          | 38,561                          | 48%            | 18,432                | 0.00               | 12     | \$16,884     | 50%               | 6%                | 3%               | 1                     | 17%             | 53%           | 62.4%             | 62.4%             | 62.4%            | 9.2       |
| 470       | Cooking             | Commercial Electric Convector Oven                              | Biz-Prescriptive       | Health        | ROB              | 12,193                          | 12,193                          | 15%            | 1,879                 | 0.00               | 12     | \$1,706      | 50%               | 15%               | 11%              | 1                     | 17%             | 53%           | 62.4%             | 62.4%             | 62.4%            | 3.9       |
| 471       | Cooking             | Commercial Electric Griddle                                     | Biz-Prescriptive       | Health        | ROB              | 17,056                          | 17,056                          | 15%            | 2,596                 | 0.00               | 12     | \$3,604      | 25%               | 14%               | 7%               | 2                     | 14%             | 17%           | 39.3%             | 33.6%             | 33.6%            | 2.0       |
| 472       | Cooking             | Commercial Electric Steam Cooker                                | Biz-Prescriptive       | Health        | ROB              | 19,549                          | 19,549                          | 67%            | 13,162                | 0.00               | 12     | \$3,500      | 100%              | 12%               | 14%              | 3                     | 6%              | 42%           | 68.6%             | 53.6%             | 53.6%            | 15.6      |
| 473       | Cooking             | Dishwasher Low Temp Door (Energy Star)                          | Biz-Prescriptive       | Health        | ROB              | 39,279                          | 39,279                          | 41%            | 16,153                | 0.00               | 15     | \$770        | 100%              | 49%               | 65%              | 4                     | 26%             | 61%           | 68.8%             | 68.8%             | 68.8%            | 18.5      |
| 474       | Cooking             | Dishwasher High Temp Door (Energy Star)                         | Biz-Prescriptive       | Health        | ROB              | 39,825                          | 39,825                          | 30%            | 11,853                | 0.00               | 15     | \$770        | 100%              | 49%               | 65%              | 4                     | 26%             | 61%           | 68.8%             | 68.8%             | 68.8%            | 13.5      |
| 475       | Cooking             | Energy efficient electric fryer                                 | Biz-Prescriptive       | Health        | ROB              | 18,182                          | 18,182                          | 14%            | 2,572                 | 0.00               | 12     | \$1,706      | 50%               | 1%                | 15%              | 5                     | 27%             | 23%           | 55.0%             | 39.3%             | 40.7%            | 99.0      |
| 476       | Cooking             | Insulated Holding Cabinets (Full Size)                          | Biz-Prescriptive       | Health        | ROB              | 7,665                           | 7,665                           | 69%            | 5,278                 | 0.00               | 12     | \$1,200      | 100%              | 6%                | 42%              | 6                     | 3%              | 23%           | 68.6%             | 52.4%             | 54.9%            | 31.2      |
| 477       | Cooking             | Insulated Holding Cabinets (Half-Size)                          | Biz-Prescriptive       | Health        | ROB              | 3,066                           | 3,066                           | 58%            | 1,788                 | 0.00               | 12     | \$1,500      | 50%               | 8%                | 12%              | 6                     | 3%              | 23%           | 52.9%             | 38.7%             | 39.1%            | 6.6       |
| 478       | HotWater            | Faucet Aerator  | Biz-Custom             | Health        | Retro            | 303                             | 303                             | 66%            | 200                   | 0.00               | 10     | \$3          | 100%              | 26%               | 100%             | 4                     | 25%             | 80%           | 84.0%             | 84.0%             | 84.0%            | 110.1     |
| 479       | HotWater            | Heat Pump Water Heater  | Biz-Custom             | Health        | ROB              | 15,809                          | 15,809                          | 35%            | 5,460                 | 0.00               | 10     | \$1,574      | 100%              | 18%               | 14%              | 1                     | 43%             | 31%           | 73.5%             | 56.6%             | 56.2%            | 6.1       |
| 480       | HotWater            | Hot Water Pipe Insulation                                       | Biz-Custom             | Health        | Retro            | 15,809                          | 15,809                          | 2%             | 316                   | 0.00               | 20     | \$60         | 100%              | 27%               | 21%              | 2                     | 100%            | 80%           | 84.0%             | 84.0%             | 84.0%            | 11.5      |
| 481       | HotWater            | Low Flow Pre-Rinse Sprayers                                     | Biz-Custom             | Health        | ROB              | 2,991                           | 2,991                           | 26%            | 764                   | 0.00               | 5      | \$35         | 100%              | 71%               | 87%              | 3                     | 25%             | 80%           | 84.0%             | 84.0%             | 84.0%            | 6.7       |
| 482       | HotWater            | ENERGY STAR Commercial Washing Machines                         | Biz-Custom             | Health        | ROB              | 1,552                           | 1,552                           | 43%            | 671                   | 0.00               | 7      | \$250        | 50%               | 14%               | 11%              | 5                     | 25%             | 35%           | 66.5%             | 53.7%             | 53.3%            | 4.0       |
| 483       | HotWater            | Ozone Commercial Laundry  | Biz-Custom             | Health        | Retro            | 2,984                           | 2,984                           | 25%            | 746                   | 0.00               | 10     | \$20,310     | 0%                | 0%                | 0%               | 6                     | 57%             | 50%           | 60.0%             | 60.0%             | 60.0%            | 5.2       |
| 484       | InteriorLighting    | LED T8 Tube Replacement   | Biz-Prescriptive Light | Health        | Retro            | 138                             | 138                             | 59%            | 82                    | 0.00               | 15     | \$7          | 100%              | 49%               | 49%              | 1                     | 78%             | 32%           | 71.1%             | 60.5%             | 60.5%            | 12.4      |
| 485       | InteriorLighting    | LED troffer retrofit kit, 2'X2' and 2'X4'                       | Biz-Prescriptive Light | Health        | Retro            | 310                             | 310                             | 50%            | 155                   | 0.00               | 18     | \$67         | 100%              | 26%               | 9%               | 1                     | 78%             | 32%           | 71.1%             | 52.9%             | 50.8%            | 5.7       |
| 486       | InteriorLighting    | LED troffer, 2'X2' and 2'X4'                                    | Biz-Prescriptive Light | Health        | Retro            | 223                             | 223                             | 50%            | 112                   | 0.00               | 18     | \$67         | 100%              | 26%               | 7%               | 1                     | 78%             | 32%           | 71.1%             | 49.3%             | 45.8%            | 4.1       |
| 487       | InteriorLighting    | LED high bay fixture  | Biz-Prescriptive Light | Health        | Retro            | 1,080                           | 1,080                           | 76%            | 821                   | 0.00               | 12     | \$323        | 100%              | 12%               | 10%              | 2                     | 1%              | 16%           | 71.1%             | 52.5%             | 52.2%            | 10.5      |
| 488       | InteriorLighting    | LED Mogul-base HID Lamp Replacing High Bay HID                  | Biz-Prescriptive Light | Health        | Retro            | 1,080                           | 1,080                           | 79%            | 855                   | 0.00               | 12     | \$110        | 100%              | 21%               | 31%              | 2                     | 1%              | 16%           | 71.1%             | 58.8%             | 59.2%            | 19.1      |
| 489       | InteriorLighting    | LED low bay fixture   | Biz-Prescriptive Light | Health        | Retro            | 1,080                           | 1,080                           | 76%            | 821                   | 0.00               | 12     | \$196        | 100%              | 20%               | 17%              | 3                     | 1%              | 16%           | 71.1%             | 56.5%             | 56.2%            | 10.5      |
| 490       | InteriorLighting    | LED Mogul-base HID Lamp Replacing Low Bay HID                   | Biz-Prescriptive Light | Health        | Retro            | 1,080                           | 1,080                           | 79%            | 855                   | 0.00               | 12     | \$60         | 100%              | 38%               | 57%              | 3                     | 1%              | 16%           | 71.1%             | 60.6%             | 61.0%            | 19.1      |
| 491       | InteriorLighting    | LED downlight, screw-in lamp, 1-3W, interior Average 2 Watts    | Biz-Prescriptive Light | Health        | ROB              | 67                              | 67                              | 88%            | 59                    | 0.00               | 4      | \$4          | 100%              | 25%               | 59%              | 4                     | 3%              | 32%           | 71.1%             | 60.3%             | 61.0%            | 10.1      |
| 492       | InteriorLighting    | LED downlight fixture   | Biz-Prescriptive Light | Health        | Retro            | 174                             | 174                             | 82%            | 142                   | 0.00               | 4      | \$13         | 100%              | 39%               | 44%              | 5                     | 18%             | 32%           | 71.1%             | 60.2%             | 60.3%            | 4.8       |
| 493       | InteriorLighting    | LED downlight, screw-in lamp, 4-20W, interior Average 11 Watts  | Biz-Prescriptive Light | Health        | ROB              | 134                             | 134                             | 84%            | 113                   | 0.00               | 4      | \$2          | 100%              | 61%               | 100%             | 5                     | 18%             | 32%           | 71.1%             | 61.7%             | 61.9%            | 19.3      |
| 494       | InteriorLighting    | DeLamp Fluorescent Fixture Average Lamp Wattage 28W             | Biz-Custom Light       | Health        | Retro            | 53                              | 53                              | 100%           | 53                    | 0.00               | 15     | \$4          | 100%              | 69%               | 53%              | 6                     | 78%             | 0%            | 71.1%             | 61.1%             | 60.8%            | 10.9      |
| 495       | InteriorLighting    | Daylighting Controls  | Biz-Custom Light       | Health        | Retro            | 8,810                           | 8,810                           | 30%            | 2,643                 | 0.00               | 12     | \$3,000      | 25%               | 5%                | 4%               | 7                     | 85%             | 8%            | 48.3%             | 39.1%             | 39.0%            | 9.8       |
| 496       | InteriorLighting    | Occupancy Sensors   | Biz-Prescriptive Light | Health        | Retro            | 1,523                           | 1,523                           | 30%            | 457                   | 0.00               | 8      | \$54         | 100%              | 37%               | 34%              | 7                     | 85%             | 8%            | 71.1%             | 59.3%             | 59.2%            | 5.6       |
| 497       | InteriorLighting    | Central Lighting Monitoring & Controls (non-networked)          | Biz-Custom Light       | Health        | Retro            | 41,703                          | 41,703                          | 20%            | 8,341                 | 0.00               | 12     | \$3,700      | 100%              | 12%               | 17%              | 7                     | 85%             | 8%            | 71.1%             | 50.8%             | 51.5%            | 9.2       |
| 498       | InteriorLighting    | Network Lighting Controls - Wireless (WiFi)                     | Biz-Custom Light       | Health        | Retro            | 16,277                          | 16,277                          | 47%            | 7,650                 | 0.00               | 8      | \$1,683      | 100%              | 24%               | 34%              | 7                     | 85%             | 8%            | 71.1%             | 56.9%             | 57.6%            | 6.5       |
| 499       | InteriorLighting    | Bi-Level Lighting Fixture - Stairwells, Hallways, and Garages   | Biz-Custom Light       | Health        | Retro            | 1,034                           | 1,034                           | 50%            | 517                   | 0.00               | 10     | \$274        | 50%               | 10%               | 8%               | 8                     | 15%             | 8%            | 62.0%             | 47.4%             | 47.1%            | 6.9       |
| 500       | InteriorLighting    | LED Exit Sign - 4 Watt Fixture (2 lamp)                         | Biz-Prescriptive Light | Health        | Retro            | 236                             | 236                             | 85%            | 201                   | 0.00               | 15     | \$60         | 100%              | 8%                | 13%              | 9                     | 1%              | 75%           | 80.0%             | 80.0%             | 80.0%            | 19.7      |
| 501       | ExteriorLighting    | LED walkpack (existing W<250)                                   | Biz-Prescriptive Light | Health        | Retro            | 856                             | 856                             | 66%            | 567                   | 0.00               | 12     | \$248        | 50%               | 10%               | 9%               | 1                     | 13%             | 46%           | 62.7%             | 56.8%             | 56.8%            | 6.6       |
| 502       | ExteriorLighting    | LED parking lot fixture (existing W250)                         | Biz-Prescriptive Light | Health        | Retro            | 1,589                           | 1,589                           | 60%            | 959                   | 0.00               | 12     | \$756        | 25%               | 3%                | 5%               | 2                     | 13%             | 41%           | 52.8%             | 52.8%             | 52.8%            | 11.2      |
| 503       | ExteriorLighting    | LED parking lot fixture (existing W<250)                        | Biz-Prescriptive Light | Health        | Retro            | 856                             | 856                             | 66%            | 567                   | 0.00               | 12     | \$248        | 50%               | 10%               | 9%               | 3                     | 13%             | 41%           | 62.7%             | 52.8%             | 52.8%            | 6.6       |
| 504       | ExteriorLighting    | LED fuel pump canopy fixture (existing W<250)                   | Biz-Prescriptive Light | Health        | Retro            | 0                               | 0                               | 0%             | 0                     | 0.00               | 12     | \$0          | 0%                | 0%                | 0%               | 4                     | 0%              | 41%           | 71.1%             | 61.9%             | 61.9%            | 0.0       |
| 505       | ExteriorLighting    | LED fuel pump canopy fixture (existing W250)                    | Biz-Prescriptive Light | Health        | Retro            | 0                               | 0                               | 0%             | 0                     | 0.00               | 12     | \$0          | 0%                | 0%                | 0%               | 5                     | 0%              | 41%           | 71.1%             | 61.9%             | 61.9%            | 0.0       |
| 506       | ExteriorLighting    | LED outdoor pole decorative fixture (existing W250)             | Biz-Prescriptive Light | Health        | Retro            | 1,589                           | 1,589                           | 60%            | 959                   | 0.00               | 12     | \$756        | 25%               | 3%                | 5%               | 6                     | 13%             | 41%           | 52.8%             | 52.8%             | 52.8%            | 11.2      |
| 507       | ExteriorLighting    | LED parking garage fixture (existing W250)                      | Biz-Prescriptive Light | Health        | Retro            | 3,235                           | 3,235                           | 60%            | 1,953                 | 0.00               | 6      | \$756        | 25%               | 3%                | 10%              | 7                     | 13%             | 41%           | 60.2%             | 52.8%             | 52.8%            | 11.8      |
| 508       | ExteriorLighting    | LED parking garage fixture (existing W<250)                     | Biz-Prescriptive Light | Health        | Retro            | 1,742                           | 1,742                           | 66%            | 1,154                 | 0.00               | 6      | \$248        | 50%               | 10%               | 19%              | 8                     | 13%             | 41%           | 66.7%             | 55.4%             | 56.0%            | 7.0       |
| 509       | ExteriorLighting    | LED Mogul-base HID Lamp Replacing Exterior HID (existing W250)  | Biz-Prescriptive Light | Health        | Retro            | 1,589                           | 1,589                           | 60%            | 959                   | 0.00               | 12     | \$756        | 25%               | 3%                | 5%               | 9                     | 13%             | 41%           | 52.8%             | 52.8%             | 52.8%            | 11.2      |
| 510       | ExteriorLighting    | LED Mogul-base HID Lamp Replacing Exterior HID (existing W<250) | Biz-Prescriptive Light | Health        | Retro            | 856                             | 856                             | 66%            | 567                   | 0.00               | 12     | \$248        | 50%               | 10%               | 9%               | 10                    | 13%             | 41%           | 62.7%             | 52.8%             | 52.8%            | 6.6       |
| 511       | Cooling             | Air Conditioner - 16 SEER (5-20 Tons)                           | Biz-Prescriptive       | Health        | ROB              | 11,239                          | 11,239                          | 13%            | 1,405                 | 0.00               | 15     | \$3,570      | 25%               | 5%                | 4%               | 1                     | 25%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 9.1       |
| 512       | Cooling             | Air Conditioner - 17 SEER (5-20 Tons)                           | Biz-Prescriptive       | Health        | ROB              | 11,239                          | 11,239                          | 13%            | 1,405                 | 0.00               | 15     | \$4,760      | 25%               | 5%                | 3%               | 1                     | 25%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 6.8       |
| 513       | Cooling             | Air Conditioner - 18 SEER (5-20 Tons)                           | Biz-Prescriptive       | Health        | ROB              | 11,239                          | 11,239                          | 19%            | 2,118                 | 0.00               | 15     | \$5,960      | 25%               | 5%                | 4%               | 1                     | 25%             | 20%           | 36.0%             | 34.9%             | 34.7%            | 8.2       |
| 514       | Cooling             | Air Conditioner - 21 SEER (5-20 Tons)                           | Biz-Prescriptive       | Health        | ROB              | 11,239                          | 11,239                          | 24%            | 2,734                 | 0.00               |        |              |                   |                   |                  |                       |                 |               |                   |                   |                  |           |

Appendix C: C&I Measure Assumptions

| Measure # | End-Use       | Measure Name   | Program          | Building Type | Replacement Type | Base (Existing) Annual Electric | Base (Standard) Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | End Use Measure Group | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|---------------|--|------------------|---------------|------------------|---------------------------------|---------------------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 526       | Cooling       | Centrifugal Chiller - Average kW/Ton = 0.626                   | Biz-Custom       | Health        | ROB              | 33,914                          | 33,914                          | 26%            | 8,896                 | 0.00               | 20     | \$20,077     | 25%               | 2%                | 3%               | 7                     | 28%             | 20%           | 36.0%             | 35.9%             | 36.0%            | 20.3      |
| 527       | Cooling       | Reciprocating Chiller - Average kW/Ton = 0.99                  | Biz-Custom       | Health        | ROB              | 41,698                          | 41,698                          | 27%            | 11,119                | 0.00               | 20     | \$16,096     | 100%              | 4%                | 5%               | 8                     | 22%             | 20%           | 63.2%             | 36.0%             | 36.0%            | 33.7      |
| 528       | Cooling       | Screw Chiller - Average kW/Ton = 0.675                         | Biz-Custom       | Health        | ROB              | 48,698                          | 48,698                          | 23%            | 11,170                | 0.00               | 20     | \$16,064     | 100%              | 4%                | 5%               | 9                     | 0%              | 20%           | 63.2%             | 36.0%             | 36.0%            | 33.1      |
| 529       | Cooling       | HVAC/Chiller Custom  | Biz-Custom       | Health        | Retro            | 5                               | 5                               | 20%            | 1                     | 0.00               | 12     | \$1          | 25%               | 6%                | 9%               | 10                    | 50%             | 20%           | 37.0%             | 36.0%             | 36.0%            | 7.2       |
| 530       | Cooling       | Chiller Tune-up  | Biz-Custom       | Health        | Retro            | 66,713                          | 66,713                          | 8%             | 5,337                 | 0.00               | 5      | \$750        | 100%              | 37%               | 53%              | 11                    | 50%             | 50%           | 63.2%             | 60.0%             | 60.0%            | 5.0       |
| 531       | Cooling       | PTAC - <7,000 Btuh - lodging                                   | Biz-Prescriptive | Health        | ROB              | 529                             | 529                             | 9%             | 48                    | 0.00               | 15     | \$22         | 100%              | 50%               | 22%              | 12                    | 0%              | 20%           | 63.2%             | 47.2%             | 43.4%            | 5.0       |
| 532       | Cooling       | PTAC - 7,000 to 15,000 Btuh - lodging                          | Biz-Prescriptive | Health        | ROB              | 1,176                           | 1,176                           | 9%             | 110                   | 0.00               | 15     | \$41         | 100%              | 50%               | 27%              | 13                    | 0%              | 20%           | 63.2%             | 48.4%             | 45.9%            | 6.2       |
| 533       | Cooling       | PTAC - >15,000 Btuh - lodging                                  | Biz-Prescriptive | Health        | ROB              | 1,988                           | 1,988                           | 10%            | 189                   | 0.00               | 15     | \$56         | 100%              | 50%               | 34%              | 14                    | 0%              | 20%           | 63.2%             | 49.5%             | 48.2%            | 7.8       |
| 534       | Cooling       | HVAC Occupancy Controls  | Biz-Custom       | Health        | ROB              | 1,046                           | 1,046                           | 20%            | 209                   | 0.00               | 15     | \$538        | 50%               | 2%                | 0%               | 15                    | 50%             | 25%           | 40.0%             | 40.0%             | 40.0%            | 28.9      |
| 535       | Cooling       | Smart Thermostat   | Biz-Custom       | Health        | ROB              | 5,245                           | 5,245                           | 18%            | 928                   | 0.00               | 10     | \$128        | 100%              | 20%               | 15%              | 16                    | 57%             | 9%            | 63.2%             | 49.2%             | 49.0%            | 10.9      |
| 536       | Cooling       | Window Film  | Biz-Custom       | Health        | Retro            | 55,597                          | 0                               | 4%             | 2,083                 | 0.00               | 10     | \$1,735      | 75%               | 6%                | 5%               | 17                    | 100%            | 25%           | 54.2%             | 40.0%             | 40.0%            | 13.1      |
| 537       | Cooling       | Energy Recovery Ventilator                                     | Biz-Custom       | Health        | Retro            | 2                               | 2                               | 50%            | 1                     | 0.00               | 20     | \$1          | 75%               | 8%                | 12%              | 18                    | 100%            | 5%            | 54.9%             | 33.4%             | 33.7%            | 11.0      |
| 538       | Heating       | Heat Pump - 16 SEER (<5 Tons)                                  | Biz-Prescriptive | Health        | ROB              | 10,732                          | 10,732                          | 19%            | 2,024                 | 0.00               | 15     | \$2,055      | 50%               | 20%               | 10%              | 1                     | 0%              | 20%           | 45.1%             | 36.0%             | 36.0%            | 3.5       |
| 539       | Heating       | Heat Pump - 17 SEER (<5 Tons)                                  | Biz-Prescriptive | Health        | ROB              | 10,732                          | 10,732                          | 22%            | 2,354                 | 0.00               | 15     | \$2,740      | 50%               | 20%               | 9%               | 1                     | 0%              | 20%           | 43.2%             | 36.0%             | 36.0%            | 3.1       |
| 540       | Heating       | Heat Pump - 18 SEER(<5 Tons)                                   | Biz-Prescriptive | Health        | ROB              | 10,732                          | 10,732                          | 25%            | 2,700                 | 0.00               | 15     | \$3,425      | 50%               | 20%               | 8%               | 1                     | 0%              | 20%           | 41.8%             | 36.0%             | 36.0%            | 2.9       |
| 541       | Heating       | Heat Pump - 21 SEER(<5 Tons)                                   | Biz-Prescriptive | Health        | ROB              | 10,732                          | 10,732                          | 31%            | 3,288                 | 0.00               | 15     | \$4,500      | 50%               | 20%               | 7%               | 1                     | 0%              | 20%           | 41.0%             | 36.0%             | 36.0%            | 2.9       |
| 542       | Heating       | Geothermal HP - SEER 20.3 (<5 Tons)                            | Biz-Prescriptive | Health        | ROB              | 10,732                          | 10,732                          | 36%            | 3,873                 | 0.00               | 15     | \$4,700      | 50%               | 11%               | 8%               | 1                     | 0%              | 20%           | 42.0%             | 36.0%             | 36.0%            | 5.5       |
| 543       | Heating       | Geothermal HP - SEER 21.5 (<5 Tons)                            | Biz-Prescriptive | Health        | ROB              | 10,732                          | 10,732                          | 40%            | 4,310                 | 0.00               | 15     | \$7,300      | 25%               | 7%                | 6%               | 1                     | 0%              | 20%           | 36.0%             | 36.0%             | 36.0%            | 6.0       |
| 544       | Heating       | Geothermal HP - SEER 23.1 (<5 Tons)                            | Biz-Prescriptive | Health        | ROB              | 10,732                          | 10,732                          | 46%            | 4,896                 | 0.00               | 15     | \$7,300      | 25%               | 7%                | 7%               | 1                     | 0%              | 20%           | 36.0%             | 36.0%             | 36.0%            | 6.9       |
| 545       | Heating       | Geothermal HP - SEER 29.3 (<5 Tons)                            | Biz-Prescriptive | Health        | ROB              | 10,732                          | 10,732                          | 51%            | 5,479                 | 0.00               | 15     | \$9,200      | 25%               | 8%                | 5%               | 1                     | 0%              | 20%           | 36.0%             | 36.0%             | 36.0%            | 4.9       |
| 546       | Heating       | Heat Pump - 16 SEER (5-20 Tons)                                | Biz-Prescriptive | Health        | ROB              | 38,730                          | 38,730                          | 10%            | 3,759                 | 0.00               | 15     | \$4,110      | 50%               | 20%               | 9%               | 2                     | 21%             | 20%           | 43.0%             | 36.0%             | 36.0%            | 3.0       |
| 547       | Heating       | Heat Pump - 17 SEER (5-20 Tons)                                | Biz-Prescriptive | Health        | ROB              | 38,730                          | 38,730                          | 13%            | 5,079                 | 0.00               | 15     | \$5,480      | 50%               | 20%               | 9%               | 2                     | 21%             | 20%           | 41.9%             | 36.0%             | 36.0%            | 2.7       |
| 548       | Heating       | Heat Pump - 18 SEER (5-20 Tons)                                | Biz-Prescriptive | Health        | ROB              | 38,730                          | 38,730                          | 19%            | 7,492                 | 0.00               | 15     | \$6,850      | 50%               | 20%               | 7%               | 2                     | 21%             | 20%           | 44.9%             | 36.0%             | 36.0%            | 3.2       |
| 549       | Heating       | Heat Pump - 21 SEER (5-20 Tons)                                | Biz-Prescriptive | Health        | ROB              | 38,730                          | 38,730                          | 25%            | 9,583                 | 0.00               | 15     | \$9,000      | 50%               | 20%               | 6%               | 2                     | 21%             | 20%           | 44.5%             | 36.0%             | 36.0%            | 3.1       |
| 550       | Heating       | Geothermal HP - SEER 20.3 (5-20 Tons)                          | Biz-Prescriptive | Health        | ROB              | 19,500                          | 19,500                          | 29%            | 5,658                 | 0.00               | 15     | \$7,700      | 75%               | 6%                | 6%               | 2                     | 21%             | 20%           | 53.1%             | 36.0%             | 36.0%            | 11.9      |
| 551       | Heating       | Geothermal HP - SEER 21.5 (5-20 Tons)                          | Biz-Prescriptive | Health        | ROB              | 19,500                          | 19,500                          | 34%            | 6,538                 | 0.00               | 15     | \$10,300     | 50%               | 5%                | 5%               | 2                     | 21%             | 20%           | 41.4%             | 36.0%             | 36.0%            | 13.1      |
| 552       | Heating       | Geothermal HP - SEER 23.1 (5-20 Tons)                          | Biz-Prescriptive | Health        | ROB              | 19,500                          | 19,500                          | 40%            | 7,721                 | 0.00               | 15     | \$12,800     | 50%               | 4%                | 4%               | 2                     | 21%             | 20%           | 39.6%             | 36.0%             | 36.0%            | 14.7      |
| 553       | Heating       | Geothermal HP - SEER 29.3 (5-20 Tons)                          | Biz-Prescriptive | Health        | ROB              | 19,500                          | 19,500                          | 46%            | 8,909                 | 0.00               | 15     | \$17,700     | 25%               | 4%                | 3%               | 2                     | 21%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 11.5      |
| 554       | Heating       | Heat Pump - 16 SEER (20+ Tons)                                 | Biz-Prescriptive | Health        | ROB              | 79,587                          | 79,587                          | 10%            | 8,333                 | 0.00               | 15     | \$8,220      | 50%               | 20%               | 6%               | 3                     | 21%             | 20%           | 42.9%             | 36.0%             | 36.0%            | 2.7       |
| 555       | Heating       | Heat Pump - 17 SEER (20+ Tons)                                 | Biz-Prescriptive | Health        | ROB              | 79,587                          | 79,587                          | 14%            | 10,973                | 0.00               | 15     | \$10,960     | 25%               | 20%               | 5%               | 3                     | 21%             | 20%           | 36.5%             | 36.0%             | 36.0%            | 2.5       |
| 556       | Heating       | Heat Pump - 18 SEER (20+ Tons)                                 | Biz-Prescriptive | Health        | ROB              | 79,587                          | 79,587                          | 20%            | 15,989                | 0.00               | 15     | \$13,700     | 50%               | 20%               | 4%               | 3                     | 21%             | 20%           | 45.2%             | 36.0%             | 36.0%            | 3.1       |
| 557       | Heating       | Heat Pump - 21 SEER (20+ Tons)                                 | Biz-Prescriptive | Health        | ROB              | 79,587                          | 79,587                          | 26%            | 20,321                | 0.00               | 15     | \$18,000     | 50%               | 20%               | 3%               | 3                     | 21%             | 20%           | 44.9%             | 36.0%             | 36.0%            | 3.1       |
| 558       | Heating       | Geothermal HP - SEER 20.3 (20+ Tons)                           | Biz-Prescriptive | Health        | ROB              | 39,503                          | 39,503                          | 30%            | 11,818                | 0.00               | 15     | \$10,700     | 100%              | 9%                | 5%               | 3                     | 21%             | 20%           | 63.2%             | 36.0%             | 36.0%            | 12.1      |
| 559       | Heating       | Geothermal HP - SEER 21.5 (20+ Tons)                           | Biz-Prescriptive | Health        | ROB              | 39,503                          | 39,503                          | 34%            | 13,577                | 0.00               | 15     | \$13,300     | 75%               | 8%                | 4%               | 3                     | 21%             | 20%           | 55.2%             | 36.0%             | 36.0%            | 13.2      |
| 560       | Heating       | Geothermal HP - SEER 23.1 (20+ Tons)                           | Biz-Prescriptive | Health        | ROB              | 39,503                          | 39,503                          | 40%            | 15,943                | 0.00               | 15     | \$18,300     | 75%               | 5%                | 3%               | 3                     | 21%             | 20%           | 53.8%             | 36.0%             | 36.0%            | 14.9      |
| 561       | Heating       | Geothermal HP - SEER 29.3 (20+ Tons)                           | Biz-Prescriptive | Health        | ROB              | 39,503                          | 39,503                          | 46%            | 18,321                | 0.00               | 15     | \$26,200     | 50%               | 4%                | 2%               | 3                     | 21%             | 20%           | 42.6%             | 36.0%             | 36.0%            | 17.5      |
| 562       | Heating       | PTHP - <7,000 Btuh - lodging                                   | Biz-Prescriptive | Health        | ROB              | 1,903                           | 1,903                           | 9%             | 163                   | 0.00               | 15     | \$13         | 100%              | 100%              | 100%             | 4                     | 0%              | 20%           | 63.2%             | 55.0%             | 55.0%            | 7.6       |
| 563       | Heating       | PTHP - 7,000 to 15,000 Btuh - lodging                          | Biz-Prescriptive | Health        | ROB              | 4,103                           | 4,103                           | 11%            | 444                   | 0.00               | 15     | \$45         | 100%              | 100%              | 98%              | 5                     | 0%              | 20%           | 63.2%             | 55.0%             | 55.0%            | 5.4       |
| 564       | Heating       | PTHP - >15,000 Btuh - lodging                                  | Biz-Prescriptive | Health        | ROB              | 6,680                           | 6,680                           | 13%            | 879                   | 0.00               | 15     | \$35         | 100%              | 100%              | 100%             | 6                     | 0%              | 20%           | 63.2%             | 55.0%             | 55.0%            | 13.1      |
| 565       | Heating       | Mini Split Ductless Heat Pump Cold Climate (Tiers & sizes TBD) | Biz-Prescriptive | Health        | ROB              | 4                               | 4                               | 25%            | 1                     | 0.00               | 12     | \$0          | 100%              | 35%               | 67%              | 7                     | 0%              | 20%           | 63.2%             | 52.3%             | 53.7%            | 18.3      |
| 566       | Heating       | Variable Refrigerant Flow Heat Pump                            | Biz-Custom       | Health        | NC               | 11                              | 11                              | 25%            | 3                     | 0.00               | 20     | \$3          | 100%              | 5%                | 3%               | 2                     | 21%             | 0%            | 63.2%             | 33.5%             | 33.4%            | 26.0      |
| 567       | Ventilation   | Kitchen Exhaust Hood Demand Ventilation Control System         | Biz-Custom       | Health        | ROB              | 5                               | 5                               | 50%            | 3                     | 0.00               | 20     | \$2          | 75%               | 8%                | 11%              | 1                     | 12%             | 24%           | 54.6%             | 39.2%             | 39.2%            | 10.7      |
| 568       | Ventilation   | Demand Controlled Ventilation                                  | Biz-Custom       | Health        | Retro            | 2,428                           | 2,428                           | 20%            | 486                   | 0.00               | 15     | \$227        | 100%              | 11%               | 16%              | 2                     | 88%             | 5%            | 63.2%             | 39.5%             | 40.3%            | 11.4      |
| 569       | Ventilation   | Pump and Fan Variable Frequency Drive Controls (Fans)          | Biz-Prescriptive | Health        | Retro            | 2,258                           | 2,258                           | 41%            | 923                   | 0.00               | 15     | \$375        | 100%              | 16%               | 18%              | 2                     | 88%             | 25%           | 63.2%             | 42.0%             | 42.4%            | 9.2       |
| 570       | Refrigeration | Strip Curtains   | Biz-Custom       | Health        | Retro            | 334                             | 334                             | 81%            | 270                   | 0.00               | 4      | \$9          | 100%              | 100%              | 100%             | 1                     | 6%              | 20%           | 60.2%             | 52.4%             | 52.4%            | 4.2       |
| 571       | Refrigeration | Bare Suction Line  | Biz-Custom       | Health        | Retro            | 23                              | 23                              | 93%            | 21                    | 0.00               | 15     | \$4          | 100%              | 27%               | 39%              | 2                     | 0%              | 25%           | 60.2%             | 45.6%             | 46.6%            | 9.2       |
| 572       | Refrigeration | Floating Head Pressure Controls                                | Biz-Prescriptive | Health        | Retro            | 2,653                           | 2,653                           | 50%            | 1,327                 | 0.00               | 15     | \$80         | 100%              | 25%               | 41%              | 3                     | 8%              | 20%           | 60.2%             | 50.1%             | 50.6%            | 31.6      |
| 573       | Refrigeration | Saturated Suction Controls                                     | Biz-Custom       | Health        | Retro            | 831                             | 831                             | 50%            | 416                   | 0.00               | 15     | \$559        | 50%               | 4%                | 6%               | 4                     | 2%              | 20%           | 36.0%             | 36.0%             | 36.0%            | 15.7      |
| 574       | Refrigeration | Compressor Retrofit  | Biz-Custom       | Health        | Retro            | 813                             | 813                             | 20%            | 163                   | 0.00               | 15     | \$477        | 25%               | 2%                | 3%               | 5                     | 14%             | 15%           | 32.0%             | 27.4%             | 27.4%            | 15.8      |
| 575       | Refrigeration | Electronically Commutated (EC) Walk-In Evaporator Fan Motor    | Biz-Prescriptive | Health        | Retro            | 1,268                           | 1,268                           | 65%            | 824                   | 0.00               | 15     | \$78         | 100%              | 45%               | 42%              | 6                     | 4%              | 33%           | 60.2%             | 49.8%             | 49.6%            | 11.2      |
| 576       | Refrigeration | Evaporator Fan Motor Controls                                  | Biz-Prescriptive | Health        | Retro            | 1,912                           | 1,912                           | 25%            | 478                   | 0.00               | 13     | \$291        | 50%               | 15%               | 7%               | 7                     | 4%              | 10%           | 30.0%             | 28.3%             | 4.7              |           |
| 577       | Refrigeration | Variable Speed Condenser Fan                                   | Biz-Custom       | Health        | Retro            | 2,960                           | 2,960                           | 50%            | 1,480                 | 0.00               | 15     | \$1,170      | 25%               | 7%                | 9%               | 8                     | 5%              | 20%           | 36.0%             | 36.0%             | 36.0%            | 6.9       |
| 578       | Refrigeration | Refrigeration Economizer                                       | Biz-Custom       | Health        | Retro            | 67,850                          | 67,850                          | 2%             | 1,357                 | 0.00               | 15     | \$2,558      | 3%                | 3%                | 4%               | 9                     | 19%             | 0%            | 20.0%             | 15.7%             | 15.9%            | 6.9       |
| 579       | Refrigeration | Anti-Sweat Heater Controls MT                                  | Biz-Prescriptive | Health        | Retro            | 1,313                           | 1,313                           | 55%            | 722                   | 0.00               | 12     | \$250        | 75%               | 10%               | 12%              | 10                    | 19%             | 36%           | 54.7%             | 48.8%             | 48.8%            | 8.7       |
| 580       | Refrigeration | Auto Door Closer, Cooler                                       | Biz-Prescriptive | Health        | Retro            | 471,500                         | 471,500                         | 0%             | 943                   | 0.00               | 8      | \$157        | 100%              | 16%               | 24%              | 11                    | 14%             | 27%           | 60.2%             | 45.7%             | 46.3%            | 11.6      |
| 581       | Refrigeration | Display Case Door Retrofit, Medium Temp                        | Biz-Prescriptive | Health        | Retro            | 1,584                           | 1,584                           | 36%            | 578                   | 0.00               | 12     | \$686        | 25%               | 22%               | 3%               | 12                    | 6%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 1.7       |
| 582       | Refrigeration | Electronically Commutated (EC) Reach-In Evaporator Fan Motor   | Biz-Prescriptive | Health        | Retro            | 1,268                           | 1,268                           | 65%            | 824                   | 0.00               | 15     | \$78         | 100%              | 45%               | 42%              | 13                    | 3%              | 33%           | 60.2%             | 49.8%             | 49.6%            | 11.2      |
| 583       | Refrigeration | Q-Sync Motor for Walk-In and Reach-In Evaporator Fan Motor     | Biz-Prescriptive | Health        | Retro            | 993                             | 993                             | 51%            | 504                   | 0.00               | 10     | \$96         | 100%              | 36%               | 21%              | 13                    | 3%              | 33%           | 60.2%             | 46.4%             | 46.4%            | 5.1       |
| 584       | Refrigeration | Energy Star Reach-In Refrigerator, Glass Doors                 | Biz-Prescriptive | Health        | ROB              | 1,546                           | 1,546                           | 27%            | 410                   | 0.00               | 12     | \$600        | 25%               | 5%                | 3%               | 14                    | 19%             | 55%           | 64.0%             | 64.0%             | 63.9%            | 5.1       |
| 585       | Refrigeration | Energy Star Reach-In Refrigerator, Solid Doors                 | Biz-Prescriptive | Health        | ROB              | 1,112                           | 1,112                           | 25%            | 283                   | 0.00               | 12     | \$600        | 5%                | 5%                | 2%               | 15                    | 19%             | 55%           | 64.0%             | 62.1%             | 61.9%            | 3.5       |
| 586       | Refrigeration | Anti-Sweat Heater Controls LT                                  | Biz-Prescriptive | Health        | Retro            | 3,147                           | 3,147                           | 55%            | 1,731                 | 0.00               | 12     | \$250        | 100%              | 10%               | 28%              | 16                    | 6%              | 36%           | 60.2%             | 48.8%             | 48.8%            | 27.8      |
| 587       | Refrigeration | Auto Door Closer, Freezer                                      | Biz-Prescriptive | Health        | Retro            | 419,455                         | 419,455                         | 1%             | 2,307                 | 0.00               | 8      | \$157</      |                   |                   |                  |                       |                 |               |                   |                   |                  |           |

Appendix C: C&I Measure Assumptions

| Measure # | End-Use             | Measure Name   | Program                | Building Type | Replacement Type | Base (Existing) Annual Electric | Base (Standard) Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | End Use Measure Group | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|---------------------|--|------------------------|---------------|------------------|---------------------------------|---------------------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 601       | PlugLoads_Office    | Energy Star Laptop   | Biz-Custom             | Health        | ROB              | 126                             | 126                             | 33%            | 41                    | 0.00               | 4      | \$0          | 0%                |                   |                  | 4                     | 17%             | 85%           | 88.0%             | 88.0%             | 88.0%            | 0.0       |
| 602       | PlugLoads_Office    | Energy Star Monitor  | Biz-Custom             | Health        | ROB              | 72                              | 72                              | 21%            | 15                    | 0.00               | 4      | \$0          | 0%                |                   |                  | 5                     | 17%             | 95%           | 96.0%             | 96.0%             | 96.0%            | 0.0       |
| 603       | PlugLoads_Office    | Energy Star Printer/Copier/Fax                                 | Biz-Custom             | Health        | ROB              | 551                             | 551                             | 40%            | 223                   | 0.00               | 6      | \$0          | 0%                |                   |                  | 6                     | 17%             | 95%           | 96.0%             | 96.0%             | 96.0%            | 0.0       |
| 604       | PlugLoads_Office    | Energy Star Server   | Biz-Custom             | Health        | ROB              | 691                             | 691                             | 13%            | 90                    | 0.00               | 15     | \$156        | 25%               | 3%                | 4%               | 7                     | 15%             | 20%           | 36.3%             | 36.0%             | 36.0%            | 9.5       |
| 605       | PlugLoads_Office    | Server Virtualization  | Biz-Custom             | Health        | Retro            | 691                             | 691                             | 13%            | 90                    | 0.00               | 15     | \$156        | 25%               | 3%                | 4%               | 7                     | 15%             | 20%           | 36.3%             | 36.0%             | 36.0%            | 9.5       |
| 606       | PlugLoads_Office    | Data Center Hot/Cold Aisle Configuration                       | Biz-Custom             | Health        | Retro            | 691                             | 691                             | 13%            | 90                    | 0.00               | 15     | \$156        | 25%               | 3%                | 4%               | 7                     | 15%             | 20%           | 36.3%             | 36.0%             | 36.0%            | 9.5       |
| 607       | Motors              | Cogged V-Belt  | Biz-Custom             | Health        | Retro            | 17,237                          | 17,237                          | 3%             | 534                   | 0.00               | 15     | \$384        | 75%               | 7%                | 10%              | 1                     | 12%             | 10%           | 61.5%             | 40.1%             | 40.4%            | 11.2      |
| 608       | Motors              | Pump and Fan Variable Frequency Drive Controls (Pumps)         | Biz-Prescriptive       | Health        | Retro            | 1,902                           | 1,902                           | 38%            | 731                   | 0.00               | 15     | \$200        | 100%              | 70%               | 27%              | 2                     | 80%             | 25%           | 68.6%             | 53.3%             | 53.1%            | 7.3       |
| 609       | Motors              | Escalators Motor Efficiency Controllers                        | Biz-Custom             | Health        | Retro            | 7,500                           | 7,500                           | 20%            | 1,500                 | 0.00               | 10     | \$5,000      | 2%                | 2%                | 2%               | 3                     | 0%              | 10%           | 28.0%             | 28.0%             | 28.0%            | 9.1       |
| 610       | CompressedAir       | Efficient Air Compressors                                      | Biz-Custom             | Health        | ROB              | 4,004                           | 4,004                           | 31%            | 1,223                 | 0.00               | 15     | \$100        | 100%              | 64%               | 100%             | 1                     | 100%            | 33%           | 68.6%             | 58.6%             | 59.7%            | 10.7      |
| 611       | CompressedAir       | Retro-commissioning_Compressed Air Optimization                | Biz-Custom RCx         | Health        | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 5      | \$0          | 100%              | 67%               | 100%             | 2                     | 100%            | 33%           | 68.6%             | 58.8%             | 59.7%            | 4.1       |
| 612       | CompressedAir       | Compressed Air - Custom  | Biz-Custom             | Health        | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 8      | \$0          | 100%              | 50%               | 100%             | 3                     | 100%            | 33%           | 68.6%             | 57.5%             | 59.7%            | 4.3       |
| 613       | Miscellaneous       | Power Distribution Equipment Upgrades                          | Biz-Custom             | Health        | Retro            | 1,150                           | 1,150                           | 1%             | 6                     | 0.00               | 30     | \$8          | 75%               | 4%                | 6%               | 1                     | 50%             | 20%           | 58.1%             | 36.0%             | 36.0%            | 18.4      |
| 614       | Miscellaneous       | Vending Machine Controller - Non-Refrigerated                  | Biz-Custom             | Health        | Retro            | 745                             | 745                             | 46%            | 343                   | 0.00               | 5      | \$80         | 63%               | 63%               | 32%              | 2                     | 1%              | 66%           | 72.8%             | 72.8%             | 72.8%            | 0.9       |
| 615       | Miscellaneous       | Vending Machine Controller - Refrigerated                      | Biz-Custom             | Health        | Retro            | 1,739                           | 1,739                           | 46%            | 800                   | 0.00               | 10     | \$216        | 100%              | 35%               | 28%              | 3                     | 3%              | 66%           | 72.8%             | 72.8%             | 72.8%            | 3.4       |
| 616       | Miscellaneous       | Miscellaneous Custom   | Biz-Custom             | Health        | Retro            | 5                               | 5                               | 20%            | 1                     | 0.00               | 10     | \$0          | 100%              | 50%               | 72%              | 4                     | 50%             | 20%           | 68.6%             | 57.8%             | 58.7%            | 8.1       |
| 617       | Whole Building_HVAC | HVAC - Energy Management System                                | Biz-Prescriptive       | Health        | Retro            | 6,960                           | 6,960                           | 15%            | 1,044                 | 0.00               | 15     | \$4,000      | 3%                | 3%                | 2%               | 1                     | 100%            | 1%            | 20.8%             | 18.4%             | 18.4%            | 4.3       |
| 618       | Whole Building_HVAC | Guest room energy management system                            | Biz-Custom             | Health        | Retro            | 0                               | 0                               | 0%             | 0                     | 0.00               | 8      | \$0          | 0%                | 0%                | 0%               | 2                     | 0%              | 0%            | 63.2%             | 55.0%             | 55.0%            | 0.0       |
| 619       | Whole Building_HVAC | Retro-commissioning_Bld Optimization                           | Biz-Custom RCx         | Health        | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 3      | \$0          | 100%              | 67%               | 22%              | 3                     | 100%            | 10%           | 63.2%             | 53.6%             | 51.8%            | 2.2       |
| 620       | WholeBld            | WholeBld - Com RET   | Biz-NC                 | Health        | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 19%              | 4                     | 40%             | 0%            | 68.6%             | 57.8%             | 56.6%            | 9.4       |
| 621       | WholeBld_NC         | WholeBld - Com NC  | Biz-NC                 | Health        | NC               | 4                               | 4                               | 25%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 72%              | 5                     | 100%            | 60%           | 68.6%             | 68.0%             | 68.0%            | 9.4       |
| 622       | Behavioral          | AMI Data Presentation & Engagement                             | Biz-Behavior           | Health        | Retro            | 100                             | 100                             | 1%             | 1                     | 0.00               | 1      | \$0          | 100%              | 100%              | 87%              | 1                     | 100%            | 10%           | 50.0%             | 50.0%             | 50.0%            | 1.2       |
| 623       | Behavioral          | BiEMS  | Biz-Behavior           | Health        | Retro            | 46                              | 46                              | 2%             | 1                     | 0.00               | 3      | \$0          | 12%               | 12%               | 5%               | 1                     | 100%            | 5%            | 42.5%             | 50.0%             | 50.0%            | 1.6       |
| 624       | Behavioral          | Building Operator Certification                                | Biz-Behavior           | Health        | Retro            | 25,800                          | 25,800                          | 1%             | 206                   | 0.00               | 3      | \$35         | 50%               | 30%               | 12%              | 1                     | 100%            | 5%            | 42.5%             | 50.0%             | 50.0%            | 2.2       |
| 625       | Cooking             | Commercial Combination Oven (Electric)                         | Biz-Prescriptive       | Lodging       | ROB              | 38,561                          | 38,561                          | 48%            | 18,432                | 0.00               | 12     | \$16,884     | 50%               | 6%                | 3%               | 1                     | 17%             | 53%           | 62.4%             | 62.4%             | 62.4%            | 9.2       |
| 626       | Cooking             | Commercial Electric Convection Oven                            | Biz-Prescriptive       | Lodging       | ROB              | 12,193                          | 12,193                          | 15%            | 1,879                 | 0.00               | 12     | \$1,706      | 50%               | 15%               | 11%              | 1                     | 17%             | 53%           | 62.4%             | 62.4%             | 62.4%            | 3.9       |
| 627       | Cooking             | Commercial Electric Griddle                                    | Biz-Prescriptive       | Lodging       | ROB              | 17,056                          | 17,056                          | 15%            | 2,596                 | 0.00               | 12     | \$3,604      | 25%               | 14%               | 7%               | 2                     | 14%             | 17%           | 39.3%             | 33.6%             | 33.6%            | 2.0       |
| 628       | Cooking             | Commercial Electric Steam Cooker                               | Biz-Prescriptive       | Lodging       | ROB              | 19,549                          | 19,549                          | 67%            | 13,162                | 0.00               | 12     | \$3,500      | 100%              | 12%               | 14%              | 3                     | 6%              | 42%           | 68.6%             | 53.6%             | 53.6%            | 15.6      |
| 629       | Cooking             | Dishwasher Low Temp Door (Energy Star)                         | Biz-Prescriptive       | Lodging       | ROB              | 39,279                          | 39,279                          | 41%            | 16,153                | 0.00               | 15     | \$770        | 100%              | 49%               | 65%              | 4                     | 26%             | 61%           | 68.8%             | 68.8%             | 68.8%            | 18.4      |
| 630       | Cooking             | Dishwasher High Temp Door (Energy Star)                        | Biz-Prescriptive       | Lodging       | ROB              | 39,825                          | 39,825                          | 30%            | 11,853                | 0.00               | 15     | \$770        | 100%              | 49%               | 65%              | 4                     | 26%             | 61%           | 68.8%             | 68.8%             | 68.8%            | 13.5      |
| 631       | Cooking             | Energy efficient electric fryer                                | Biz-Prescriptive       | Lodging       | ROB              | 18,182                          | 18,182                          | 14%            | 2,572                 | 0.00               | 12     | \$1,706      | 50%               | 1%                | 15%              | 5                     | 27%             | 25%           | 55.0%             | 39.3%             | 40.7%            | 9.2       |
| 632       | Cooking             | Insulated Holding Cabinets (Full Size)                         | Biz-Prescriptive       | Lodging       | ROB              | 7,665                           | 7,665                           | 69%            | 5,278                 | 0.00               | 12     | \$1,200      | 100%              | 6%                | 42%              | 6                     | 3%              | 23%           | 68.6%             | 52.4%             | 54.9%            | 31.2      |
| 633       | Cooking             | Insulated Holding Cabinets (Half-Size)                         | Biz-Prescriptive       | Lodging       | ROB              | 3,066                           | 3,066                           | 58%            | 1,788                 | 0.00               | 12     | \$1,500      | 50%               | 8%                | 12%              | 6                     | 3%              | 23%           | 52.9%             | 38.7%             | 39.1%            | 6.6       |
| 634       | HotWater            | Faucet Aerator   | Biz-Custom             | Lodging       | Retro            | 303                             | 303                             | 66%            | 200                   | 0.00               | 10     | \$3          | 100%              | 26%               | 100%             | 4                     | 25%             | 80%           | 84.0%             | 84.0%             | 84.0%            | 108.0     |
| 635       | HotWater            | Heat Pump Water Heater   | Biz-Custom             | Lodging       | ROB              | 10,967                          | 10,967                          | 35%            | 3,788                 | 0.00               | 10     | \$1,574      | 50%               | 13%               | 10%              | 1                     | 65%             | 33%           | 66.0%             | 52.6%             | 52.2%            | 5.9       |
| 636       | HotWater            | Hot Water Pipe Insulation                                      | Biz-Custom             | Lodging       | Retro            | 10,967                          | 10,967                          | 2%             | 219                   | 0.00               | 20     | \$60         | 100%              | 19%               | 15%              | 2                     | 100%            | 80%           | 84.0%             | 84.0%             | 84.0%            | 11.3      |
| 637       | HotWater            | Low Flow Pre-Rinse Sprayers                                    | Biz-Custom             | Lodging       | ROB              | 2,991                           | 2,991                           | 26%            | 764                   | 0.00               | 5      | \$35         | 100%              | 71%               | 87%              | 3                     | 25%             | 80%           | 84.0%             | 84.0%             | 84.0%            | 6.6       |
| 638       | HotWater            | ENERGY STAR Commercial Washing Machines                        | Biz-Custom             | Lodging       | ROB              | 1,552                           | 1,552                           | 43%            | 671                   | 0.00               | 7      | \$250        | 50%               | 14%               | 11%              | 5                     | 25%             | 35%           | 66.5%             | 53.7%             | 53.3%            | 3.9       |
| 639       | HotWater            | Ozone Commercial Laundry                                       | Biz-Custom             | Lodging       | Retro            | 2,984                           | 2,984                           | 25%            | 746                   | 0.00               | 10     | \$20,310     | 0%                | 0%                | 0%               | 6                     | 35%             | 50%           | 60.0%             | 60.0%             | 60.0%            | 5.0       |
| 640       | InteriorLighting    | LED T8 Tube Replacement  | Biz-Prescriptive Light | Lodging       | Retro            | 138                             | 138                             | 59%            | 82                    | 0.00               | 15     | \$7          | 100%              | 49%               | 49%              | 1                     | 46%             | 32%           | 71.1%             | 60.5%             | 60.5%            | 12.3      |
| 641       | InteriorLighting    | LED troffer retrofit kit, 2'X2' and 2'X4'                      | Biz-Prescriptive Light | Lodging       | Retro            | 310                             | 310                             | 50%            | 155                   | 0.00               | 18     | \$67         | 100%              | 26%               | 9%               | 1                     | 46%             | 32%           | 71.1%             | 52.9%             | 50.8%            | 5.6       |
| 642       | InteriorLighting    | LED troffer, 2'X2' and 2'X4'                                   | Biz-Prescriptive Light | Lodging       | Retro            | 223                             | 223                             | 50%            | 112                   | 0.00               | 18     | \$67         | 100%              | 26%               | 7%               | 1                     | 46%             | 32%           | 71.1%             | 49.3%             | 45.8%            | 4.1       |
| 643       | InteriorLighting    | LED high bay fixture   | Biz-Prescriptive Light | Lodging       | Retro            | 1,080                           | 1,080                           | 76%            | 821                   | 0.00               | 12     | \$323        | 100%              | 12%               | 10%              | 2                     | 1%              | 16%           | 71.1%             | 52.5%             | 52.2%            | 10.4      |
| 644       | InteriorLighting    | LED Mogul-base HID Lamp Replacing High Bay HID                 | Biz-Prescriptive Light | Lodging       | Retro            | 1,080                           | 1,080                           | 79%            | 855                   | 0.00               | 12     | \$110        | 100%              | 21%               | 31%              | 2                     | 1%              | 16%           | 71.1%             | 58.8%             | 59.2%            | 18.9      |
| 645       | InteriorLighting    | LED low bay fixture  | Biz-Prescriptive Light | Lodging       | Retro            | 1,080                           | 1,080                           | 76%            | 821                   | 0.00               | 12     | \$196        | 100%              | 20%               | 17%              | 3                     | 1%              | 16%           | 71.1%             | 56.5%             | 56.2%            | 10.4      |
| 646       | InteriorLighting    | LED Mogul-base HID Lamp Replacing Low Bay HID                  | Biz-Prescriptive Light | Lodging       | Retro            | 1,080                           | 1,080                           | 79%            | 855                   | 0.00               | 12     | \$60         | 100%              | 38%               | 57%              | 3                     | 1%              | 16%           | 71.1%             | 60.6%             | 61.0%            | 18.9      |
| 647       | InteriorLighting    | LED downlight, screw-in lamp, 1-3W, interior Average 2 Watts   | Biz-Prescriptive Light | Lodging       | ROB              | 67                              | 67                              | 88%            | 59                    | 0.00               | 4      | \$4          | 100%              | 25%               | 59%              | 4                     | 8%              | 32%           | 71.1%             | 60.3%             | 61.0%            | 10.0      |
| 648       | InteriorLighting    | LED downlight fixture  | Biz-Prescriptive Light | Lodging       | Retro            | 174                             | 174                             | 82%            | 142                   | 0.00               | 4      | \$13         | 100%              | 39%               | 44%              | 5                     | 45%             | 32%           | 71.1%             | 60.2%             | 60.3%            | 4.8       |
| 649       | InteriorLighting    | LED downlight, screw-in lamp, 4-20W, interior Average 11 Watts | Biz-Prescriptive Light | Lodging       | ROB              | 134                             | 134                             | 84%            | 113                   | 0.00               | 4      | \$2          | 100%              | 61%               | 100%             | 5                     | 45%             | 32%           | 71.1%             | 61.7%             | 61.9%            | 19.1      |
| 650       | InteriorLighting    | DeLamp Fluorescent Fixture Average Lamp Wattage 28W            | Biz-Custom Light       | Lodging       | Retro            | 53                              | 53                              | 100%           | 53                    | 0.00               | 15     | \$4          | 100%              | 69%               | 53%              | 6                     | 46%             | 0%            | 71.1%             | 61.1%             | 60.8%            | 10.8      |
| 651       | InteriorLighting    | Daylighting Controls   | Biz-Prescriptive Light | Lodging       | Retro            | 8,810                           | 8,810                           | 30%            | 2,643                 | 0.00               | 12     | \$3,000      | 25%               | 5%                | 4%               | 7                     | 85%             | 8%            | 48.3%             | 39.1%             | 39.0%            | 9.7       |
| 652       | InteriorLighting    | Occupancy Sensors  | Biz-Prescriptive Light | Lodging       | Retro            | 1,523                           | 1,523                           | 30%            | 457                   | 0.00               | 8      | \$54         | 100%              | 37%               | 34%              | 7                     | 85%             | 8%            | 71.1%             | 59.3%             | 59.2%            | 5.5       |
| 653       | InteriorLighting    | Central Lighting Monitoring & Controls (non-networked)         | Biz-Custom Light       | Lodging       | Retro            | 41,703                          | 41,703                          | 20%            | 8,341                 | 0.00               | 12     | \$3,700      | 100%              | 12%               | 17%              | 7                     | 85%             | 8%            | 71.1%             | 50.8%             | 51.5%            | 9.1       |
| 654       | InteriorLighting    | Network Lighting Controls - Wireless (WiFi)                    | Biz-Custom Light       | Lodging       | Retro            | 16,277                          | 16,277                          | 47%            | 7,650                 | 0.00               | 8      | \$1,683      | 100%              | 24%               | 34%              | 7                     | 85%             | 8%            | 71.1%             | 56.9%             | 57.6%            | 6.5       |
| 655       | InteriorLighting    | Bi-Level Lighting Fixture - Stairwells, Hallways, and Garages  | Biz-Custom Light       | Lodging       | Retro            | 1,034                           | 1,034                           | 50%            | 517                   | 0.00               | 10     | \$274        | 50%               | 10%               | 8%               | 8                     | 15%             | 8%            | 62.0%             | 47.4%             | 47.1%            | 6.8       |
| 656       | InteriorLighting    | LED Exit Sign - 4 Watt Fixture (2 lamp)                        | Biz-Prescriptive Light | Lodging       | Retro            | 236                             | 236                             | 85%            | 201                   | 0.00               | 15     | \$60         | 100%              | 8%                | 13%              | 9                     | 1%              | 75%           | 80.0%             | 80.0%             | 80.0%            | 19.6      |
| 657       | ExteriorLighting    | LED wallpack (existing W<250)                                  | Biz-Prescriptive Light | Lodging       | Retro            | 856                             | 856                             | 66%            | 567                   | 0.00               | 12     | \$248        | 50%               | 10%               | 9%               | 1                     | 13%             | 46%           | 62.7%             | 56.8%             | 56.8%            | 6.6       |
| 658       | ExteriorLighting    | LED parking lot fixture (existing W<250)                       | Biz-Prescriptive Light | Lodging       | Retro            | 1,589                           | 1,589                           | 60%            | 959                   | 0.00               | 12     | \$756        | 25%               | 3%                | 5%               | 2                     | 13%             | 41%           | 52.8%             | 52.8%             | 52.8%            | 11.1      |
| 659       | ExteriorLighting    | LED parking lot fixture (existing W<250)                       | Biz-Prescriptive Light | Lodging       | Retro            | 856                             | 856                             | 66%            | 567                   | 0.00               | 12     | \$248        | 50%               | 10%               | 9%               | 3                     | 13%             | 41%           | 62.7%             | 52.8%             | 52.8%            | 6.6       |
| 660       | ExteriorLighting    | LED fuel pump canopy fixture (existing W<250)                  | Biz-Prescriptive Light | Lodging       | Retro            | 0                               | 0                               | 0%             | 0                     | 0.00               | 12     | \$0          | 0%                | 0%                | 0%               | 4                     | 0%              | 41%           | 71.1%             | 61.9%             | 61.9%            | 0.0       |
| 661       | ExteriorLighting    | LED fuel pump canopy fixture (existing W<250)                  | Biz-Prescriptive Light | Lodging       | Retro            | 0                               | 0                               | 0%             | 0                     | 0.00               | 12     | \$0          | 0%                | 0%                | 0%               | 5                     | 0%              | 41%           | 71.1%             | 61.9%             | 61.9%            | 0.0       |
| 662       | ExteriorLighting    | LED outdoor pole decorative fixture (existing W<250)           | Biz-Prescriptive Light | Lodging       | Retro            | 1,589                           | 1,589                           | 60%            | 959                   | 0.00               | 12     | \$756        | 25%               | 3%                | 5%               | 6                     | 13%             | 41%           | 52.8%             | 52.8%             | 52.8%            | 11.1      |
| 663       | ExteriorLighting    | LED parking garage fixture (existing W<250)                    | Biz-Prescriptive Light | Lodging       | Retro            | 3,235                           | 3,235                           | 60%            | 1,953                 | 0.00               | 6      | \$756        | 25%               | 3%                | 10%              | 7                     | 13%             | 41%           | 60.2%             | 52.8%             | 52.8%            | 11.7      |
| 664       | ExteriorLighting    | LED parking garage fixture (existing W<250)                    | Biz-Prescriptive Light | Lodging       | Retro            | 1,742                           | 1,742                           | 66%            | 1,154                 | 0.00               | 6      | \$248        | 50%               | 10%               | 19%              | 8                     | 13%             | 41%           | 66.7%             | 55.4%             | 56.0%            | 6.9       |
| 665       | ExteriorLighting    | LED Mogul-base HID Lamp Replacing Exterior HID (existing       |                        |               |                  |                                 |                                 |                |                       |                    |        |              |                   |                   |                  |                       |                 |               |                   |                   |                  |           |

Appendix C: C&I Measure Assumptions

| Measure # | End-Use       | Measure Name   | Program          | Building Type | Replacement Type | Base (Existing) Annual Electric | Base (Standard) Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | End Use Measure Group | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|---------------|--|------------------|---------------|------------------|---------------------------------|---------------------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 676       | Cooling       | Air Side Economizer  | Biz-Custom       | Lodging       | Retro            | 4,458                           | 4,458                           | 3%             | 130                   | 0.00               | 5      | \$170        | 4%                | 4%                | 6%               | 4                     | 38%             | 33%           | 46.4%             | 46.4%             | 46.4%            | 2.9       |
| 677       | Cooling       | Advanced Rooftop Controls                                      | Biz-Custom       | Lodging       | Retro            | 3,715                           | 3,715                           | 42%            | 1,568                 | 0.00               | 10     | \$3,412      | 25%               | 2%                | 3%               | 5                     | 38%             | 3%            | 27.6%             | 22.0%             | 22.0%            | 15.6      |
| 678       | Cooling       | Air Conditioner - 16 SEER (<5 Tons)                            | Biz-Prescriptive | Lodging       | ROB              | 3,429                           | 3,429                           | 19%            | 643                   | 0.00               | 15     | \$1,785      | 50%               | 5%                | 4%               | 6                     | 0%              | 20%           | 36.0%             | 35.1%             | 34.9%            | 10.7      |
| 679       | Cooling       | Air Conditioner - 17 SEER (<5 Tons)                            | Biz-Prescriptive | Lodging       | ROB              | 3,429                           | 3,429                           | 24%            | 807                   | 0.00               | 15     | \$2,380      | 50%               | 5%                | 3%               | 6                     | 0%              | 20%           | 36.0%             | 34.3%             | 34.1%            | 10.0      |
| 680       | Cooling       | Air Conditioner - 18 SEER (<5 Tons)                            | Biz-Prescriptive | Lodging       | ROB              | 3,429                           | 3,429                           | 28%            | 953                   | 0.00               | 15     | \$2,980      | 25%               | 5%                | 3%               | 6                     | 0%              | 20%           | 36.0%             | 34.1%             | 34.1%            | 9.4       |
| 681       | Cooling       | Air Conditioner - 21 SEER (<5 Tons)                            | Biz-Prescriptive | Lodging       | ROB              | 3,429                           | 3,429                           | 38%            | 1,306                 | 0.00               | 15     | \$4,540      | 25%               | 5%                | 3%               | 6                     | 0%              | 20%           | 36.0%             | 34.1%             | 34.1%            | 8.5       |
| 682       | Cooling       | Centrifugal Chiller - Average kW/Ton = 0.626                   | Biz-Custom       | Lodging       | ROB              | 37,629                          | 37,629                          | 26%            | 9,870                 | 0.00               | 20     | \$22,276     | 25%               | 2%                | 3%               | 7                     | 0%              | 20%           | 36.0%             | 35.1%             | 35.2%            | 20.5      |
| 683       | Cooling       | Reciprocating Chiller - Average kW/Ton = 0.99                  | Biz-Custom       | Lodging       | ROB              | 46,266                          | 46,266                          | 27%            | 12,338                | 0.00               | 20     | \$17,859     | 100%              | 4%                | 5%               | 8                     | 31%             | 20%           | 63.2%             | 36.0%             | 36.0%            | 33.8      |
| 684       | Cooling       | Screw Chiller - Average kW/Ton = 0.675                         | Biz-Custom       | Lodging       | ROB              | 54,033                          | 54,033                          | 23%            | 12,394                | 0.00               | 20     | \$17,824     | 100%              | 4%                | 5%               | 9                     | 15%             | 20%           | 63.2%             | 36.0%             | 36.0%            | 33.3      |
| 685       | Cooling       | HVAC/Chiller Custom  | Biz-Custom       | Lodging       | Retro            | 5                               | 5                               | 20%            | 1                     | 0.00               | 12     | \$1          | 25%               | 6%                | 9%               | 10                    | 46%             | 20%           | 37.0%             | 36.0%             | 36.0%            | 7.4       |
| 686       | Cooling       | Chiller Tune-up  | Biz-Custom       | Lodging       | Retro            | 74,025                          | 74,025                          | 8%             | 5,922                 | 0.00               | 5      | \$1,175      | 100%              | 26%               | 38%              | 11                    | 46%             | 50%           | 63.2%             | 60.0%             | 60.0%            | 6.3       |
| 687       | Cooling       | PTAC - <7,000 Btuh - lodging                                   | Biz-Prescriptive | Lodging       | ROB              | 375                             | 375                             | 9%             | 34                    | 0.00               | 15     | \$22         | 100%              | 50%               | 15%              | 12                    | 5%              | 20%           | 63.2%             | 44.5%             | 38.2%            | 4.5       |
| 688       | Cooling       | PTAC - 7,000 to 15,000 Btuh - lodging                          | Biz-Prescriptive | Lodging       | ROB              | 833                             | 833                             | 9%             | 78                    | 0.00               | 15     | \$41         | 100%              | 50%               | 19%              | 13                    | 5%              | 20%           | 63.2%             | 46.2%             | 41.6%            | 5.6       |
| 689       | Cooling       | PTAC - >15,000 Btuh - lodging                                  | Biz-Prescriptive | Lodging       | ROB              | 1,408                           | 1,408                           | 10%            | 134                   | 0.00               | 15     | \$56         | 100%              | 50%               | 24%              | 14                    | 5%              | 20%           | 63.2%             | 47.8%             | 44.7%            | 7.0       |
| 690       | Cooling       | HVAC Occupancy Controls  | Biz-Custom       | Lodging       | ROB              | 9,061                           | 9,061                           | 20%            | 1,812                 | 0.00               | 15     | \$538        | 100%              | 18%               | 0%               | 15                    | 38%             | 25%           | 63.2%             | 44.7%             | 42.8%            | 12.7      |
| 691       | Cooling       | Smart Thermostat   | Biz-Custom       | Lodging       | ROB              | 3,715                           | 3,715                           | 18%            | 658                   | 0.00               | 10     | \$128        | 100%              | 20%               | 15%              | 16                    | 57%             | 9%            | 63.2%             | 47.4%             | 47.0%            | 7.8       |
| 692       | Cooling       | Window Film  | Biz-Custom       | Lodging       | Retro            | 61,688                          | 0                               | 5%             | 2,838                 | 0.00               | 10     | \$2,364      | 75%               | 6%                | 5%               | 17                    | 100%            | 25%           | 53.7%             | 40.0%             | 40.0%            | 13.2      |
| 693       | Cooling       | Energy Recovery Ventilator                                     | Biz-Custom       | Lodging       | Retro            | 2                               | 2                               | 50%            | 1                     | 0.00               | 20     | \$1          | 75%               | 8%                | 12%              | 18                    | 100%            | 5%            | 54.9%             | 33.4%             | 33.7%            | 10.7      |
| 694       | Heating       | Heat Pump - 16 SEER (<5 Tons)                                  | Biz-Prescriptive | Lodging       | ROB              | 13,045                          | 13,045                          | 19%            | 2,465                 | 0.00               | 15     | \$2,055      | 75%               | 20%               | 12%              | 1                     | 0%              | 20%           | 62.9%             | 54.2%             | 54.1%            | 3.8       |
| 695       | Heating       | Heat Pump - 17 SEER (<5 Tons)                                  | Biz-Prescriptive | Lodging       | ROB              | 13,045                          | 13,045                          | 21%            | 2,789                 | 0.00               | 15     | \$2,740      | 50%               | 20%               | 10%              | 1                     | 0%              | 20%           | 62.6%             | 54.1%             | 54.0%            | 3.4       |
| 696       | Heating       | Heat Pump - 18 SEER (<5 Tons)                                  | Biz-Prescriptive | Lodging       | ROB              | 13,045                          | 13,045                          | 24%            | 3,164                 | 0.00               | 15     | \$3,425      | 50%               | 20%               | 9%               | 1                     | 0%              | 20%           | 62.5%             | 54.0%             | 53.9%            | 3.1       |
| 697       | Heating       | Heat Pump - 21 SEER (<5 Tons)                                  | Biz-Prescriptive | Lodging       | ROB              | 13,045                          | 13,045                          | 28%            | 3,663                 | 0.00               | 15     | \$4,500      | 50%               | 20%               | 8%               | 1                     | 0%              | 20%           | 62.5%             | 54.1%             | 53.9%            | 3.0       |
| 698       | Heating       | Geothermal HP - SEER 20.3 (<5 Tons)                            | Biz-Prescriptive | Lodging       | ROB              | 13,045                          | 13,045                          | 36%            | 4,707                 | 0.00               | 15     | \$4,700      | 50%               | 11%               | 10%              | 1                     | 0%              | 20%           | 62.5%             | 53.9%             | 53.9%            | 6.0       |
| 699       | Heating       | Geothermal HP - SEER 21.5 (<5 Tons)                            | Biz-Prescriptive | Lodging       | ROB              | 13,045                          | 13,045                          | 40%            | 5,263                 | 0.00               | 15     | \$7,300      | 25%               | 7%                | 7%               | 1                     | 0%              | 20%           | 61.6%             | 53.3%             | 53.3%            | 6.7       |
| 700       | Heating       | Geothermal HP - SEER 23.1 (<5 Tons)                            | Biz-Prescriptive | Lodging       | ROB              | 13,045                          | 13,045                          | 46%            | 5,986                 | 0.00               | 15     | \$7,300      | 50%               | 7%                | 7%               | 1                     | 0%              | 20%           | 62.3%             | 53.5%             | 53.5%            | 7.6       |
| 701       | Heating       | Geothermal HP - SEER 29.3 (<5 Tons)                            | Biz-Prescriptive | Lodging       | ROB              | 13,045                          | 13,045                          | 49%            | 6,413                 | 0.00               | 15     | \$9,200      | 25%               | 8%                | 5%               | 1                     | 0%              | 20%           | 61.4%             | 53.1%             | 53.1%            | 5.2       |
| 702       | Heating       | Heat Pump - 16 SEER (5-20 Tons)                                | Biz-Prescriptive | Lodging       | ROB              | 52,833                          | 52,833                          | 9%             | 4,837                 | 0.00               | 15     | \$4,110      | 50%               | 20%               | 12%              | 2                     | 20%             | 20%           | 62.4%             | 53.9%             | 53.8%            | 3.4       |
| 703       | Heating       | Heat Pump - 17 SEER (5-20 Tons)                                | Biz-Prescriptive | Lodging       | ROB              | 52,833                          | 52,833                          | 13%            | 6,991                 | 0.00               | 15     | \$5,480      | 50%               | 20%               | 9%               | 2                     | 20%             | 20%           | 62.2%             | 53.5%             | 53.3%            | 3.2       |
| 704       | Heating       | Heat Pump - 18 SEER (5-20 Tons)                                | Biz-Prescriptive | Lodging       | ROB              | 52,833                          | 52,833                          | 19%            | 10,273                | 0.00               | 15     | \$6,850      | 75%               | 20%               | 7%               | 2                     | 20%             | 20%           | 62.8%             | 53.8%             | 53.6%            | 3.8       |
| 705       | Heating       | Heat Pump - 21 SEER (5-20 Tons)                                | Biz-Prescriptive | Lodging       | ROB              | 52,833                          | 52,833                          | 25%            | 13,116                | 0.00               | 15     | \$9,000      | 75%               | 20%               | 6%               | 2                     | 20%             | 20%           | 62.8%             | 53.8%             | 53.6%            | 3.8       |
| 706       | Heating       | Geothermal HP - SEER 20.3 (5-20 Tons)                          | Biz-Prescriptive | Lodging       | ROB              | 21,256                          | 21,256                          | 21%            | 4,492                 | 0.00               | 15     | \$7,700      | 50%               | 6%                | 6%               | 2                     | 20%             | 20%           | 62.8%             | 54.3%             | 54.3%            | 11.0      |
| 707       | Heating       | Geothermal HP - SEER 21.5 (5-20 Tons)                          | Biz-Prescriptive | Lodging       | ROB              | 21,256                          | 21,256                          | 26%            | 5,610                 | 0.00               | 15     | \$10,300     | 50%               | 5%                | 5%               | 2                     | 20%             | 20%           | 62.7%             | 54.2%             | 54.2%            | 12.3      |
| 708       | Heating       | Geothermal HP - SEER 23.1 (5-20 Tons)                          | Biz-Prescriptive | Lodging       | ROB              | 21,256                          | 21,256                          | 33%            | 7,063                 | 0.00               | 15     | \$12,800     | 50%               | 4%                | 4%               | 2                     | 20%             | 20%           | 62.6%             | 54.0%             | 54.0%            | 14.1      |
| 709       | Heating       | Geothermal HP - SEER 29.3 (5-20 Tons)                          | Biz-Prescriptive | Lodging       | ROB              | 21,256                          | 21,256                          | 37%            | 7,933                 | 0.00               | 15     | \$17,700     | 25%               | 4%                | 3%               | 2                     | 20%             | 20%           | 62.2%             | 53.9%             | 53.9%            | 11.0      |
| 710       | Heating       | Heat Pump - 16 SEER (20+ Tons)                                 | Biz-Prescriptive | Lodging       | ROB              | 108,761                         | 108,761                         | 11%            | 11,839                | 0.00               | 15     | \$8,220      | 50%               | 20%               | 6%               | 3                     | 20%             | 20%           | 62.1%             | 53.4%             | 53.1%            | 3.4       |
| 711       | Heating       | Heat Pump - 17 SEER (20+ Tons)                                 | Biz-Prescriptive | Lodging       | ROB              | 108,761                         | 108,761                         | 15%            | 16,148                | 0.00               | 15     | \$10,960     | 50%               | 20%               | 5%               | 3                     | 20%             | 20%           | 61.7%             | 52.9%             | 52.5%            | 3.3       |
| 712       | Heating       | Heat Pump - 18 SEER (20+ Tons)                                 | Biz-Prescriptive | Lodging       | ROB              | 108,761                         | 108,761                         | 21%            | 22,845                | 0.00               | 15     | \$13,700     | 75%               | 20%               | 4%               | 3                     | 20%             | 20%           | 62.7%             | 53.6%             | 53.3%            | 4.0       |
| 713       | Heating       | Heat Pump - 21 SEER (20+ Tons)                                 | Biz-Prescriptive | Lodging       | ROB              | 108,761                         | 108,761                         | 26%            | 28,638                | 0.00               | 15     | \$18,000     | 75%               | 20%               | 3%               | 3                     | 20%             | 20%           | 62.7%             | 53.6%             | 53.3%            | 3.9       |
| 714       | Heating       | Geothermal HP - SEER 20.3 (20+ Tons)                           | Biz-Prescriptive | Lodging       | ROB              | 43,332                          | 43,332                          | 23%            | 9,804                 | 0.00               | 15     | \$10,700     | 100%              | 9%                | 5%               | 3                     | 20%             | 20%           | 63.2%             | 54.6%             | 54.6%            | 11.3      |
| 715       | Heating       | Geothermal HP - SEER 21.5 (20+ Tons)                           | Biz-Prescriptive | Lodging       | ROB              | 43,332                          | 43,332                          | 28%            | 12,039                | 0.00               | 15     | \$13,300     | 75%               | 8%                | 4%               | 3                     | 20%             | 20%           | 63.1%             | 54.5%             | 54.5%            | 12.6      |
| 716       | Heating       | Geothermal HP - SEER 23.1 (20+ Tons)                           | Biz-Prescriptive | Lodging       | ROB              | 43,332                          | 43,332                          | 34%            | 14,946                | 0.00               | 15     | \$18,300     | 75%               | 5%                | 3%               | 3                     | 20%             | 20%           | 63.0%             | 54.3%             | 54.3%            | 14.4      |
| 717       | Heating       | Geothermal HP - SEER 29.3 (20+ Tons)                           | Biz-Prescriptive | Lodging       | ROB              | 43,332                          | 43,332                          | 39%            | 16,685                | 0.00               | 15     | \$26,200     | 50%               | 4%                | 2%               | 3                     | 20%             | 20%           | 62.7%             | 54.2%             | 54.2%            | 16.8      |
| 718       | Heating       | PTHP - 7,000 Btuh - lodging                                    | Biz-Prescriptive | Lodging       | ROB              | 2,618                           | 2,618                           | 8%             | 221                   | 0.00               | 15     | \$13         | 100%              | 100%              | 100%             | 4                     | 3%              | 20%           | 63.2%             | 55.0%             | 55.0%            | 9.1       |
| 719       | Heating       | PTHP - 7,000 to 15,000 Btuh - lodging                          | Biz-Prescriptive | Lodging       | ROB              | 5,610                           | 5,610                           | 11%            | 624                   | 0.00               | 15     | \$45         | 100%              | 100%              | 100%             | 5                     | 3%              | 20%           | 63.2%             | 55.0%             | 55.0%            | 6.8       |
| 720       | Heating       | PTHP - >15,000 Btuh - lodging                                  | Biz-Prescriptive | Lodging       | ROB              | 9,067                           | 9,067                           | 14%            | 1,260                 | 0.00               | 15     | \$35         | 100%              | 100%              | 100%             | 6                     | 3%              | 20%           | 63.2%             | 55.0%             | 55.0%            | 16.7      |
| 721       | Heating       | Mini Split Ductless Heat Pump Cold Climate (Tiers & sizes TBD) | Biz-Prescriptive | Lodging       | ROB              | 4                               | 4                               | 25%            | 1                     | 0.00               | 12     | \$0          | 100%              | 35%               | 67%              | 7                     | 0%              | 20%           | 63.2%             | 55.0%             | 55.0%            | 23.3      |
| 722       | Heating       | Variable Refrigerant Flow Heat Pump                            | Biz-Custom       | Lodging       | NC               | 11                              | 11                              | 25%            | 3                     | 0.00               | 20     | \$3          | 100%              | 5%                | 3%               | 2                     | 0%              | 0%            | 63.2%             | 54.7%             | 54.7%            | 33.1      |
| 723       | Ventilation   | Kitchen Exhaust Hood Demand Ventilation Control System         | Biz-Custom       | Lodging       | ROB              | 5                               | 5                               | 50%            | 3                     | 0.00               | 20     | \$2          | 75%               | 8%                | 11%              | 1                     | 20%             | 24%           | 54.6%             | 39.2%             | 39.2%            | 10.4      |
| 724       | Ventilation   | Demand Controlled Ventilation                                  | Biz-Custom       | Lodging       | Retro            | 2,455                           | 2,455                           | 20%            | 491                   | 0.00               | 15     | \$227        | 100%              | 11%               | 16%              | 2                     | 80%             | 5%            | 63.2%             | 39.7%             | 40.5%            | 11.1      |
| 725       | Ventilation   | Pump and Fan Variable Frequency Drive Controls (Fans)          | Biz-Prescriptive | Lodging       | Retro            | 2,258                           | 2,258                           | 41%            | 923                   | 0.00               | 15     | \$375        | 100%              | 16%               | 18%              | 2                     | 80%             | 25%           | 63.2%             | 42.0%             | 42.4%            | 8.9       |
| 726       | Refrigeration | Strip Curtains   | Biz-Custom       | Lodging       | Retro            | 334                             | 334                             | 81%            | 270                   | 0.00               | 4      | \$9          | 100%              | 100%              | 100%             | 1                     | 12%             | 26%           | 60.2%             | 52.4%             | 52.4%            | 4.2       |
| 727       | Refrigeration | Bare Suction Line  | Biz-Custom       | Lodging       | Retro            | 23                              | 23                              | 93%            | 21                    | 0.00               | 15     | \$4          | 100%              | 27%               | 39%              | 2                     | 0%              | 25%           | 60.2%             | 45.6%             | 46.6%            | 9.2       |
| 728       | Refrigeration | Floating Head Pressure Controls                                | Biz-Prescriptive | Lodging       | Retro            | 2,653                           | 2,653                           | 50%            | 1,327                 | 0.00               | 15     | \$80         | 100%              | 25%               | 41%              | 3                     | 8%              | 20%           | 60.2%             | 50.1%             | 50.6%            | 31.6      |
| 729       | Refrigeration | Saturated Suction Controls                                     | Biz-Custom       | Lodging       | Retro            | 831                             | 831                             | 50%            | 416                   | 0.00               | 15     | \$559        | 50%               | 4%                | 6%               | 4                     | 2%              | 20%           | 36.0%             | 36.0%             | 36.0%            | 15.7      |
| 730       | Refrigeration | Compressor Retrofit  | Biz-Custom       | Lodging       | Retro            | 813                             | 813                             | 20%            | 163                   | 0.00               | 15     | \$477        | 25%               | 2%                | 3%               | 5                     | 27%             | 15%           | 32.0%             | 27.4%             | 27.4%            | 15.8      |
| 731       | Refrigeration | Electronically Commutated (EC) Walk-In Evaporator Fan Motor    | Biz-Prescriptive | Lodging       | Retro            | 1,268                           | 1,268                           | 65%            | 824                   | 0.00               | 15     | \$78         | 100%              | 45%               | 42%              | 6                     | 8%              | 33%           | 60.2%             | 49.8%             | 49.6%            | 11.2      |
| 732       | Refrigeration | Evaporator Fan Motor Controls                                  | Biz-Prescriptive | Lodging       | Retro            | 1,912                           | 1,912                           | 25%            | 478                   | 0.00               | 13     | \$291        | 50%               | 15%               | 7%               | 7                     | 8%              | 10%           | 44.4%             | 30.0%             | 28.3%            | 4.7       |
| 733       | Refrigeration | Variable Speed Condenser Fan                                   | Biz-Custom       | Lodging       | Retro            | 2,960                           | 2,960                           | 50%            | 1,480                 | 0.00               | 15     | \$1,170      | 25%               | 7%                | 9%               | 8                     | 10%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 6.9       |
| 734       | Refrigeration | Refrigeration Economizer                                       | Biz-Custom       | Lodging       | Retro            | 67,850                          | 67,850                          | 2%             | 1,357                 | 0.00               | 15     | \$2,558      | 3%                | 3%                | 4%               | 9                     | 38%             | 0%            | 20.0%             | 15.7%             | 15.9%            | 6.9       |
| 735       | Refrigeration | Anti-Sweat Heater Controls MT                                  | Biz-Prescriptive | Lodging       | Retro            | 1,313                           | 1,313                           | 55%            | 722                   | 0.00               | 12     | \$250        | 75%               | 10%               | 12%              | 10                    | 13%             | 36%           | 54.7%             | 48.8%             | 48.8%            | 8.7       |
| 736       | Refrigeration | Auto Door Closer, Cooler                                       | Biz-Prescriptive | Lodging       | Retro            | 471,500                         | 471,500                         | 0%             | 943                   | 0.00               | 8      | \$157        | 100%              | 16%               | 24%              | 11                    | 9%              | 27%           | 60.2%             | 45.7%             | 46.3%            | 11.6      |
| 737       | Refrigeration | Display Case Door Retrofit, Medium Temp                        | Biz-Prescriptive | Lodging       | Retro            | 1,5                             |                                 |                |                       |                    |        |              |                   |                   |                  |                       |                 |               |                   |                   |                  |           |

Appendix C: C&I Measure Assumptions

| Measure # | End-Use             | Measure Name   | Program                | Building Type | Replacement Type | Base (Existing) Annual Electric | Base (Standard) Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | End Use Measure Group | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|---------------------|--|------------------------|---------------|------------------|---------------------------------|---------------------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 751       | PlugLoads_Office    | ENERGY STAR Uninterrupted Power Supply                         | Biz-Custom             | Lodging       | ROB              | 3,096                           | 3,096                           | 3%             | 85                    | 0.00               | 15     | \$59         | 75%               | 7%                | 11%              | 1                     | 1%              | 70%           | 76.0%             | 76.0%             | 76.0%            | 10.4      |
| 752       | PlugLoads_Office    | Smart Power Strip - Commercial Use                             | Biz-Custom             | Lodging       | Retro            | 64                              | 64                              | 100%           | 64                    | 0.00               | 5      | \$50         | 7%                | 7%                | 10%              | 2                     | 50%             | 10%           | 44.3%             | 38.5%             | 38.9%            | 3.1       |
| 753       | PlugLoads_Office    | Plug Load Occupancy Sensor                                     | Biz-Custom             | Lodging       | Retro            | 1,126                           | 1,126                           | 15%            | 169                   | 0.00               | 8      | \$70         | 50%               | 13%               | 18%              | 2                     | 50%             | 10%           | 59.4%             | 46.1%             | 47.0%            | 4.1       |
| 754       | PlugLoads_Office    | Electrically Commutated Plug Fans in data centers              | Biz-Custom             | Lodging       | Retro            | 86,783                          | 86,783                          | 18%            | 15,778                | 0.00               | 15     | \$480        | 100%              | 100%              | 100%             | 3                     | 0%              | 33%           | 68.6%             | 59.7%             | 59.7%            | 15.8      |
| 755       | PlugLoads_Office    | High Efficiency CRAC unit                                      | Biz-Custom             | Lodging       | ROB              | 541                             | 541                             | 30%            | 162                   | 0.00               | 15     | \$63         | 100%              | 14%               | 19%              | 3                     | 0%              | 33%           | 68.6%             | 48.5%             | 49.2%            | 9.6       |
| 756       | PlugLoads_Office    | Computer Room Air Conditioner Economizer                       | Biz-Custom             | Lodging       | Retro            | 418                             | 418                             | 86%            | 358                   | 0.00               | 15     | \$82         | 100%              | 23%               | 33%              | 3                     | 0%              | 33%           | 68.6%             | 52.8%             | 53.6%            | 6.9       |
| 757       | PlugLoads_Office    | Energy Star Laptop   | Biz-Custom             | Lodging       | ROB              | 126                             | 126                             | 33%            | 41                    | 0.00               | 4      | \$0          | 0%                |                   |                  | 4                     | 17%             | 85%           | 88.0%             | 88.0%             | 88.0%            | 0.0       |
| 758       | PlugLoads_Office    | Energy Star Monitor  | Biz-Custom             | Lodging       | ROB              | 72                              | 72                              | 21%            | 15                    | 0.00               | 4      | \$0          | 0%                |                   |                  | 5                     | 17%             | 95%           | 96.0%             | 96.0%             | 96.0%            | 0.0       |
| 759       | PlugLoads_Office    | Energy Star Printer/Copier/Fax                                 | Biz-Custom             | Lodging       | ROB              | 551                             | 551                             | 40%            | 223                   | 0.00               | 6      | \$0          | 0%                |                   |                  | 6                     | 17%             | 95%           | 96.0%             | 96.0%             | 96.0%            | 0.0       |
| 760       | PlugLoads_Office    | Energy Star Server   | Biz-Custom             | Lodging       | ROB              | 691                             | 691                             | 13%            | 90                    | 0.00               | 15     | \$156        | 25%               | 3%                | 4%               | 7                     | 1%              | 20%           | 36.3%             | 36.0%             | 36.0%            | 9.3       |
| 761       | PlugLoads_Office    | Server Virtualization  | Biz-Custom             | Lodging       | Retro            | 691                             | 691                             | 13%            | 90                    | 0.00               | 15     | \$156        | 25%               | 3%                | 4%               | 7                     | 0%              | 20%           | 36.3%             | 36.0%             | 36.0%            | 9.3       |
| 762       | PlugLoads_Office    | Data Center Hot/Cold Aisle Configuration                       | Biz-Custom             | Lodging       | Retro            | 691                             | 691                             | 13%            | 90                    | 0.00               | 15     | \$156        | 25%               | 3%                | 4%               | 7                     | 0%              | 20%           | 36.3%             | 36.0%             | 36.0%            | 9.3       |
| 763       | Motors              | Cogged V-Belt  | Biz-Custom             | Lodging       | Retro            | 29,207                          | 29,207                          | 3%             | 905                   | 0.00               | 15     | \$384        | 100%              | 12%               | 18%              | 1                     | 20%             | 10%           | 68.6%             | 47.0%             | 47.0%            | 9.0       |
| 764       | Motors              | Pump and Fan Variable Frequency Drive Controls (Pumps)         | Biz-Prescriptive       | Lodging       | Retro            | 1,902                           | 1,902                           | 38%            | 731                   | 0.00               | 15     | \$200        | 100%              | 30%               | 27%              | 2                     | 18%             | 25%           | 68.6%             | 53.3%             | 53.3%            | 7.0       |
| 765       | Motors              | Escalators Motor Efficiency Controllers                        | Biz-Custom             | Lodging       | Retro            | 7,500                           | 7,500                           | 20%            | 1,500                 | 0.00               | 10     | \$5,000      | 2%                | 2%                | 2%               | 3                     | 0%              | 10%           | 28.0%             | 28.0%             | 28.0%            | 8.6       |
| 766       | CompressedAir       | Efficient Air Compressors                                      | Biz-Custom             | Lodging       | ROB              | 4,004                           | 4,004                           | 31%            | 1,223                 | 0.00               | 15     | \$100        | 100%              | 6%                | 100%             | 1                     | 100%            | 33%           | 68.6%             | 58.6%             | 59.7%            | 10.4      |
| 767       | CompressedAir       | Retro-commissioning_Compresed Air Optimization                 | Biz-Custom RCx         | Lodging       | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 5      | \$0          | 100%              | 67%               | 100%             | 2                     | 100%            | 33%           | 68.6%             | 58.8%             | 59.7%            | 4.0       |
| 768       | CompressedAir       | Compressed Air - Custom  | Biz-Custom             | Lodging       | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 8      | \$0          | 100%              | 50%               | 100%             | 3                     | 100%            | 33%           | 68.6%             | 57.5%             | 59.7%            | 4.1       |
| 769       | Miscellaneous       | Power Distribution Equipment Upgrades                          | Biz-Custom             | Lodging       | Retro            | 1,150                           | 1,150                           | 1%             | 6                     | 0.00               | 30     | \$8          | 75%               | 4%                | 6%               | 1                     | 62%             | 20%           | 58.1%             | 36.0%             | 36.0%            | 18.0      |
| 770       | Miscellaneous       | Vending Machine Controller - Non-Refrigerated                  | Biz-Custom             | Lodging       | Retro            | 745                             | 745                             | 46%            | 343                   | 0.00               | 5      | \$80         | 63%               | 63%               | 32%              | 2                     | 3%              | 60%           | 72.8%             | 72.8%             | 72.8%            | 0.9       |
| 771       | Miscellaneous       | Vending Machine Controller - Refrigerated                      | Biz-Custom             | Lodging       | Retro            | 1,739                           | 1,739                           | 46%            | 800                   | 0.00               | 10     | \$216        | 100%              | 25%               | 28%              | 3                     | 9%              | 66%           | 72.8%             | 72.8%             | 72.8%            | 3.2       |
| 772       | Miscellaneous       | Miscellaneous Custom   | Biz-Custom             | Lodging       | Retro            | 5                               | 5                               | 20%            | 1                     | 0.00               | 10     | \$0          | 100%              | 50%               | 72%              | 4                     | 38%             | 20%           | 68.6%             | 57.8%             | 58.7%            | 7.8       |
| 773       | Whole Building_HVAC | HVAC - Energy Management System                                | Biz-Prescriptive       | Lodging       | Retro            | 6,960                           | 6,960                           | 15%            | 1,044                 | 0.00               | 15     | \$4,000      | 3%                | 3%                | 2%               | 1                     | 0%              | 1%            | 20.8%             | 18.4%             | 18.4%            | 4.2       |
| 774       | Whole Building_HVAC | Guest room energy management system                            | Biz-Custom             | Lodging       | Retro            | 3                               | 3                               | 30%            | 1                     | 0.00               | 8      | \$0          | 100%              | 19%               | 27%              | 2                     | 60%             | 10%           | 63.2%             | 45.6%             | 46.5%            | 6.5       |
| 775       | Whole Building_HVAC | Retro-commissioning_Bld Optimization                           | Biz-Custom RCx         | Lodging       | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 3      | \$0          | 100%              | 67%               | 22%              | 3                     | 100%            | 10%           | 63.2%             | 53.6%             | 51.7%            | 2.2       |
| 776       | WholeBld            | WholeBld - Com RET   | Biz-NC                 | Lodging       | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 19%              | 4                     | 40%             | 0%            | 68.6%             | 57.8%             | 56.6%            | 9.3       |
| 777       | Whole Building_NC   | WholeBld - Com NC  | Biz-NC                 | Lodging       | NC               | 4                               | 4                               | 25%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 72%              | 5                     | 100%            | 60%           | 68.0%             | 68.0%             | 68.0%            | 9.3       |
| 778       | Behavioral          | AMI Data Presentation & Engagement                             | Biz-Behavior           | Lodging       | Retro            | 100                             | 100                             | 1%             | 1                     | 0.00               | 1      | \$0          | 100%              | 100%              | 87%              | 1                     | 100%            | 10%           | 50.0%             | 50.0%             | 50.0%            | 1.2       |
| 779       | Behavioral          | BIEMS  | Biz-Behavior           | Lodging       | Retro            | 28                              | 28                              | 4%             | 1                     | 0.00               | 3      | \$0          | 12%               | 12%               | 5%               | 1                     | 100%            | 5%            | 42.5%             | 50.0%             | 50.0%            | 1.6       |
| 780       | Behavioral          | Building Operator Certification                                | Biz-Behavior           | Lodging       | Retro            | 15,300                          | 15,300                          | 1%             | 122                   | 0.00               | 3      | \$21         | 50%               | 30%               | 12%              | 1                     | 100%            | 5%            | 42.5%             | 50.0%             | 50.0%            | 2.1       |
| 781       | Cooking             | Commercial Combination Oven (Electric)                         | Biz-Prescriptive       | Retail        | ROB              | 38,561                          | 38,561                          | 48%            | 18,432                | 0.00               | 12     | \$16,884     | 50%               | 6%                | 3%               | 1                     | 17%             | 53%           | 62.4%             | 62.4%             | 62.4%            | 9.5       |
| 782       | Cooking             | Commercial Electric Convection Oven                            | Biz-Prescriptive       | Retail        | ROB              | 12,193                          | 12,193                          | 15%            | 1,879                 | 0.00               | 12     | \$1,706      | 50%               | 15%               | 11%              | 1                     | 17%             | 53%           | 62.4%             | 62.4%             | 62.4%            | 4.0       |
| 783       | Cooking             | Commercial Electric Griddle                                    | Biz-Prescriptive       | Retail        | ROB              | 17,056                          | 17,056                          | 15%            | 2,596                 | 0.00               | 12     | \$3,604      | 25%               | 14%               | 7%               | 2                     | 14%             | 17%           | 39.3%             | 33.6%             | 33.6%            | 2.1       |
| 784       | Cooking             | Commercial Electric Steam Cooker                               | Biz-Prescriptive       | Retail        | ROB              | 19,549                          | 19,549                          | 67%            | 13,162                | 0.00               | 12     | \$3,500      | 100%              | 12%               | 14%              | 3                     | 6%              | 42%           | 68.6%             | 53.6%             | 53.6%            | 16.0      |
| 785       | Cooking             | Dishwasher Low Temp Door (Energy Star)                         | Biz-Prescriptive       | Retail        | ROB              | 39,279                          | 39,279                          | 41%            | 16,153                | 0.00               | 15     | \$770        | 100%              | 49%               | 65%              | 4                     | 26%             | 61%           | 68.8%             | 68.8%             | 68.8%            | 19.1      |
| 786       | Cooking             | Dishwasher High Temp Door (Energy Star)                        | Biz-Prescriptive       | Retail        | ROB              | 39,825                          | 39,825                          | 30%            | 11,853                | 0.00               | 15     | \$770        | 100%              | 49%               | 65%              | 4                     | 26%             | 61%           | 68.8%             | 68.8%             | 68.8%            | 14.0      |
| 787       | Cooking             | Energy efficient electric fryer                                | Biz-Prescriptive       | Retail        | ROB              | 18,182                          | 18,182                          | 14%            | 2,572                 | 0.00               | 12     | \$1,706      | 50%               | 1%                | 15%              | 5                     | 27%             | 23%           | 55.0%             | 39.3%             | 40.7%            | 96.4      |
| 788       | Cooking             | Insulated Holding Cabinets (Full Size)                         | Biz-Prescriptive       | Retail        | ROB              | 7,665                           | 7,665                           | 69%            | 5,278                 | 0.00               | 12     | \$1,200      | 100%              | 6%                | 42%              | 6                     | 3%              | 23%           | 68.6%             | 52.4%             | 54.9%            | 32.2      |
| 789       | Cooking             | Insulated Holding Cabinets (Half-Size)                         | Biz-Prescriptive       | Retail        | ROB              | 3,066                           | 3,066                           | 58%            | 1,788                 | 0.00               | 12     | \$1,500      | 50%               | 8%                | 12%              | 6                     | 3%              | 23%           | 52.9%             | 38.7%             | 39.1%            | 6.8       |
| 790       | HotWater            | Faucet Aerator   | Biz-Custom             | Retail        | Retro            | 2,162                           | 2,162                           | 66%            | 1,425                 | 0.00               | 10     | \$3          | 100%              | 26%               | 100%             | 4                     | 25%             | 80%           | 84.0%             | 84.0%             | 84.0%            | 785.3     |
| 791       | HotWater            | Heat Pump Water Heater   | Biz-Custom             | Retail        | ROB              | 10,967                          | 10,967                          | 35%            | 3,788                 | 0.00               | 10     | \$1,574      | 75%               | 13%               | 10%              | 1                     | 57%             | 23%           | 69.5%             | 52.6%             | 52.2%            | 6.1       |
| 792       | HotWater            | Hot Water Pipe Insulation                                      | Biz-Custom             | Retail        | ROB              | 10,967                          | 10,967                          | 2%             | 219                   | 0.00               | 20     | \$60         | 100%              | 19%               | 15%              | 2                     | 100%            | 80%           | 84.0%             | 84.0%             | 84.0%            | 11.5      |
| 793       | HotWater            | Low Flow Pre-Rinse Sprayers                                    | Biz-Custom             | Retail        | ROB              | 2,991                           | 2,991                           | 26%            | 764                   | 0.00               | 5      | \$35         | 100%              | 71%               | 87%              | 3                     | 25%             | 80%           | 84.0%             | 84.0%             | 84.0%            | 6.7       |
| 794       | HotWater            | ENERGY STAR Commercial Washing Machines                        | Biz-Custom             | Retail        | ROB              | 1,552                           | 1,552                           | 43%            | 671                   | 0.00               | 7      | \$250        | 50%               | 14%               | 11%              | 5                     | 25%             | 35%           | 66.5%             | 53.7%             | 53.3%            | 4.0       |
| 795       | HotWater            | Ozone Commercial Laundry                                       | Biz-Custom             | Retail        | Retro            | 2,984                           | 2,984                           | 25%            | 746                   | 0.00               | 10     | \$20,310     | 0%                | 0%                | 0%               | 6                     | 43%             | 50%           | 60.0%             | 60.0%             | 60.0%            | 5.1       |
| 796       | InteriorLighting    | LED T8 Tube Replacement  | Biz-Prescriptive Light | Retail        | Retro            | 138                             | 138                             | 59%            | 82                    | 0.00               | 15     | \$7          | 100%              | 49%               | 50%              | 1                     | 75%             | 32%           | 71.1%             | 60.5%             | 60.6%            | 12.5      |
| 797       | InteriorLighting    | LED troffer retrofit kit, 2'X2' and 2'X4'                      | Biz-Prescriptive Light | Retail        | Retro            | 310                             | 310                             | 50%            | 155                   | 0.00               | 18     | \$67         | 100%              | 26%               | 50%              | 1                     | 75%             | 32%           | 71.1%             | 52.9%             | 55.7%            | 5.7       |
| 798       | InteriorLighting    | LED troffer, 2'X2' and 2'X4'                                   | Biz-Prescriptive Light | Retail        | Retro            | 223                             | 223                             | 50%            | 112                   | 0.00               | 18     | \$67         | 100%              | 26%               | 50%              | 1                     | 75%             | 32%           | 71.1%             | 49.3%             | 53.4%            | 4.1       |
| 799       | InteriorLighting    | LED high bay fixture   | Biz-Prescriptive Light | Retail        | Retro            | 1,080                           | 1,080                           | 76%            | 821                   | 0.00               | 12     | \$323        | 100%              | 12%               | 50%              | 2                     | 2%              | 16%           | 71.1%             | 52.5%             | 56.3%            | 10.6      |
| 800       | InteriorLighting    | LED Mogul-base HID Lamp Replacing High Bay HID                 | Biz-Prescriptive Light | Retail        | Retro            | 1,080                           | 1,080                           | 79%            | 855                   | 0.00               | 12     | \$110        | 100%              | 21%               | 50%              | 2                     | 2%              | 16%           | 71.1%             | 58.8%             | 60.0%            | 19.2      |
| 801       | InteriorLighting    | LED low bay fixture  | Biz-Prescriptive Light | Retail        | Retro            | 1,080                           | 1,080                           | 76%            | 821                   | 0.00               | 12     | \$196        | 100%              | 20%               | 50%              | 3                     | 2%              | 16%           | 71.1%             | 56.5%             | 58.3%            | 10.6      |
| 802       | InteriorLighting    | LED Mogul-base HID Lamp Replacing Low Bay HID                  | Biz-Prescriptive Light | Retail        | Retro            | 1,080                           | 1,080                           | 79%            | 855                   | 0.00               | 12     | \$60         | 100%              | 38%               | 50%              | 3                     | 2%              | 16%           | 71.1%             | 60.6%             | 60.8%            | 19.2      |
| 803       | InteriorLighting    | LED downlight, screw-in lamp, 1-3W, interior Average 2 Watts   | Biz-Prescriptive Light | Retail        | ROB              | 67                              | 67                              | 88%            | 59                    | 0.00               | 4      | \$4          | 100%              | 25%               | 50%              | 4                     | 3%              | 32%           | 71.1%             | 60.3%             | 60.8%            | 10.2      |
| 804       | InteriorLighting    | LED downlight fixture  | Biz-Prescriptive Light | Retail        | Retro            | 174                             | 174                             | 82%            | 142                   | 0.00               | 4      | \$13         | 100%              | 39%               | 50%              | 5                     | 19%             | 32%           | 71.1%             | 60.2%             | 60.5%            | 4.9       |
| 805       | InteriorLighting    | LED downlight, screw-in lamp, 4-20W, interior Average 11 Watts | Biz-Prescriptive Light | Retail        | ROB              | 134                             | 134                             | 84%            | 113                   | 0.00               | 4      | \$2          | 100%              | 61%               | 50%              | 5                     | 19%             | 32%           | 71.1%             | 61.7%             | 61.6%            | 19.5      |
| 806       | InteriorLighting    | DeLamp Fluorescent Fixture Average Lamp Wattage 28W            | Biz-Custom Light       | Retail        | Retro            | 53                              | 53                              | 100%           | 53                    | 0.00               | 15     | \$4          | 100%              | 69%               | 50%              | 6                     | 75%             | 0%            | 71.1%             | 61.1%             | 60.7%            | 11.0      |
| 807       | InteriorLighting    | Daylighting Controls   | Biz-Custom Light       | Retail        | Retro            | 8,810                           | 8,810                           | 30%            | 2,643                 | 0.00               | 12     | \$3,000      | 25%               | 5%                | 50%              | 7                     | 95%             | 8%            | 48.3%             | 39.1%             | 46.0%            | 9.8       |
| 808       | InteriorLighting    | Occupancy Sensors  | Biz-Prescriptive Light | Retail        | Retro            | 1,523                           | 1,523                           | 30%            | 457                   | 0.00               | 8      | \$54         | 100%              | 37%               | 50%              | 7                     | 95%             | 8%            | 71.1%             | 59.3%             | 59.8%            | 5.7       |
| 809       | InteriorLighting    | Central Lighting Monitoring & Controls (non-networked)         | Biz-Custom Light       | Retail        | Retro            | 41,703                          | 41,703                          | 20%            | 8,341                 | 0.00               | 12     | \$3,700      | 100%              | 12%               | 17%              | 7                     | 95%             | 8%            | 71.1%             | 50.8%             | 51.5%            | 9.3       |
| 810       | InteriorLighting    | Network Lighting Controls - Wireless (WiFi)                    | Biz-Custom Light       | Retail        | Retro            | 16,277                          | 16,277                          | 47%            | 7,650                 | 0.00               | 8      | \$1,683      | 100%              | 24%               | 34%              | 7                     | 95%             | 8%            | 71.1%             | 56.9%             | 57.6%            | 6.6       |
| 811       | InteriorLighting    | Bi-Level Lighting Fixture - Stairwells, Hallways, and Garages  | Biz-Custom Light       | Retail        | Retro            | 1,034                           | 1,034                           | 50%            | 517                   | 0.00               | 10     | \$274        | 50%               | 10%               | 50%              | 8                     | 5%              | 8%            | 62.0%             | 47.4%             | 53.9%            | 7.0       |
| 812       | InteriorLighting    | LED Exit Sign - 4 Watt Fixture (2 lamp)                        | Biz-Prescriptive Light | Retail        | Retro            | 236                             | 236                             | 85%            | 201                   | 0.00               | 15     | \$60         | 100%              | 8%                | 50%              | 9                     | 1%              | 75%           | 80.0%             | 80.0%             | 80.0%            | 19.9      |
| 813       | ExteriorLighting    | LED wallpack (existing W<250)                                  | Biz-Prescriptive Light | Retail        | Retro            | 856                             | 856                             | 66%            | 567                   | 0.00               | 12     | \$248        | 50%               | 10%               | 9%               | 1                     | 13%             | 46%           | 62.7%             | 56.8%             | 56.8%            | 6.6       |
| 814       | ExteriorLighting    | LED parking lot fixture (existing W250)                        | Biz-Prescriptive Light | Retail        | Retro            | 1,589                           | 1,589                           | 60%            | 959                   | 0.00               | 12     | \$756        | 25%               | 3%                | 5%               | 2                     | 13%             | 41%           | 52.8%             | 52.8%             | 52.8%            | 11.2      |
| 815       | ExteriorLighting    | LED parking lot fixture (existing W<250)                       | Biz-Prescriptive Light | Retail        | Retro            |                                 |                                 |                |                       |                    |        |              |                   |                   |                  |                       |                 |               |                   |                   |                  |           |

## Appendix C: C&amp;I Measure Assumptions

| Measure # | End-Use       | Measure Name   | Program          | Building Type | Replacement Type | Base (Existing) Annual Electric | Base (Standard) Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | End Use Measure Group | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|---------------|--|------------------|---------------|------------------|---------------------------------|---------------------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 826       | Cooling       | Air Conditioner - 21 SEER (5-20 Tons)                          | Biz-Prescriptive | Retail        | ROB              | 10,955                          | 10,955                          | 24%            | 2,665                 | 0.00               | 15     | \$9,080      | 25%               | 5%                | 3%               | 1                     | 14%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 7.1       |
| 827       | Cooling       | Air Conditioner - 16 SEER (20+ Tons)                           | Biz-Prescriptive | Retail        | ROB              | 22,309                          | 22,309                          | 8%             | 1,859                 | 0.00               | 15     | \$7,140      | 25%               | 5%                | 3%               | 2                     | 14%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 6.3       |
| 828       | Cooling       | Air Conditioner - 17 SEER (20+ Tons)                           | Biz-Prescriptive | Retail        | ROB              | 22,309                          | 22,309                          | 8%             | 1,859                 | 0.00               | 15     | \$9,520      | 5%                | 5%                | 2%               | 2                     | 14%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 4.7       |
| 829       | Cooling       | Air Conditioner - 18 SEER (20+ Tons)                           | Biz-Prescriptive | Retail        | ROB              | 22,309                          | 22,309                          | 15%            | 3,432                 | 0.00               | 15     | \$11,920     | 25%               | 5%                | 3%               | 2                     | 14%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 6.9       |
| 830       | Cooling       | Air Conditioner - 21 SEER (20+ Tons)                           | Biz-Prescriptive | Retail        | ROB              | 22,309                          | 22,309                          | 21%            | 4,781                 | 0.00               | 15     | \$18,160     | 25%               | 5%                | 3%               | 2                     | 14%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 6.3       |
| 831       | Cooling       | Comprehensive Rooftop Unit Quality Maintenance (AC Tune-up)    | Biz-Custom       | Retail        | Retro            | 38,651                          | 38,651                          | 6%             | 2,443                 | 0.00               | 3      | \$500        | 100%              | 25%               | 37%              | 3                     | 28%             | 50%           | 63.2%             | 60.0%             | 60.0%            | 4.3       |
| 832       | Cooling       | Air Side Economizer  | Biz-Custom       | Retail        | Retro            | 6,135                           | 6,135                           | 3%             | 179                   | 0.00               | 5      | \$170        | 5%                | 5%                | 8%               | 4                     | 28%             | 33%           | 46.4%             | 46.4%             | 46.4%            | 3.1       |
| 833       | Cooling       | Advanced Rooftop Controls                                      | Biz-Custom       | Retail        | Retro            | 5,113                           | 5,113                           | 28%            | 1,422                 | 0.00               | 10     | \$7,140      | 25%               | 2%                | 3%               | 5                     | 28%             | 3%            | 25.0%             | 19.7%             | 19.7%            | 13.2      |
| 834       | Cooling       | Air Conditioner - 16 SEER (<5 Tons)                            | Biz-Prescriptive | Retail        | ROB              | 4,719                           | 4,719                           | 19%            | 885                   | 0.00               | 15     | \$1,785      | 50%               | 5%                | 5%               | 6                     | 22%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 11.9      |
| 835       | Cooling       | Air Conditioner - 17 SEER (<5 Tons)                            | Biz-Prescriptive | Retail        | ROB              | 4,719                           | 4,719                           | 24%            | 1,110                 | 0.00               | 15     | \$2,380      | 50%               | 5%                | 5%               | 6                     | 22%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 11.2      |
| 836       | Cooling       | Air Conditioner - 18 SEER (<5 Tons)                            | Biz-Prescriptive | Retail        | ROB              | 4,719                           | 4,719                           | 28%            | 1,311                 | 0.00               | 15     | \$2,980      | 50%               | 5%                | 4%               | 6                     | 22%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 10.6      |
| 837       | Cooling       | Air Conditioner - 21 SEER (<5 Tons)                            | Biz-Prescriptive | Retail        | ROB              | 4,719                           | 4,719                           | 38%            | 1,798                 | 0.00               | 15     | \$4,540      | 25%               | 5%                | 4%               | 6                     | 22%             | 20%           | 36.0%             | 34.8%             | 34.7%            | 9.5       |
| 838       | Cooling       | Centrifugal Chiller - Average kW/Ton = 0.626                   | Biz-Custom       | Retail        | ROB              | 23,577                          | 23,577                          | 26%            | 6,184                 | 0.00               | 20     | \$13,957     | 25%               | 2%                | 3%               | 7                     | 20%             | 20%           | 36.0%             | 34.8%             | 34.9%            | 20.9      |
| 839       | Cooling       | Reciprocating Chiller - Average kW/Ton = 0.99                  | Biz-Custom       | Retail        | ROB              | 28,988                          | 28,988                          | 27%            | 7,730                 | 0.00               | 20     | \$11,190     | 100%              | 4%                | 5%               | 8                     | 12%             | 20%           | 63.2%             | 36.0%             | 36.0%            | 34.2      |
| 840       | Cooling       | Screw Chiller - Average kW/Ton = 0.675                         | Biz-Custom       | Retail        | ROB              | 33,854                          | 33,854                          | 23%            | 7,765                 | 0.00               | 20     | \$11,168     | 100%              | 4%                | 5%               | 9                     | 0%              | 20%           | 63.2%             | 36.0%             | 36.0%            | 33.7      |
| 841       | Cooling       | HVAC/Chiller Custom  | Biz-Custom       | Retail        | Retro            | 5                               | 5                               | 20%            | 1                     | 0.00               | 12     | \$1          | 25%               | 6%                | 9%               | 10                    | 33%             | 20%           | 37.0%             | 36.0%             | 36.0%            | 7.7       |
| 842       | Cooling       | Chiller Tune-up  | Biz-Custom       | Retail        | Retro            | 46,375                          | 46,375                          | 8%             | 3,710                 | 0.00               | 5      | \$535        | 100%              | 36%               | 52%              | 11                    | 33%             | 50%           | 63.2%             | 60.0%             | 60.0%            | 5.5       |
| 843       | Cooling       | PTAC - <7,000 Btuh - lodging                                   | Biz-Prescriptive | Retail        | ROB              | 516                             | 516                             | 9%             | 47                    | 0.00               | 15     | \$22         | 100%              | 50%               | 21%              | 12                    | 0%              | 20%           | 63.2%             | 46.2%             | 41.8%            | 5.1       |
| 844       | Cooling       | PTAC - 7,000 to 15,000 Btuh - lodging                          | Biz-Prescriptive | Retail        | ROB              | 1,147                           | 1,147                           | 9%             | 107                   | 0.00               | 15     | \$41         | 100%              | 50%               | 26%              | 13                    | 0%              | 20%           | 63.2%             | 47.6%             | 44.6%            | 6.2       |
| 845       | Cooling       | PTAC - >15,000 Btuh - lodging                                  | Biz-Prescriptive | Retail        | ROB              | 1,937                           | 1,937                           | 10%            | 185                   | 0.00               | 15     | \$56         | 100%              | 50%               | 33%              | 14                    | 0%              | 20%           | 63.2%             | 48.9%             | 47.2%            | 7.9       |
| 846       | Cooling       | HVAC Occupancy Controls  | Biz-Custom       | Retail        | ROB              | 2,636                           | 2,636                           | 20%            | 527                   | 0.00               | 15     | \$538        | 75%               | 5%                | 0%               | 15                    | 28%             | 25%           | 51.2%             | 40.0%             | 40.0%            | 15.1      |
| 847       | Cooling       | Smart Thermostat   | Biz-Custom       | Retail        | ROB              | 5,113                           | 5,113                           | 18%            | 905                   | 0.00               | 10     | \$128        | 100%              | 14%               | 10%              | 16                    | 48%             | 9%            | 63.2%             | 48.8%             | 48.6%            | 16.5      |
| 848       | Cooling       | Window Film  | Biz-Custom       | Retail        | Retro            | 38,651                          | 0                               | 4%             | 1,523                 | 0.00               | 10     | \$1,269      | 75%               | 6%                | 5%               | 17                    | 100%            | 25%           | 53.5%             | 40.0%             | 40.0%            | 13.5      |
| 849       | Cooling       | Energy Recovery Ventilator                                     | Biz-Custom       | Retail        | Retro            | 2                               | 2                               | 50%            | 1                     | 0.00               | 20     | \$1          | 75%               | 8%                | 12%              | 18                    | 100%            | 5%            | 54.9%             | 33.4%             | 33.7%            | 11.1      |
| 850       | Heating       | Heat Pump - 16 SEER (<5 Tons)                                  | Biz-Prescriptive | Retail        | ROB              | 10,976                          | 10,976                          | 19%            | 2,070                 | 0.00               | 15     | \$2,055      | 50%               | 20%               | 10%              | 1                     | 18%             | 20%           | 43.7%             | 36.0%             | 36.0%            | 3.5       |
| 851       | Heating       | Heat Pump - 17 SEER (<5 Tons)                                  | Biz-Prescriptive | Retail        | ROB              | 10,976                          | 10,976                          | 22%            | 2,401                 | 0.00               | 15     | \$2,740      | 50%               | 20%               | 9%               | 1                     | 18%             | 20%           | 41.4%             | 36.0%             | 36.0%            | 3.2       |
| 852       | Heating       | Heat Pump - 18 SEER (<5 Tons)                                  | Biz-Prescriptive | Retail        | ROB              | 10,976                          | 10,976                          | 25%            | 2,750                 | 0.00               | 15     | \$3,425      | 50%               | 20%               | 8%               | 1                     | 18%             | 20%           | 39.8%             | 36.0%             | 36.0%            | 3.0       |
| 853       | Heating       | Heat Pump - 21 SEER (<5 Tons)                                  | Biz-Prescriptive | Retail        | ROB              | 10,976                          | 10,976                          | 30%            | 3,331                 | 0.00               | 15     | \$4,500      | 50%               | 20%               | 7%               | 1                     | 18%             | 20%           | 38.9%             | 36.0%             | 36.0%            | 2.9       |
| 854       | Heating       | Geothermal HP - SEER 20.3 (<5 Tons)                            | Biz-Prescriptive | Retail        | ROB              | 10,976                          | 10,976                          | 36%            | 3,961                 | 0.00               | 15     | \$4,700      | 50%               | 11%               | 8%               | 1                     | 18%             | 20%           | 40.3%             | 36.0%             | 36.0%            | 5.6       |
| 855       | Heating       | Geothermal HP - SEER 21.5 (<5 Tons)                            | Biz-Prescriptive | Retail        | ROB              | 10,976                          | 10,976                          | 40%            | 4,410                 | 0.00               | 15     | \$7,300      | 25%               | 7%                | 6%               | 1                     | 18%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 6.1       |
| 856       | Heating       | Geothermal HP - SEER 23.1 (<5 Tons)                            | Biz-Prescriptive | Retail        | ROB              | 10,976                          | 10,976                          | 46%            | 5,011                 | 0.00               | 15     | \$7,300      | 25%               | 7%                | 7%               | 1                     | 18%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 7.0       |
| 857       | Heating       | Geothermal HP - SEER 29.3 (<5 Tons)                            | Biz-Prescriptive | Retail        | ROB              | 10,976                          | 10,976                          | 51%            | 5,580                 | 0.00               | 15     | \$9,200      | 25%               | 8%                | 5%               | 1                     | 18%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 4.9       |
| 858       | Heating       | Heat Pump - 16 SEER (5-20 Tons)                                | Biz-Prescriptive | Retail        | ROB              | 40,155                          | 40,155                          | 10%            | 3,870                 | 0.00               | 15     | \$4,110      | 50%               | 20%               | 9%               | 2                     | 23%             | 20%           | 41.8%             | 36.0%             | 36.0%            | 3.0       |
| 859       | Heating       | Heat Pump - 17 SEER (5-20 Tons)                                | Biz-Prescriptive | Retail        | ROB              | 40,155                          | 40,155                          | 13%            | 5,271                 | 0.00               | 15     | \$5,480      | 50%               | 20%               | 9%               | 2                     | 23%             | 20%           | 41.2%             | 36.0%             | 36.0%            | 2.7       |
| 860       | Heating       | Heat Pump - 18 SEER (5-20 Tons)                                | Biz-Prescriptive | Retail        | ROB              | 40,155                          | 40,155                          | 19%            | 7,773                 | 0.00               | 15     | \$6,850      | 50%               | 20%               | 7%               | 2                     | 23%             | 20%           | 44.3%             | 36.0%             | 36.0%            | 3.3       |
| 861       | Heating       | Heat Pump - 21 SEER (5-20 Tons)                                | Biz-Prescriptive | Retail        | ROB              | 40,155                          | 40,155                          | 25%            | 9,940                 | 0.00               | 15     | \$9,000      | 50%               | 20%               | 6%               | 2                     | 23%             | 20%           | 43.8%             | 36.0%             | 36.0%            | 3.2       |
| 862       | Heating       | Geothermal HP - SEER 20.3 (5-20 Tons)                          | Biz-Prescriptive | Retail        | ROB              | 19,712                          | 19,712                          | 28%            | 5,561                 | 0.00               | 15     | \$7,700      | 75%               | 6%                | 6%               | 2                     | 23%             | 20%           | 51.5%             | 36.0%             | 36.0%            | 11.9      |
| 863       | Heating       | Geothermal HP - SEER 21.5 (5-20 Tons)                          | Biz-Prescriptive | Retail        | ROB              | 19,712                          | 19,712                          | 33%            | 6,465                 | 0.00               | 15     | \$10,300     | 50%               | 5%                | 5%               | 2                     | 23%             | 20%           | 38.6%             | 36.0%             | 36.0%            | 13.0      |
| 864       | Heating       | Geothermal HP - SEER 23.1 (5-20 Tons)                          | Biz-Prescriptive | Retail        | ROB              | 19,712                          | 19,712                          | 39%            | 7,676                 | 0.00               | 15     | \$12,800     | 50%               | 4%                | 4%               | 2                     | 23%             | 20%           | 37.9%             | 36.0%             | 36.0%            | 14.7      |
| 865       | Heating       | Geothermal HP - SEER 29.3 (5-20 Tons)                          | Biz-Prescriptive | Retail        | ROB              | 19,712                          | 19,712                          | 45%            | 8,838                 | 0.00               | 15     | \$17,700     | 25%               | 4%                | 3%               | 2                     | 23%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 11.6      |
| 866       | Heating       | Heat Pump - 16 SEER (20+ Tons)                                 | Biz-Prescriptive | Retail        | ROB              | 82,534                          | 82,534                          | 13%            | 8,684                 | 0.00               | 15     | \$8,220      | 50%               | 20%               | 6%               | 3                     | 23%             | 20%           | 42.5%             | 36.0%             | 36.0%            | 2.8       |
| 867       | Heating       | Heat Pump - 17 SEER (20+ Tons)                                 | Biz-Prescriptive | Retail        | ROB              | 82,534                          | 82,534                          | 14%            | 11,488                | 0.00               | 15     | \$10,960     | 50%               | 20%               | 5%               | 3                     | 23%             | 20%           | 41.8%             | 36.0%             | 36.0%            | 2.6       |
| 868       | Heating       | Heat Pump - 18 SEER (20+ Tons)                                 | Biz-Prescriptive | Retail        | ROB              | 82,534                          | 82,534                          | 20%            | 16,675                | 0.00               | 15     | \$13,700     | 50%               | 20%               | 4%               | 3                     | 23%             | 20%           | 44.9%             | 36.0%             | 36.0%            | 3.2       |
| 869       | Heating       | Heat Pump - 21 SEER (20+ Tons)                                 | Biz-Prescriptive | Retail        | ROB              | 82,534                          | 82,534                          | 26%            | 21,156                | 0.00               | 15     | \$18,000     | 50%               | 20%               | 3%               | 3                     | 23%             | 20%           | 44.5%             | 36.0%             | 36.0%            | 3.2       |
| 870       | Heating       | Geothermal HP - SEER 20.3 (20+ Tons)                           | Biz-Prescriptive | Retail        | ROB              | 39,957                          | 39,957                          | 29%            | 11,655                | 0.00               | 15     | \$10,700     | 100%              | 9%                | 5%               | 3                     | 23%             | 20%           | 63.2%             | 36.0%             | 36.0%            | 12.1      |
| 871       | Heating       | Geothermal HP - SEER 21.5 (20+ Tons)                           | Biz-Prescriptive | Retail        | ROB              | 39,957                          | 39,957                          | 34%            | 13,463                | 0.00               | 15     | \$13,300     | 75%               | 8%                | 4%               | 3                     | 23%             | 20%           | 54.1%             | 36.0%             | 36.0%            | 13.2      |
| 872       | Heating       | Geothermal HP - SEER 23.1 (20+ Tons)                           | Biz-Prescriptive | Retail        | ROB              | 39,957                          | 39,957                          | 40%            | 15,886                | 0.00               | 15     | \$18,300     | 75%               | 5%                | 3%               | 3                     | 23%             | 20%           | 52.6%             | 36.0%             | 36.0%            | 14.9      |
| 873       | Heating       | Geothermal HP - SEER 29.3 (20+ Tons)                           | Biz-Prescriptive | Retail        | ROB              | 39,957                          | 39,957                          | 46%            | 18,209                | 0.00               | 15     | \$26,200     | 50%               | 4%                | 2%               | 3                     | 23%             | 20%           | 39.6%             | 36.0%             | 36.0%            | 17.5      |
| 874       | Heating       | PTHP - <7,000 Btuh - lodging                                   | Biz-Prescriptive | Retail        | ROB              | 1,976                           | 1,976                           | 9%             | 169                   | 0.00               | 15     | \$13         | 100%              | 100%              | 100%             | 4                     | 0%              | 20%           | 63.2%             | 55.0%             | 55.0%            | 7.8       |
| 875       | Heating       | PTHP - 7,000 to 15,000 Btuh - lodging                          | Biz-Prescriptive | Retail        | ROB              | 4,255                           | 4,255                           | 11%            | 462                   | 0.00               | 15     | \$45         | 100%              | 100%              | 100%             | 5                     | 0%              | 20%           | 63.2%             | 55.0%             | 55.0%            | 5.6       |
| 876       | Heating       | PTHP - >15,000 Btuh - lodging                                  | Biz-Prescriptive | Retail        | ROB              | 6,922                           | 6,922                           | 13%            | 917                   | 0.00               | 15     | \$35         | 100%              | 100%              | 100%             | 6                     | 0%              | 20%           | 63.2%             | 55.0%             | 55.0%            | 13.6      |
| 877       | Heating       | Mini Split Ductless Heat Pump Cold Climate (Tiers & sizes TBD) | Biz-Prescriptive | Retail        | ROB              | 4                               | 4                               | 25%            | 1                     | 0.00               | 12     | \$0          | 100%              | 35%               | 67%              | 7                     | 18%             | 20%           | 63.2%             | 51.8%             | 53.4%            | 18.6      |
| 878       | Heating       | Variable Refrigerant Flow Heat Pump                            | Biz-Custom       | Retail        | NC               | 11                              | 11                              | 25%            | 3                     | 0.00               | 20     | \$3          | 100%              | 5%                | 3%               | 2                     | 23%             | 0%            | 63.2%             | 32.1%             | 32.0%            | 26.7      |
| 879       | Ventilation   | Kitchen Exhaust Hood Demand Ventilation Control System         | Biz-Custom       | Retail        | ROB              | 0                               | 0                               | 0%             | 0                     | 0.00               | 20     | \$0          | 0%                | 0%                | 0%               | 1                     | 0%              | 24%           | 63.2%             | 55.0%             | 55.0%            | 0.0       |
| 880       | Ventilation   | Demand Controlled Ventilation                                  | Biz-Custom       | Retail        | ROB              | 2,579                           | 2,579                           | 20%            | 516                   | 0.00               | 15     | \$227        | 100%              | 12%               | 17%              | 2                     | 100%            | 5%            | 63.2%             | 41.0%             | 41.8%            | 12.8      |
| 881       | Ventilation   | Pump and Fan Variable Frequency Drive Controls (Fans)          | Biz-Prescriptive | Retail        | ROB              | 2,258                           | 2,258                           | 41%            | 923                   | 0.00               | 15     | \$375        | 100%              | 16%               | 18%              | 2                     | 100%            | 25%           | 63.2%             | 42.0%             | 42.4%            | 9.2       |
| 882       | Refrigeration | Strip Curtains   | Biz-Custom       | Retail        | Retro            | 334                             | 334                             | 81%            | 270                   | 0.00               | 4      | \$9          | 100%              | 100%              | 100%             | 1                     | 6%              | 26%           | 60.2%             | 52.4%             | 52.4%            | 4.2       |
| 883       | Refrigeration | Bare Suction Line  | Biz-Custom       | Retail        | Retro            | 23                              | 23                              | 93%            | 21                    | 0.00               | 15     | \$4          | 100%              | 27%               | 39%              | 2                     | 0%              | 25%           | 60.2%             | 45.6%             | 46.6%            | 9.2       |
| 884       | Refrigeration | Floating Head Pressure Controls                                | Biz-Prescriptive | Retail        | Retro            | 2,653                           | 2,653                           | 50%            | 1,327                 | 0.00               | 15     | \$80         | 100%              | 25%               | 41%              | 3                     | 8%              | 20%           | 60.2%             | 50.1%             | 50.6%            | 31.6      |
| 885       | Refrigeration | Saturated Suction Controls                                     | Biz-Custom       | Retail        | Retro            | 831                             | 831                             | 50%            | 416                   | 0.00               | 15     | \$559        | 50%               | 4%                | 6%               | 4                     | 2%              | 20%           | 36.0%             | 36.0%             | 36.0%            | 15.7      |
| 886       | Refrigeration | Compressor Retrofit  | Biz-Custom       | Retail        | Retro            | 813                             | 813                             | 20%            | 163                   | 0.00               | 15     | \$477        | 25%               | 2%                | 3%               | 5                     | 14%             | 15%           | 32.0%             | 27.4%             | 27.4%            | 15.8      |
| 887       | Refrigeration | Electronically Commutated (EC) Walk-In Evaporator Fan Motor    | Biz-Prescriptive | Retail        | Retro            | 1,                              |                                 |                |                       |                    |        |              |                   |                   |                  |                       |                 |               |                   |                   |                  |           |

Appendix C: C&I Measure Assumptions

| Measure # | End-Use             | Measure Name   | Program                | Building Type | Replacement Type | Base (Existing) Annual Electric | Base (Standard) Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | End Use Measure Group | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|---------------------|--|------------------------|---------------|------------------|---------------------------------|---------------------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 901       | Refrigeration       | Energy Star Reach-In Freezer, Glass Doors                      | Biz-Prescriptive       | Retail        | ROB              | 3,234                           | 3,234                           | 15%            | 488                   | 0.00               | 12     | \$450        | 25%               | 15%               | 4%               | 18                    | 6%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 2.9       |
| 902       | Refrigeration       | Energy Star Reach-In Freezer, Solid Doors                      | Biz-Prescriptive       | Retail        | ROB              | 4,676                           | 4,676                           | 20%            | 935                   | 0.00               | 12     | \$450        | 75%               | 15%               | 8%               | 19                    | 6%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 5.5       |
| 903       | Refrigeration       | Refrigeration - Custom   | Biz-Custom             | Retail        | ROB              | 7                               | 7                               | 15%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 72%              | 20                    | 90%             | 20%           | 60.2%             | 49.9%             | 51.0%            | 9.1       |
| 904       | Refrigeration       | Retro-commissioning_Refrigerator Optimization                  | Biz-Custom RCx         | Retail        | Retro            | 33                              | 33                              | 3%             | 1                     | 0.00               | 3      | \$0          | 100%              | 67%               | 22%              | 21                    | 90%             | 10%           | 60.2%             | 50.9%             | 49.0%            | 2.0       |
| 905       | Refrigeration       | Energy Star Ice Machine  | Biz-Prescriptive       | Retail        | ROB              | 6,993                           | 6,993                           | 10%            | 721                   | 0.00               | 15     | \$1,426      | 3%                | 3%                | 2%               | 22                    | 2%              | 49%           | 59.2%             | 57.2%             | 57.2%            | 8.9       |
| 906       | Refrigeration       | LED Refrigerated Display Case Lighting Average 6W/LF           | Biz-Prescriptive       | Retail        | Retro            | 1,573                           | 1,573                           | 37%            | 574                   | 0.00               | 12     | \$1,010      | 34%               | 34%               | 2%               | 23                    | 11%             | 30%           | 44.0%             | 44.0%             | 43.1%            | 0.9       |
| 907       | PlugLoads_Office    | ENERGY STAR Uninterrupted Power Supply                         | Biz-Custom             | Retail        | ROB              | 3,096                           | 3,096                           | 3%             | 85                    | 0.00               | 15     | \$59         | 75%               | 7%                | 11%              | 1                     | 1%              | 70%           | 76.0%             | 76.0%             | 76.0%            | 10.6      |
| 908       | PlugLoads_Office    | Smart Power Strip – Commercial Use                             | Biz-Custom             | Retail        | Retro            | 64                              | 64                              | 100%           | 64                    | 0.00               | 5      | \$50         | 7%                | 7%                | 10%              | 2                     | 50%             | 10%           | 44.3%             | 38.5%             | 38.9%            | 3.2       |
| 909       | PlugLoads_Office    | Plug Load Occupancy Sensor                                     | Biz-Custom             | Retail        | Retro            | 1,126                           | 1,126                           | 15%            | 169                   | 0.00               | 8      | \$70         | 50%               | 13%               | 18%              | 2                     | 50%             | 10%           | 59.4%             | 46.1%             | 47.0%            | 4.2       |
| 910       | PlugLoads_Office    | Electrically Commutated Plug Fans in data centers              | Biz-Custom             | Retail        | Retro            | 86,783                          | 86,783                          | 18%            | 15,778                | 0.00               | 15     | \$480        | 100%              | 100%              | 100%             | 3                     | 0%              | 33%           | 68.6%             | 59.7%             | 59.7%            | 16.2      |
| 911       | PlugLoads_Office    | High Efficiency CRAC unit                                      | Biz-Custom             | Retail        | ROB              | 541                             | 541                             | 30%            | 162                   | 0.00               | 15     | \$63         | 100%              | 14%               | 19%              | 3                     | 0%              | 33%           | 68.6%             | 48.5%             | 49.2%            | 9.8       |
| 912       | PlugLoads_Office    | Computer Room Air Conditioner Economizer                       | Biz-Custom             | Retail        | Retro            | 418                             | 418                             | 86%            | 358                   | 0.00               | 15     | \$82         | 100%              | 23%               | 33%              | 3                     | 0%              | 33%           | 68.6%             | 52.8%             | 53.6%            | 7.1       |
| 913       | PlugLoads_Office    | Energy Star Laptop   | Biz-Custom             | Retail        | ROB              | 126                             | 126                             | 33%            | 41                    | 0.00               | 4      | \$0          | 0%                | 0%                | 0%               | 4                     | 17%             | 85%           | 88.0%             | 88.0%             | 88.0%            | 0.0       |
| 914       | PlugLoads_Office    | Energy Star Monitor  | Biz-Custom             | Retail        | ROB              | 72                              | 72                              | 21%            | 15                    | 0.00               | 4      | \$0          | 0%                | 0%                | 0%               | 5                     | 17%             | 95%           | 96.0%             | 96.0%             | 96.0%            | 0.0       |
| 915       | PlugLoads_Office    | Energy Star Printer/Copier/Fax                                 | Biz-Custom             | Retail        | ROB              | 551                             | 551                             | 40%            | 223                   | 0.00               | 6      | \$0          | 0%                | 0%                | 0%               | 6                     | 17%             | 95%           | 96.0%             | 96.0%             | 96.0%            | 0.0       |
| 916       | PlugLoads_Office    | Energy Star Server   | Biz-Custom             | Retail        | ROB              | 691                             | 691                             | 13%            | 90                    | 0.00               | 15     | \$156        | 25%               | 3%                | 4%               | 7                     | 0%              | 20%           | 36.3%             | 36.0%             | 36.0%            | 9.5       |
| 917       | PlugLoads_Office    | Server Virtualization  | Biz-Custom             | Retail        | Retro            | 691                             | 691                             | 13%            | 90                    | 0.00               | 15     | \$156        | 25%               | 3%                | 4%               | 7                     | 0%              | 20%           | 36.3%             | 36.0%             | 36.0%            | 9.5       |
| 918       | PlugLoads_Office    | Data Center Hot/Cold Aisle Configuration                       | Biz-Custom             | Retail        | Retro            | 691                             | 691                             | 13%            | 90                    | 0.00               | 15     | \$156        | 25%               | 3%                | 4%               | 7                     | 0%              | 20%           | 36.3%             | 36.0%             | 36.0%            | 9.5       |
| 919       | Motors              | Cogged V-Belt  | Biz-Custom             | Retail        | Retro            | 14,670                          | 14,670                          | 3%             | 455                   | 0.00               | 15     | \$384        | 50%               | 6%                | 9%               | 1                     | 77%             | 10%           | 53.3%             | 38.7%             | 39.0%            | 11.4      |
| 920       | Motors              | Pump and Fan Variable Frequency Drive Controls (Pumps)         | Biz-Prescriptive       | Retail        | Retro            | 1,902                           | 1,902                           | 38%            | 731                   | 0.00               | 15     | \$200        | 100%              | 30%               | 27%              | 2                     | 4%              | 25%           | 68.6%             | 53.3%             | 53.0%            | 7.0       |
| 921       | Motors              | Escalators Motor Efficiency Controllers                        | Biz-Custom             | Retail        | Retro            | 7,500                           | 7,500                           | 20%            | 1,500                 | 0.00               | 10     | \$5,000      | 2%                | 2%                | 2%               | 3                     | 0%              | 10%           | 28.0%             | 28.0%             | 28.0%            | 8.6       |
| 922       | CompressedAir       | Efficient Air Compressors                                      | Biz-Custom             | Retail        | ROB              | 4,004                           | 4,004                           | 31%            | 1,223                 | 0.00               | 15     | \$100        | 100%              | 64%               | 100%             | 1                     | 100%            | 33%           | 68.6%             | 58.6%             | 59.7%            | 10.6      |
| 923       | CompressedAir       | Retro-commissioning_Compressed Air Optimization                | Biz-Custom RCx         | Retail        | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 5      | \$0          | 100%              | 67%               | 100%             | 2                     | 100%            | 33%           | 68.6%             | 58.6%             | 59.7%            | 4.1       |
| 924       | CompressedAir       | Compressed Air - Custom  | Biz-Custom             | Retail        | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 8      | \$0          | 100%              | 50%               | 100%             | 3                     | 100%            | 33%           | 68.6%             | 57.5%             | 59.7%            | 4.2       |
| 925       | Miscellaneous       | Power Distribution Equipment Upgrades                          | Biz-Custom             | Retail        | Retro            | 1,150                           | 1,150                           | 1%             | 6                     | 0.00               | 30     | \$8          | 75%               | 4%                | 6%               | 1                     | 52%             | 20%           | 58.1%             | 36.0%             | 36.0%            | 18.3      |
| 926       | Miscellaneous       | Vending Machine Controller - Non-Refrigerated                  | Biz-Custom             | Retail        | Retro            | 745                             | 745                             | 46%            | 343                   | 0.00               | 5      | \$80         | 63%               | 63%               | 32%              | 2                     | 9%              | 66%           | 72.8%             | 72.8%             | 72.8%            | 0.9       |
| 927       | Miscellaneous       | Vending Machine Controller - Refrigerated                      | Biz-Custom             | Retail        | Retro            | 1,739                           | 1,739                           | 46%            | 800                   | 0.00               | 10     | \$216        | 100%              | 35%               | 28%              | 3                     | 29%             | 66%           | 72.8%             | 72.8%             | 72.8%            | 3.3       |
| 928       | Miscellaneous       | Miscellaneous Custom   | Biz-Custom             | Retail        | Retro            | 5                               | 5                               | 20%            | 1                     | 0.00               | 10     | \$0          | 100%              | 50%               | 72%              | 4                     | 48%             | 20%           | 68.6%             | 57.8%             | 58.7%            | 8.0       |
| 929       | Whole Building_HVAC | HVAC - Energy Management System                                | Biz-Prescriptive       | Retail        | Retro            | 6,960                           | 6,960                           | 15%            | 1,044                 | 0.00               | 15     | \$4,000      | 3%                | 3%                | 2%               | 1                     | 100%            | 1%            | 20.8%             | 18.4%             | 18.4%            | 4.3       |
| 930       | Whole Building_HVAC | Guest room energy management system                            | Biz-Custom             | Retail        | Retro            | 0                               | 0                               | 0%             | 0                     | 0.00               | 8      | \$0          | 0%                | 0%                | 0%               | 2                     | 0%              | 0%            | 63.2%             | 55.0%             | 55.0%            | 0.0       |
| 931       | Whole Building_HVAC | Retro-commissioning_Bld Optimization                           | Biz-Custom RCx         | Retail        | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 3      | \$0          | 100%              | 67%               | 22%              | 3                     | 100%            | 10%           | 63.2%             | 53.6%             | 51.7%            | 7.2       |
| 932       | WholeBld            | WholeBld - Com RET   | Biz-NC                 | Retail        | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 19%              | 4                     | 40%             | 0%            | 68.6%             | 57.8%             | 56.6%            | 9.5       |
| 933       | Whole Building_NC   | WholeBld - Com NC  | Biz-NC                 | Retail        | NC               | 4                               | 4                               | 25%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 72%              | 5                     | 100%            | 60%           | 68.6%             | 68.0%             | 68.0%            | 9.5       |
| 934       | Behavioral          | AMI Data Presentation & Engagement                             | Biz-Behavior           | Retail        | Retro            | 100                             | 100                             | 1%             | 1                     | 0.00               | 1      | \$0          | 100%              | 100%              | 87%              | 1                     | 100%            | 10%           | 50.0%             | 50.0%             | 50.0%            | 1.2       |
| 935       | Behavioral          | BIEMS  | Biz-Behavior           | Retail        | Retro            | 37                              | 37                              | 3%             | 1                     | 0.00               | 3      | \$0          | 12%               | 12%               | 5%               | 1                     | 100%            | 5%            | 42.5%             | 50.0%             | 50.0%            | 1.6       |
| 936       | Behavioral          | Building Operator Certification                                | Biz-Behavior           | Retail        | Retro            | 18,300                          | 18,300                          | 1%             | 146                   | 0.00               | 3      | \$25         | 50%               | 30%               | 12%              | 1                     | 100%            | 5%            | 42.5%             | 50.0%             | 50.0%            | 2.2       |
| 937       | Cooking             | Commercial Combination Oven (Electric)                         | Biz-Prescriptive       | Office        | ROB              | 38,561                          | 38,561                          | 48%            | 18,432                | 0.00               | 12     | \$16,884     | 50%               | 6%                | 3%               | 1                     | 17%             | 53%           | 62.4%             | 62.4%             | 62.4%            | 9.6       |
| 938       | Cooking             | Commercial Electric Convection Oven                            | Biz-Prescriptive       | Office        | ROB              | 12,193                          | 12,193                          | 15%            | 1,879                 | 0.00               | 12     | \$1,706      | 50%               | 15%               | 11%              | 1                     | 17%             | 53%           | 62.4%             | 62.4%             | 62.4%            | 4.0       |
| 939       | Cooking             | Commercial Electric Griddle                                    | Biz-Prescriptive       | Office        | ROB              | 17,056                          | 17,056                          | 15%            | 2,596                 | 0.00               | 12     | \$3,604      | 25%               | 14%               | 7%               | 2                     | 14%             | 17%           | 39.3%             | 33.6%             | 33.6%            | 2.1       |
| 940       | Cooking             | Commercial Electric Steam Cooker                               | Biz-Prescriptive       | Office        | ROB              | 19,549                          | 19,549                          | 67%            | 13,162                | 0.00               | 12     | \$3,500      | 100%              | 12%               | 14%              | 3                     | 6%              | 42%           | 68.6%             | 53.6%             | 53.6%            | 16.1      |
| 941       | Cooking             | Dishwasher Low Temp Door (Energy Star)                         | Biz-Prescriptive       | Office        | ROB              | 39,279                          | 39,279                          | 41%            | 16,153                | 0.00               | 15     | \$770        | 100%              | 49%               | 65%              | 4                     | 26%             | 61%           | 68.8%             | 68.8%             | 68.8%            | 19.3      |
| 942       | Cooking             | Dishwasher High Temp Door (Energy Star)                        | Biz-Prescriptive       | Office        | ROB              | 39,825                          | 39,825                          | 30%            | 11,853                | 0.00               | 15     | \$770        | 100%              | 49%               | 65%              | 4                     | 26%             | 61%           | 68.8%             | 68.8%             | 68.8%            | 14.1      |
| 943       | Cooking             | Energy efficient electric fryer                                | Biz-Prescriptive       | Office        | ROB              | 18,182                          | 18,182                          | 14%            | 2,572                 | 0.00               | 12     | \$1,706      | 50%               | 1%                | 15%              | 5                     | 27%             | 25%           | 55.0%             | 39.3%             | 40.7%            | 97.4      |
| 944       | Cooking             | Insulated Holding Cabinets (Full Size)                         | Biz-Prescriptive       | Office        | ROB              | 7,665                           | 7,665                           | 69%            | 5,278                 | 0.00               | 12     | \$1,200      | 100%              | 6%                | 42%              | 6                     | 3%              | 23%           | 68.6%             | 52.4%             | 54.9%            | 32.4      |
| 945       | Cooking             | Insulated Holding Cabinets (Half-Size)                         | Biz-Prescriptive       | Office        | ROB              | 3,066                           | 3,066                           | 58%            | 1,788                 | 0.00               | 12     | \$1,500      | 50%               | 8%                | 12%              | 6                     | 3%              | 23%           | 52.9%             | 38.7%             | 39.1%            | 6.8       |
| 946       | HotWater            | Faucet Aerator   | Biz-Custom             | Office        | Retro            | 2,162                           | 2,162                           | 66%            | 1,425                 | 0.00               | 10     | \$3          | 100%              | 26%               | 100%             | 4                     | 25%             | 80%           | 84.0%             | 84.0%             | 84.0%            | 814.2     |
| 947       | HotWater            | Heat Pump Water Heater   | Biz-Custom             | Office        | ROB              | 9,674                           | 9,674                           | 35%            | 3,341                 | 0.00               | 10     | \$1,574      | 50%               | 11%               | 8%               | 1                     | 100%            | 16%           | 65.0%             | 50.8%             | 50.4%            | 6.3       |
| 948       | HotWater            | Hot Water Pipe Insulation                                      | Biz-Custom             | Office        | Retro            | 9,674                           | 9,674                           | 2%             | 193                   | 0.00               | 20     | \$60         | 100%              | 17%               | 13%              | 2                     | 100%            | 80%           | 84.0%             | 84.0%             | 84.0%            | 11.8      |
| 949       | HotWater            | Low Flow Pre-Rinse Sprayers                                    | Biz-Custom             | Office        | ROB              | 2,991                           | 2,991                           | 26%            | 764                   | 0.00               | 5      | \$35         | 100%              | 71%               | 87%              | 3                     | 25%             | 80%           | 84.0%             | 84.0%             | 84.0%            | 6.9       |
| 950       | HotWater            | ENERGY STAR Commercial Washing Machines                        | Biz-Custom             | Office        | ROB              | 1,552                           | 1,552                           | 43%            | 671                   | 0.00               | 7      | \$250        | 50%               | 14%               | 11%              | 5                     | 25%             | 35%           | 66.5%             | 53.7%             | 53.3%            | 4.2       |
| 951       | HotWater            | Ozone Commercial Laundry                                       | Biz-Custom             | Office        | Retro            | 2,984                           | 2,984                           | 25%            | 746                   | 0.00               | 10     | \$20,310     | 0%                | 0%                | 0%               | 6                     | 0%              | 0%            | 60.0%             | 60.0%             | 60.0%            | 5.4       |
| 952       | InteriorLighting    | LED T8 Tube Replacement  | Biz-Prescriptive Light | Office        | Retro            | 138                             | 138                             | 59%            | 82                    | 0.00               | 15     | \$7          | 100%              | 49%               | 49%              | 1                     | 79%             | 32%           | 71.1%             | 60.5%             | 60.5%            | 12.9      |
| 953       | InteriorLighting    | LED troffer retrofit kit, 2'X2' and 2'X4'                      | Biz-Prescriptive Light | Office        | Retro            | 310                             | 310                             | 50%            | 155                   | 0.00               | 18     | \$67         | 100%              | 26%               | 9%               | 1                     | 79%             | 32%           | 71.1%             | 52.9%             | 50.8%            | 5.9       |
| 954       | InteriorLighting    | LED troffer, 2'X2' and 2'X4'                                   | Biz-Prescriptive Light | Office        | Retro            | 223                             | 223                             | 50%            | 112                   | 0.00               | 18     | \$67         | 100%              | 26%               | 7%               | 1                     | 79%             | 32%           | 71.1%             | 49.3%             | 45.8%            | 4.2       |
| 955       | InteriorLighting    | LED high bay fixture   | Biz-Prescriptive Light | Office        | Retro            | 1,080                           | 1,080                           | 76%            | 821                   | 0.00               | 12     | \$323        | 100%              | 12%               | 10%              | 2                     | 1%              | 16%           | 71.1%             | 52.5%             | 52.2%            | 10.9      |
| 956       | InteriorLighting    | LED Mogul-base HID Lamp Replacing High Bay HID                 | Biz-Prescriptive Light | Office        | Retro            | 1,080                           | 1,080                           | 79%            | 855                   | 0.00               | 12     | \$110        | 100%              | 21%               | 31%              | 2                     | 1%              | 16%           | 71.1%             | 58.8%             | 59.2%            | 19.8      |
| 957       | InteriorLighting    | LED low bay fixture  | Biz-Prescriptive Light | Office        | Retro            | 1,080                           | 1,080                           | 76%            | 821                   | 0.00               | 12     | \$196        | 100%              | 20%               | 17%              | 3                     | 1%              | 16%           | 71.1%             | 56.5%             | 56.2%            | 10.9      |
| 958       | InteriorLighting    | LED Mogul-base HID Lamp Replacing Low Bay HID                  | Biz-Prescriptive Light | Office        | Retro            | 1,080                           | 1,080                           | 79%            | 855                   | 0.00               | 12     | \$60         | 100%              | 38%               | 57%              | 3                     | 1%              | 16%           | 71.1%             | 60.6%             | 61.0%            | 19.8      |
| 959       | InteriorLighting    | LED downlight, screw-in lamp, 1-3W, interior Average 2 Watts   | Biz-Prescriptive Light | Office        | ROB              | 67                              | 67                              | 88%            | 59                    | 0.00               | 4      | \$4          | 100%              | 25%               | 59%              | 4                     | 3%              | 32%           | 71.1%             | 60.3%             | 61.0%            | 10.5      |
| 960       | InteriorLighting    | LED downlight fixture  | Biz-Prescriptive Light | Office        | Retro            | 174                             | 174                             | 82%            | 142                   | 0.00               | 4      | \$13         | 100%              | 39%               | 44%              | 5                     | 16%             | 32%           | 71.1%             | 60.2%             | 60.3%            | 5.1       |
| 961       | InteriorLighting    | LED downlight, screw-in lamp, 4-20W, interior Average 11 Watts | Biz-Prescriptive Light | Office        | ROB              | 134                             | 134                             | 84%            | 113                   | 0.00               | 4      | \$2          | 100%              | 61%               | 100%             | 5                     | 16%             | 32%           | 71.1%             | 61.7%             | 61.9%            | 20.2      |
| 962       | InteriorLighting    | Delamp Fluorescent Fixture Average Lamp Wattage 28W            | Biz-Custom Light       | Office        | Retro            | 53                              | 53                              | 100%           | 53                    | 0.00               | 15     | \$4          | 100%              | 69%               | 53%              | 6                     | 79%             | 0%            | 71.1%             | 61.1%             | 60.8%            | 11.3      |
| 963       | InteriorLighting    | Daylighting Controls   | Biz-Custom Light       | Office        | Retro            | 8,810                           | 8,810                           | 30%            | 2,643                 | 0.00               | 12     | \$3,000      | 25%               | 5%                | 4%               | 7                     | 85%             | 8%            | 48.3%             | 39.1%             | 39.0%            | 10.1      |
| 964       | InteriorLighting    | Occupancy Sensors  | Biz-Prescriptive Light | Office        | Retro            | 1,523                           | 1,523                           | 30%            | 457                   | 0.00               | 8      | \$54         | 100%              | 37%               | 34%              | 7                     | 85%             | 8%            | 71.1%             | 59.3%             | 59.2%            | 5.9       |
| 965       | InteriorLighting    | Central Lighting Monitoring & Controls (non-networked)         | Biz-Custom Light       | Office        | Retro            | 41,703                          | 41,703                          |                |                       |                    |        |              |                   |                   |                  |                       |                 |               |                   |                   |                  |           |

Appendix C: C&I Measure Assumptions

| Measure # | End-Use          | Measure Name  | Program                | Building Type | Replacement Type | Base (Existing) Annual Electric | Base (Standard) Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | End Use Measure Group | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|------------------|---|------------------------|---------------|------------------|---------------------------------|---------------------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 976       | ExteriorLighting | LED parking garage fixture (existing W<250)                     | Biz-Prescriptive Light | Office        | Retro            | 1,742                           | 1,742                           | 66%            | 1,154                 | 0.00               | 6      | \$248        | 50%               | 10%               | 19%              | 8                     | 13%             | 41%           | 66.7%             | 55.4%             | 56.0%            | 7.0       |
| 977       | ExteriorLighting | LED Mogul-base HID Lamp Replacing Exterior HID (existing W250)  | Biz-Prescriptive Light | Office        | Retro            | 1,589                           | 1,589                           | 60%            | 959                   | 0.00               | 12     | \$756        | 25%               | 3%                | 5%               | 9                     | 13%             | 41%           | 52.8%             | 52.8%             | 52.8%            | 11.2      |
| 978       | ExteriorLighting | LED Mogul-base HID Lamp Replacing Exterior HID (existing W<250) | Biz-Prescriptive Light | Office        | Retro            | 856                             | 856                             | 66%            | 567                   | 0.00               | 12     | \$248        | 50%               | 10%               | 9%               | 10                    | 13%             | 41%           | 62.7%             | 52.8%             | 52.8%            | 6.6       |
| 979       | Cooling          | Air Conditioner - 16 SEER (5-20 Tons)                           | Biz-Prescriptive       | Office        | ROB              | 11,239                          | 11,239                          | 13%            | 1,405                 | 0.00               | 15     | \$3,570      | 25%               | 5%                | 4%               | 1                     | 24%             | 20%           | 36.0%             | 35.8%             | 35.6%            | 9.3       |
| 980       | Cooling          | Air Conditioner - 17 SEER (5-20 Tons)                           | Biz-Prescriptive       | Office        | ROB              | 11,239                          | 11,239                          | 13%            | 1,405                 | 0.00               | 15     | \$4,760      | 25%               | 5%                | 3%               | 1                     | 24%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 7.0       |
| 981       | Cooling          | Air Conditioner - 18 SEER (5-20 Tons)                           | Biz-Prescriptive       | Office        | ROB              | 11,239                          | 11,239                          | 19%            | 2,118                 | 0.00               | 15     | \$5,960      | 25%               | 5%                | 4%               | 1                     | 24%             | 20%           | 36.0%             | 34.4%             | 34.1%            | 8.5       |
| 982       | Cooling          | Air Conditioner - 21 SEER (5-20 Tons)                           | Biz-Prescriptive       | Office        | ROB              | 11,239                          | 11,239                          | 24%            | 2,734                 | 0.00               | 15     | \$9,080      | 25%               | 5%                | 3%               | 1                     | 24%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 7.2       |
| 983       | Cooling          | Air Conditioner - 16 SEER (20+ Tons)                            | Biz-Prescriptive       | Office        | ROB              | 22,887                          | 22,887                          | 8%             | 1,907                 | 0.00               | 15     | \$7,140      | 25%               | 5%                | 3%               | 2                     | 24%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 6.4       |
| 984       | Cooling          | Air Conditioner - 17 SEER (20+ Tons)                            | Biz-Prescriptive       | Office        | ROB              | 22,887                          | 22,887                          | 8%             | 1,907                 | 0.00               | 15     | \$9,520      | 5%                | 5%                | 2%               | 2                     | 24%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 4.8       |
| 985       | Cooling          | Air Conditioner - 18 SEER (20+ Tons)                            | Biz-Prescriptive       | Office        | ROB              | 22,887                          | 22,887                          | 15%            | 3,521                 | 0.00               | 15     | \$11,920     | 25%               | 5%                | 3%               | 2                     | 24%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 7.0       |
| 986       | Cooling          | Air Conditioner - 21 SEER (20+ Tons)                            | Biz-Prescriptive       | Office        | ROB              | 22,887                          | 22,887                          | 21%            | 4,904                 | 0.00               | 15     | \$18,160     | 25%               | 5%                | 3%               | 2                     | 24%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 6.4       |
| 987       | Cooling          | Comprehensive Rooftop Unit Quality Maintenance (AC Tune-up)     | Biz-Custom             | Office        | Retro            | 35,220                          | 35,220                          | 6%             | 2,226                 | 0.00               | 3      | \$500        | 75%               | 23%               | 33%              | 3                     | 48%             | 50%           | 60.4%             | 60.0%             | 60.0%            | 4.3       |
| 988       | Cooling          | Air Side Economizer   | Biz-Custom             | Office        | Retro            | 6,294                           | 6,294                           | 3%             | 183                   | 0.00               | 5      | \$170        | 6%                | 6%                | 8%               | 4                     | 48%             | 33%           | 46.4%             | 46.4%             | 46.4%            | 3.1       |
| 989       | Cooling          | Advanced Rooftop Controls                                       | Biz-Custom             | Office        | Retro            | 5,245                           | 5,245                           | 41%            | 2,132                 | 0.00               | 10     | \$3,412      | 25%               | 3%                | 5%               | 5                     | 48%             | 3%            | 31.0%             | 24.3%             | 24.5%            | 13.2      |
| 990       | Cooling          | Air Conditioner - 16 SEER (<5 Tons)                             | Biz-Prescriptive       | Office        | ROB              | 4,842                           | 4,842                           | 19%            | 908                   | 0.00               | 15     | \$1,785      | 50%               | 5%                | 5%               | 6                     | 8%              | 20%           | 36.0%             | 36.0%             | 36.0%            | 12.1      |
| 991       | Cooling          | Air Conditioner - 17 SEER (<5 Tons)                             | Biz-Prescriptive       | Office        | ROB              | 4,842                           | 4,842                           | 24%            | 1,139                 | 0.00               | 15     | \$2,380      | 50%               | 5%                | 5%               | 6                     | 8%              | 20%           | 36.0%             | 36.0%             | 36.0%            | 11.4      |
| 992       | Cooling          | Air Conditioner - 18 SEER(<5 Tons)                              | Biz-Prescriptive       | Office        | ROB              | 4,842                           | 4,842                           | 28%            | 1,345                 | 0.00               | 15     | \$2,980      | 50%               | 5%                | 5%               | 6                     | 8%              | 20%           | 36.0%             | 36.0%             | 36.0%            | 10.7      |
| 993       | Cooling          | Air Conditioner - 21 SEER(<5 Tons)                              | Biz-Prescriptive       | Office        | ROB              | 4,842                           | 4,842                           | 38%            | 1,844                 | 0.00               | 15     | \$4,540      | 25%               | 5%                | 4%               | 6                     | 8%              | 20%           | 36.0%             | 36.0%             | 36.0%            | 9.7       |
| 994       | Cooling          | Centrifugal Chiller - Average kW/Ton = 0.626                    | Biz-Custom             | Office        | ROB              | 21,484                          | 21,484                          | 26%            | 5,635                 | 0.00               | 20     | \$12,718     | 25%               | 2%                | 3%               | 7                     | 13%             | 20%           | 36.0%             | 35.5%             | 35.7%            | 21.1      |
| 995       | Cooling          | Reciprocating Chiller - Average kW/Ton = 0.99                   | Biz-Custom             | Office        | ROB              | 26,415                          | 26,415                          | 27%            | 7,044                 | 0.00               | 20     | \$10,196     | 100%              | 4%                | 5%               | 8                     | 22%             | 20%           | 63.2%             | 36.0%             | 36.0%            | 34.4      |
| 996       | Cooling          | Screw Chiller - Average kW/Ton = 0.675                          | Biz-Custom             | Office        | ROB              | 30,850                          | 30,850                          | 23%            | 7,076                 | 0.00               | 20     | \$10,177     | 100%              | 4%                | 5%               | 9                     | 1%              | 20%           | 63.2%             | 36.0%             | 36.0%            | 33.9      |
| 997       | Cooling          | HVAC/Chiller Custom   | Biz-Custom             | Office        | Retro            | 5                               | 5                               | 20%            | 1                     | 0.00               | 12     | \$1          | 25%               | 6%                | 9%               | 10                    | 36%             | 20%           | 37.0%             | 36.0%             | 36.0%            | 7.8       |
| 998       | Cooling          | Chiller Tune-up   | Biz-Custom             | Office        | Retro            | 42,263                          | 42,263                          | 8%             | 3,381                 | 0.00               | 5      | \$475        | 100%              | 37%               | 53%              | 11                    | 36%             | 50%           | 63.2%             | 60.0%             | 60.0%            | 5.5       |
| 999       | Cooling          | PTAC - <7,000 Btuh - lodging                                    | Biz-Prescriptive       | Office        | ROB              | 529                             | 529                             | 9%             | 48                    | 0.00               | 15     | \$22         | 100%              | 50%               | 22%              | 12                    | 0%              | 20%           | 63.2%             | 46.9%             | 43.0%            | 5.1       |
| 1000      | Cooling          | PTAC - 7,000 to 15,000 Btuh - lodging                           | Biz-Prescriptive       | Office        | ROB              | 1,176                           | 1,176                           | 9%             | 110                   | 0.00               | 15     | \$41         | 100%              | 50%               | 27%              | 13                    | 0%              | 20%           | 63.2%             | 48.2%             | 45.6%            | 6.3       |
| 1001      | Cooling          | PTAC - >15,000 Btuh - lodging                                   | Biz-Prescriptive       | Office        | ROB              | 1,988                           | 1,988                           | 10%            | 189                   | 0.00               | 15     | \$56         | 100%              | 50%               | 34%              | 14                    | 0%              | 20%           | 63.2%             | 49.4%             | 47.9%            | 8.0       |
| 1002      | Cooling          | HVAC Occupancy Controls   | Biz-Custom             | Office        | ROB              | 2,636                           | 2,636                           | 20%            | 527                   | 0.00               | 15     | \$538        | 75%               | 5%                | 0%               | 15                    | 48%             | 25%           | 51.6%             | 40.0%             | 40.0%            | 15.3      |
| 1003      | Cooling          | Smart Thermostat  | Biz-Custom             | Office        | ROB              | 5,245                           | 5,245                           | 18%            | 928                   | 0.00               | 10     | \$128        | 100%              | 13%               | 10%              | 16                    | 53%             | 9%            | 63.2%             | 48.9%             | 48.7%            | 18.1      |
| 1004      | Cooling          | Window Film   | Biz-Custom             | Office        | Retro            | 35,220                          | 0                               | 5%             | 1,608                 | 0.00               | 10     | \$1,340      | 75%               | 6%                | 5%               | 17                    | 100%            | 25%           | 54.0%             | 40.0%             | 40.0%            | 13.6      |
| 1005      | Cooling          | Energy Recovery Ventilator                                      | Biz-Custom             | Office        | Retro            | 2                               | 2                               | 50%            | 1                     | 0.00               | 20     | \$1          | 75%               | 8%                | 12%              | 18                    | 100%            | 5%            | 54.8%             | 33.2%             | 33.5%            | 11.6      |
| 1006      | Heating          | Heat Pump - 16 SEER (<5 Tons)                                   | Biz-Prescriptive       | Office        | ROB              | 10,732                          | 10,732                          | 19%            | 2,024                 | 0.00               | 15     | \$2,055      | 50%               | 20%               | 10%              | 1                     | 5%              | 20%           | 43.4%             | 36.0%             | 36.0%            | 3.6       |
| 1007      | Heating          | Heat Pump - 17 SEER (<5 Tons)                                   | Biz-Prescriptive       | Office        | ROB              | 10,732                          | 10,732                          | 22%            | 2,354                 | 0.00               | 15     | \$2,740      | 50%               | 20%               | 9%               | 1                     | 5%              | 20%           | 41.1%             | 36.0%             | 36.0%            | 3.2       |
| 1008      | Heating          | Heat Pump - 18 SEER(<5 Tons)                                    | Biz-Prescriptive       | Office        | ROB              | 10,732                          | 10,732                          | 25%            | 2,700                 | 0.00               | 15     | \$3,425      | 50%               | 20%               | 8%               | 1                     | 5%              | 20%           | 39.5%             | 36.0%             | 36.0%            | 3.0       |
| 1009      | Heating          | Heat Pump - 21 SEER(<5 Tons)                                    | Biz-Prescriptive       | Office        | ROB              | 10,732                          | 10,732                          | 31%            | 3,288                 | 0.00               | 15     | \$4,500      | 50%               | 20%               | 7%               | 1                     | 5%              | 20%           | 38.8%             | 36.0%             | 36.0%            | 3.0       |
| 1010      | Heating          | Geothermal HP - SEER 20.3 (<5 Tons)                             | Biz-Prescriptive       | Office        | ROB              | 10,732                          | 10,732                          | 36%            | 3,873                 | 0.00               | 15     | \$4,700      | 50%               | 11%               | 8%               | 1                     | 5%              | 20%           | 40.0%             | 36.0%             | 36.0%            | 5.6       |
| 1011      | Heating          | Geothermal HP - SEER 21.5 (<5 Tons)                             | Biz-Prescriptive       | Office        | ROB              | 10,732                          | 10,732                          | 40%            | 4,310                 | 0.00               | 15     | \$7,300      | 25%               | 7%                | 6%               | 1                     | 5%              | 20%           | 36.0%             | 36.0%             | 36.0%            | 6.2       |
| 1012      | Heating          | Geothermal HP - SEER 23.1 (<5 Tons)                             | Biz-Prescriptive       | Office        | ROB              | 10,732                          | 10,732                          | 46%            | 4,896                 | 0.00               | 15     | \$7,300      | 25%               | 7%                | 7%               | 1                     | 5%              | 20%           | 36.0%             | 36.0%             | 36.0%            | 7.0       |
| 1013      | Heating          | Geothermal HP - SEER 29.3 (<5 Tons)                             | Biz-Prescriptive       | Office        | ROB              | 10,732                          | 10,732                          | 51%            | 5,479                 | 0.00               | 15     | \$9,200      | 25%               | 8%                | 5%               | 1                     | 5%              | 20%           | 36.0%             | 36.0%             | 36.0%            | 5.0       |
| 1014      | Heating          | Heat Pump - 16 SEER (5-20 Tons)                                 | Biz-Prescriptive       | Office        | ROB              | 38,730                          | 38,730                          | 10%            | 3,759                 | 0.00               | 15     | \$4,110      | 50%               | 20%               | 9%               | 2                     | 28%             | 20%           | 41.3%             | 36.0%             | 36.0%            | 3.1       |
| 1015      | Heating          | Heat Pump - 17 SEER (5-20 Tons)                                 | Biz-Prescriptive       | Office        | ROB              | 38,730                          | 38,730                          | 13%            | 5,079                 | 0.00               | 15     | \$5,480      | 50%               | 20%               | 9%               | 2                     | 28%             | 20%           | 40.5%             | 36.0%             | 36.0%            | 2.8       |
| 1016      | Heating          | Heat Pump - 18 SEER (5-20 Tons)                                 | Biz-Prescriptive       | Office        | ROB              | 38,730                          | 38,730                          | 19%            | 7,492                 | 0.00               | 15     | \$6,850      | 50%               | 20%               | 7%               | 2                     | 28%             | 20%           | 43.7%             | 36.0%             | 36.0%            | 3.3       |
| 1017      | Heating          | Heat Pump - 21 SEER (5-20 Tons)                                 | Biz-Prescriptive       | Office        | ROB              | 38,730                          | 38,730                          | 25%            | 9,583                 | 0.00               | 15     | \$9,000      | 50%               | 20%               | 6%               | 2                     | 28%             | 20%           | 43.3%             | 36.0%             | 36.0%            | 3.2       |
| 1018      | Heating          | Geothermal HP - SEER 20.3 (5-20 Tons)                           | Biz-Prescriptive       | Office        | ROB              | 19,500                          | 19,500                          | 29%            | 5,658                 | 0.00               | 15     | \$7,700      | 75%               | 6%                | 2%               | 2                     | 28%             | 20%           | 51.6%             | 36.0%             | 36.0%            | 12.1      |
| 1019      | Heating          | Geothermal HP - SEER 21.5 (5-20 Tons)                           | Biz-Prescriptive       | Office        | ROB              | 19,500                          | 19,500                          | 34%            | 6,538                 | 0.00               | 15     | \$10,300     | 50%               | 5%                | 5%               | 2                     | 28%             | 20%           | 38.6%             | 36.0%             | 36.0%            | 13.3      |
| 1020      | Heating          | Geothermal HP - SEER 23.1 (5-20 Tons)                           | Biz-Prescriptive       | Office        | ROB              | 19,500                          | 19,500                          | 40%            | 7,721                 | 0.00               | 15     | \$12,800     | 50%               | 4%                | 4%               | 2                     | 28%             | 20%           | 37.9%             | 36.0%             | 36.0%            | 15.0      |
| 1021      | Heating          | Geothermal HP - SEER 29.3 (5-20 Tons)                           | Biz-Prescriptive       | Office        | ROB              | 19,500                          | 19,500                          | 46%            | 8,909                 | 0.00               | 15     | \$17,700     | 25%               | 4%                | 3%               | 2                     | 28%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 11.8      |
| 1022      | Heating          | Heat Pump - 16 SEER (20+ Tons)                                  | Biz-Prescriptive       | Office        | ROB              | 79,587                          | 79,587                          | 10%            | 8,333                 | 0.00               | 15     | \$8,220      | 50%               | 20%               | 6%               | 3                     | 28%             | 20%           | 41.8%             | 36.0%             | 36.0%            | 2.8       |
| 1023      | Heating          | Heat Pump - 17 SEER (20+ Tons)                                  | Biz-Prescriptive       | Office        | ROB              | 79,587                          | 79,587                          | 14%            | 10,973                | 0.00               | 15     | \$10,960     | 50%               | 20%               | 5%               | 3                     | 28%             | 20%           | 41.0%             | 36.0%             | 36.0%            | 2.6       |
| 1024      | Heating          | Heat Pump - 18 SEER (20+ Tons)                                  | Biz-Prescriptive       | Office        | ROB              | 79,587                          | 79,587                          | 20%            | 15,989                | 0.00               | 15     | \$13,700     | 50%               | 20%               | 4%               | 3                     | 28%             | 20%           | 44.3%             | 36.0%             | 36.0%            | 3.2       |
| 1025      | Heating          | Heat Pump - 21 SEER (20+ Tons)                                  | Biz-Prescriptive       | Office        | ROB              | 79,587                          | 79,587                          | 26%            | 20,321                | 0.00               | 15     | \$18,000     | 50%               | 20%               | 3%               | 3                     | 28%             | 20%           | 43.9%             | 36.0%             | 36.0%            | 3.2       |
| 1026      | Heating          | Geothermal HP - SEER 20.3 (20+ Tons)                            | Biz-Prescriptive       | Office        | ROB              | 39,503                          | 39,503                          | 30%            | 11,818                | 0.00               | 15     | \$10,700     | 100%              | 9%                | 5%               | 3                     | 28%             | 20%           | 63.2%             | 36.0%             | 36.0%            | 12.3      |
| 1027      | Heating          | Geothermal HP - SEER 21.5 (20+ Tons)                            | Biz-Prescriptive       | Office        | ROB              | 39,503                          | 39,503                          | 34%            | 13,577                | 0.00               | 15     | \$13,300     | 100%              | 8%                | 4%               | 3                     | 28%             | 20%           | 63.2%             | 36.0%             | 36.0%            | 13.5      |
| 1028      | Heating          | Geothermal HP - SEER 23.1 (20+ Tons)                            | Biz-Prescriptive       | Office        | ROB              | 39,503                          | 39,503                          | 40%            | 15,943                | 0.00               | 15     | \$18,300     | 75%               | 5%                | 3%               | 3                     | 28%             | 20%           | 52.6%             | 36.0%             | 36.0%            | 15.2      |
| 1029      | Heating          | Geothermal HP - SEER 29.3 (20+ Tons)                            | Biz-Prescriptive       | Office        | ROB              | 39,503                          | 39,503                          | 46%            | 18,321                | 0.00               | 15     | \$26,200     | 50%               | 4%                | 2%               | 3                     | 28%             | 20%           | 39.6%             | 36.0%             | 36.0%            | 17.9      |
| 1030      | Heating          | PTHP - <7,000 Btuh - lodging                                    | Biz-Prescriptive       | Office        | ROB              | 1,903                           | 1,903                           | 9%             | 163                   | 0.00               | 15     | \$13         | 100%              | 100%              | 100%             | 4                     | 0%              | 20%           | 63.2%             | 55.0%             | 55.0%            | 7.8       |
| 1031      | Heating          | PTHP - 7,000 to 15,000 Btuh - lodging                           | Biz-Prescriptive       | Office        | ROB              | 4,103                           | 4,103                           | 11%            | 444                   | 0.00               | 15     | \$45         | 100%              | 100%              | 98%              | 5                     | 0%              | 20%           | 63.2%             | 55.0%             | 55.0%            | 5.6       |
| 1032      | Heating          | PTHP - >15,000 Btuh - lodging                                   | Biz-Prescriptive       | Office        | ROB              | 6,680                           | 6,680                           | 13%            | 879                   | 0.00               | 15     | \$35         | 100%              | 100%              | 100%             | 6                     | 0%              | 20%           | 63.2%             | 55.0%             | 55.0%            | 13.6      |
| 1033      | Heating          | Mini Split Ductless Heat Pump Cold Climate (Tiers & sizes TBD)  | Biz-Prescriptive       | Office        | ROB              | 4                               | 4                               | 25%            | 1                     | 0.00               | 12     | \$0          | 100%              | 35%               | 67%              | 7                     | 5%              | 20%           | 63.2%             | 51.8%             | 53.4%            | 18.6      |
| 1034      | Heating          | Variable Refrigerant Flow Heat Pump                             | Biz-Custom             | Office        | NC               | 11                              | 11                              | 25%            | 3                     | 0.00               | 20     | \$3          | 100%              | 5%                | 3%               | 2                     | 28%             | 0%            | 63.2%             | 32.0%             | 31.9%            | 26.5      |
| 1035      | Ventilation      | Kitchen Exhaust Hood Demand Ventilation Control System          | Biz-Custom             | Office        | ROB              | 0                               | 0                               | 0%             | 0                     | 0.00               | 20     | \$0          | 0%                | 0%                | 0%               | 1                     | 0%              | 24%           | 63.2%             | 55.0%             | 55.0%            | 0.0       |
| 1036      | Ventilation      | Demand Controlled Ventilation                                   | Biz-Custom             | Office        | Retro            | 2,531                           | 2,531                           | 20%            | 506                   | 0.00               | 15     | \$227        | 100%              | 12%               | 17%              |                       |                 |               |                   |                   |                  |           |



Appendix C: C&I Measure Assumptions

| Measure # | End-Use             | Measure Name   | Program          | Building Type | Replacement Type | Base (Existing) Annual Electric | Base (Standard) Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | End Use Measure Group | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|---------------------|--|------------------|---------------|------------------|---------------------------------|---------------------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 1051      | Refrigeration       | Q-Sync Motor for Walk-In and Reach-In Evaporator Fan Motor | Biz-Prescriptive | Office        | Retro            | 993                             | 993                             | 51%            | 504                   | 0.00               | 10     | \$96         | 100%              | 36%               | 21%              | 13                    | 4%              | 33%           | 60.2%             | 46.4%             | 46.4%            | 5.1       |
| 1052      | Refrigeration       | Energy Star Reach-In Refrigerator, Glass Doors             | Biz-Prescriptive | Office        | ROB              | 1,546                           | 1,546                           | 27%            | 410                   | 0.00               | 12     | \$600        | 25%               | 5%                | 3%               | 14                    | 24%             | 55%           | 64.0%             | 64.0%             | 63.9%            | 5.1       |
| 1053      | Refrigeration       | Energy Star Reach-In Refrigerator, Solid Doors             | Biz-Prescriptive | Office        | ROB              | 1,112                           | 1,112                           | 25%            | 283                   | 0.00               | 12     | \$600        | 5%                | 5%                | 2%               | 15                    | 24%             | 55%           | 64.0%             | 62.1%             | 61.9%            | 3.5       |
| 1054      | Refrigeration       | Anti-Sweat Heater Controls LT                              | Biz-Prescriptive | Office        | Retro            | 3,147                           | 3,147                           | 55%            | 1,731                 | 0.00               | 12     | \$250        | 100%              | 10%               | 28%              | 16                    | 8%              | 36%           | 60.2%             | 48.8%             | 48.8%            | 27.9      |
| 1055      | Refrigeration       | Auto Door Closer, Freezer                                  | Biz-Prescriptive | Office        | Retro            | 419,455                         | 419,455                         | 1%             | 2,307                 | 0.00               | 8      | \$157        | 100%              | 16%               | 59%              | 17                    | 8%              | 27%           | 60.2%             | 49.6%             | 51.0%            | 27.8      |
| 1056      | Refrigeration       | Display Case Door Retrofit, Low Temp                       | Biz-Prescriptive | Office        | Retro            | 2,922                           | 2,922                           | 50%            | 1,453                 | 0.00               | 12     | \$686        | 75%               | 22%               | 8%               | 17                    | 8%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 4.3       |
| 1057      | Refrigeration       | Energy Star Reach-In Freezer, Glass Doors                  | Biz-Prescriptive | Office        | ROB              | 3,234                           | 3,234                           | 15%            | 488                   | 0.00               | 12     | \$450        | 25%               | 15%               | 4%               | 18                    | 8%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 2.9       |
| 1058      | Refrigeration       | Energy Star Reach-In Freezer, Solid Doors                  | Biz-Prescriptive | Office        | ROB              | 4,676                           | 4,676                           | 20%            | 935                   | 0.00               | 12     | \$450        | 75%               | 15%               | 8%               | 19                    | 8%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 5.5       |
| 1059      | Refrigeration       | Refrigerator - Custom                                      | Biz-Custom       | Office        | ROB              | 7                               | 7                               | 15%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 72%              | 20                    | 90%             | 20%           | 60.2%             | 49.9%             | 51.0%            | 9.1       |
| 1060      | Refrigeration       | Retro-commissioning_Refrigerator Optimization              | Biz-Custom RCx   | Office        | Retro            | 33                              | 33                              | 3%             | 1                     | 0.00               | 3      | \$0          | 100%              | 67%               | 22%              | 21                    | 90%             | 10%           | 60.2%             | 50.9%             | 49.0%            | 2.0       |
| 1061      | Refrigeration       | Energy Star Ice Machine                                    | Biz-Prescriptive | Office        | ROB              | 6,993                           | 6,993                           | 10%            | 721                   | 0.00               | 15     | \$1,426      | 3%                | 3%                | 2%               | 22                    | 9%              | 49%           | 59.2%             | 57.2%             | 57.2%            | 8.9       |
| 1062      | Refrigeration       | LED Refrigerated Display Case Lighting Average 6W/LF       | Biz-Prescriptive | Office        | Retro            | 1,573                           | 1,573                           | 37%            | 574                   | 0.00               | 12     | \$1,010      | 34%               | 34%               | 2%               | 23                    | 14%             | 30%           | 44.0%             | 44.0%             | 43.1%            | 0.9       |
| 1063      | PlugLoads_Office    | ENERGY STAR Uninterrupted Power Supply                     | Biz-Custom       | Office        | ROB              | 3,096                           | 3,096                           | 3%             | 85                    | 0.00               | 15     | \$59         | 75%               | 7%                | 11%              | 1                     | 2%              | 70%           | 76.0%             | 76.0%             | 76.0%            | 10.8      |
| 1064      | PlugLoads_Office    | Smart Power Strip - Commercial Use                         | Biz-Custom       | Office        | Retro            | 64                              | 64                              | 100%           | 64                    | 0.00               | 5      | \$50         | 7%                | 7%                | 10%              | 2                     | 50%             | 10%           | 44.3%             | 38.5%             | 38.9%            | 3.3       |
| 1065      | PlugLoads_Office    | Plug Load Occupancy Sensor                                 | Biz-Custom       | Office        | Retro            | 1,126                           | 1,126                           | 15%            | 169                   | 0.00               | 8      | \$70         | 50%               | 13%               | 18%              | 2                     | 50%             | 10%           | 59.4%             | 46.1%             | 47.0%            | 4.4       |
| 1066      | PlugLoads_Office    | Electrically Commutated Plug Fans in data centers          | Biz-Custom       | Office        | Retro            | 86,783                          | 86,783                          | 18%            | 15,778                | 0.00               | 15     | \$480        | 100%              | 100%              | 100%             | 3                     | 50%             | 33%           | 68.6%             | 59.7%             | 59.7%            | 16.6      |
| 1067      | PlugLoads_Office    | High Efficiency CRAC unit                                  | Biz-Custom       | Office        | ROB              | 541                             | 541                             | 30%            | 162                   | 0.00               | 15     | \$63         | 100%              | 14%               | 19%              | 3                     | 50%             | 33%           | 68.6%             | 48.5%             | 49.2%            | 10.0      |
| 1068      | PlugLoads_Office    | Computer Room Air Conditioner Economizer                   | Biz-Custom       | Office        | Retro            | 418                             | 418                             | 86%            | 358                   | 0.00               | 15     | \$82         | 100%              | 23%               | 33%              | 3                     | 50%             | 33%           | 68.6%             | 52.8%             | 53.6%            | 7.3       |
| 1069      | PlugLoads_Office    | Energy Star Laptop   | Biz-Custom       | Office        | ROB              | 126                             | 126                             | 33%            | 41                    | 0.00               | 4      | \$0          | 0%                | 0%                | 0%               | 4                     | 17%             | 85%           | 88.0%             | 88.0%             | 88.0%            | 0.0       |
| 1070      | PlugLoads_Office    | Energy Star Monitor  | Biz-Custom       | Office        | ROB              | 72                              | 72                              | 21%            | 15                    | 0.00               | 4      | \$0          | 0%                | 0%                | 0%               | 5                     | 17%             | 95%           | 96.0%             | 96.0%             | 96.0%            | 0.0       |
| 1071      | PlugLoads_Office    | Energy Star Printer/Copier/Fax                             | Biz-Custom       | Office        | ROB              | 551                             | 551                             | 40%            | 223                   | 0.00               | 6      | \$0          | 0%                | 0%                | 0%               | 6                     | 17%             | 95%           | 96.0%             | 96.0%             | 96.0%            | 0.0       |
| 1072      | PlugLoads_Office    | Energy Star Server   | Biz-Custom       | Office        | ROB              | 691                             | 691                             | 13%            | 90                    | 0.00               | 15     | \$156        | 25%               | 3%                | 4%               | 7                     | 15%             | 20%           | 36.3%             | 36.0%             | 36.0%            | 9.7       |
| 1073      | PlugLoads_Office    | Server Virtualization                                      | Biz-Custom       | Office        | Retro            | 691                             | 691                             | 13%            | 90                    | 0.00               | 15     | \$156        | 25%               | 3%                | 4%               | 7                     | 15%             | 20%           | 36.3%             | 36.0%             | 36.0%            | 9.7       |
| 1074      | PlugLoads_Office    | Data Center Hot/Cold Aisle Configuration                   | Biz-Custom       | Office        | Retro            | 691                             | 691                             | 13%            | 90                    | 0.00               | 15     | \$156        | 25%               | 3%                | 4%               | 7                     | 15%             | 20%           | 36.3%             | 36.0%             | 36.0%            | 9.7       |
| 1075      | Motors              | Cogged V-Belt  | Biz-Custom       | Office        | Retro            | 9,092                           | 9,092                           | 3%             | 282                   | 0.00               | 15     | \$384        | 50%               | 4%                | 6%               | 1                     | 69%             | 10%           | 46.9%             | 33.7%             | 33.9%            | 15.2      |
| 1076      | Motors              | Pump and Fan Variable Frequency Drive Controls (Pumps)     | Biz-Prescriptive | Office        | Retro            | 1,902                           | 1,902                           | 38%            | 731                   | 0.00               | 15     | \$200        | 100%              | 30%               | 27%              | 2                     | 12%             | 25%           | 68.6%             | 53.2%             | 53.0%            | 7.6       |
| 1077      | Motors              | Escalators Motor Efficiency Controllers                    | Biz-Custom       | Office        | Retro            | 7,500                           | 7,500                           | 20%            | 1,500                 | 0.00               | 10     | \$5,000      | 2%                | 2%                | 2%               | 3                     | 0%              | 10%           | 28.0%             | 28.0%             | 28.0%            | 9.4       |
| 1078      | CompressedAir       | Efficient Air Compressors                                  | Biz-Custom       | Office        | ROB              | 4,004                           | 4,004                           | 31%            | 1,223                 | 0.00               | 15     | \$100        | 100%              | 64%               | 100%             | 1                     | 100%            | 33%           | 68.6%             | 58.6%             | 59.7%            | 10.8      |
| 1079      | CompressedAir       | Retro-commissioning_Compressed Air Optimization            | Biz-Custom RCx   | Office        | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 5      | \$0          | 100%              | 67%               | 100%             | 2                     | 100%            | 33%           | 68.6%             | 58.6%             | 59.7%            | 4.2       |
| 1080      | CompressedAir       | Compressed Air - Custom                                    | Biz-Custom       | Office        | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 8      | \$0          | 100%              | 50%               | 100%             | 3                     | 100%            | 33%           | 68.6%             | 57.5%             | 59.7%            | 4.4       |
| 1081      | Miscellaneous       | Power Distribution Equipment Upgrades                      | Biz-Custom       | Office        | Retro            | 1,150                           | 1,150                           | 1%             | 6                     | 0.00               | 30     | \$8          | 75%               | 4%                | 6%               | 1                     | 41%             | 20%           | 58.1%             | 36.0%             | 36.0%            | 18.6      |
| 1082      | Miscellaneous       | Vending Machine Controller - Non-Refrigerated              | Biz-Custom       | Office        | Retro            | 745                             | 745                             | 46%            | 343                   | 0.00               | 5      | \$80         | 63%               | 63%               | 32%              | 2                     | 1%              | 66%           | 72.8%             | 72.8%             | 72.8%            | 0.9       |
| 1083      | Miscellaneous       | Vending Machine Controller - Refrigerated                  | Biz-Custom       | Office        | Retro            | 1,739                           | 1,739                           | 46%            | 800                   | 0.00               | 10     | \$216        | 100%              | 35%               | 28%              | 3                     | 3%              | 66%           | 72.8%             | 72.8%             | 72.8%            | 3.4       |
| 1084      | Miscellaneous       | Miscellaneous Custom                                       | Biz-Custom       | Office        | Retro            | 5                               | 5                               | 20%            | 1                     | 0.00               | 10     | \$0          | 100%              | 50%               | 72%              | 4                     | 59%             | 20%           | 68.6%             | 57.8%             | 58.7%            | 8.2       |
| 1085      | Whole Building_HVAC | HVAC - Energy Management System                            | Biz-Prescriptive | Office        | Retro            | 6,960                           | 6,960                           | 15%            | 1,044                 | 0.00               | 15     | \$4,000      | 3%                | 3%                | 2%               | 1                     | 100%            | 1%            | 20.8%             | 18.4%             | 18.4%            | 4.5       |
| 1086      | Whole Building_HVAC | Guest room energy management system                        | Biz-Custom       | Office        | Retro            | 0                               | 0                               | 0%             | 0                     | 0.00               | 8      | \$0          | 0%                | 0%                | 0%               | 2                     | 0%              | 0%            | 63.2%             | 55.0%             | 55.0%            | 0.0       |
| 1087      | Whole Building_HVAC | Retro-commissioning_Bld Optimization                       | Biz-Custom RCx   | Office        | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 3      | \$0          | 100%              | 67%               | 22%              | 3                     | 100%            | 10%           | 63.2%             | 53.6%             | 51.7%            | 2.3       |
| 1088      | WholeBld            | WholeBld - Com RET   | Biz-NC           | Office        | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 19%              | 4                     | 40%             | 0%            | 68.6%             | 57.8%             | 56.6%            | 9.8       |
| 1089      | Whole Building_NC   | WholeBld - Com NC  | Biz-NC           | Office        | NC               | 4                               | 4                               | 25%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 72%              | 5                     | 100%            | 60%           | 68.6%             | 68.0%             | 68.0%            | 9.8       |
| 1090      | Behavioral          | AMI Data Presentation & Engagement                         | Biz-Behavior     | Office        | Retro            | 100                             | 100                             | 1%             | 1                     | 0.00               | 1      | \$0          | 100%              | 100%              | 87%              | 1                     | 100%            | 10%           | 50.0%             | 50.0%             | 50.0%            | 1.3       |
| 1091      | Behavioral          | BIEMS  | Biz-Behavior     | Office        | Retro            | 40                              | 40                              | 3%             | 1                     | 0.00               | 3      | \$0          | 12%               | 12%               | 5%               | 1                     | 100%            | 5%            | 42.5%             | 50.0%             | 50.0%            | 0.7       |
| 1092      | Behavioral          | Building Operator Certification                            | Biz-Behavior     | Office        | Retro            | 15,900                          | 15,900                          | 1%             | 127                   | 0.00               | 3      | \$22         | 50%               | 30%               | 12%              | 1                     | 100%            | 5%            | 42.5%             | 50.0%             | 50.0%            | 2.3       |
| 1093      | Cooking             | Commercial Combination Oven (Electric)                     | Biz-Prescriptive | Warehouse     | ROB              | 38,561                          | 38,561                          | 48%            | 18,432                | 0.00               | 12     | \$16,884     | 50%               | 6%                | 3%               | 1                     | 17%             | 53%           | 62.4%             | 62.4%             | 62.4%            | 9.6       |
| 1094      | Cooking             | Commercial Electric Convection Oven                        | Biz-Prescriptive | Warehouse     | ROB              | 12,193                          | 12,193                          | 15%            | 1,879                 | 0.00               | 12     | \$1,706      | 50%               | 15%               | 11%              | 1                     | 17%             | 53%           | 62.4%             | 62.4%             | 62.4%            | 4.0       |
| 1095      | Cooking             | Commercial Electric Griddle                                | Biz-Prescriptive | Warehouse     | ROB              | 17,056                          | 17,056                          | 15%            | 2,596                 | 0.00               | 12     | \$3,604      | 25%               | 14%               | 7%               | 2                     | 14%             | 17%           | 39.3%             | 33.6%             | 33.6%            | 2.1       |
| 1096      | Cooking             | Commercial Electric Steam Cooker                           | Biz-Prescriptive | Warehouse     | ROB              | 19,549                          | 19,549                          | 67%            | 13,162                | 0.00               | 12     | \$3,500      | 100%              | 12%               | 14%              | 3                     | 6%              | 42%           | 68.6%             | 53.6%             | 53.6%            | 16.1      |
| 1097      | Cooking             | Dishwasher Low Temp Door (Energy Star)                     | Biz-Prescriptive | Warehouse     | ROB              | 39,279                          | 39,279                          | 41%            | 16,153                | 0.00               | 15     | \$770        | 100%              | 49%               | 65%              | 4                     | 26%             | 61%           | 68.8%             | 68.8%             | 68.8%            | 19.3      |
| 1098      | Cooking             | Dishwasher High Temp Door (Energy Star)                    | Biz-Prescriptive | Warehouse     | ROB              | 39,825                          | 39,825                          | 30%            | 11,853                | 0.00               | 15     | \$770        | 100%              | 49%               | 65%              | 4                     | 26%             | 61%           | 68.8%             | 68.8%             | 68.8%            | 14.1      |
| 1099      | Cooking             | Energy efficient electric fryer                            | Biz-Prescriptive | Warehouse     | ROB              | 18,182                          | 18,182                          | 14%            | 2,572                 | 0.00               | 12     | \$1,706      | 50%               | 1%                | 15%              | 5                     | 27%             | 23%           | 55.0%             | 39.3%             | 40.7%            | 97.4      |
| 1100      | Cooking             | Insulated Holding Cabinets (Full Size)                     | Biz-Prescriptive | Warehouse     | ROB              | 7,665                           | 7,665                           | 69%            | 5,278                 | 0.00               | 12     | \$1,200      | 100%              | 6%                | 42%              | 6                     | 3%              | 23%           | 68.6%             | 52.4%             | 54.9%            | 32.4      |
| 1101      | Cooking             | Insulated Holding Cabinets (Half-Size)                     | Biz-Prescriptive | Warehouse     | ROB              | 3,066                           | 3,066                           | 58%            | 1,788                 | 0.00               | 12     | \$1,500      | 50%               | 8%                | 12%              | 6                     | 3%              | 23%           | 52.9%             | 38.7%             | 39.1%            | 6.8       |
| 1102      | HotWater            | Faucet Aerator   | Biz-Custom       | Warehouse     | Retro            | 2,162                           | 2,162                           | 66%            | 1,425                 | 0.00               | 10     | \$3          | 100%              | 26%               | 100%             | 4                     | 25%             | 80%           | 84.0%             | 84.0%             | 84.0%            | 805.6     |
| 1103      | HotWater            | Heat Pump Water Heater                                     | Biz-Custom       | Warehouse     | ROB              | 10,967                          | 10,967                          | 35%            | 3,788                 | 0.00               | 10     | \$1,574      | 75%               | 13%               | 10%              | 1                     | 100%            | 0%            | 69.5%             | 52.6%             | 52.2%            | 6.2       |
| 1104      | HotWater            | Hot Water Pipe Insulation                                  | Biz-Custom       | Warehouse     | Retro            | 10,967                          | 10,967                          | 2%             | 219                   | 0.00               | 20     | \$60         | 100%              | 19%               | 15%              | 2                     | 100%            | 80%           | 84.0%             | 84.0%             | 84.0%            | 11.7      |
| 1105      | HotWater            | Low Flow Pre-Rinse Sprayers                                | Biz-Custom       | Warehouse     | ROB              | 2,991                           | 2,991                           | 26%            | 764                   | 0.00               | 5      | \$35         | 100%              | 71%               | 87%              | 3                     | 25%             | 80%           | 84.0%             | 84.0%             | 84.0%            | 6.8       |
| 1106      | HotWater            | ENERGY STAR Commercial Washing Machines                    | Biz-Custom       | Warehouse     | ROB              | 1,552                           | 1,552                           | 43%            | 671                   | 0.00               | 7      | \$250        | 50%               | 14%               | 11%              | 5                     | 25%             | 35%           | 66.5%             | 53.7%             | 53.3%            | 4.1       |
| 1107      | HotWater            | Ozone Commercial Laundry                                   | Biz-Custom       | Warehouse     | Retro            | 2,984                           | 2,984                           | 25%            | 746                   | 0.00               | 10     | \$20,310     |                   |                   |                  |                       |                 |               |                   |                   |                  |           |

Appendix C: C&I Measure Assumptions

| Measure # | End-Use          | Measure Name   | Program                | Building Type | Replacement Type | Base (Existing) Annual Electric | Base (Standard) Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | End Use Measure Group | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|------------------|--|------------------------|---------------|------------------|---------------------------------|---------------------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 1126      | ExteriorLighting | LED parking lot fixture (existing W250)                        | Biz-Prescriptive Light | Warehouse     | Retro            | 1,589                           | 1,589                           | 60%            | 959                   | 0.00               | 12     | \$756        | 25%               | 3%                | 5%               | 2                     | 13%             | 41%           | 52.8%             | 52.8%             | 52.8%            | 11.2      |
| 1127      | ExteriorLighting | LED parking lot fixture (existing W250)                        | Biz-Prescriptive Light | Warehouse     | Retro            | 856                             | 856                             | 66%            | 567                   | 0.00               | 12     | \$248        | 50%               | 10%               | 9%               | 3                     | 13%             | 41%           | 62.7%             | 52.8%             | 52.8%            | 6.6       |
| 1128      | ExteriorLighting | LED fuel pump canopy fixture (existing W250)                   | Biz-Prescriptive Light | Warehouse     | Retro            | 0                               | 0                               | 0%             | 0                     | 0.00               | 12     | \$0          | 0%                | 0%                | 0%               | 4                     | 0%              | 41%           | 71.1%             | 61.9%             | 61.9%            | 0.0       |
| 1129      | ExteriorLighting | LED fuel pump canopy fixture (existing W250)                   | Biz-Prescriptive Light | Warehouse     | Retro            | 0                               | 0                               | 0%             | 0                     | 0.00               | 12     | \$0          | 0%                | 0%                | 0%               | 5                     | 0%              | 41%           | 71.1%             | 61.9%             | 61.9%            | 0.0       |
| 1130      | ExteriorLighting | LED outdoor pole decorative fixture (existing W250)            | Biz-Prescriptive Light | Warehouse     | Retro            | 1,589                           | 1,589                           | 60%            | 959                   | 0.00               | 12     | \$756        | 25%               | 3%                | 5%               | 6                     | 13%             | 41%           | 52.8%             | 52.8%             | 52.8%            | 11.2      |
| 1131      | ExteriorLighting | LED parking garage fixture (existing W250)                     | Biz-Prescriptive Light | Warehouse     | Retro            | 3,235                           | 3,235                           | 60%            | 1,953                 | 0.00               | 6      | \$756        | 25%               | 3%                | 10%              | 7                     | 13%             | 41%           | 60.2%             | 52.8%             | 52.8%            | 11.8      |
| 1132      | ExteriorLighting | LED parking garage fixture (existing W250)                     | Biz-Prescriptive Light | Warehouse     | Retro            | 1,742                           | 1,742                           | 66%            | 1,154                 | 0.00               | 6      | \$248        | 50%               | 10%               | 19%              | 8                     | 13%             | 41%           | 66.7%             | 55.4%             | 56.0%            | 7.0       |
| 1133      | ExteriorLighting | LED Mogul-base HID Lamp Replacing Exterior HID (existing W250) | Biz-Prescriptive Light | Warehouse     | Retro            | 1,589                           | 1,589                           | 60%            | 959                   | 0.00               | 12     | \$756        | 25%               | 3%                | 5%               | 9                     | 13%             | 41%           | 52.8%             | 52.8%             | 52.8%            | 11.2      |
| 1134      | ExteriorLighting | LED Mogul-base HID Lamp Replacing Exterior HID (existing W250) | Biz-Prescriptive Light | Warehouse     | Retro            | 856                             | 856                             | 66%            | 567                   | 0.00               | 12     | \$248        | 50%               | 10%               | 9%               | 10                    | 13%             | 41%           | 62.7%             | 52.8%             | 52.8%            | 6.6       |
| 1135      | Cooling          | Air Conditioner - 16 SEER (5-20 Tons)                          | Biz-Prescriptive       | Warehouse     | ROB              | 6,943                           | 6,943                           | 12%            | 868                   | 0.00               | 15     | \$3,570      | 25%               | 5%                | 2%               | 1                     | 25%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 8.3       |
| 1136      | Cooling          | Air Conditioner - 17 SEER (5-20 Tons)                          | Biz-Prescriptive       | Warehouse     | ROB              | 6,943                           | 6,943                           | 12%            | 868                   | 0.00               | 15     | \$4,760      | 25%               | 5%                | 2%               | 1                     | 25%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 6.3       |
| 1137      | Cooling          | Air Conditioner - 18 SEER (5-20 Tons)                          | Biz-Prescriptive       | Warehouse     | ROB              | 6,943                           | 6,943                           | 19%            | 1,308                 | 0.00               | 15     | \$5,960      | 25%               | 5%                | 2%               | 1                     | 25%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 7.5       |
| 1138      | Cooling          | Air Conditioner - 21 SEER (5-20 Tons)                          | Biz-Prescriptive       | Warehouse     | ROB              | 6,943                           | 6,943                           | 24%            | 1,689                 | 0.00               | 15     | \$9,080      | 25%               | 5%                | 2%               | 1                     | 25%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 6.4       |
| 1139      | Cooling          | Air Conditioner - 16 SEER (20+ Tons)                           | Biz-Prescriptive       | Warehouse     | ROB              | 14,138                          | 14,138                          | 8%             | 1,178                 | 0.00               | 15     | \$7,140      | 25%               | 5%                | 2%               | 2                     | 25%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 5.7       |
| 1140      | Cooling          | Air Conditioner - 17 SEER (20+ Tons)                           | Biz-Prescriptive       | Warehouse     | ROB              | 14,138                          | 14,138                          | 8%             | 1,178                 | 0.00               | 15     | \$9,520      | 5%                | 5%                | 1%               | 2                     | 25%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 4.3       |
| 1141      | Cooling          | Air Conditioner - 18 SEER (20+ Tons)                           | Biz-Prescriptive       | Warehouse     | ROB              | 14,138                          | 14,138                          | 15%            | 2,175                 | 0.00               | 15     | \$11,920     | 25%               | 5%                | 2%               | 2                     | 25%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 6.3       |
| 1142      | Cooling          | Air Conditioner - 21 SEER (20+ Tons)                           | Biz-Prescriptive       | Warehouse     | ROB              | 14,138                          | 14,138                          | 21%            | 3,030                 | 0.00               | 15     | \$18,160     | 25%               | 5%                | 2%               | 2                     | 25%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 5.7       |
| 1143      | Cooling          | Comprehensive Rooftop Unit Quality Maintenance (AC Tune-up)    | Biz-Custom             | Warehouse     | Retro            | 7,533                           | 7,533                           | 6%             | 476                   | 0.00               | 3      | \$500        | 25%               | 5%                | 7%               | 3                     | 50%             | 50%           | 60.0%             | 60.0%             | 60.0%            | 6.0       |
| 1144      | Cooling          | Air Side Economizer  | Biz-Custom             | Warehouse     | Retro            | 3,888                           | 3,888                           | 3%             | 113                   | 0.00               | 5      | \$170        | 3%                | 3%                | 5%               | 4                     | 50%             | 33%           | 46.4%             | 46.4%             | 46.4%            | 3.7       |
| 1145      | Cooling          | Advanced Rooftop Controls                                      | Biz-Custom             | Warehouse     | Retro            | 3,240                           | 3,240                           | 23%            | 746                   | 0.00               | 10     | \$3,412      | 1%                | 1%                | 2%               | 5                     | 50%             | 3%            | 22.0%             | 19.7%             | 19.7%            | 18.4      |
| 1146      | Cooling          | Air Conditioner - 16 SEER (<5 Tons)                            | Biz-Prescriptive       | Warehouse     | ROB              | 2,991                           | 2,991                           | 19%            | 561                   | 0.00               | 15     | \$1,785      | 50%               | 5%                | 3%               | 6                     | 50%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 10.8      |
| 1147      | Cooling          | Air Conditioner - 17 SEER (<5 Tons)                            | Biz-Prescriptive       | Warehouse     | ROB              | 2,991                           | 2,991                           | 24%            | 704                   | 0.00               | 15     | \$2,380      | 50%               | 5%                | 3%               | 6                     | 50%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 10.2      |
| 1148      | Cooling          | Air Conditioner - 18 SEER (<5 Tons)                            | Biz-Prescriptive       | Warehouse     | ROB              | 2,991                           | 2,991                           | 28%            | 831                   | 0.00               | 15     | \$2,980      | 25%               | 5%                | 3%               | 6                     | 50%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 9.6       |
| 1149      | Cooling          | Air Conditioner - 21 SEER (<5 Tons)                            | Biz-Prescriptive       | Warehouse     | ROB              | 2,991                           | 2,991                           | 38%            | 1,139                 | 0.00               | 15     | \$4,540      | 25%               | 5%                | 3%               | 6                     | 50%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 8.6       |
| 1150      | Cooling          | Centrifugal Chiller - Average kW/Ton = 0.626                   | Biz-Custom             | Warehouse     | ROB              | 4,595                           | 4,595                           | 26%            | 1,205                 | 0.00               | 20     | \$2,720      | 50%               | 2%                | 3%               | 7                     | 0%              | 20%           | 36.0%             | 34.1%             | 34.1%            | 22.4      |
| 1151      | Cooling          | Reciprocating Chiller - Average kW/Ton = 0.99                  | Biz-Custom             | Warehouse     | ROB              | 5,650                           | 5,650                           | 27%            | 1,507                 | 0.00               | 20     | \$2,181      | 100%              | 4%                | 5%               | 8                     | 0%              | 20%           | 63.2%             | 36.0%             | 36.0%            | 35.7      |
| 1152      | Cooling          | Screw Chiller - Average kW/Ton = 0.675                         | Biz-Custom             | Warehouse     | ROB              | 6,598                           | 6,598                           | 23%            | 1,513                 | 0.00               | 20     | \$2,177      | 100%              | 4%                | 5%               | 9                     | 0%              | 20%           | 63.2%             | 36.0%             | 36.0%            | 35.2      |
| 1153      | Cooling          | HVAC/Chiller Custom  | Biz-Custom             | Warehouse     | Retro            | 5                               | 5                               | 20%            | 1                     | 0.00               | 12     | \$1          | 50%               | 6%                | 9%               | 10                    | 0%              | 20%           | 42.6%             | 36.0%             | 36.0%            | 8.9       |
| 1154      | Cooling          | Chiller Tune-up  | Biz-Custom             | Warehouse     | Retro            | 9,038                           | 9,038                           | 8%             | 723                   | 0.00               | 5      | \$164        | 100%              | 23%               | 33%              | 11                    | 0%              | 50%           | 63.2%             | 60.0%             | 60.0%            | 7.6       |
| 1155      | Cooling          | PTAC - <7,000 Btuh - lodging                                   | Biz-Prescriptive       | Warehouse     | ROB              | 327                             | 327                             | 9%             | 30                    | 0.00               | 15     | \$22         | 100%              | 50%               | 13%              | 12                    | 0%              | 20%           | 63.2%             | 41.7%             | 36.0%            | 4.6       |
| 1156      | Cooling          | PTAC - 7,000 to 15,000 Btuh - lodging                          | Biz-Prescriptive       | Warehouse     | ROB              | 727                             | 727                             | 9%             | 68                    | 0.00               | 15     | \$41         | 100%              | 50%               | 16%              | 13                    | 0%              | 20%           | 63.2%             | 44.0%             | 37.6%            | 5.7       |
| 1157      | Cooling          | PTAC - >15,000 Btuh - lodging                                  | Biz-Prescriptive       | Warehouse     | ROB              | 1,228                           | 1,228                           | 10%            | 117                   | 0.00               | 15     | \$56         | 100%              | 50%               | 21%              | 14                    | 0%              | 20%           | 63.2%             | 46.0%             | 41.5%            | 7.2       |
| 1158      | Cooling          | HVAC Occupancy Controls  | Biz-Custom             | Warehouse     | ROB              | 387                             | 387                             | 20%            | 77                    | 0.00               | 15     | \$538        | 1%                | 1%                | 0%               | 15                    | 50%             | 25%           | 40.0%             | 38.2%             | 38.2%            | 9.5       |
| 1159      | Cooling          | Smart Thermostat   | Biz-Custom             | Warehouse     | ROB              | 3,240                           | 3,240                           | 18%            | 573                   | 0.00               | 10     | \$128        | 100%              | 21%               | 16%              | 16                    | 57%             | 9%            | 63.2%             | 46.5%             | 46.1%            | 8.0       |
| 1160      | Cooling          | Window Film  | Biz-Custom             | Warehouse     | Retro            | 7,533                           | 0                               | 2%             | 151                   | 0.00               | 10     | \$126        | 75%               | 6%                | 5%               | 17                    | 100%            | 25%           | 53.0%             | 40.0%             | 40.0%            | 14.6      |
| 1161      | Cooling          | Energy Recovery Ventilator                                     | Biz-Custom             | Warehouse     | Retro            | 2                               | 2                               | 50%            | 1                     | 0.00               | 20     | \$1          | 75%               | 8%                | 12%              | 18                    | 100%            | 5%            | 54.9%             | 33.4%             | 33.7%            | 11.3      |
| 1162      | Heating          | Heat Pump - 16 SEER (<5 Tons)                                  | Biz-Prescriptive       | Warehouse     | ROB              | 12,489                          | 12,489                          | 19%            | 2,361                 | 0.00               | 15     | \$2,055      | 75%               | 20%               | 11%              | 1                     | 13%             | 20%           | 53.5%             | 36.0%             | 36.0%            | 3.9       |
| 1163      | Heating          | Heat Pump - 17 SEER (<5 Tons)                                  | Biz-Prescriptive       | Warehouse     | ROB              | 12,489                          | 12,489                          | 21%            | 2,662                 | 0.00               | 15     | \$2,740      | 50%               | 20%               | 10%              | 1                     | 13%             | 20%           | 43.0%             | 36.0%             | 36.0%            | 3.4       |
| 1164      | Heating          | Heat Pump - 18 SEER (<5 Tons)                                  | Biz-Prescriptive       | Warehouse     | ROB              | 12,489                          | 12,489                          | 24%            | 3,015                 | 0.00               | 15     | \$3,425      | 50%               | 20%               | 9%               | 1                     | 13%             | 20%           | 41.3%             | 36.0%             | 36.0%            | 3.0       |
| 1165      | Heating          | Heat Pump - 21 SEER (<5 Tons)                                  | Biz-Prescriptive       | Warehouse     | ROB              | 12,489                          | 12,489                          | 28%            | 3,467                 | 0.00               | 15     | \$4,500      | 50%               | 20%               | 8%               | 1                     | 13%             | 20%           | 39.3%             | 36.0%             | 36.0%            | 3.0       |
| 1166      | Heating          | Geothermal HP - SEER 20.3 (<5 Tons)                            | Biz-Prescriptive       | Warehouse     | ROB              | 12,489                          | 12,489                          | 36%            | 4,506                 | 0.00               | 15     | \$4,700      | 50%               | 11%               | 10%              | 1                     | 13%             | 20%           | 42.3%             | 36.0%             | 36.0%            | 6.1       |
| 1167      | Heating          | Geothermal HP - SEER 21.5 (<5 Tons)                            | Biz-Prescriptive       | Warehouse     | ROB              | 12,489                          | 12,489                          | 40%            | 5,042                 | 0.00               | 15     | \$7,300      | 25%               | 7%                | 7%               | 1                     | 13%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 6.7       |
| 1168      | Heating          | Geothermal HP - SEER 23.1 (<5 Tons)                            | Biz-Prescriptive       | Warehouse     | ROB              | 12,489                          | 12,489                          | 46%            | 5,736                 | 0.00               | 15     | \$7,300      | 50%               | 7%                | 7%               | 1                     | 13%             | 20%           | 38.7%             | 36.0%             | 36.0%            | 7.6       |
| 1169      | Heating          | Geothermal HP - SEER 29.3 (<5 Tons)                            | Biz-Prescriptive       | Warehouse     | ROB              | 12,489                          | 12,489                          | 49%            | 6,111                 | 0.00               | 15     | \$9,200      | 25%               | 8%                | 5%               | 1                     | 13%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 5.3       |
| 1170      | Heating          | Heat Pump - 16 SEER (5-20 Tons)                                | Biz-Prescriptive       | Warehouse     | ROB              | 51,270                          | 51,270                          | 9%             | 4,663                 | 0.00               | 15     | \$4,110      | 50%               | 20%               | 11%              | 2                     | 13%             | 20%           | 44.5%             | 36.0%             | 36.0%            | 3.4       |
| 1171      | Heating          | Heat Pump - 17 SEER (5-20 Tons)                                | Biz-Prescriptive       | Warehouse     | ROB              | 51,270                          | 51,270                          | 13%            | 6,791                 | 0.00               | 15     | \$5,480      | 50%               | 20%               | 9%               | 2                     | 13%             | 20%           | 45.1%             | 36.0%             | 36.0%            | 3.3       |
| 1172      | Heating          | Heat Pump - 18 SEER (5-20 Tons)                                | Biz-Prescriptive       | Warehouse     | ROB              | 51,270                          | 51,270                          | 19%            | 9,975                 | 0.00               | 15     | \$6,850      | 75%               | 20%               | 7%               | 2                     | 13%             | 20%           | 54.6%             | 36.0%             | 36.0%            | 3.9       |
| 1173      | Heating          | Heat Pump - 21 SEER (5-20 Tons)                                | Biz-Prescriptive       | Warehouse     | ROB              | 51,270                          | 51,270                          | 25%            | 12,733                | 0.00               | 15     | \$9,000      | 75%               | 20%               | 6%               | 2                     | 13%             | 20%           | 54.4%             | 36.0%             | 36.0%            | 3.8       |
| 1174      | Heating          | Geothermal HP - SEER 20.3 (5-20 Tons)                          | Biz-Prescriptive       | Warehouse     | ROB              | 20,060                          | 20,060                          | 20%            | 4,017                 | 0.00               | 15     | \$7,700      | 50%               | 6%                | 5%               | 2                     | 13%             | 20%           | 38.4%             | 36.0%             | 36.0%            | 10.8      |
| 1175      | Heating          | Geothermal HP - SEER 21.5 (5-20 Tons)                          | Biz-Prescriptive       | Warehouse     | ROB              | 20,060                          | 20,060                          | 25%            | 5,093                 | 0.00               | 15     | \$10,300     | 50%               | 5%                | 5%               | 2                     | 13%             | 20%           | 37.2%             | 36.0%             | 36.0%            | 12.2      |
| 1176      | Heating          | Geothermal HP - SEER 23.1 (5-20 Tons)                          | Biz-Prescriptive       | Warehouse     | ROB              | 20,060                          | 20,060                          | 32%            | 6,486                 | 0.00               | 15     | \$12,800     | 50%               | 4%                | 4%               | 2                     | 13%             | 20%           | 36.8%             | 36.0%             | 36.0%            | 14.0      |
| 1177      | Heating          | Geothermal HP - SEER 29.3 (5-20 Tons)                          | Biz-Prescriptive       | Warehouse     | ROB              | 20,060                          | 20,060                          | 36%            | 7,251                 | 0.00               | 15     | \$17,700     | 25%               | 4%                | 3%               | 2                     | 13%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 10.9      |
| 1178      | Heating          | Heat Pump - 16 SEER (20+ Tons)                                 | Biz-Prescriptive       | Warehouse     | ROB              | 105,563                         | 105,563                         | 11%            | 11,539                | 0.00               | 15     | \$8,220      | 50%               | 20%               | 6%               | 3                     | 13%             | 20%           | 46.7%             | 36.0%             | 36.0%            | 3.5       |
| 1179      | Heating          | Heat Pump - 17 SEER (20+ Tons)                                 | Biz-Prescriptive       | Warehouse     | ROB              | 105,563                         | 105,563                         | 15%            | 15,796                | 0.00               | 15     | \$10,960     | 50%               | 20%               | 5%               | 3                     | 13%             | 20%           | 46.7%             | 36.0%             | 36.0%            | 3.4       |
| 1180      | Heating          | Heat Pump - 18 SEER (20+ Tons)                                 | Biz-Prescriptive       | Warehouse     | ROB              | 105,563                         | 105,563                         | 21%            | 22,279                | 0.00               | 15     | \$13,700     | 75%               | 20%               | 4%               | 3                     | 13%             | 20%           | 55.2%             | 36.0%             | 36.0%            | 4.1       |
| 1181      | Heating          | Heat Pump - 21 SEER (20+ Tons)                                 | Biz-Prescriptive       | Warehouse     | ROB              | 105,563                         | 105,563                         | 26%            | 27,888                | 0.00               | 15     | \$18,000     | 75%               | 20%               | 3%               | 3                     | 13%             | 20%           | 54.9%             | 36.0%             | 36.0%            | 4.0       |
| 1182      | Heating          | Geothermal HP - SEER 20.3 (20+ Tons)                           | Biz-Prescriptive       | Warehouse     | ROB              | 40,929                          | 40,929                          | 22%            | 8,843                 | 0.00               | 15     | \$10,700     | 100%              | 9%                | 5%               | 3                     | 13%             | 20%           | 63.2%             | 36.0%             | 36.0%            | 11.1      |
| 1183      | Heating          | Geothermal HP - SEER 21.5 (20+ Tons)                           | Biz-Prescriptive       | Warehouse     | ROB              | 40,929                          | 40,929                          | 27%            | 10,994                | 0.00               | 15     | \$13,300     | 75%               | 8%                | 4%               | 3                     | 13%             | 20%           | 53.0%             | 36.0%             | 36.0%            | 12.5      |
| 1184      | Heating          | Geothermal HP - SEER 23.1 (20+ Tons)                           | Biz-Prescriptive       | Warehouse     | ROB              | 40,929                          | 40,929                          | 34%            | 13,782                | 0.00               | 15     | \$18,300     | 75%               | 5%                | 3%               | 3                     | 13%             | 20%           | 51.7%             | 36.0%             | 36.0%            | 14.3      |
| 1185      | Heating          | Geothermal HP - SEER 29.3 (20+ Tons)                           | Biz-Prescriptive       | Warehouse     | ROB              | 40,929                          | 40,929                          | 37%            | 15,310                | 0.00               | 15     | \$26,200     | 50%               | 4%                | 2%               | 3                     | 13%             | 20%           | 38.2%             | 36.0%             | 36.0%            | 16.6      |
| 1186      | Heating          | PTHP - <7,000 Btuh - lodging                                   | Biz-Prescriptive       | Warehouse     | ROB              | 2,543                           | 2,543                           | 8%             | 215                   | 0.00               | 15     | \$13         | 100%              | 100%              | 100%             | 4                     | 0%              | 20            |                   |                   |                  |           |

Appendix C: C&I Measure Assumptions

| Measure # | End-Use             | Measure Name   | Program                  | Building Type | Replacement Type | Base (Existing) Annual Electric | Base (Standard) Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | End Use Measure Group | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|---------------------|--|--------------------------|---------------|------------------|---------------------------------|---------------------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 1201      | Refrigeration       | Variable Speed Condenser Fan                                 | Biz-Custom               | Warehouse     | Retro            | 2,960                           | 2,960                           | 50%            | 1,480                 | 0.00               | 15     | \$1,170      | 25%               | 7%                | 9%               | 8                     | 12%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 6.9       |
| 1202      | Refrigeration       | Refrigeration Economizer                                     | Biz-Custom               | Warehouse     | Retro            | 67,850                          | 67,850                          | 2%             | 1,357                 | 0.00               | 15     | \$2,558      | 3%                | 3%                | 4%               | 9                     | 45%             | 0%            | 20.0%             | 15.7%             | 15.9%            | 6.9       |
| 1203      | Refrigeration       | Anti-Sweat Heater Controls MT                                | Biz-Prescriptive         | Warehouse     | Retro            | 1,313                           | 1,313                           | 55%            | 722                   | 0.00               | 12     | \$250        | 75%               | 10%               | 12%              | 10                    | 10%             | 36%           | 54.7%             | 48.8%             | 48.3%            | 8.7       |
| 1204      | Refrigeration       | Auto Door Closer, Cooler                                     | Biz-Prescriptive         | Warehouse     | Retro            | 471,500                         | 471,500                         | 0%             | 943                   | 0.00               | 8      | \$157        | 100%              | 16%               | 24%              | 11                    | 7%              | 27%           | 60.2%             | 45.7%             | 46.3%            | 11.6      |
| 1205      | Refrigeration       | Display Case Door Retrofit, Medium Temp                      | Biz-Prescriptive         | Warehouse     | Retro            | 1,584                           | 1,584                           | 36%            | 578                   | 0.00               | 12     | \$686        | 25%               | 22%               | 3%               | 12                    | 3%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 1.7       |
| 1206      | Refrigeration       | Electronically Commutated (EC) Reach-In Evaporator Fan Motor | Biz-Prescriptive         | Warehouse     | Retro            | 1,268                           | 1,268                           | 65%            | 824                   | 0.00               | 15     | \$78         | 100%              | 45%               | 42%              | 13                    | 2%              | 33%           | 60.2%             | 49.8%             | 49.6%            | 11.2      |
| 1207      | Refrigeration       | Q-Sync Motor for Walk-In and Reach-In Evaporator Fan Motor   | Biz-Prescriptive         | Warehouse     | Retro            | 993                             | 993                             | 51%            | 504                   | 0.00               | 10     | \$96         | 100%              | 36%               | 21%              | 13                    | 2%              | 33%           | 60.2%             | 46.4%             | 46.4%            | 5.1       |
| 1208      | Refrigeration       | Energy Star Reach-In Refrigerator, Glass Doors               | Biz-Prescriptive         | Warehouse     | ROB              | 1,546                           | 1,546                           | 27%            | 410                   | 0.00               | 12     | \$600        | 25%               | 5%                | 3%               | 14                    | 10%             | 55%           | 64.0%             | 64.0%             | 63.9%            | 5.1       |
| 1209      | Refrigeration       | Energy Star Reach-In Refrigerator, Solid Doors               | Biz-Prescriptive         | Warehouse     | ROB              | 1,112                           | 1,112                           | 25%            | 283                   | 0.00               | 12     | \$600        | 5%                | 5%                | 2%               | 15                    | 10%             | 55%           | 64.0%             | 62.1%             | 61.9%            | 3.5       |
| 1210      | Refrigeration       | Anti-Sweat Heater Controls LT                                | Biz-Prescriptive         | Warehouse     | Retro            | 3,147                           | 3,147                           | 55%            | 1,731                 | 0.00               | 12     | \$250        | 100%              | 10%               | 28%              | 16                    | 3%              | 36%           | 60.2%             | 48.8%             | 48.8%            | 27.9      |
| 1211      | Refrigeration       | Auto Door Closer, Freezer                                    | Biz-Prescriptive         | Warehouse     | Retro            | 419,455                         | 419,455                         | 1%             | 2,307                 | 0.00               | 8      | \$157        | 100%              | 16%               | 59%              | 17                    | 3%              | 27%           | 60.2%             | 49.6%             | 51.0%            | 27.8      |
| 1212      | Refrigeration       | Display Case Door Retrofit, Low Temp                         | Biz-Prescriptive         | Warehouse     | Retro            | 2,922                           | 2,922                           | 50%            | 1,453                 | 0.00               | 12     | \$686        | 75%               | 22%               | 8%               | 17                    | 3%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 4.3       |
| 1213      | Refrigeration       | Energy Star Reach-In Freezer, Glass Doors                    | Biz-Prescriptive         | Warehouse     | ROB              | 3,234                           | 3,234                           | 15%            | 488                   | 0.00               | 12     | \$450        | 25%               | 15%               | 4%               | 18                    | 3%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 2.9       |
| 1214      | Refrigeration       | Energy Star Reach-In Freezer, Solid Doors                    | Biz-Prescriptive         | Warehouse     | ROB              | 4,676                           | 4,676                           | 20%            | 935                   | 0.00               | 12     | \$450        | 25%               | 15%               | 8%               | 19                    | 3%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 5.5       |
| 1215      | Refrigeration       | Refrigeration - Custom                                       | Biz-Custom               | Warehouse     | ROB              | 7                               | 7                               | 15%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 72%              | 20                    | 90%             | 20%           | 60.2%             | 49.9%             | 51.0%            | 9.1       |
| 1216      | Refrigeration       | Retro-commissioning_ Refrigerator Optimization               | Biz-Custom RCx           | Warehouse     | Retro            | 33                              | 33                              | 3%             | 1                     | 0.00               | 3      | \$0          | 100%              | 67%               | 22%              | 21                    | 90%             | 10%           | 60.2%             | 50.9%             | 49.0%            | 2.0       |
| 1217      | Refrigeration       | Energy Star Ice Machine                                      | Biz-Prescriptive         | Warehouse     | ROB              | 6,993                           | 6,993                           | 10%            | 721                   | 0.00               | 15     | \$1,426      | 3%                | 3%                | 2%               | 22                    | 0%              | 49%           | 59.2%             | 57.2%             | 57.2%            | 8.9       |
| 1218      | Refrigeration       | LED Refrigerated Display Case Lighting Average 6W/LF         | Biz-Prescriptive         | Warehouse     | Retro            | 1,573                           | 1,573                           | 37%            | 574                   | 0.00               | 12     | \$1,010      | 34%               | 34%               | 2%               | 23                    | 6%              | 30%           | 44.0%             | 44.0%             | 43.1%            | 0.9       |
| 1219      | PlugLoads_Office    | ENERGY STAR Uninterrupted Power Supply                       | Biz-Custom               | Warehouse     | ROB              | 3,096                           | 3,096                           | 3%             | 85                    | 0.00               | 15     | \$59         | 75%               | 7%                | 11%              | 1                     | 8%              | 70%           | 76.0%             | 76.0%             | 76.0%            | 10.9      |
| 1220      | PlugLoads_Office    | Smart Power Strip - Commercial Use                           | Biz-Custom               | Warehouse     | Retro            | 64                              | 64                              | 100%           | 64                    | 0.00               | 5      | \$50         | 7%                | 7%                | 10%              | 2                     | 50%             | 10%           | 44.3%             | 38.5%             | 38.9%            | 3.4       |
| 1221      | PlugLoads_Office    | Plug Load Occupancy Sensor                                   | Biz-Custom               | Warehouse     | Retro            | 1,126                           | 1,126                           | 15%            | 169                   | 0.00               | 8      | \$70         | 50%               | 13%               | 18%              | 2                     | 50%             | 10%           | 59.4%             | 46.1%             | 47.0%            | 4.4       |
| 1222      | PlugLoads_Office    | Electrically Commutated Plug Fans in data centers            | Biz-Custom               | Warehouse     | Retro            | 86,783                          | 86,783                          | 18%            | 15,778                | 0.00               | 15     | \$480        | 100%              | 100%              | 100%             | 3                     | 50%             | 33%           | 68.6%             | 59.7%             | 59.7%            | 16.7      |
| 1223      | PlugLoads_Office    | High Efficiency CRAC unit                                    | Biz-Custom               | Warehouse     | ROB              | 541                             | 541                             | 30%            | 162                   | 0.00               | 15     | \$63         | 100%              | 14%               | 19%              | 3                     | 50%             | 33%           | 68.6%             | 48.5%             | 49.2%            | 10.1      |
| 1224      | PlugLoads_Office    | Computer Room Air Conditioner Economizer                     | Biz-Custom               | Warehouse     | Retro            | 418                             | 418                             | 86%            | 358                   | 0.00               | 15     | \$82         | 100%              | 23%               | 33%              | 3                     | 50%             | 33%           | 68.6%             | 52.8%             | 53.6%            | 7.4       |
| 1225      | PlugLoads_Office    | Energy Star Laptop   | Biz-Custom               | Warehouse     | ROB              | 126                             | 126                             | 33%            | 41                    | 0.00               | 4      | \$0          | 0%                |                   |                  | 4                     | 17%             | 85%           | 88.0%             | 88.0%             | 88.0%            | 0.0       |
| 1226      | PlugLoads_Office    | Energy Star Monitor  | Biz-Custom               | Warehouse     | ROB              | 72                              | 72                              | 21%            | 15                    | 0.00               | 4      | \$0          | 0%                |                   |                  | 5                     | 17%             | 95%           | 96.0%             | 96.0%             | 96.0%            | 0.0       |
| 1227      | PlugLoads_Office    | Energy Star Printer/Copier/Fax                               | Biz-Custom               | Warehouse     | ROB              | 551                             | 551                             | 40%            | 223                   | 0.00               | 6      | \$0          | 0%                |                   |                  | 6                     | 17%             | 95%           | 96.0%             | 96.0%             | 96.0%            | 0.0       |
| 1228      | PlugLoads_Office    | Energy Star Server   | Biz-Custom               | Warehouse     | ROB              | 691                             | 691                             | 13%            | 90                    | 0.00               | 15     | \$156        | 25%               | 3%                | 4%               | 7                     | 15%             | 20%           | 36.3%             | 36.0%             | 36.0%            | 9.7       |
| 1229      | PlugLoads_Office    | Server Virtualization  | Biz-Custom               | Warehouse     | Retro            | 691                             | 691                             | 13%            | 90                    | 0.00               | 15     | \$156        | 25%               | 3%                | 4%               | 7                     | 15%             | 20%           | 36.3%             | 36.0%             | 36.0%            | 9.7       |
| 1230      | PlugLoads_Office    | Data Center Hot/Cold Aisle Configuration                     | Biz-Custom               | Warehouse     | Retro            | 691                             | 691                             | 13%            | 90                    | 0.00               | 15     | \$156        | 25%               | 3%                | 4%               | 7                     | 15%             | 20%           | 36.3%             | 36.0%             | 36.0%            | 9.7       |
| 1231      | Motors              | Cogged V-Belt  | Biz-Custom               | Warehouse     | Retro            | 20,965                          | 20,965                          | 3%             | 650                   | 0.00               | 15     | \$384        | 75%               | 9%                | 13%              | 1                     | 40%             | 10%           | 62.5%             | 41.9%             | 42.7%            | 10.0      |
| 1232      | Motors              | Pump and Fan Variable Frequency Drive Controls (Pumps)       | Biz-Prescriptive         | Warehouse     | Retro            | 1,902                           | 1,902                           | 38%            | 731                   | 0.00               | 15     | \$200        | 100%              | 30%               | 27%              | 2                     | 4%              | 25%           | 68.6%             | 53.3%             | 53.0%            | 7.0       |
| 1233      | Motors              | Escalators Motor Efficiency Controllers                      | Biz-Custom               | Warehouse     | Retro            | 7,500                           | 7,500                           | 20%            | 1,500                 | 0.00               | 10     | \$5,000      | 2%                | 2%                | 2%               | 3                     | 0%              | 10%           | 28.0%             | 28.0%             | 28.0%            | 8.6       |
| 1234      | CompressedAir       | Efficient Air Compressors                                    | Biz-Custom               | Warehouse     | ROB              | 4,004                           | 4,004                           | 31%            | 1,223                 | 0.00               | 15     | \$100        | 100%              | 64%               | 100%             | 1                     | 100%            | 33%           | 68.6%             | 58.6%             | 59.7%            | 10.9      |
| 1235      | CompressedAir       | Retro-commissioning_Compressed Air Optimization              | Biz-Custom RCx           | Warehouse     | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 5      | \$0          | 100%              | 67%               | 100%             | 2                     | 100%            | 33%           | 68.6%             | 58.8%             | 59.7%            | 4.2       |
| 1236      | CompressedAir       | Compressed Air - Custom                                      | Biz-Custom               | Warehouse     | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 8      | \$0          | 100%              | 50%               | 100%             | 3                     | 100%            | 33%           | 68.6%             | 57.5%             | 59.7%            | 4.4       |
| 1237      | Miscellaneous       | Power Distribution Equipment Upgrades                        | Biz-Custom               | Warehouse     | Retro            | 1,150                           | 1,150                           | 1%             | 6                     | 0.00               | 30     | \$8          | 75%               | 4%                | 6%               | 1                     | 18%             | 20%           | 58.1%             | 36.0%             | 36.0%            | 18.6      |
| 1238      | Miscellaneous       | Vending Machine Controller - Non-Refrigerated                | Biz-Custom               | Warehouse     | Retro            | 745                             | 745                             | 46%            | 343                   | 0.00               | 5      | \$80         | 63%               | 63%               | 32%              | 2                     | 5%              | 66%           | 72.8%             | 72.8%             | 72.8%            | 1.0       |
| 1239      | Miscellaneous       | Vending Machine Controller - Refrigerated                    | Biz-Custom               | Warehouse     | Retro            | 1,739                           | 1,739                           | 46%            | 800                   | 0.00               | 10     | \$216        | 100%              | 35%               | 28%              | 3                     | 17%             | 66%           | 72.8%             | 72.8%             | 72.8%            | 3.4       |
| 1240      | Miscellaneous       | Miscellaneous Custom   | Biz-Custom               | Warehouse     | Retro            | 5                               | 5                               | 20%            | 1                     | 0.00               | 10     | \$0          | 100%              | 50%               | 72%              | 4                     | 82%             | 20%           | 68.6%             | 57.8%             | 58.7%            | 8.2       |
| 1241      | Whole Building_HVAC | HVAC - Energy Management System                              | Biz-Prescriptive         | Warehouse     | Retro            | 6,960                           | 6,960                           | 15%            | 1,044                 | 0.00               | 15     | \$4,000      | 3%                | 3%                | 2%               | 1                     | 100%            | 1%            | 20.8%             | 18.4%             | 18.4%            | 4.3       |
| 1242      | Whole Building_HVAC | Guest room energy management system                          | Biz-Custom               | Warehouse     | Retro            | 0                               | 0                               | 0%             | 0                     | 0.00               | 8      | \$0          | 0%                | 0%                | 0%               | 2                     | 0%              | 0%            | 63.2%             | 55.0%             | 55.0%            | 0.0       |
| 1243      | Whole Building_HVAC | Retro-commissioning_Bld Optimization                         | Biz-Custom RCx           | Warehouse     | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 3      | \$0          | 100%              | 67%               | 22%              | 3                     | 100%            | 10%           | 63.2%             | 53.6%             | 51.7%            | 2.2       |
| 1244      | WholeBld            | WholeBld - Com RET   | Biz-NC                   | Warehouse     | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 19%              | 4                     | 40%             | 0%            | 68.6%             | 57.8%             | 56.5%            | 9.5       |
| 1245      | Whole Building_NC   | WholeBld - Com NC  | Biz-NC                   | Warehouse     | NC               | 4                               | 4                               | 25%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 72%              | 5                     | 100%            | 60%           | 68.6%             | 68.0%             | 68.0%            | 9.5       |
| 1246      | Behavioral          | AMI Data Presentation & Engagement                           | Biz-Behavior             | Warehouse     | Retro            | 100                             | 100                             | 1%             | 1                     | 0.00               | 1      | \$0          | 100%              | 100%              | 87%              | 1                     | 100%            | 10%           | 50.0%             | 50.0%             | 50.0%            | 1.3       |
| 1247      | Behavioral          | BIEMS  | Biz-Behavior             | Warehouse     | Retro            | 0                               | 0                               | 0%             | 0                     | 0.00               | 3      | \$0          | 0%                | 0%                | 0%               | 1                     | 100%            | 5%            | 42.5%             | 50.0%             | 50.0%            | 0.0       |
| 1248      | Behavioral          | Building Operator Certification                              | Biz-Behavior             | Warehouse     | Retro            | 6,600                           | 6,600                           | 1%             | 53                    | 0.00               | 3      | \$9          | 50%               | 30%               | 12%              | 1                     | 100%            | 5%            | 42.5%             | 50.0%             | 50.0%            | 2.2       |
| 1249      | Cooking             | Commercial Combination Oven (Electric)                       | Biz-Prescriptive         | Other         | ROB              | 38,561                          | 38,561                          | 48%            | 18,432                | 0.00               | 12     | \$16,884     | 50%               | 6%                | 3%               | 1                     | 17%             | 53%           | 62.4%             | 62.4%             | 62.4%            | 9.6       |
| 1250      | Cooking             | Commercial Electric Convection Oven                          | Biz-Prescriptive         | Other         | ROB              | 12,193                          | 12,193                          | 15%            | 1,879                 | 0.00               | 12     | \$1,706      | 50%               | 15%               | 11%              | 1                     | 17%             | 53%           | 62.4%             | 62.4%             | 62.4%            | 4.0       |
| 1251      | Cooking             | Commercial Electric Griddle                                  | Biz-Prescriptive         | Other         | ROB              | 17,056                          | 17,056                          | 15%            | 2,596                 | 0.00               | 12     | \$3,604      | 25%               | 14%               | 7%               | 2                     | 14%             | 17%           | 39.3%             | 33.6%             | 33.6%            | 2.1       |
| 1252      | Cooking             | Commercial Electric Steam Cooker                             | Biz-Prescriptive         | Other         | ROB              | 19,549                          | 19,549                          | 67%            | 13,162                | 0.00               | 12     | \$3,500      | 100%              | 12%               | 14%              | 3                     | 6%              | 42%           | 68.6%             | 53.6%             | 53.6%            | 16.1      |
| 1253      | Cooking             | Dishwasher Low Temp Door (Energy Star)                       | Biz-Prescriptive         | Other         | ROB              | 39,279                          | 39,279                          | 41%            | 16,153                | 0.00               | 15     | \$770        | 100%              | 49%               | 65%              | 4                     | 26%             | 61%           | 68.8%             | 68.8%             | 68.8%            | 19.3      |
| 1254      | Cooking             | Dishwasher High Temp Door (Energy Star)                      | Biz-Prescriptive         | Other         | ROB              | 39,825                          | 39,825                          | 30%            | 11,853                | 0.00               | 15     | \$770        | 100%              | 49%               | 65%              | 4                     | 26%             | 61%           | 68.8%             | 68.8%             | 68.8%            | 14.1      |
| 1255      | Cooking             | Energy efficient electric fryer                              | Biz-Prescriptive         | Other         | ROB              | 18,182                          | 18,182                          | 14%            | 2,572                 | 0.00               | 12     | \$1,706      | 50%               | 1%                | 15%              | 5                     | 27%             | 23%           | 55.0%             | 39.3%             | 40.7%            | 97.4      |
| 1256      | Cooking             | Insulated Holding Cabinets (Full Size)                       | Biz-Prescriptive         | Other         | ROB              | 7,665                           | 7,665                           | 69%            | 5,278                 | 0.00               | 12     | \$1,200      | 100%              | 6%                | 42%              | 6                     | 3%              | 23%           | 68.6%             | 52.4%             | 54.9%            | 32.4      |
| 1257      | Cooking             | Insulated Holding Cabinets (Half-Size)                       | Biz-Prescriptive         | Other         | ROB              | 3,066                           | 3,066                           | 58%            | 1,788                 | 0.00               | 12     | \$1,500      | 50%               | 8%                | 12%              | 6                     | 3%              | 23%           | 68.6%             | 38.7%             | 39.1%            | 6.8       |
| 1258      | HotWater            | Faucet Aerator   | Biz-Custom               | Other         | Retro            | 2,162                           | 2,162                           | 66%            | 1,425                 | 0.00               | 10     | \$3          | 100%              | 26%               | 100%             | 4                     | 25%             | 80%           | 84.0%             | 84.0%             | 84.0%            | 792.1     |
| 1259      | HotWater            | Heat Pump Water Heater                                       | Biz-Custom               | Other         | ROB              | 10,967                          | 10,967                          | 35%            | 3,788                 | 0.00               | 10     | \$1,574      | 75%               | 13%               | 10%              | 1                     | 100%            | 56%           | 69.5%             | 64.8%             | 64.8%            | 6.1       |
| 1260      | HotWater            | Hot Water Pipe Insulation                                    | Biz-Custom               | Other         | Retro            | 10,967                          | 10,967                          | 2%             | 219                   | 0.00               | 20     | \$60         | 100%              | 19%               | 15%              | 2                     | 100%            | 80%           | 84.0%             | 84.0%             | 84.0%            | 11.6      |
| 1261      | HotWater            | Low Flow Pre-Rinse Sprayers                                  | Biz-Custom               | Other         | ROB              | 2,991                           | 2,991                           | 26%            | 764                   | 0.00               | 5      | \$35         | 100%              | 71%               | 87%              | 3                     | 25%             | 80%           | 84.0%             | 84.0%             | 84.0%            | 6.7       |
| 1262      | HotWater            | ENERGY STAR Commercial Washing Machines                      | Biz-Custom               | Other         | ROB              | 1,552                           | 1,552                           | 43%            | 671                   | 0.00               | 7      | \$250        | 50%               | 14%               | 11%              | 5                     | 25%             | 35%           | 66.5%             | 53.7%             | 53.3%            | 4.0       |
| 1263      | HotWater            | Ozone Commercial Laundry                                     | Biz-Custom               | Other         | Retro            | 2,984                           | 2,984                           | 25%            | 746                   | 0.00               | 10     | \$20,310     | 0%                | 0%                | 0%               | 6                     | 0%              | 0%            | 60.0%             | 60.0%             | 60.0%            | 5.2       |
| 1264      | InteriorLighting    | LED T8 Tube Replacement                                      | Biz-Prescriptive Light   | Other         | Retro            | 138                             | 138                             | 59%            | 82                    | 0.00               | 15     | \$7          | 100%              | 49%               | 49%              | 1                     | 75%             | 32%           | 71.1%             | 60.5%             | 60.5%            | 12.6      |
| 1265      | InteriorLighting    | LED troffer retrofit kit, 2'X2' and 2'X4'                    | Biz-Prescriptive Light</ |               |                  |                                 |                                 |                |                       |                    |        |              |                   |                   |                  |                       |                 |               |                   |                   |                  |           |

Appendix C: C&I Measure Assumptions

| Measure # | End-Use          | Measure Name  | Program                | Building Type | Replacement Type | Base (Existing) Annual Electric | Base (Standard) Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL  | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | End Use Measure Group | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|------------------|---|------------------------|---------------|------------------|---------------------------------|---------------------------------|----------------|-----------------------|--------------------|---------|--------------|-------------------|-------------------|------------------|-----------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 1276      | InteriorLighting | Occupancy Sensors   | Biz-Prescriptive Light | Other         | Retro            | 1,523                           | 1,523                           | 30%            | 457                   | 0.00               | 8       | \$54         | 100%              | 37%               | 34%              | 7                     | 90%             | 8%            | 71.1%             | 59.3%             | 59.2%            | 5.8       |
| 1277      | InteriorLighting | Central Lighting Monitoring & Controls (non-networked)          | Biz-Custom Light       | Other         | Retro            | 41,703                          | 41,703                          | 20%            | 8,341                 | 0.00               | 12      | \$3,700      | 100%              | 12%               | 17%              | 7                     | 90%             | 8%            | 71.1%             | 50.8%             | 51.5%            | 9.4       |
| 1278      | InteriorLighting | Network Lighting Controls - Wireless (WiFi)                     | Biz-Custom Light       | Other         | Retro            | 16,277                          | 16,277                          | 47%            | 7,650                 | 0.00               | 8       | \$1,683      | 100%              | 24%               | 34%              | 7                     | 90%             | 8%            | 71.1%             | 56.9%             | 57.6%            | 6.7       |
| 1279      | InteriorLighting | Bi-Level Lighting Fixture - Stairwells, Hallways, and Garages   | Biz-Custom Light       | Other         | Retro            | 1,034                           | 1,034                           | 50%            | 517                   | 0.00               | 10      | \$274        | 50%               | 10%               | 8%               | 8                     | 10%             | 8%            | 62.0%             | 47.4%             | 47.1%            | 7.0       |
| 1280      | InteriorLighting | LED Exit Sign - 4 Watt Fixture (2 lamp)                         | Biz-Prescriptive Light | Other         | Retro            | 236                             | 236                             | 85%            | 201                   | 0.00               | 15      | \$60         | 100%              | 8%                | 13%              | 9                     | 1%              | 75%           | 80.0%             | 80.0%             | 80.0%            | 20.1      |
| 1281      | ExteriorLighting | LED walkpack (existing W<250)                                   | Biz-Prescriptive Light | Other         | Retro            | 856                             | 856                             | 66%            | 567                   | 0.00               | 12      | \$248        | 50%               | 10%               | 9%               | 1                     | 10%             | 46%           | 62.7%             | 56.8%             | 56.8%            | 6.6       |
| 1282      | ExteriorLighting | LED parking lot fixture (existing W<250)                        | Biz-Prescriptive Light | Other         | Retro            | 1,589                           | 1,589                           | 60%            | 959                   | 0.00               | 12      | \$756        | 25%               | 3%                | 5%               | 2                     | 10%             | 41%           | 52.8%             | 52.8%             | 52.8%            | 11.2      |
| 1283      | ExteriorLighting | LED parking lot fixture (existing W<250)                        | Biz-Prescriptive Light | Other         | Retro            | 856                             | 856                             | 66%            | 567                   | 0.00               | 12      | \$248        | 50%               | 10%               | 9%               | 3                     | 10%             | 41%           | 62.7%             | 52.8%             | 52.8%            | 6.6       |
| 1284      | ExteriorLighting | LED fuel pump canopy fixture (existing W<250)                   | Biz-Prescriptive Light | Other         | Retro            | 856                             | 856                             | 66%            | 567                   | 0.00               | 12      | \$248        | 50%               | 10%               | 9%               | 4                     | 10%             | 41%           | 62.7%             | 52.8%             | 52.8%            | 6.6       |
| 1285      | ExteriorLighting | LED fuel pump canopy fixture (existing W<250)                   | Biz-Prescriptive Light | Other         | Retro            | 1,589                           | 1,589                           | 60%            | 959                   | 0.00               | 12      | \$756        | 25%               | 3%                | 5%               | 5                     | 10%             | 41%           | 52.8%             | 52.8%             | 52.8%            | 11.2      |
| 1286      | ExteriorLighting | LED outdoor pole decorative fixture (existing W<250)            | Biz-Prescriptive Light | Other         | Retro            | 1,589                           | 1,589                           | 60%            | 959                   | 0.00               | 12      | \$756        | 25%               | 3%                | 5%               | 6                     | 10%             | 41%           | 52.8%             | 52.8%             | 52.8%            | 11.2      |
| 1287      | ExteriorLighting | LED parking garage fixture (existing W<250)                     | Biz-Prescriptive Light | Other         | Retro            | 3,235                           | 3,235                           | 60%            | 1,953                 | 0.00               | 6       | \$756        | 25%               | 3%                | 10%              | 7                     | 10%             | 41%           | 60.2%             | 52.8%             | 52.8%            | 11.8      |
| 1288      | ExteriorLighting | LED parking garage fixture (existing W<250)                     | Biz-Prescriptive Light | Other         | Retro            | 1,742                           | 1,742                           | 66%            | 1,154                 | 0.00               | 6       | \$248        | 50%               | 10%               | 19%              | 8                     | 10%             | 41%           | 66.7%             | 55.4%             | 56.0%            | 7.0       |
| 1289      | ExteriorLighting | LED Mogul-base HID Lamp Replacing Exterior HID (existing W<250) | Biz-Prescriptive Light | Other         | Retro            | 1,589                           | 1,589                           | 60%            | 959                   | 0.00               | 12      | \$756        | 25%               | 3%                | 5%               | 9                     | 10%             | 41%           | 52.8%             | 52.8%             | 52.8%            | 11.2      |
| 1290      | ExteriorLighting | LED Mogul-base HID Lamp Replacing Exterior HID (existing W<250) | Biz-Prescriptive Light | Other         | Retro            | 856                             | 856                             | 66%            | 567                   | 0.00               | 12      | \$248        | 50%               | 10%               | 9%               | 10                    | 10%             | 41%           | 62.7%             | 52.8%             | 52.8%            | 6.6       |
| 1291      | Cooling          | Air Conditioner - 16 SEER (5-20 Tons)                           | Biz-Prescriptive Other | ROB           | Retro            | 7,961                           | 7,961                           | 12%            | 995                   | 0.00               | 15      | \$3,570      | 25%               | 5%                | 3%               | 1                     | 21%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 8.2       |
| 1292      | Cooling          | Air Conditioner - 17 SEER (5-20 Tons)                           | Biz-Prescriptive Other | ROB           | Retro            | 7,961                           | 7,961                           | 12%            | 995                   | 0.00               | 15      | \$4,760      | 25%               | 5%                | 2%               | 1                     | 21%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 6.2       |
| 1293      | Cooling          | Air Conditioner - 18 SEER (5-20 Tons)                           | Biz-Prescriptive Other | ROB           | Retro            | 7,961                           | 7,961                           | 19%            | 1,500                 | 0.00               | 15      | \$5,960      | 25%               | 5%                | 3%               | 1                     | 21%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 7.4       |
| 1294      | Cooling          | Air Conditioner - 21 SEER (5-20 Tons)                           | Biz-Prescriptive Other | ROB           | Retro            | 7,961                           | 7,961                           | 24%            | 1,936                 | 0.00               | 15      | \$9,080      | 25%               | 5%                | 2%               | 1                     | 21%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 6.3       |
| 1295      | Cooling          | Air Conditioner - 16 SEER (20+ Tons)                            | Biz-Prescriptive Other | ROB           | Retro            | 16,211                          | 16,211                          | 8%             | 1,351                 | 0.00               | 15      | \$7,140      | 25%               | 5%                | 2%               | 2                     | 21%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 5.6       |
| 1296      | Cooling          | Air Conditioner - 17 SEER (20+ Tons)                            | Biz-Prescriptive Other | ROB           | Retro            | 16,211                          | 16,211                          | 8%             | 1,351                 | 0.00               | 15      | \$9,520      | 5%                | 5%                | 1%               | 2                     | 21%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 4.2       |
| 1297      | Cooling          | Air Conditioner - 18 SEER (20+ Tons)                            | Biz-Prescriptive Other | ROB           | Retro            | 16,211                          | 16,211                          | 15%            | 2,494                 | 0.00               | 15      | \$11,920     | 25%               | 5%                | 2%               | 2                     | 21%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 6.2       |
| 1298      | Cooling          | Air Conditioner - 21 SEER (20+ Tons)                            | Biz-Prescriptive Other | ROB           | Retro            | 16,211                          | 16,211                          | 21%            | 3,474                 | 0.00               | 15      | \$18,160     | 25%               | 5%                | 2%               | 2                     | 21%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 5.6       |
| 1299      | Cooling          | Comprehensive Rooftop Unit Quality Maintenance (AC Tune-up)     | Biz-Custom Other       | Retro         | 25,578           | 25,578                          | 6%                              | 1,617          | 0.00                  | 3                  | \$500   | 75%          | 17%               | 24%               | 3                | 42%                   | 50%             | 60.0%         | 60.0%             | 60.0%             | 5.0              |           |
| 1300      | Cooling          | Air Side Economizer   | Biz-Custom Other       | Retro         | 4,458            | 4,458                           | 3%                              | 130            | 0.00                  | 5                  | \$170   | 4%           | 4%                | 6%                | 4                | 42%                   | 33%             | 46.4%         | 46.4%             | 46.4%             | 2.9              |           |
| 1301      | Cooling          | Advanced Rooftop Controls                                       | Biz-Custom Other       | Retro         | 3,715            | 3,715                           | 40%                             | 1,493          | 0.00                  | 10                 | \$3,412 | 25%          | 2%                | 3%                | 5                | 42%                   | 3%              | 27.7%         | 22.0%             | 22.0%             | 15.6             |           |
| 1302      | Cooling          | Air Conditioner - 16 SEER (<5 Tons)                             | Biz-Prescriptive Other | ROB           | Retro            | 3,429                           | 3,429                           | 19%            | 643                   | 0.00               | 15      | \$1,785      | 50%               | 5%                | 4%               | 6                     | 22%             | 20%           | 36.0%             | 35.3%             | 35.9%            | 10.6      |
| 1303      | Cooling          | Air Conditioner - 17 SEER (<5 Tons)                             | Biz-Prescriptive Other | ROB           | Retro            | 3,429                           | 3,429                           | 24%            | 807                   | 0.00               | 15      | \$2,380      | 25%               | 5%                | 3%               | 6                     | 22%             | 20%           | 36.0%             | 35.3%             | 35.1%            | 10.0      |
| 1304      | Cooling          | Air Conditioner - 18 SEER (<5 Tons)                             | Biz-Prescriptive Other | ROB           | Retro            | 3,429                           | 3,429                           | 28%            | 953                   | 0.00               | 15      | \$2,980      | 25%               | 5%                | 3%               | 6                     | 22%             | 20%           | 36.0%             | 34.5%             | 34.2%            | 9.4       |
| 1305      | Cooling          | Air Conditioner - 21 SEER (<5 Tons)                             | Biz-Prescriptive Other | ROB           | Retro            | 3,429                           | 3,429                           | 38%            | 1,306                 | 0.00               | 15      | \$4,540      | 25%               | 5%                | 3%               | 6                     | 22%             | 20%           | 36.0%             | 34.1%             | 34.1%            | 8.5       |
| 1306      | Cooling          | Centrifugal Chiller - Average kW/Ton = 0.626                    | Biz-Custom Other       | ROB           | Retro            | 15,602                          | 15,602                          | 26%            | 4,092                 | 0.00               | 20      | \$9,236      | 25%               | 2%                | 3%               | 7                     | 0%              | 20%           | 36.0%             | 35.6%             | 35.7%            | 20.5      |
| 1307      | Cooling          | Reciprocating Chiller - Average kW/Ton = 0.99                   | Biz-Custom Other       | ROB           | Retro            | 19,183                          | 19,183                          | 27%            | 5,116                 | 0.00               | 20      | \$7,405      | 100%              | 4%                | 5%               | 8                     | 25%             | 20%           | 63.2%             | 36.0%             | 36.0%            | 33.8      |
| 1308      | Cooling          | Screw Chiller - Average kW/Ton = 0.675                          | Biz-Custom Other       | ROB           | Retro            | 22,404                          | 22,404                          | 23%            | 5,139                 | 0.00               | 20      | \$7,391      | 100%              | 4%                | 5%               | 9                     | 11%             | 20%           | 63.2%             | 36.0%             | 36.0%            | 33.3      |
| 1309      | Cooling          | HVAC/Chiller Custom   | Biz-Custom Other       | Retro         | 5                | 5                               | 20%                             | 1              | 0.00                  | 12                 | \$1     | 25%          | 6%                | 9%                | 10               | 35%                   | 20%             | 37.0%         | 36.0%             | 36.0%             | 7.3              |           |
| 1310      | Cooling          | Chiller Tune-up   | Biz-Custom Other       | Retro         | 30,688           | 30,688                          | 8%                              | 2,455          | 0.00                  | 5                  | \$487   | 100%         | 26%               | 38%               | 11               | 35%                   | 50%             | 63.2%         | 60.0%             | 60.0%             | 6.0              |           |
| 1311      | Cooling          | PTAC - <7,000 Btuh - lodging                                    | Biz-Prescriptive Other | ROB           | Retro            | 375                             | 375                             | 9%             | 34                    | 0.00               | 15      | \$22         | 100%              | 50%               | 15%              | 12                    | 0%              | 20%           | 63.2%             | 45.1%             | 39.2%            | 4.5       |
| 1312      | Cooling          | PTAC - 7,000 to 15,000 Btuh - lodging                           | Biz-Prescriptive Other | ROB           | Retro            | 833                             | 833                             | 9%             | 78                    | 0.00               | 15      | \$41         | 100%              | 50%               | 19%              | 13                    | 0%              | 20%           | 63.2%             | 46.7%             | 42.4%            | 5.6       |
| 1313      | Cooling          | PTAC - >15,000 Btuh - lodging                                   | Biz-Prescriptive Other | ROB           | Retro            | 1,408                           | 1,408                           | 10%            | 134                   | 0.00               | 15      | \$56         | 100%              | 50%               | 24%              | 14                    | 0%              | 20%           | 63.2%             | 48.2%             | 45.3%            | 7.0       |
| 1314      | Cooling          | HVAC Occupancy Controls   | Biz-Custom Other       | ROB           | Retro            | 2,636                           | 2,636                           | 20%            | 527                   | 0.00               | 15      | \$538        | 75%               | 5%                | 0%               | 15                    | 42%             | 25%           | 51.6%             | 40.0%             | 40.0%            | 14.7      |
| 1315      | Cooling          | Smart Thermostat  | Biz-Custom Other       | ROB           | Retro            | 3,715                           | 3,715                           | 18%            | 658                   | 0.00               | 10      | \$128        | 100%              | 20%               | 15%              | 16                    | 57%             | 9%            | 63.2%             | 47.4%             | 47.0%            | 7.7       |
| 1316      | Cooling          | Window Film   | Biz-Custom Other       | Retro         | 25,578           | 0                               | 5%                              | 1,330          | 0.00                  | 10                 | \$1,107 | 75%          | 6%                | 5%                | 17               | 100%                  | 25%             | 54.0%         | 40.0%             | 40.0%             | 13.2             |           |
| 1317      | Cooling          | Energy Recovery Ventilator                                      | Biz-Custom Other       | Retro         | 2                | 2                               | 50%                             | 1              | 0.00                  | 20                 | \$1     | 75%          | 8%                | 12%               | 18               | 100%                  | 5%              | 55.1%         | 33.6%             | 33.9%             | 11.3             |           |
| 1318      | Heating          | Heat Pump - 16 SEER (<5 Tons)                                   | Biz-Prescriptive Other | ROB           | Retro            | 13,045                          | 13,045                          | 19%            | 2,465                 | 0.00               | 15      | \$2,055      | 75%               | 20%               | 12%              | 1                     | 13%             | 20%           | 59.0%             | 44.9%             | 44.1%            | 3.9       |
| 1319      | Heating          | Heat Pump - 17 SEER (<5 Tons)                                   | Biz-Prescriptive Other | ROB           | Retro            | 13,045                          | 13,045                          | 21%            | 2,789                 | 0.00               | 15      | \$2,740      | 50%               | 20%               | 10%              | 1                     | 13%             | 20%           | 54.8%             | 44.1%             | 42.9%            | 3.5       |
| 1320      | Heating          | Heat Pump - 18 SEER (<5 Tons)                                   | Biz-Prescriptive Other | ROB           | Retro            | 13,045                          | 13,045                          | 24%            | 3,164                 | 0.00               | 15      | \$3,425      | 50%               | 20%               | 10%              | 1                     | 13%             | 20%           | 54.3%             | 43.4%             | 42.0%            | 3.2       |
| 1321      | Heating          | Heat Pump - 21 SEER (<5 Tons)                                   | Biz-Prescriptive Other | ROB           | Retro            | 13,045                          | 13,045                          | 28%            | 3,663                 | 0.00               | 15      | \$4,500      | 50%               | 20%               | 8%               | 1                     | 13%             | 20%           | 54.3%             | 43.4%             | 41.8%            | 3.1       |
| 1322      | Heating          | Geothermal HP - SEER 20.3 (<5 Tons)                             | Biz-Prescriptive Other | ROB           | Retro            | 13,045                          | 13,045                          | 36%            | 4,707                 | 0.00               | 15      | \$4,700      | 50%               | 11%               | 10%              | 1                     | 13%             | 20%           | 54.2%             | 42.0%             | 42.0%            | 6.1       |
| 1323      | Heating          | Geothermal HP - SEER 21.5 (<5 Tons)                             | Biz-Prescriptive Other | ROB           | Retro            | 13,045                          | 13,045                          | 40%            | 5,263                 | 0.00               | 15      | \$7,300      | 25%               | 7%                | 7%               | 1                     | 13%             | 20%           | 45.9%             | 36.8%             | 36.8%            | 6.8       |
| 1324      | Heating          | Geothermal HP - SEER 23.1 (<5 Tons)                             | Biz-Prescriptive Other | ROB           | Retro            | 13,045                          | 13,045                          | 46%            | 5,986                 | 0.00               | 15      | \$7,300      | 50%               | 7%                | 7%               | 1                     | 13%             | 20%           | 52.4%             | 38.7%             | 38.7%            | 7.7       |
| 1325      | Heating          | Geothermal HP - SEER 29.3 (<5 Tons)                             | Biz-Prescriptive Other | ROB           | Retro            | 13,045                          | 13,045                          | 49%            | 6,413                 | 0.00               | 15      | \$9,200      | 25%               | 8%                | 5%               | 1                     | 13%             | 20%           | 44.6%             | 36.0%             | 36.0%            | 5.4       |
| 1326      | Heating          | Heat Pump - 16 SEER (5-20 Tons)                                 | Biz-Prescriptive Other | ROB           | Retro            | 52,833                          | 52,833                          | 9%             | 4,837                 | 0.00               | 15      | \$4,110      | 50%               | 20%               | 12%              | 2                     | 24%             | 20%           | 54.2%             | 43.3%             | 42.2%            | 3.5       |
| 1327      | Heating          | Heat Pump - 17 SEER (5-20 Tons)                                 | Biz-Prescriptive Other | ROB           | Retro            | 52,833                          | 52,833                          | 13%            | 6,991                 | 0.00               | 15      | \$5,480      | 50%               | 20%               | 9%               | 2                     | 24%             | 20%           | 53.2%             | 41.8%             | 40.2%            | 3.3       |
| 1328      | Heating          | Heat Pump - 18 SEER (5-20 Tons)                                 | Biz-Prescriptive Other | ROB           | Retro            | 52,833                          | 52,833                          | 19%            | 10,273                | 0.00               | 15      | \$6,850      | 75%               | 20%               | 7%               | 2                     | 24%             | 20%           | 58.5%             | 43.7%             | 42.1%            | 3.9       |
| 1329      | Heating          | Heat Pump - 21 SEER (5-20 Tons)                                 | Biz-Prescriptive Other | ROB           | Retro            | 52,833                          | 52,833                          | 25%            | 13,116                | 0.00               | 15      | \$9,000      | 75%               | 20%               | 6%               | 2                     | 24%             | 20%           | 58.4%             | 43.5%             | 41.6%            | 3.8       |
| 1330      | Heating          | Geothermal HP - SEER 20.3 (5-20 Tons)                           | Biz-Prescriptive Other | ROB           | Retro            | 21,256                          | 21,256                          | 21%            | 4,492                 | 0.00               | 15      | \$7,700      | 50%               | 6%                | 6%               | 2                     | 24%             | 20%           | 56.4%             | 45.0%             | 45.0%            | 11.1      |
| 1331      | Heating          | Geothermal HP - SEER 21.5 (5-20 Tons)                           | Biz-Prescriptive Other | ROB           | Retro            | 21,256                          | 21,256                          | 26%            | 5,610                 | 0.00               | 15      | \$10,300     | 50%               | 5%                | 5%               | 2                     | 24%             | 20%           | 55.2%             | 42.9%             | 42.9%            | 12.4      |
| 1332      | Heating          | Geothermal HP - SEER 23.1 (5-20 Tons)                           | Biz-Prescriptive Other | ROB           | Retro            | 21,256                          | 21,256                          | 33%            | 7,063                 | 0.00               | 15      | \$12,800     | 50%               | 4%                | 4%               | 2                     | 24%             | 20%           | 54.4%             | 41.5%             | 41.5%            | 14.3      |
| 1333      | Heating          | Geothermal HP - SEER 29.3 (5-20 Tons)                           | Biz-Prescriptive Other | ROB           | Retro            | 21,256                          | 21,256                          | 37%            | 7,933                 | 0.00               | 15      | \$17,700     | 25%               | 4%                | 3%               | 2                     | 24%             | 20%           | 48.9%             | 39.6%             | 39.4%            | 11.1      |
| 1334      | Heating          | Heat Pump - 16 SEER (20+ Tons)                                  | Biz-Prescriptive Other | ROB           | Retro            | 108,761                         | 108,761                         | 11%            | 11,839                | 0.00               | 15      | \$8,220      | 50%               | 20%               | 6%               | 3                     | 24%             | 20%           | 53.2%             | 41.9%             | 39.9%            | 3.5       |
| 1335      | Heating          | Heat Pump - 17 SEER (20+ Tons)                                  | Biz-Prescriptive Other | ROB           | Retro            | 108,761                         | 108,761                         | 15%            | 16,148                | 0.00               | 15      | \$10,960     | 50%               | 20%               | 5%               | 3                     | 24%             | 20%           | 52.2%             | 40.5%             | 38.1%            | 3.4       |
| 1336      | Heating          | Heat Pump - 18 SEER (20+ Tons)                                  | Biz-Prescriptive Other | ROB           | Retro            | 108,761                         | 108,761                         | 21%            | 22,845                | 0.00               | 15      | \$13,700     | 75%               | 20%               | 4%               | 3                     |                 |               |                   |                   |                  |           |

Appendix C: C&I Measure Assumptions

| Measure # | End-Use             | Measure Name   | Program          | Building Type | Replacement Type | Base (Existing) Annual Electric | Base (Standard) Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | End Use Measure Group | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|---------------------|--|------------------|---------------|------------------|---------------------------------|---------------------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 1351      | Refrigeration       | Bare Suction Line  | Biz-Custom       | Other         | Retro            | 23                              | 23                              | 93%            | 21                    | 0.00               | 15     | \$4          | 100%              | 27%               | 39%              | 2                     | 0%              | 25%           | 60.2%             | 45.6%             | 46.6%            | 9.2       |
| 1352      | Refrigeration       | Floating Head Pressure Controls                              | Biz-Prescriptive | Other         | Retro            | 2,653                           | 2,653                           | 50%            | 1,327                 | 0.00               | 15     | \$80         | 100%              | 25%               | 41%              | 3                     | 8%              | 20%           | 60.2%             | 50.1%             | 50.6%            | 31.6      |
| 1353      | Refrigeration       | Saturated Suction Controls                                   | Biz-Custom       | Other         | Retro            | 831                             | 831                             | 50%            | 416                   | 0.00               | 15     | \$559        | 50%               | 4%                | 6%               | 4                     | 2%              | 20%           | 36.0%             | 36.0%             | 36.0%            | 15.7      |
| 1354      | Refrigeration       | Compressor Retrofit  | Biz-Custom       | Other         | Retro            | 813                             | 813                             | 20%            | 163                   | 0.00               | 15     | \$477        | 25%               | 2%                | 3%               | 5                     | 27%             | 15%           | 32.0%             | 27.4%             | 27.4%            | 15.8      |
| 1355      | Refrigeration       | Electronically Commutated (EC) Walk-In Evaporator Fan Motor  | Biz-Prescriptive | Other         | Retro            | 1,268                           | 1,268                           | 65%            | 824                   | 0.00               | 15     | \$78         | 100%              | 45%               | 42%              | 6                     | 8%              | 33%           | 60.2%             | 49.8%             | 49.6%            | 11.2      |
| 1356      | Refrigeration       | Evaporator Fan Motor Controls                                | Biz-Prescriptive | Other         | Retro            | 1,912                           | 1,912                           | 25%            | 478                   | 0.00               | 13     | \$291        | 50%               | 15%               | 7%               | 7                     | 8%              | 10%           | 44.4%             | 30.0%             | 28.3%            | 4.7       |
| 1357      | Refrigeration       | Variable Speed Condenser Fan                                 | Biz-Custom       | Other         | Retro            | 2,960                           | 2,960                           | 50%            | 1,480                 | 0.00               | 15     | \$1,170      | 25%               | 7%                | 9%               | 8                     | 10%             | 20%           | 36.0%             | 36.0%             | 36.0%            | 6.9       |
| 1358      | Refrigeration       | Refrigeration Economizer                                     | Biz-Custom       | Other         | Retro            | 67,850                          | 67,850                          | 2%             | 1,357                 | 0.00               | 15     | \$2,558      | 3%                | 3%                | 4%               | 9                     | 38%             | 0%            | 20.0%             | 15.7%             | 15.9%            | 6.9       |
| 1359      | Refrigeration       | Anti-Sweat Heater Controls MT                                | Biz-Prescriptive | Other         | Retro            | 1,313                           | 1,313                           | 55%            | 722                   | 0.00               | 12     | \$250        | 75%               | 10%               | 12%              | 10                    | 13%             | 36%           | 54.7%             | 48.8%             | 48.8%            | 8.7       |
| 1360      | Refrigeration       | Auto Door Closer, Cooler                                     | Biz-Prescriptive | Other         | Retro            | 471,500                         | 471,500                         | 0%             | 943                   | 0.00               | 8      | \$157        | 100%              | 16%               | 24%              | 11                    | 9%              | 27%           | 60.2%             | 45.7%             | 46.3%            | 11.6      |
| 1361      | Refrigeration       | Display Case Door Retrofit, Medium Temp                      | Biz-Prescriptive | Other         | Retro            | 1,584                           | 1,584                           | 36%            | 578                   | 0.00               | 12     | \$686        | 25%               | 22%               | 3%               | 12                    | 4%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 1.7       |
| 1362      | Refrigeration       | Electronically Commutated (EC) Reach-In Evaporator Fan Motor | Biz-Prescriptive | Other         | Retro            | 1,268                           | 1,268                           | 65%            | 824                   | 0.00               | 15     | \$78         | 100%              | 45%               | 42%              | 13                    | 2%              | 33%           | 60.2%             | 49.8%             | 49.6%            | 11.2      |
| 1363      | Refrigeration       | Q-Sync Motor for Walk-In and Reach-In Evaporator Fan Motor   | Biz-Prescriptive | Other         | Retro            | 993                             | 993                             | 51%            | 504                   | 0.00               | 10     | \$96         | 100%              | 36%               | 21%              | 13                    | 2%              | 33%           | 60.2%             | 46.4%             | 46.4%            | 5.1       |
| 1364      | Refrigeration       | Energy Star Reach-In Refrigerator, Glass Doors               | Biz-Prescriptive | Other         | ROB              | 1,546                           | 1,546                           | 27%            | 410                   | 0.00               | 12     | \$600        | 25%               | 5%                | 3%               | 14                    | 12%             | 55%           | 64.0%             | 64.0%             | 63.9%            | 5.1       |
| 1365      | Refrigeration       | Energy Star Reach-In Refrigerator, Solid Doors               | Biz-Prescriptive | Other         | ROB              | 1,112                           | 1,112                           | 25%            | 283                   | 0.00               | 12     | \$600        | 5%                | 5%                | 2%               | 15                    | 12%             | 55%           | 64.0%             | 62.1%             | 61.9%            | 3.5       |
| 1366      | Refrigeration       | Anti-Sweat Heater Controls LT                                | Biz-Prescriptive | Other         | Retro            | 3,147                           | 3,147                           | 55%            | 1,731                 | 0.00               | 12     | \$250        | 100%              | 10%               | 28%              | 16                    | 4%              | 36%           | 60.2%             | 48.8%             | 48.8%            | 27.9      |
| 1367      | Refrigeration       | Auto Door Closer, Freezer                                    | Biz-Prescriptive | Other         | Retro            | 419,455                         | 419,455                         | 1%             | 2,307                 | 0.00               | 8      | \$157        | 100%              | 16%               | 59%              | 17                    | 4%              | 27%           | 60.2%             | 49.6%             | 51.0%            | 27.8      |
| 1368      | Refrigeration       | Display Case Door Retrofit, Low Temp                         | Biz-Prescriptive | Other         | Retro            | 2,922                           | 2,922                           | 25%            | 1,453                 | 0.00               | 12     | \$686        | 75%               | 22%               | 8%               | 17                    | 4%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 4.3       |
| 1369      | Refrigeration       | Energy Star Reach-In Freezer, Glass Doors                    | Biz-Prescriptive | Other         | ROB              | 3,234                           | 3,234                           | 15%            | 488                   | 0.00               | 12     | \$450        | 25%               | 15%               | 4%               | 18                    | 4%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 2.9       |
| 1370      | Refrigeration       | Energy Star Reach-In Freezer, Solid Doors                    | Biz-Prescriptive | Other         | ROB              | 4,676                           | 4,676                           | 20%            | 935                   | 0.00               | 12     | \$450        | 75%               | 15%               | 8%               | 19                    | 4%              | 55%           | 64.0%             | 64.0%             | 64.0%            | 5.5       |
| 1371      | Refrigeration       | Refrigeration - Custom                                       | Biz-Custom       | Other         | ROB              | 7                               | 7                               | 15%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 72%              | 20                    | 90%             | 20%           | 60.2%             | 49.9%             | 51.0%            | 9.1       |
| 1372      | Refrigeration       | Retro-commissioning, Refrigerator Optimization               | Biz-Custom RCx   | Other         | Retro            | 33                              | 33                              | 3%             | 1                     | 0.00               | 3      | \$0          | 100%              | 67%               | 22%              | 21                    | 90%             | 10%           | 60.2%             | 50.9%             | 49.0%            | 2.0       |
| 1373      | Refrigeration       | Energy Star Ice Machine                                      | Biz-Prescriptive | Other         | ROB              | 6,993                           | 6,993                           | 10%            | 721                   | 0.00               | 15     | \$1,426      | 3%                | 3%                | 2%               | 22                    | 6%              | 49%           | 59.2%             | 57.2%             | 57.2%            | 8.9       |
| 1374      | Refrigeration       | LED Refrigerated Display Case Lighting Average 6W/LF         | Biz-Prescriptive | Other         | Retro            | 1,573                           | 1,573                           | 37%            | 574                   | 0.00               | 12     | \$1,010      | 34%               | 34%               | 2%               | 23                    | 8%              | 30%           | 44.0%             | 44.0%             | 43.1%            | 0.9       |
| 1375      | PlugLoads_Office    | ENERGY STAR Uninterrupted Power Supply                       | Biz-Custom       | Other         | ROB              | 3,096                           | 3,096                           | 3%             | 85                    | 0.00               | 15     | \$59         | 75%               | 7%                | 11%              | 1                     | 2%              | 70%           | 76.0%             | 76.0%             | 76.0%            | 10.7      |
| 1376      | PlugLoads_Office    | Smart Power Strip - Commercial Use                           | Biz-Custom       | Other         | Retro            | 64                              | 64                              | 100%           | 64                    | 0.00               | 5      | \$50         | 7%                | 7%                | 10%              | 2                     | 50%             | 10%           | 44.3%             | 38.5%             | 38.9%            | 3.3       |
| 1377      | PlugLoads_Office    | Plug Load Occupancy Sensor                                   | Biz-Custom       | Other         | Retro            | 1,126                           | 1,126                           | 15%            | 169                   | 0.00               | 8      | \$70         | 50%               | 13%               | 18%              | 2                     | 50%             | 10%           | 59.4%             | 46.1%             | 47.0%            | 4.3       |
| 1378      | PlugLoads_Office    | Electrically Commutated Plug Fans in data centers            | Biz-Custom       | Other         | Retro            | 86,783                          | 86,783                          | 18%            | 15,778                | 0.00               | 15     | \$480        | 100%              | 100%              | 100%             | 3                     | 0%              | 33%           | 68.6%             | 59.7%             | 59.7%            | 16.3      |
| 1379      | PlugLoads_Office    | High Efficiency CRAC unit                                    | Biz-Custom       | Other         | ROB              | 541                             | 541                             | 30%            | 162                   | 0.00               | 15     | \$63         | 100%              | 14%               | 19%              | 3                     | 0%              | 33%           | 68.6%             | 48.5%             | 49.2%            | 9.9       |
| 1380      | PlugLoads_Office    | Computer Room Air Conditioner Economizer                     | Biz-Custom       | Other         | Retro            | 418                             | 418                             | 86%            | 358                   | 0.00               | 15     | \$82         | 100%              | 23%               | 33%              | 3                     | 0%              | 33%           | 68.6%             | 52.8%             | 53.6%            | 7.2       |
| 1381      | PlugLoads_Office    | Energy Star Laptop   | Biz-Custom       | Other         | ROB              | 126                             | 126                             | 33%            | 41                    | 0.00               | 4      | \$0          | 0%                | 0%                | 4                | 4                     | 17%             | 85%           | 88.0%             | 88.0%             | 88.0%            | 0.0       |
| 1382      | PlugLoads_Office    | Energy Star Monitor  | Biz-Custom       | Other         | ROB              | 72                              | 72                              | 21%            | 15                    | 0.00               | 4      | \$0          | 0%                | 0%                | 7                | 0%                    | 20%             | 36.3%         | 36.0%             | 36.0%             | 9.5              |           |
| 1383      | PlugLoads_Office    | Energy Star Printer/Copier/Fax                               | Biz-Custom       | Other         | ROB              | 551                             | 551                             | 40%            | 223                   | 0.00               | 6      | \$0          | 0%                | 0%                | 6                | 17%                   | 95%             | 96.0%         | 96.0%             | 96.0%             | 0.0              |           |
| 1384      | PlugLoads_Office    | Energy Star Server   | Biz-Custom       | Other         | ROB              | 691                             | 691                             | 13%            | 90                    | 0.00               | 15     | \$156        | 25%               | 3%                | 4%               | 7                     | 0%              | 20%           | 36.3%             | 36.0%             | 36.0%            | 9.5       |
| 1385      | PlugLoads_Office    | Server Virtualization  | Biz-Custom       | Other         | Retro            | 691                             | 691                             | 13%            | 90                    | 0.00               | 15     | \$156        | 25%               | 3%                | 4%               | 7                     | 0%              | 20%           | 36.3%             | 36.0%             | 36.0%            | 9.5       |
| 1386      | PlugLoads_Office    | Data Center Hot/Cold Aisle Configuration                     | Biz-Custom       | Other         | Retro            | 691                             | 691                             | 13%            | 90                    | 0.00               | 15     | \$156        | 25%               | 3%                | 4%               | 7                     | 0%              | 20%           | 36.3%             | 36.0%             | 36.0%            | 9.5       |
| 1387      | Motors              | Cogged V-Belt  | Biz-Custom       | Other         | Retro            | 17,237                          | 17,237                          | 3%             | 534                   | 0.00               | 15     | \$384        | 75%               | 7%                | 10%              | 1                     | 82%             | 10%           | 61.6%             | 40.2%             | 40.5%            | 11.3      |
| 1388      | Motors              | Pump and Fan Variable Frequency Drive Controls (Pumps)       | Biz-Prescriptive | Other         | Retro            | 1,902                           | 1,902                           | 38%            | 731                   | 0.00               | 15     | \$200        | 100%              | 30%               | 27%              | 2                     | 4%              | 25%           | 68.6%             | 53.3%             | 53.1%            | 7.4       |
| 1389      | Motors              | Escalators Motor Efficiency Controllers                      | Biz-Custom       | Other         | Retro            | 7,500                           | 7,500                           | 20%            | 1,500                 | 0.00               | 10     | \$5,000      | 2%                | 2%                | 2%               | 3                     | 0%              | 10%           | 28.0%             | 28.0%             | 28.0%            | 9.2       |
| 1390      | CompressedAir       | Efficient Air Compressors                                    | Biz-Custom       | Other         | Retro            | 4,004                           | 4,004                           | 31%            | 1,223                 | 0.00               | 15     | \$100        | 100%              | 64%               | 100%             | 1                     | 100%            | 33%           | 68.6%             | 58.6%             | 59.7%            | 10.7      |
| 1391      | CompressedAir       | Retro-commissioning, Compressed Air Optimization             | Biz-Custom RCx   | Other         | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 5      | \$0          | 100%              | 67%               | 100%             | 2                     | 100%            | 33%           | 68.6%             | 58.6%             | 59.7%            | 4.1       |
| 1392      | CompressedAir       | Compressed Air - Custom                                      | Biz-Custom       | Other         | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 8      | \$0          | 100%              | 50%               | 100%             | 3                     | 100%            | 33%           | 68.6%             | 57.5%             | 59.7%            | 4.3       |
| 1393      | Miscellaneous       | Power Distribution Equipment Upgrades                        | Biz-Custom       | Other         | Retro            | 1,150                           | 1,150                           | 1%             | 6                     | 0.00               | 30     | \$8          | 75%               | 4%                | 6%               | 1                     | 34%             | 20%           | 58.1%             | 36.0%             | 36.0%            | 18.4      |
| 1394      | Miscellaneous       | Vending Machine Controller - Non-Refrigerated                | Biz-Custom       | Other         | Retro            | 745                             | 745                             | 46%            | 343                   | 0.00               | 5      | \$80         | 63%               | 63%               | 32%              | 2                     | 1%              | 66%           | 72.8%             | 72.8%             | 72.8%            | 0.9       |
| 1395      | Miscellaneous       | Vending Machine Controller - Refrigerated                    | Biz-Custom       | Other         | Retro            | 1,739                           | 1,739                           | 46%            | 800                   | 0.00               | 10     | \$216        | 100%              | 35%               | 28%              | 3                     | 4%              | 6%            | 72.8%             | 72.8%             | 72.8%            | 3.3       |
| 1396      | Miscellaneous       | Miscellaneous Custom   | Biz-Custom       | Other         | Retro            | 5                               | 5                               | 20%            | 1                     | 0.00               | 10     | \$0          | 100%              | 50%               | 72%              | 4                     | 66%             | 20%           | 68.6%             | 57.8%             | 58.7%            | 8.1       |
| 1397      | Whole Building_HVAC | HVAC - Energy Management System                              | Biz-Prescriptive | Other         | Retro            | 6,960                           | 6,960                           | 15%            | 1,044                 | 0.00               | 15     | \$4,000      | 3%                | 3%                | 2%               | 1                     | 100%            | 1%            | 20.8%             | 18.4%             | 18.4%            | 4.3       |
| 1398      | Whole Building_HVAC | Guest room energy management system                          | Biz-Custom       | Other         | Retro            | 0                               | 0                               | 0%             | 0                     | 0.00               | 8      | \$0          | 0%                | 0%                | 0%               | 2                     | 0%              | 0%            | 63.2%             | 55.0%             | 55.0%            | 0.0       |
| 1399      | Whole Building_HVAC | Retro-commissioning, Bld Optimization                        | Biz-Custom RCx   | Other         | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 3      | \$0          | 100%              | 67%               | 22%              | 3                     | 100%            | 10%           | 63.2%             | 53.6%             | 51.7%            | 2.2       |
| 1400      | WholeBld            | WholeBld - Com RET   | Biz-NC           | Other         | Retro            | 7                               | 7                               | 15%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 19%              | 4                     | 40%             | 0%            | 68.6%             | 57.8%             | 56.6%            | 9.5       |
| 1401      | Whole Building_NC   | WholeBld - Com NC  | Biz-NC           | Other         | NC               | 4                               | 4                               | 25%            | 1                     | 0.00               | 12     | \$0          | 100%              | 50%               | 72%              | 5                     | 100%            | 60%           | 68.6%             | 68.0%             | 68.0%            | 9.5       |
| 1402      | Behavioral          | AMI Data Presentment & Engagement                            | Biz-Behavior     | Other         | Retro            | 100                             | 100                             | 1%             | 1                     | 0.00               | 1      | \$0          | 100%              | 100%              | 87%              | 1                     | 100%            | 10%           | 50.0%             | 50.0%             | 50.0%            | 1.3       |
| 1403      | Behavioral          | BIEMS  | Biz-Behavior     | Other         | Retro            | 50                              | 50                              | 2%             | 1                     | 0.00               | 3      | \$0          | 12%               | 12%               | 5%               | 1                     | 100%            | 5%            | 42.5%             | 50.0%             | 50.0%            | 0.6       |
| 1404      | Behavioral          | Building Operator Certification                              | Biz-Behavior     | Other         | Retro            | 28,300                          | 28,300                          | 1%             | 226                   | 0.00               | 3      | \$39         | 50%               | 30%               | 12%              | 1                     | 100%            | 5%            | 42.5%             | 50.0%             | 50.0%            | 2.2       |
| 1405      | Compressed Air      | Efficient Air Compressor Equipment                           | Biz-Custom       | Industrial    | ROB              | 9                               | 9                               | 11%            | 1                     | 0.00               | 13     | \$0          | 100%              | 13%               | 37%              | 1                     | 100%            | 33%           | 68.6%             | 46.4%             | 46.4%            | 9.5       |
| 1406      | Compressed Air      | Efficient Air Compressor Controls                            | Biz-Custom RCx   | Industrial    | Retro            | 15                              | 15                              | 7%             | 1                     | 0.00               | 3      | \$0          | 100%              | 49%               | 100%             | 2                     | 100%            | 25%           | 68.6%             | 56.0%             | 59.7%            | 2.1       |
| 1407      | HVAC                | Efficient HVAC Equipment                                     | Biz-Custom       | Industrial    | ROB              | 8                               | 8                               | 13%            | 1                     | 0.00               | 15     | \$0          | 100%              | 27%               | 39%              | 1                     | 100%            | 33%           | 63.2%             | 46.4%             | 47.1%            | 10.4      |
| 1408      | HVAC                | Efficient HVAC O&M   | Biz-Custom RCx   | Industrial    | Retro            | 33                              | 33                              | 3%             | 1                     | 0.00               | 3      | \$0          | 100%              | 63%               | 100%             | 2                     | 100%            | 25%           | 63.2%             | 52.4%             | 55.0%            | 2.0       |
| 1409      | Lighting            | Efficient Lighting Equipment                                 | Biz-Custom Light | Industrial    | Retro            | 2                               | 2                               | 42%            | 1                     | 0.00               | 15     | \$0          | 100%              | 30%               | 23%              | 1                     | 100%            | 50%           | 71.1%             | 60.0%             | 60.0%            | 10.6      |
| 1410      | Lighting            | Efficient Lighting O&M                                       | Biz-Custom Light | Industrial    | Retro            | 33                              | 33                              | 3%             | 1                     | 0.00               | 3      | \$0          | 100%              | 75%               | 100%             | 2                     | 100%            | 25%           | 71.1%             | 61.0%             | 61.9%            | 2.4       |
| 1411      | Machine Drive       | Efficient MachDr Equipment                                   | Biz-Custom       | Industrial    | ROB              | 5                               | 5                               | 20%            | 1                     | 0.00               | 15     | \$0          | 100%              | 30%               | 44%              | 1                     | 100%            | 33%           | 68.6%             | 53.1%             | 54.3%            | 10.2      |
| 1412      | Machine Drive       | Efficient MachDr O&M   | Biz-Custom RCx   | Industrial    | Retro            | 33                              | 33                              | 3%             | 1                     | 0.00               | 3      | \$0          | 100%              | 55%               | 100%             | 2                     | 100%            | 25%           | 68.6%             | 57.2%             | 59.7%            | 2.3       |
| 1413      | Process Heat        | Efficient ProHeat Equipment                                  | Biz-Custom       | Industrial    | ROB              | 10                              | 10                              | 10%            | 1                     | 0.00               | 15     | \$0          | 100%              | 30%               | 43%              | 1                     | 100%            | 33%           | 68.6%             | 53.1%             | 54.2%            | 10.6      |
| 1414      | Process Heat        | Efficient ProHeat O&M  | Biz-Custom RCx   | Industrial    | Retro            | 33                              | 33                              | 3%             | 1                     | 0.00               | 3      | \$0          | 100%              | 68%               | 100%             | 2                     | 100%            | 25%           | 68.6%             | 58.3%             | 59.7%            | 2.4       |
| 1415      | Process Ref         | Efficient ProRefrig Equipment                                | Biz-Custom       | Industrial    | ROB              | 6                               | 6                               | 16%            | 1                     | 0.00               | 15     | \$0          | 100%              | 29%               | 42%              | 1                     | 100%            | 33%           | 68.6%             | 52.9%             | 54.0%            | 10.4      |
| 1416      | Process Ref         | Eff  |                  |               |                  |                                 |                                 |                |                       |                    |        |              |                   |                   |                  |                       |                 |               |                   |                   |                  |           |

Appendix C: C&I Measure Assumptions

| Measure # | End-Use           | Measure Name                      | Program                | Building Type | Replacement Type | Base (Existing) Annual Electric | Base (Standard) Annual Electric | % Elec Savings | Per Unit Elec Savings | Per Unit Summer kW | EE EUL | Measure Cost | MAP Incentive (%) | RAP Incentive (%) | PP Incentive (%) | End Use Measure Group | Base Saturation | EE Saturation | MAP Adoption Rate | RAP Adoption Rate | PP Adoption Rate | UCT Score |
|-----------|-------------------|-----------------------------------|------------------------|---------------|------------------|---------------------------------|---------------------------------|----------------|-----------------------|--------------------|--------|--------------|-------------------|-------------------|------------------|-----------------------|-----------------|---------------|-------------------|-------------------|------------------|-----------|
| 1426      | Refrigeration     | Efficient Refrigeration Equipment | Biz-Custom             | Agriculture   | ROB              | 7                               | 7                               | 15%            | 1                     | 0.00               | 15     | \$0          | 100%              | 29%               | 42%              | 1                     | 100%            | 25%           | 60.2%             | 43.9%             | 45.3%            | 11.6      |
| 1427      | Refrigeration     | Refrigeration Equipment O&M       | Biz-Custom RCx         | Agriculture   | Retro            | 33                              | 33                              | 3%             | 1                     | 0.00               | 3      | \$0          | 100%              | 49%               | 71%              | 2                     | 100%            | 25%           | 60.2%             | 48.5%             | 50.2%            | 2.7       |
| 1428      | Lighting          | Efficient Lighting                | Biz-Prescriptive Light | Agriculture   | ROB              | 2                               | 2                               | 42%            | 1                     | 0.00               | 15     | \$0          | 100%              | 30%               | 23%              | 1                     | 100%            | 25%           | 71.1%             | 55.3%             | 54.7%            | 8.2       |
| 1429      | Lighting          | Grow Lighting                     | Biz-Custom Light       | Agriculture   | Retro            | 3                               | 3                               | 39%            | 1                     | 0.00               | 15     | \$0          | 100%              | 19%               | 15%              | 2                     | 100%            | 25%           | 71.1%             | 50.4%             | 49.7%            | 8.2       |
| 1430      | Ventilation       | Efficient Ventilation             | Biz-Custom             | Agriculture   | ROB              | 2                               | 2                               | 54%            | 1                     | 0.00               | 10     | \$0          | 100%              | 16%               | 23%              | 1                     | 100%            | 25%           | 63.2%             | 40.0%             | 40.9%            | 8.5       |
| 1431      | HVAC              | Efficient Dehumidification        | Biz-Custom             | Agriculture   | ROB              | 4                               | 4                               | 27%            | 1                     | 0.00               | 10     | \$0          | 100%              | 27%               | 39%              | 1                     | 100%            | 25%           | 63.2%             | 45.2%             | 46.6%            | 8.6       |
| 1432      | HVAC              | Efficient HVAC                    | Biz-Custom             | Agriculture   | ROB              | 8                               | 8                               | 13%            | 1                     | 0.00               | 15     | \$0          | 100%              | 27%               | 39%              | 2                     | 100%            | 25%           | 63.2%             | 46.5%             | 47.7%            | 11.6      |
| 1433      | Exterior Lighting | LED Streetlighting                | Biz-StreetLight        | StreetLight   | Retro            | 1,269                           | 1,269                           | 45%            | 577                   | 0.00               | 20     | \$506        | 25%               | 10%               | 9%               | 1                     | 100%            | 80%           | 85.0%             | 100.0%            | 100.0%           | 4.9       |



# 2021 POTENTIAL STUDY

FINAL REPORT

*September*  
**2021**