



# ComEd Small Business Kits Impact Evaluation Report

**Energy Efficiency / Demand Response Plan:  
Program Year 2019 (CY2019)  
(1/1/2019-12/31/2019)**

**Presented to  
ComEd**

**FINAL**

April 16, 2020

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## ComEd Small Business Kits Impact Evaluation Report

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## TABLE OF CONTENTS

|  |    |
|--|----|
| 1. Introduction .....  | 1  |
| 2. Program Description .....   | 1  |
| 3. Program Savings Detail .....                                      | 2  |
| 4. Cumulative Persisting Annual Savings .....                        | 3  |
| 5. Program Savings by Measure .....                                  | 10 |
| 6. Impact Analysis Findings and Recommendations .....                | 16 |
| 6.1 Impact Parameter Estimates .....                                 | 16 |
| 6.2 CY2020 Carryover Savings Estimates .....                         | 17 |
| 6.3 Other Impact Findings and Recommendations .....                  | 18 |
| 6.3.1 Program Level .....  | 18 |
| 6.3.2 Bathroom Aerator, Kitchen Aerator, Pre-Rinse Spray Valve ..... | 19 |
| 6.3.3 9W LED, 8W BR30, 14W PAR30 .....                               | 20 |
| 7. Appendix 1. Impact Analysis Detail .....                          | 20 |
| 8. Appendix 2. Total Resource Cost Detail .....                      | 25 |

## LIST OF TABLES AND FIGURES

|   |    |
|---|----|
| Figure 2-1. Number of Measures Installed by Type .....                                  | 2  |
| Figure 4-1. Cumulative Persisting Annual Savings .....                                  | 10 |
| Figure 5-1. Verified Net Savings by Measure – Electric .....                            | 11 |
| Table 2-1. CY2019 Volumetric Findings Detail .....                                      | 1  |
| Table 3-1. CY2019 Total Annual Incremental Electric Savings .....                       | 3  |
| Table 4-1. Cumulative Persisting Annual Savings (CPAS) – Electric .....                 | 4  |
| Table 4-2. Cumulative Persisting Annual Savings (CPAS) – Gas .....                      | 6  |
| Table 4-3. Cumulative Persisting Annual Savings (CPAS) – Total .....                    | 8  |
| Table 5-1. CY2019 Energy Savings by Measure – Electric .....                            | 11 |
| Table 5-2. CY2019 Non-Coincident Demand Savings by Measure .....                        | 12 |
| Table 5-3. CY2019 Summer Peak Demand Savings by Measure .....                           | 13 |
| Table 5-4. CY2019 Energy Savings by Measure – Gas .....                                 | 14 |
| Table 5-5. CY2019 Energy Savings by Measure – Total Combining Electricity and Gas ..... | 15 |
| Table 5-6. Secondary Energy Savings from Water Reduction by Measure – Electric .....    | 16 |
| Table 6-1. Savings Parameters .....   | 17 |
| Table 6-2. CY2020 Verified Savings Carryover Estimate .....                             | 18 |
| Table 6-3. ISR Comparison from CY2018 to CY2019 .....                                   | 19 |
| Table 7-1. 9W LED Custom and Deemed Values Comparison .....                             | 20 |
| Table 7-2. 8W BR30 Custom and Deemed Values Comparison .....                            | 21 |
| Table 7-3. 14W PAR30 Custom and Deemed Values Comparison .....                          | 21 |
| Table 7-4. Bathroom Aerator Custom and Deemed Values Comparison .....                   | 22 |
| Table 7-5. Kitchen Aerator Custom and Deemed Values Comparison .....                    | 23 |
| Table 7-6. PRSV Custom and Deemed Values Comparison .....                               | 23 |
| Table 7-7. APS Custom and Deemed Values Comparison .....                                | 24 |
| Table 8-1. Total Resource Cost Savings Summary .....                                    | 25 |

## 1. INTRODUCTION

This report presents the results of the impact evaluation of ComEd's CY2019 Small Business Kits (SB Kits) Program. It includes a summary of the energy and demand impacts for the total program broken out by relevant measure and program structure details. The appendix provides the impact analysis methodology and details of the Total Resource Cost inputs. CY2019 covers January 1, 2019 through December 31, 2019.

## 2. PROGRAM DESCRIPTION

The ComEd SB Kits Program aims to cost-effectively capture electric savings in small commercial facilities located in ComEd's service territory by targeting customers that operate office, restaurant, and other small businesses. This is an opt-in program where customers must request to receive an energy efficiency kit that includes self-install measures.

To participate in the program, the ComEd customer must have a peak electric load of 100 kW or less and take delivery from ComEd, regardless of their choice of electric supplier. The customer cannot have participated in the current ComEd Small Business Program. Franklin Energy is responsible for implementing the program and kits are delivered by direct mail. Customers can order a kit via telephone call, website request, or email request. Most of the kit orders are received by outbound calling. Resource Action Programs (RAP), a Franklin Energy company, creates and ships the small business energy efficiency kits directly to customer facilities. The kits contain products particularly selected for the specific business types, as well as detailed installation instructions. A Franklin Energy representative follows up with a random sample of customers within six weeks of energy kit receipt to verify that each customer received the kit, confirm what measures were installed or learn if the customer plans to install, answer any questions about the measures or program, and determine customer satisfaction with the products and program.

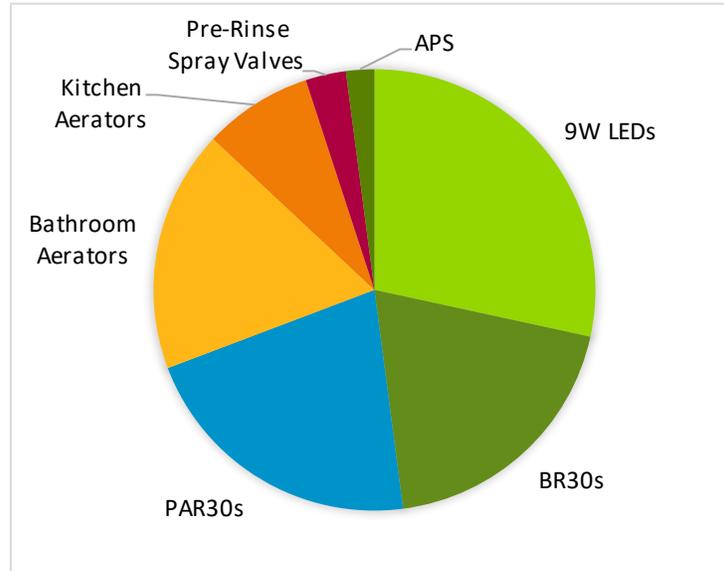
The program had 6,209 participants in CY2019 and distributed 48,807 measures as shown in the following table and graph.

**Table 2-1. CY2019 Volumetric Findings Detail**

| Participation                                | Small Office | Restaurant | Other/General | Total  |
|--|--------------|------------|---------------|--------|
| Number of Measures/Kit                       | 5            | 5          | 4             | 14     |
| Number of Total Kits Distributed             | 1,009        | 1,445      | 3,755         | 6,209  |
| Number of 9W LEDs Distributed                | 2,018        | 4,335      | 7,510         | 13,863 |
| Number of BR30 8W LEDs                       | 2,018        | 0          | 7,510         | 9,528  |
| Number of PAR30 14W LEDs                     | 0            | 2,890      | 7,510         | 10,400 |
| Number of Bathroom Aerators Distributed      | 2,018        | 2,890      | 3,755         | 8,663  |
| Number of Kitchen Aerators Distributed       | 1,009        | 2,890      | 0             | 3,899  |
| Number of Pre-Rinse Spray Valves Distributed | 0            | 1,445      | 0             | 1,445  |
| Number of Advanced Power Strips Distributed  | 1,009        | 0          | 0             | 1,009  |
| Number of Total Measure Distributed          | 8,072        | 14,450     | 26,285        | 48,807 |

Source: ComEd tracking data and evaluation team analysis

**Figure 2-1. Number of Measures Installed by Type**



Source: ComEd tracking data and evaluation team analysis

### 3. PROGRAM SAVINGS DETAIL

Table 3-1 summarizes the incremental energy and demand savings the SB Kits Program achieved in CY2019. The gas savings are only those that ComEd may be able to claim, which excludes savings the gas utilities claim, either via joint or non-joint programs.<sup>1</sup> Verified net electric savings for CY2019 is 10,277,744 kWh. The ex ante and verified gross savings in Table 3-1 do not include carryover savings from PY9 and CY2018. Carryover is included as a separate line item and in the total net verified savings.

<sup>1</sup> The evaluation will determine which gas savings will be counted toward goal while producing the portfolio-wide Summary Report.

**Table 3-1. CY2019 Total Annual Incremental Electric Savings**

| Savings Category                               | Energy Savings (kWh) | Non-Coincident Demand Savings (kW) | Summer Peak* Demand Savings (kW) |
|--|----------------------|------------------------------------|----------------------------------|
| <b>Electricity</b>                             |                      |                                    |                                  |
| Ex Ante Gross Savings                          | 5,015,674            | NR                                 | 871                              |
| Program Gross Realization Rate                 | 1.28                 | NA                                 | 1.45                             |
| Verified Gross Savings                         | 6,430,450            | 8,621                              | 1,266                            |
| Program Net-to-Gross Ratio (NTG)               | 0.92                 | 0.92                               | 0.92                             |
| PY9 and CY2018 Verified Net Carryover Savings  | 461,067              | 174                                | 110                              |
| Total Verified Net Savings including Carryover | 6,377,081            | 8,106                              | 1,275                            |
| <b>Converted from Gas†</b>                     |                      |                                    |                                  |
| Ex Ante Gross Savings                          | 1,537,954            | NA                                 | NA                               |
| Program Gross Realization Rate                 | 2.76                 | NA                                 | NA                               |
| Verified Gross Savings                         | 4,239,851            | NA                                 | NA                               |
| Program Net-to-Gross Ratio (NTG)               | 0.92                 | NA                                 | NA                               |
| Verified Net Savings                           | 3,900,663            | NA                                 | NA                               |
| <b>Total Electric Plus Gas</b>                 |                      |                                    |                                  |
| Ex Ante Gross Savings                          | 6,553,628            | NR                                 | 871                              |
| Program Gross Realization Rate                 | 1.63                 | NA                                 | 1.45                             |
| Verified Gross Savings                         | 10,670,301           | 8,621                              | 1,266                            |
| Program Net-to-Gross Ratio (NTG)               | 0.92                 | 0.92                               | 0.92                             |
| PY9 and CY2018 Verified Net Carryover Savings  | 461,067              | 174                                | 110                              |
| Verified Net Savings                           | 10,277,744           | 8,106                              | 1,275                            |

NR = Not reported (refers a piece of data that was not reported, i.e., non-coincident demand savings)

NA = Not applicable (refers a piece of data cannot be produced or does not apply)

\* The coincident summer peak period is defined as 1:00-5:00 p.m. Central Prevailing Time on non-holiday weekdays, June through August.

† Gas savings converted to kWh by multiplying therms \* 29.31 (which is based on 100,000 Btu/therm and 3,412 Btu/kWh). The evaluation will determine which gas savings will be converted to kWh and counted toward ComEd's electric savings goal while producing the portfolio-wide Summary Report. According to Section 8-103B(b-25) of the Illinois Public Utilities Act, "In no event shall more than 10% of each year's applicable annual incremental goal as defined in paragraph (7) of subsection (g) of this Section be met through savings of fuels other than electricity."

Source: ComEd tracking data and evaluation team analysis

## 4. CUMULATIVE PERSISTING ANNUAL SAVINGS

Table 4-1 to Table 4-3 and Figure 4-1 show the measure-specific and total verified gross savings for the SB Kits Program and the cumulative persisting annual savings (CPAS) for the measures installed in CY2019. The electric CPAS across all measures installed in 2019 is 5,960,426 kWh (Table 4-1). The CY2019 gas contribution to CPAS (converted to equivalent electricity) is 3,900,663 kWh (Table 4-2). Adding the gas and electric contributions produces 9,861,089 kWh of total CY2019 contribution to CPAS (Table 4-3). The "historic" rows in each table are the CPAS contribution back to CY2018. The "Program Total Electric CPAS" and the "Program Total Gas CPAS" are the sum of the CY2019 contribution and the historic contribution.

The ex ante savings did not include an estimate for carryover savings from light bulbs that were distributed in PY9 and CY2018 but were installed in CY2019. The Guidehouse team included carryover for PY9 and CY2018 into CY2019 in Table 4-1 through Table 4-3.



# ComEd Small Business Kits Impact Evaluation Report

**Table 4-1. Cumulative Persisting Annual Savings (CPAS) – Electric**

| End Use Type  | Research Category                           | EUL  | CY2019<br>Verified Gross<br>Savings<br>(kWh) | Lifetime Net<br>Savings<br>(kWh)† | Verified Net kWh Savings |                  |                  |                  |                  |                  |                  |                  |                  |                  |        |
|---|---|------|--|-----------------------------------|--------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--------|
|   |   |      |  |                                   | 2018                     | 2019             | 2020             | 2021             | 2022             | 2023             | 2024             | 2025             | 2026             |                  |        |
| Lighting  | PAR30 LED 14 W - Other/General              | 15.0 | 1,541,047                                    | 0.92                              |                          | 1,417,763        | 1,417,763        | 1,417,763        | 1,417,763        | 1,417,763        | 241,717          | 241,717          | 241,717          |                  |        |
| Lighting  | BR30 LED 8 W - Other/General                | 15.0 | 1,435,790                                    | 0.92                              |                          | 1,320,927        | 1,320,927        | 1,320,927        | 1,320,927        | 1,320,927        | 347,612          | 347,612          | 347,612          |                  |        |
| Lighting  | PAR30 LED 14 W - Restaurant                 | 10.5 | 829,437                                      | 0.92                              |                          | 763,082          | 763,082          | 763,082          | 763,082          | 763,082          | 130,099          | 130,099          | 130,099          |                  |        |
| Hot Water   | Pre-rinse Spray Valve - Restaurant          | 5.0  | 568,084                                      | 0.92                              |                          | 522,638          | 522,638          | 522,638          | 522,638          | 522,638          |                  |                  |                  |                  |        |
| Lighting  | LED 9W - Other/General                      | 15.0 | 525,914                                      | 0.92                              |                          | 483,841          | 483,841          | 67,738           | 67,738           | 67,738           | 67,738           | 67,738           | 67,738           |                  |        |
| Lighting  | LED 9W - Restaurant                         | 10.5 | 396,198                                      | 0.92                              |                          | 364,502          | 364,502          | 51,030           | 51,030           | 51,030           | 51,030           | 51,030           | 51,030           |                  |        |
| Lighting  | BR30 LED 8 W - Small Office                 | 15.0 | 285,178                                      | 0.92                              |                          | 262,363          | 262,363          | 262,363          | 262,363          | 262,363          | 69,043           | 69,043           | 69,043           |                  |        |
| Hot Water   | Kitchen Aerator - Low Flow - Restaurant     | 9.0  | 273,083                                      | 0.92                              |                          | 251,236          | 251,236          | 251,236          | 251,236          | 251,236          | 251,236          | 251,236          | 251,236          |                  |        |
| Hot Water   | Bath Aerator - Low Flow - Restaurant        | 9.0  | 224,539                                      | 0.92                              |                          | 206,576          | 206,576          | 206,576          | 206,576          | 206,576          | 206,576          | 206,576          | 206,576          |                  |        |
| Hot Water   | Bath Aerator - Low Flow - Other/General     | 9.0  | 109,033                                      | 0.92                              |                          | 100,311          | 100,311          | 100,311          | 100,311          | 100,311          | 100,311          | 100,311          | 100,311          |                  |        |
| Lighting  | LED 9W - Small Office                       | 15.0 | 105,435                                      | 0.92                              |                          | 97,000           | 97,000           | 13,580           | 13,580           | 13,580           | 13,580           | 13,580           | 13,580           |                  |        |
| Consumer Electronics  | Advanced SmartStrip - Tier 1 - Small Office | 7.0  | 94,398                                       | 0.92                              |                          | 86,846           | 86,846           | 86,846           | 86,846           | 86,846           | 86,846           | 86,846           | 86,846           |                  |        |
| Hot Water   | Bath Aerator - Low Flow - Small Office      | 9.0  | 26,930                                       | 0.92                              |                          | 24,775           | 24,775           | 24,775           | 24,775           | 24,775           | 24,775           | 24,775           | 24,775           |                  |        |
| Hot Water   | Kitchen Aerator - Low Flow - Small Office   | 9.0  | 15,383                                       | 0.92                              |                          | 14,152           | 14,152           | 14,152           | 14,152           | 14,152           | 14,152           | 14,152           | 14,152           |                  |        |
| Carryover   | PY9 & CY2018 Carryover                      | 14.0 | 512,297                                      | 0.90                              |                          | 461,067          | 461,067          | 258,207          | 258,207          | 258,207          | 56,088           | 56,088           | 56,088           |                  |        |
| <b>CY2019 Program Total Electric Contribution to CPAS</b>       |   |      | <b>6,942,747</b>                             | <b>40,331,185</b>                 |                          | <b>6,377,081</b> | <b>6,377,081</b> | <b>5,361,226</b> | <b>5,361,226</b> | <b>5,361,226</b> | <b>1,660,805</b> | <b>1,660,805</b> | <b>1,573,959</b> |                  |        |
| <b>Historic Program Total Electric Contribution to CPAS‡</b>    |   |      |  |                                   |                          | <b>2,049,602</b> | <b>2,049,602</b> | <b>1,987,233</b> | <b>1,568,626</b> | <b>1,568,626</b> | <b>1,353,768</b> | <b>1,262,267</b> | <b>1,205,944</b> | <b>1,204,851</b> |        |
| <b>Program Total Electric CPAS</b>                              |   |      |  |                                   |                          | <b>2,049,602</b> | <b>8,426,683</b> | <b>8,364,314</b> | <b>6,929,852</b> | <b>6,929,852</b> | <b>6,714,994</b> | <b>2,923,072</b> | <b>2,866,749</b> | <b>2,778,810</b> |        |
| <b>CY2019 Program Incremental Expiring Electric Savings§</b>    |   |      |  |                                   |                          |                  |                  | -                | 1,015,856        | -                | -                | 3,700,421        | -                | 86,846           |        |
| <b>Historic Program Incremental Expiring Electric Savings‡§</b> |   |      |  |                                   |                          |                  |                  | -                | 62,369           | 418,607          | -                | 214,858          | 91,501           | 56,323           | 1,093  |
| <b>Program Total Incremental Expiring Electric Savings§</b>     |   |      |  |                                   |                          |                  |                  | -                | 62,369           | 1,434,463        | -                | 214,858          | 3,791,922        | 56,323           | 87,939 |



## ComEd Small Business Kits Impact Evaluation Report

| End Use Type  | Research Category                            | 2027             | 2028             | 2029             | 2030             | 2031             | 2032             | 2033             | 2034             | 2035 | 2036 | 2037 | 2038 |
|---|--|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------|------|------|------|
| Lighting  | PAR30 LED 14 W - Other/General               | 241,717          | 241,717          | 241,717          | 241,717          | 241,717          | 241,717          | 241,717          |                  |      |      |      |      |
| Lighting  | BR30 LED 8 W - Other/General                 | 347,612          | 347,612          | 347,612          | 347,612          | 347,612          | 347,612          | 347,612          |                  |      |      |      |      |
| Lighting  | PAR30 LED 14 W - Restaurant                  | 130,099          | 130,099          | 65,050           |                  |                  |                  |                  |                  |      |      |      |      |
| Hot Water   | Pre-rinse Spray Valve - Restaurant           |                  |                  |                  |                  |                  |                  |                  |                  |      |      |      |      |
| Lighting  | LED 9W - Other/General                       | 67,738           | 67,738           | 67,738           | 67,738           | 67,738           | 67,738           | 67,738           |                  |      |      |      |      |
| Lighting  | LED 9W - Restaurant                          | 51,030           | 51,030           | 25,515           |                  |                  |                  |                  |                  |      |      |      |      |
| Lighting  | BR30 LED 8 W - Small Office                  | 69,043           | 69,043           | 69,043           | 69,043           | 69,043           | 69,043           | 69,043           |                  |      |      |      |      |
| Hot Water   | Kitchen Aerator - Low Flow - Restaurant      | 251,236          |                  |                  |                  |                  |                  |                  |                  |      |      |      |      |
| Hot Water   | Bath Aerator - Low Flow - Restaurant         | 206,576          |                  |                  |                  |                  |                  |                  |                  |      |      |      |      |
| Hot Water   | Bath Aerator - Low Flow - Other/General      | 100,311          |                  |                  |                  |                  |                  |                  |                  |      |      |      |      |
| Lighting  | LED 9W - Small Office                        | 13,580           | 13,580           | 13,580           | 13,580           | 13,580           | 13,580           | 13,580           |                  |      |      |      |      |
| Consumer Electronics  | Advanced Smart Strip - Tier 1 - Small Office |                  |                  |                  |                  |                  |                  |                  |                  |      |      |      |      |
| Hot Water   | Bath Aerator - Low Flow - Small Office       | 24,775           |                  |                  |                  |                  |                  |                  |                  |      |      |      |      |
| Hot Water   | Kitchen Aerator - Low Flow - Small Office    | 14,152           |                  |                  |                  |                  |                  |                  |                  |      |      |      |      |
| Carryover   | PY9 & CY2018 Carryover                       | 56,088           | 56,088           | 53,583           | 51,078           | 51,078           | 51,078           | 51,078           |                  |      |      |      |      |
| <b>CY2019 Program Total Electric Contribution to CPAS</b>       |  | <b>1,573,959</b> | <b>976,908</b>   | <b>883,838</b>   | <b>790,768</b>   | <b>790,768</b>   | <b>790,768</b>   | <b>790,768</b>   | -                | -    | -    | -    | -    |
| <b>Historic Program Total Electric Contribution to CPAS†</b>    |  | <b>1,041,271</b> | <b>1,034,840</b> | <b>1,028,410</b> | <b>1,027,883</b> | <b>1,011,654</b> | <b>1,002,410</b> | <b>529,066</b>   |                  |      |      |      |      |
| <b>Program Total Electric CPAS</b>                              |  | <b>2,615,230</b> | <b>2,011,748</b> | <b>1,912,248</b> | <b>1,818,651</b> | <b>1,802,422</b> | <b>1,793,178</b> | <b>1,319,834</b> | -                | -    | -    | -    | -    |
| <b>CY2019 Program Incremental Expiring Electric Savings§</b>    |  | -                | <b>597,050</b>   | <b>93,070</b>    | <b>93,070</b>    | -                | -                | -                | <b>790,768</b>   | -    | -    | -    | -    |
| <b>Historic Program Incremental Expiring Electric Savings‡§</b> |  | <b>163,580</b>   | <b>6,431</b>     | <b>6,430</b>     | <b>527</b>       | <b>16,229</b>    | <b>9,244</b>     | <b>473,344</b>   | <b>529,066</b>   | -    | -    | -    | -    |
| <b>Program Total Incremental Expiring Electric Savings§</b>     |  | <b>163,580</b>   | <b>603,481</b>   | <b>99,500</b>    | <b>93,597</b>    | <b>16,229</b>    | <b>9,244</b>     | <b>473,344</b>   | <b>1,319,834</b> | -    | -    | -    | -    |

Note: The green highlighted cell shows program total first year electric savings. The gray cells are blank, indicating values irrelevant to the CY2019 contribution to CPAS.

\* A deemed value. Source: ComEd Third-Party Programs' CY2019 Net-to-Gross Values Memo, May 1, 2019.

† Lifetime savings are the sum of CPAS savings through the EUL.

‡ Historical savings go back to CY2018

§ Incremental expiring savings are equal to  $CPAS_{Y_{n-1}} - CPAS_{Y_n}$

Source: Evaluation team analysis



# ComEd Small Business Kits Impact Evaluation Report

**Table 4-2. Cumulative Persisting Annual Savings (CPAS) – Gas**

| End Use Type   | Research Category                            | EUL  | CY2019 Verified Gross Savings (Therms) | NTG* | Lifetime Net Savings (Therms)† | Verified Net Therms Savings |           |           |           |           |           |           |           |           |           |   |
|--|--|------|--|------|--------------------------------|-----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---|
|  |  |      |  |      |                                | 2018                        | 2019      | 2020      | 2021      | 2022      | 2023      | 2024      | 2025      | 2026      |           |   |
| Lighting   | PAR30 LED 14 W - Other/General               | 15.0 | -                                      | 0.92 |                                |                             | -         | -         |           |           |           |           |           |           |           |   |
| Lighting   | BR30 LED 8 W - Other/General                 | 15.0 | -                                      | 0.92 |                                |                             | -         | -         |           |           |           |           |           |           |           |   |
| Lighting   | PAR30 LED 14 W - Restaurant                  | 10.5 | -                                      | 0.92 |                                |                             | -         | -         |           |           |           |           |           |           |           |   |
| Hot Water  | Pre-rinse Spray Valve - Restaurant           | 5.0  | 62,178                                 | 0.92 |                                |                             | 57,204    | 57,204    | 57,204    | 57,204    | 57,204    |           |           |           |           |   |
| Lighting   | LED 9W - Other/General                       | 15.0 | -                                      | 0.92 |                                |                             | -         | -         |           |           |           |           |           |           |           |   |
| Lighting   | LED 9W - Restaurant                          | 10.5 | -                                      | 0.92 |                                |                             | -         | -         |           |           |           |           |           |           |           |   |
| Lighting   | BR30 LED 8 W - Small Office                  | 15.0 | -                                      | 0.92 |                                |                             | -         | -         |           |           |           |           |           |           |           |   |
| Hot Water  | Kitchen Aerator - Low Flow - Restaurant      | 9.0  | 33,921                                 | 0.92 |                                |                             | 31,207    | 31,207    | 31,207    | 31,207    | 31,207    | 31,207    | 31,207    | 31,207    |           |   |
| Hot Water  | Bath Aerator - Low Flow - Restaurant         | 9.0  | 27,318                                 | 0.92 |                                |                             | 25,132    | 25,132    | 25,132    | 25,132    | 25,132    | 25,132    | 25,132    | 25,132    |           |   |
| Hot Water  | Bath Aerator - Low Flow - Other/General      | 9.0  | 15,352                                 | 0.92 |                                |                             | 14,124    | 14,124    | 14,124    | 14,124    | 14,124    | 14,124    | 14,124    | 14,124    |           |   |
| Lighting   | LED 9W - Small Office                        | 15.0 | -                                      | 0.92 |                                |                             | -         | -         |           |           |           |           |           |           |           |   |
| Consumer Electronics   | Advanced Smart Strip - Tier 1 - Small Office | 7.0  | -                                      | 0.92 |                                |                             | -         | -         |           |           |           |           |           |           |           |   |
| Hot Water  | Bath Aerator - Low Flow - Small Office       | 9.0  | 3,703                                  | 0.92 |                                |                             | 3,407     | 3,407     | 3,407     | 3,407     | 3,407     | 3,407     | 3,407     | 3,407     |           |   |
| Hot Water  | Kitchen Aerator - Low Flow - Small Office    | 9.0  | 2,184                                  | 0.92 |                                |                             | 2,009     | 2,009     | 2,009     | 2,009     | 2,009     | 2,009     | 2,009     | 2,009     |           |   |
| Lighting   | BR30 LED 8 W - Restaurant                    | 10.5 | -                                      | 0.92 |                                |                             | -         | -         |           |           |           |           |           |           |           |   |
| Lighting   | PAR30 LED 14 W - Small Office                | 15.0 | -                                      | 0.92 |                                |                             | -         | -         |           |           |           |           |           |           |           |   |
| Carryover  | PY9 & CY2018 Carryover                       | 14.0 | -                                      | 0.90 |                                |                             | -         | -         |           |           |           |           |           |           |           |   |
| CY2019 Program Total Gas Contribution to CPAS (Therms)               |  |      | 144,655                                |      | 968,933                        |                             |           | 133,083   | 133,083   | 133,083   | 133,083   | 133,083   | 75,879    | 75,879    | 75,879    |   |
| CY2019 Program Total Gas Contribution to CPAS (kWh Equivalent)‡      |  |      |  |      | 28,399,422                     |                             |           | 3,900,663 | 3,900,663 | 3,900,663 | 3,900,663 | 3,900,663 | 2,224,027 | 2,224,027 | 2,224,027 |   |
| Historic Program Total Gas Contribution to CPAS (kWh Equivalent)‡§   |  |      |  |      |                                |                             | 1,042,527 | 1,042,527 | 1,042,527 | 1,042,527 | 1,042,527 | 494,596   | 494,596   | 494,596   | 494,596   |   |
| Program Total Gas CPAS (kWh Equivalent)‡                             |  |      |  |      |                                |                             | 1,042,527 | 4,943,190 | 4,943,190 | 4,943,190 | 4,943,190 | 4,395,259 | 2,718,623 | 2,718,623 | 2,718,623 |   |
| CY2019 Program Incremental Expiring Gas Savings (Therms)             |  |      |  |      |                                |                             |           | -         | -         | -         | -         | 57,204    | -         | -         | -         |   |
| CY2019 Program Incremental Expiring Gas Savings (kWh Equivalent)‡    |  |      |  |      |                                |                             |           | -         | -         | -         | -         | 1,676,636 | -         | -         | -         |   |
| Historic Program Incremental Expiring Gas Savings (kWh Equivalent)‡§ |  |      |  |      |                                |                             |           | -         | -         | -         | -         | 547,931   | -         | -         | -         |   |
| Program Total Incremental Expiring Gas Savings (kWh Equivalent)‡     |  |      |  |      |                                |                             |           | -         | -         | -         | -         | 547,931   | 1,676,636 | -         | -         | - |



# ComEd Small Business Kits Impact Evaluation Report

| End Use Type   | Research Category                            | 2027      | 2028      | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 |
|--|--|-----------|-----------|------|------|------|------|------|------|------|------|------|------|
| Lighting   | PAR30 LED 14 W - Other/General               |           |           |      |      |      |      |      |      |      |      |      |      |
| Lighting   | BR30 LED 8 W - Other/General                 |           |           |      |      |      |      |      |      |      |      |      |      |
| Lighting   | PAR30 LED 14 W - Restaurant                  |           |           |      |      |      |      |      |      |      |      |      |      |
| Hot Water  | Pre-rinse Spray Valve - Restaurant           |           |           |      |      |      |      |      |      |      |      |      |      |
| Lighting   | LED 9W - Other/General                       |           |           |      |      |      |      |      |      |      |      |      |      |
| Lighting   | LED 9W - Restaurant                          |           |           |      |      |      |      |      |      |      |      |      |      |
| Lighting   | BR30 LED 8 W - Small Office                  |           |           |      |      |      |      |      |      |      |      |      |      |
| Hot Water  | Kitchen Aerator - Low Flow - Restaurant      | 31,207    |           |      |      |      |      |      |      |      |      |      |      |
| Hot Water  | Bath Aerator - Low Flow - Restaurant         | 25,132    |           |      |      |      |      |      |      |      |      |      |      |
| Hot Water  | Bath Aerator - Low Flow - Other/General      | 14,124    |           |      |      |      |      |      |      |      |      |      |      |
| Lighting   | LED 9W - Small Office                        |           |           |      |      |      |      |      |      |      |      |      |      |
| Consumer Electronics   | Advanced Smart Strip - Tier 1 - Small Office |           |           |      |      |      |      |      |      |      |      |      |      |
| Hot Water  | Bath Aerator - Low Flow - Small Office       | 3,407     |           |      |      |      |      |      |      |      |      |      |      |
| Hot Water  | Kitchen Aerator - Low Flow - Small Office    | 2,009     |           |      |      |      |      |      |      |      |      |      |      |
| Lighting   | BR30 LED 8 W - Restaurant                    |           |           |      |      |      |      |      |      |      |      |      |      |
| Lighting   | PAR30 LED 14 W - Small Office                |           |           |      |      |      |      |      |      |      |      |      |      |
| Carryover  | PY9 & CY2018 Carryover                       |           |           |      |      |      |      |      |      |      |      |      |      |
| CY2019 Program Total Gas Contribution to CPAS (Therms)               |  | 75,879    | -         | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |
| CY2019 Program Total Gas Contribution to CPAS (kWh Equivalent)†      |  | 2,224,027 | -         | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |
| Historic Program Total Gas Contribution to CPAS (kWh Equivalent)†§   |  |           |           |      |      |      |      |      |      |      |      |      |      |
| Program Total Gas CPAS (kWh Equivalent)†                             |  | 2,224,027 | -         | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |
| CY2019 Program Incremental Expiring Gas Savings (Therms)             |  | -         | 75,879    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |
| CY2019 Program Incremental Expiring Gas Savings (kWh Equivalent)†    |  | -         | 2,224,027 | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |
| Historic Program Incremental Expiring Gas Savings (kWh Equivalent)†§ |  | 494,596   | -         | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |
| Program Total Incremental Expiring Gas Savings (kWh Equivalent)†     |  | 494,596   | 2,224,027 | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |

Note: The green highlighted cell shows program total first year gas savings in kWh equivalents. The gray cells are blank, indicating no values or do not contribute to calculating CPAS in CY2019.

\* A deemed value. Source: ComEd Third-Party Programs' CY2019 Net-to-Gross Values Memo, May 1, 2019.

† Lifetime savings are the sum of CPAS savings through the EUL.

‡ kWh equivalent savings are calculated by multiplying therm savings by 29.31.

§ Historic savings go back to CY2018.

|| Incremental expiring savings are equal to CPAS Yn-1 - CPAS Yn.

Source: Evaluation team analysis



# ComEd Small Business Kits Impact Evaluation Report

**Table 4-3. Cumulative Persisting Annual Savings (CPAS) – Total**

| End Use Type                                     | Research Category                            | EUL  | CY2019 Verified Gross Savings (kWh) | NTG* Savings (kWh)† | Lifetime Net Savings (kWh)† | Verified Net kWh Savings (Including Those Converted from Gas Savings) |            |            |            |            |            |           |           |           |        |
|--|--|------|-------------------------------------|---------------------|-----------------------------|---|------------|------------|------------|------------|------------|-----------|-----------|-----------|--------|
|  |  |      |                                     |                     |                             | 2018  | 2019       | 2020       | 2021       | 2022       | 2023       | 2024      | 2025      | 2026      |        |
| Lighting   | PAR30 LED 14 W - Other/General               | 15.0 | 1,541,047                           | 0.92                | 9,505,987                   |   | 1,417,763  | 1,417,763  | 1,417,763  | 1,417,763  | 1,417,763  | 241,717   | 241,717   | 241,717   |        |
| Lighting   | BR30 LED 8 W - Other/General                 | 15.0 | 1,435,790                           | 0.92                | 10,080,760                  |   | 1,320,927  | 1,320,927  | 1,320,927  | 1,320,927  | 1,320,927  | 347,612   | 347,612   | 347,612   |        |
| Lighting   | PAR30 LED 14 W - Restaurant                  | 10.5 | 829,437                             | 0.92                | 4,530,958                   |   | 763,082    | 763,082    | 763,082    | 763,082    | 763,082    | 130,099   | 130,099   | 130,099   |        |
| Hot Water  | Pre-rinse Spray Valve - Restaurant           | 5.0  | 2,390,514                           | 0.92                | 10,996,366                  |   | 2,199,273  | 2,199,273  | 2,199,273  | 2,199,273  | 2,199,273  | -         | -         | -         |        |
| Lighting   | LED 9W - Other/General                       | 15.0 | 525,914                             | 0.92                | 1,848,273                   |   | 483,841    | 483,841    | 67,738     | 67,738     | 67,738     | 67,738    | 67,738    | 67,738    |        |
| Lighting   | LED 9W - Restaurant                          | 10.5 | 396,198                             | 0.92                | 1,162,762                   |   | 364,502    | 364,502    | 51,030     | 51,030     | 51,030     | 51,030    | 51,030    | 51,030    |        |
| Lighting   | BR30 LED 8 W - Small Office                  | 15.0 | 285,178                             | 0.92                | 2,002,247                   |   | 262,363    | 262,363    | 262,363    | 262,363    | 262,363    | 69,043    | 69,043    | 69,043    |        |
| Hot Water  | Kitchen Aerator - Low Flow - Restaurant      | 9.0  | 1,267,303                           | 0.92                | 10,493,268                  |   | 1,165,919  | 1,165,919  | 1,165,919  | 1,165,919  | 1,165,919  | 1,165,919 | 1,165,919 | 1,165,919 |        |
| Hot Water  | Bath Aerator - Low Flow - Restaurant         | 9.0  | 1,025,219                           | 0.92                | 8,488,812                   |   | 943,201    | 943,201    | 943,201    | 943,201    | 943,201    | 943,201   | 943,201   | 943,201   |        |
| Hot Water  | Bath Aerator - Low Flow - Other/General      | 9.0  | 558,999                             | 0.92                | 4,628,509                   |   | 514,279    | 514,279    | 514,279    | 514,279    | 514,279    | 514,279   | 514,279   | 514,279   |        |
| Lighting   | LED 9W - Small Office                        | 15.0 | 105,435                             | 0.92                | 370,540                     |   | 97,000     | 97,000     | 13,580     | 13,580     | 13,580     | 13,580    | 13,580    | 13,580    |        |
| Consumer Electronics                             | Advanced Smart Strip - Tier 1 - Small Office | 7.0  | 94,398                              | 0.92                | 607,922                     |   | 86,846     | 86,846     | 86,846     | 86,846     | 86,846     | 86,846    | 86,846    | -         |        |
| Hot Water  | Bath Aerator - Low Flow - Small Office       | 9.0  | 135,479                             | 0.92                | 1,121,766                   |   | 124,641    | 124,641    | 124,641    | 124,641    | 124,641    | 124,641   | 124,641   | 124,641   |        |
| Hot Water  | Kitchen Aerator - Low Flow - Small Office    | 9.0  | 79,389                              | 0.92                | 657,341                     |   | 73,038     | 73,038     | 73,038     | 73,038     | 73,038     | 73,038    | 73,038    | 73,038    |        |
| Carryover  | PY9 & CY2018 Carryover                       | 14.0 | 512,297                             | 0.90                | 2,235,094                   |   | 461,067    | 461,067    | 258,207    | 258,207    | 258,207    | 56,088    | 56,088    | 56,088    |        |
| CY2019 Program Total Contribution to CPAS        |  |      | 11,182,598                          |                     | 68,730,607                  |   | 10,277,744 | 10,277,744 | 9,261,888  | 9,261,888  | 9,261,888  | 3,884,832 | 3,884,832 | 3,797,986 |        |
| Historic Program Total Contribution to CPAS†     |  |      |                                     |                     |                             | 3,092,129   | 3,092,129  | 3,029,760  | 2,611,153  | 2,611,153  | 1,848,364  | 1,756,863 | 1,700,540 | 1,699,447 |        |
| Program Total CPAS                               |  |      |                                     |                     |                             | 3,092,129   | 13,369,873 | 13,307,504 | 11,873,041 | 11,873,041 | 11,110,252 | 5,641,695 | 5,585,372 | 5,497,433 |        |
| CY2019 Program Incremental Expiring Savings\$    |  |      |                                     |                     |                             |   |            | -          | 1,015,856  | -          | -          | 5,377,056 | -         | 86,846    |        |
| Historic Program Incremental Expiring Savings†\$ |  |      |                                     |                     |                             |   |            | -          | 62,369     | 418,607    | -          | 762,789   | 91,501    | 56,323    | 1,093  |
| Program Total Incremental Expiring Savings\$     |  |      |                                     |                     |                             |   |            | -          | 62,369     | 1,434,463  | -          | 762,789   | 5,468,557 | 56,323    | 87,939 |



## ComEd Small Business Kits Impact Evaluation Report

| End Use Type   | Research Category                            | 2027             | 2028             | 2029             | 2030             | 2031             | 2032             | 2033             | 2034             | 2035 | 2036 | 2037 | 2038 |
|--|--|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------|------|------|------|
| Lighting   | PAR30 LED 14 W - Other/General               | 241,717          | 241,717          | 241,717          | 241,717          | 241,717          | 241,717          | 241,717          | -                | -    | -    | -    | -    |
| Lighting   | BR30 LED 8 W - Other/General                 | 347,612          | 347,612          | 347,612          | 347,612          | 347,612          | 347,612          | 347,612          | -                | -    | -    | -    | -    |
| Lighting   | PAR30 LED 14 W - Restaurant                  | 130,099          | 130,099          | 65,050           | -                | -                | -                | -                | -                | -    | -    | -    | -    |
| Hot Water  | Pre-rinse Spray Valve - Restaurant           | -                | -                | -                | -                | -                | -                | -                | -                | -    | -    | -    | -    |
| Lighting   | LED 9W - Other/General                       | 67,738           | 67,738           | 67,738           | 67,738           | 67,738           | 67,738           | 67,738           | -                | -    | -    | -    | -    |
| Lighting   | LED 9W - Restaurant                          | 51,030           | 51,030           | 25,515           | -                | -                | -                | -                | -                | -    | -    | -    | -    |
| Lighting   | BR30 LED 8 W - Small Office                  | 69,043           | 69,043           | 69,043           | 69,043           | 69,043           | 69,043           | 69,043           | -                | -    | -    | -    | -    |
| Hot Water  | Kitchen Aerator - Low Flow - Restaurant      | 1,165,919        | -                | -                | -                | -                | -                | -                | -                | -    | -    | -    | -    |
| Hot Water  | Bath Aerator - Low Flow - Restaurant         | 943,201          | -                | -                | -                | -                | -                | -                | -                | -    | -    | -    | -    |
| Hot Water  | Bath Aerator - Low Flow - Other/General      | 514,279          | -                | -                | -                | -                | -                | -                | -                | -    | -    | -    | -    |
| Lighting   | LED 9W - Small Office                        | 13,580           | 13,580           | 13,580           | 13,580           | 13,580           | 13,580           | 13,580           | -                | -    | -    | -    | -    |
| Consumer Electronics                                   | Advanced Smart Strip - Tier 1 - Small Office | -                | -                | -                | -                | -                | -                | -                | -                | -    | -    | -    | -    |
| Hot Water  | Bath Aerator - Low Flow - Small Office       | 124,641          | -                | -                | -                | -                | -                | -                | -                | -    | -    | -    | -    |
| Hot Water  | Kitchen Aerator - Low Flow - Small Office    | 73,038           | -                | -                | -                | -                | -                | -                | -                | -    | -    | -    | -    |
| Carryover  | PY9 & CY2018 Carryover                       | 56,088           | 56,088           | 53,583           | 51,078           | 51,078           | 51,078           | 51,078           | -                | -    | -    | -    | -    |
| <b>CY2019 Program Total Contribution to CPAS</b>       |  | <b>3,797,986</b> | <b>976,908</b>   | <b>883,838</b>   | <b>790,768</b>   | <b>790,768</b>   | <b>790,768</b>   | <b>790,768</b>   | -                | -    | -    | -    | -    |
| <b>Historic Program Total Contribution to CPAS†</b>    |  | <b>1,041,271</b> | <b>1,034,840</b> | <b>1,028,410</b> | <b>1,027,883</b> | <b>1,011,654</b> | <b>1,002,410</b> | <b>529,066</b>   | -                | -    | -    | -    | -    |
| <b>Program Total CPAS</b>                              |  | <b>4,839,257</b> | <b>2,011,748</b> | <b>1,912,248</b> | <b>1,818,651</b> | <b>1,802,422</b> | <b>1,793,178</b> | <b>1,319,834</b> | -                | -    | -    | -    | -    |
| <b>CY2019 Program Incremental Expiring Savings§</b>    |  | -                | <b>2,821,077</b> | <b>93,070</b>    | <b>93,070</b>    | -                | -                | -                | <b>790,768</b>   | -    | -    | -    | -    |
| <b>Historic Program Incremental Expiring Savings‡§</b> |  | <b>658,176</b>   | <b>6,431</b>     | <b>6,430</b>     | <b>527</b>       | <b>16,229</b>    | <b>9,244</b>     | <b>473,344</b>   | <b>529,066</b>   | -    | -    | -    | -    |
| <b>Program Total Incremental Expiring Savings§</b>     |  | <b>658,176</b>   | <b>2,827,508</b> | <b>99,500</b>    | <b>93,597</b>    | <b>16,229</b>    | <b>9,244</b>     | <b>473,344</b>   | <b>1,319,834</b> | -    | -    | -    | -    |

Note: The green highlighted cell shows program total first year electric savings (including direct electric savings and those converted from gas). The gray cells are blank, indicating no values or do not contribute to calculating CPAS in CY2019.

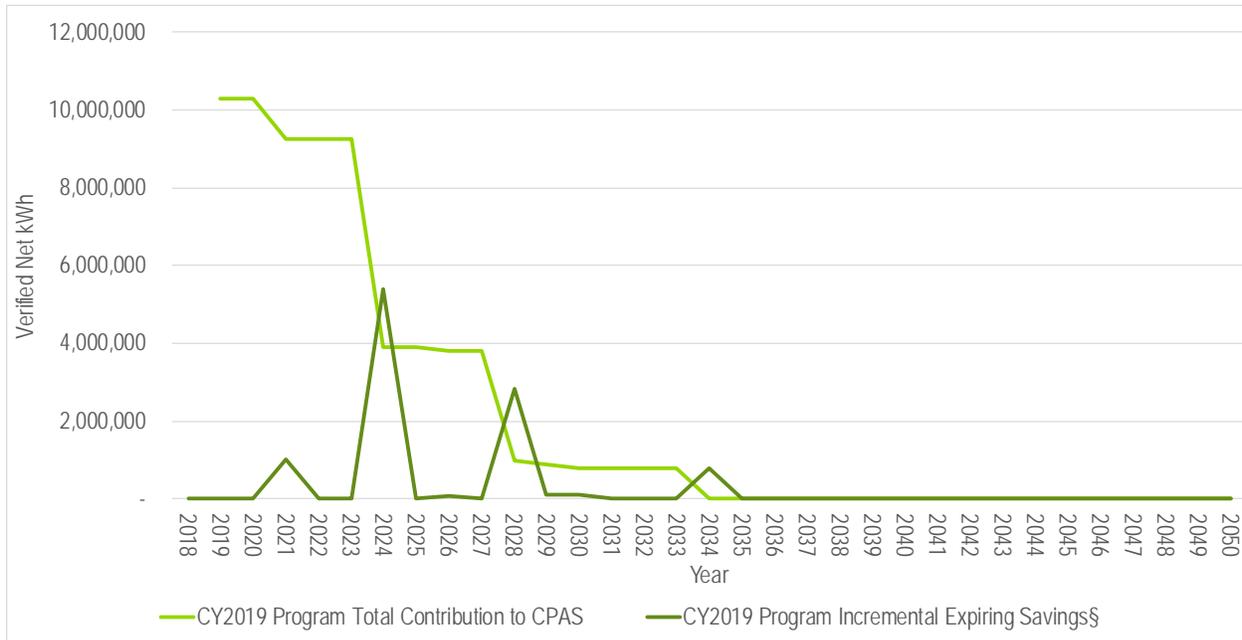
\* A deemed value. Source: ComEd Third-Party Programs' CY2019 Net-to-Gross Values Memo, May 1, 2019.

† Lifetime savings are the sum of CPAS savings through the EUL.

‡ Historic savings go back to CY2018.

§ Incremental expiring savings are equal to  $CPAS_{Y_{n-1}} - CPAS_{Y_n}$

Source: Evaluation team analysis

**Figure 4-1. Cumulative Persisting Annual Savings**


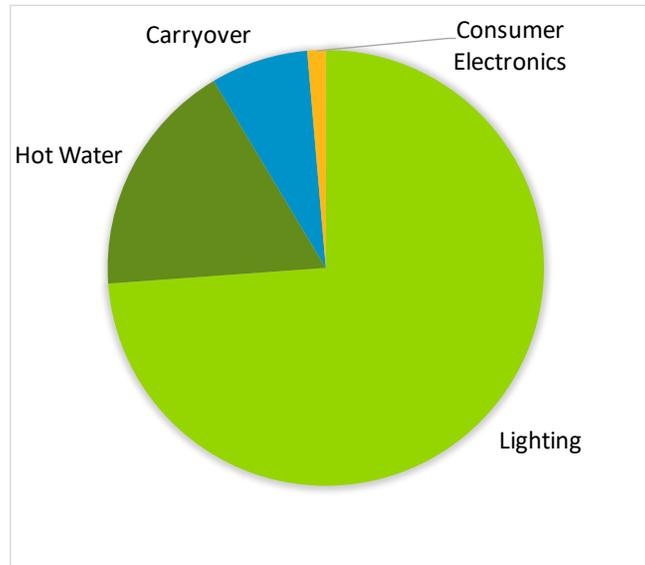
\* Expiring savings are equal to CPAS  $Y_{n-1}$  - CPAS  $Y_n$ .

Source: Evaluation team analysis

## 5. PROGRAM SAVINGS BY MEASURE

The program includes 15 measures as shown in the following tables. The PAR30 and BR30 LEDs contributed the most savings. Lighting measures in aggregate (PAR30, BR30, and 9W LEDs) are the largest source of savings for the SB Kits Program (see Figure 5-1). Pre-rinse spray valves contribute the most savings after gas savings were converted to electric energy savings.

The evaluation team calculated custom in-service rates (ISRs) and domestic hot water fuel splits using the participant telephone survey data provided by ComEd. All the other input parameters for the savings algorithms were from the appropriate C&I section of the Illinois TRM v7.0, or the Illinois TRM v7.0 Errata. The telephone survey was conducted by the program implementation contractor on a sample of program participants and the evaluation team reviewed the final summary results along with the survey questions. The custom ISR values the evaluation team calculated from the survey responses are higher than the values used in the ex ante calculations (where the ex ante calculations used CY2018 evaluation results), and the comparison of these values is detailed in Section 8 (Appendix 2) The discrepancies between the verified and ex ante observations in the tables below are due in large part to the use of custom ISR values and in part adding secondary electric savings due to water measures. The evaluation team applied the Energy Independence and Security Act (EISA) baseline shift for omnidirectional lamps starting in 2021, and for the BR30 and PAR30 lamps starting in 2024. Gross and net verified electric savings for the bathroom aerator, kitchen aerator, and pre-rinse spray valve measures include the secondary kWh savings derived from water supply and wastewater treatment savings. The ex ante electric savings did not include secondary kWh savings.

**Figure 5-1. Verified Net Savings by Measure – Electric**


Source: ComEd tracking data and evaluation team analysis

**Table 5-1. CY2019 Energy Savings by Measure – Electric**

| End Use Type         | Research Category                            | Ex Ante Gross Savings (kWh) | Verified Gross Realization Rate | Verified Gross Savings (kWh)* | NTG†      | Verified Net Savings (kWh) | EUL (years) |
|----------------------|--|-----------------------------|---------------------------------|-------------------------------|-----------|----------------------------|-------------|
| Lighting             | PAR30 LED 14 W - Other/General               | 1,170,961                   | 1.32                            | 1,541,047                     | 0.92      | 1,417,763                  | 15.0        |
| Lighting             | BR30 LED 8 W - Other/General                 | 978,127                     | 1.47                            | 1,435,790                     | 0.92      | 1,320,927                  | 15.0        |
| Lighting             | PAR30 LED 14 W - Restaurant                  | 651,251                     | 1.27                            | 829,437                       | 0.92      | 763,082                    | 10.5        |
| Hot Water            | Pre-rinse Spray Valve - Restaurant           | 686,275                     | 0.83                            | 568,084                       | 0.92      | 522,638                    | 5.0         |
| Lighting             | LED 9W - Other/General                       | 418,824                     | 1.26                            | 525,914                       | 0.92      | 483,841                    | 15.0        |
| Lighting             | LED 9W - Restaurant                          | 296,023                     | 1.34                            | 396,198                       | 0.92      | 364,502                    | 10.5        |
| Lighting             | BR30 LED 8 W - Small Office                  | 260,220                     | 1.10                            | 285,178                       | 0.92      | 262,363                    | 15.0        |
| Hot Water            | Kitchen Aerator - Low Flow - Restaurant      | 180,183                     | 1.52                            | 273,083                       | 0.92      | 251,236                    | 9.0         |
| Hot Water            | Bath Aerator - Low Flow - Restaurant         | 147,822                     | 1.52                            | 224,539                       | 0.92      | 206,576                    | 9.0         |
| Hot Water            | Bath Aerator - Low Flow - Other/General      | 68,624                      | 1.59                            | 109,033                       | 0.92      | 100,311                    | 9.0         |
| Lighting             | LED 9W - Small Office                        | 73,321                      | 1.44                            | 105,435                       | 0.92      | 97,000                     | 15.0        |
| Consumer Electronics | Advanced Smart Strip - Tier 1 - Small Office | 63,312                      | 1.49                            | 94,398                        | 0.92      | 86,846                     | 7.0         |
| Hot Water            | Bath Aerator - Low Flow - Small Office       | 12,881                      | 2.09                            | 26,930                        | 0.92      | 24,775                     | 9.0         |
| Hot Water            | Kitchen Aerator - Low Flow - Small Office    | 7,850                       | 1.96                            | 15,383                        | 0.92      | 14,152                     | 9.0         |
| Lighting             | PY9 & CY2018 Carryover                       | NR                          | NA                              | 512,297                       | 0.90      | 461,067                    | 14.0        |
| <b>Total</b>         |  | <b>5,015,674</b>            | <b>1.38</b>                     | <b>6,942,747</b>              | <b>NA</b> | <b>6,377,081</b>           | <b>NA</b>   |

NA = Not applicable

NR = Not reported

\*The gross values in this table differ from Table 3-1. The values in this table include gross carryover savings, whereas the values in Table 3-1 include net carryover only.

† A deemed value. Source: is to be found on the Illinois SAG web site here: [https://www.ilsag.info/ntg\\_2019](https://www.ilsag.info/ntg_2019).

Note: The savings in this table includes secondary electric energy (kWh) savings from water supply and wastewater treatment plants for measures claimed by ComEd.

Source: ComEd tracking data and evaluation team analysis

**Table 5-2. CY2019 Non-Coincident Demand Savings by Measure**

| End Use Type         | Research Category                            | Ex Ante Gross Non-Coincident Demand Reduction (kW) | Verified Gross Realization Rate | Verified Gross Non-Coincident Demand Reduction (kW)* | NTG†      | Verified Net Non-Coincident Demand Reduction (kW) |
|----------------------|--|--|---------------------------------|--|-----------|---|
| Lighting             | PAR30 LED 14 W - Other/General               | NR   | NA                              | 609.29   | 0.92      | 560.55  |
| Lighting             | BR30 LED 8 W - Other/General                 | NR   | NA                              | 567.68   | 0.92      | 522.26  |
| Lighting             | PAR30 LED 14 W - Restaurant                  | NR   | NA                              | 194.12   | 0.92      | 178.59  |
| Hot Water            | Pre-rinse Spray Valve - Restaurant           | NR   | NA                              | 0.00   | 0.92      | 0.00  |
| Lighting             | LED 9W - Other/General                       | NR   | NA                              | 207.93   | 0.92      | 191.30  |
| Lighting             | LED 9W - Restaurant                          | NR   | NA                              | 92.73  | 0.92      | 85.31   |
| Lighting             | BR30 LED 8 W - Small Office                  | NR   | NA                              | 108.99   | 0.92      | 100.27  |
| Hot Water            | Kitchen Aerator - Low Flow - Restaurant      | NR   | NA                              | 1,925.33   | 0.92      | 1,771.30  |
| Hot Water            | Bath Aerator - Low Flow - Restaurant         | NR   | NA                              | 1,550.88   | 0.92      | 1,426.81  |
| Hot Water            | Bath Aerator - Low Flow - Other/General      | NR   | NA                              | 1,848.88   | 0.92      | 1,700.97  |
| Lighting             | LED 9W - Small Office                        | NR   | NA                              | 40.30  | 0.92      | 37.07   |
| Consumer Electronics | Advanced Smart Strip - Tier 1 - Small Office | NR   | NA                              | 0.00   | 0.92      | 0.00  |
| Hot Water            | Bath Aerator - Low Flow - Small Office       | NR   | NA                              | 928.14   | 0.92      | 853.89  |
| Hot Water            | Kitchen Aerator - Low Flow - Small Office    | NR   | NA                              | 547.16   | 0.92      | 503.38  |
| Lighting             | PY9 & CY2018 Carryover                       | NR   | NA                              | 193.78   | 0.90      | 174.40  |
| <b>Total</b>         |  | <b>NR</b>  | <b>NA</b>                       | <b>8,815.21</b>                                      | <b>NA</b> | <b>8,106.11</b>                                   |

NA = Not applicable

NR = Not reported

\* The gross values in this table differ from Table 3-1. The values in this table include gross carryover savings, whereas the values in Table 3-1 include net carryover only.

†A deemed value. Source: is to be found on the Illinois SAG web site here: [https://www.ilsag.info/ntg\\_2019](https://www.ilsag.info/ntg_2019).

Source: ComEd tracking data and evaluation team analysis

**Table 5-3. CY2019 Summer Peak Demand Savings by Measure**

| End Use Type         | Research Category                            | Ex Ante Gross Peak Demand Reduction (kW) | Verified Gross Realization Rate | Verified Gross Peak Demand Reduction (kW)* | NTG†      | Verified Net Peak Demand Reduction (kW) |
|----------------------|--|--|---------------------------------|--|-----------|---|
| Lighting             | PAR30 LED 14 W - Other/General               | 281.11                                   | 1.43                            | 402.13                                     | 0.92      | 369.96                                  |
| Lighting             | BR30 LED 8 W - Other/General                 | 234.82                                   | 1.60                            | 374.67                                     | 0.92      | 344.69                                  |
| Lighting             | PAR30 LED 14 W - Restaurant                  | 95.35                                    | 1.38                            | 132.00                                     | 0.92      | 121.44                                  |
| Hot Water            | Pre-rinse Spray Valve - Restaurant           | 0.00                                     | NA                              | 0.00                                       | 0.92      | 0.00                                    |
| Lighting             | LED 9W - Other/General                       | 100.55                                   | 1.36                            | 137.24                                     | 0.92      | 126.26                                  |
| Lighting             | LED 9W - Restaurant                          | 43.34                                    | 1.45                            | 63.05                                      | 0.92      | 58.01                                   |
| Lighting             | BR30 LED 8 W - Small Office                  | 47.58                                    | 1.19                            | 56.67                                      | 0.92      | 52.14                                   |
| Hot Water            | Kitchen Aerator - Low Flow - Restaurant      | 18.06                                    | 1.43                            | 25.80                                      | 0.92      | 23.74                                   |
| Hot Water            | Bath Aerator - Low Flow - Restaurant         | 14.82                                    | 1.40                            | 20.78                                      | 0.92      | 19.12                                   |
| Hot Water            | Bath Aerator - Low Flow - Other/General      | 16.49                                    | 1.43                            | 23.67                                      | 0.92      | 21.77                                   |
| Lighting             | LED 9W - Small Office                        | 13.41                                    | 1.56                            | 20.95                                      | 0.92      | 19.28                                   |
| Consumer Electronics | Advanced Smart Strip - Tier 1 - Small Office | 0.00                                     | NA                              | 0.00                                       | 0.92      | 0.00                                    |
| Hot Water            | Bath Aerator - Low Flow - Small Office       | 3.16                                     | 1.88                            | 5.94                                       | 0.92      | 5.46                                    |
| Hot Water            | Kitchen Aerator - Low Flow - Small Office    | 1.93                                     | 1.82                            | 3.50                                       | 0.92      | 3.22                                    |
| Lighting             | PY9 & CY2018 Carryover                       | NR                                       | NA                              | 121.79                                     | 0.90      | 109.61                                  |
| <b>Total</b>         |  | <b>870.62</b>                            | <b>1.59</b>                     | <b>1,388.20</b>                            | <b>NA</b> | <b>1,274.71</b>                         |

NA = Not applicable

NR = Not reported

\* The gross values in this table differ from Table 3-1. The values in this table include gross carryover savings, whereas the values in Table 3-1 include net carryover only.

† A deemed value. Source: is to be found on the Illinois SAG web site here: [https://www.ilsag.info/ntg\\_2019](https://www.ilsag.info/ntg_2019).

Source: ComEd tracking data and evaluation team analysis

**Table 5-4. CY2019 Energy Savings by Measure – Gas**

| End Use Type                            | Research Category                            | Ex Ante Gross Savings (Therms) | Verified Gross Realization Rate | Verified Gross Savings (Therms) | NTG*      | Verified Net Savings (Therms) | EUL (years) |
|---|--|--------------------------------|---------------------------------|---------------------------------|-----------|-------------------------------|-------------|
| Lighting                                | PAR30 LED 14 W - Other/General               | -10,279                        | 0.00                            | 0                               | 0.92      | 0                             | 15.0        |
| Lighting                                | BR30 LED 8 W - Other/General                 | -9,605                         | 0.00                            | 0                               | 0.92      | 0                             | 15.0        |
| Lighting                                | PAR30 LED 14 W - Restaurant                  | -5,845                         | 0.00                            | 0                               | 0.92      | 0                             | 10.5        |
| Hot Water                               | Pre-rinse Spray Valve - Restaurant           | 60,332                         | 1.03                            | 62,178                          | 0.92      | 57,204                        | 5.0         |
| Lighting                                | LED 9W - Other/General                       | -3,677                         | 0.00                            | 0                               | 0.92      | 0                             | 15.0        |
| Lighting                                | LED 9W - Restaurant                          | -1,771                         | 0.00                            | 0                               | 0.92      | 0                             | 10.5        |
| Lighting                                | BR30 LED 8 W - Small Office                  | -1,875                         | 0.00                            | 0                               | 0.92      | 0                             | 15.0        |
| Hot Water                               | Kitchen Aerator - Low Flow - Restaurant      | 9,562                          | 3.55                            | 33,921                          | 0.92      | 31,207                        | 9.0         |
| Hot Water                               | Bath Aerator - Low Flow - Restaurant         | 7,843                          | 3.48                            | 27,318                          | 0.92      | 25,132                        | 9.0         |
| Hot Water                               | Bath Aerator - Low Flow - Other/General      | 6,750                          | 2.27                            | 15,352                          | 0.92      | 14,124                        | 9.0         |
| Lighting                                | LED 9W - Small Office                        | -528                           | 0.00                            | 0                               | 0.92      | 0                             | 15.0        |
| Consumer Electronics                    | Advanced Smart Strip - Tier 1 - Small Office | 0                              | NA                              | 0                               | 0.92      | 0                             | 7.0         |
| Hot Water                               | Bath Aerator - Low Flow - Small Office       | 705                            | 5.25                            | 3,703                           | 0.92      | 3,407                         | 9.0         |
| Hot Water                               | Kitchen Aerator - Low Flow - Small Office    | 860                            | 2.54                            | 2,184                           | 0.92      | 2,009                         | 9.0         |
| Lighting                                | PY9 & CY2018 Carryover                       | NR                             | NA                              | 0                               | NA        | 0                             | NA          |
| <b>Total Therms</b>                     |  | <b>52,472</b>                  | <b>2.76</b>                     | <b>144,655</b>                  | <b>NA</b> | <b>133,083</b>                | <b>NA</b>   |
| <b>Total kWh Converted From Therms†</b> |  | <b>1,537,954</b>               | <b>2.76</b>                     | <b>4,239,851</b>                | <b>NA</b> | <b>3,900,663</b>              | <b>NA</b>   |

NA = Not applicable

NR = Not reported

\* A deemed value. Source: is to be found on the Illinois SAG web site here: [https://www.ilsag.info/ntg\\_2019](https://www.ilsag.info/ntg_2019).

† Gas savings converted to kWh by multiplying therms \* 29.31 (which is based on 100,000 Btu/therm and 3,412 Btu/kWh).

Source: ComEd tracking data and evaluation team analysis

**Table 5-5. CY2019 Energy Savings by Measure – Total Combining Electricity and Gas**

| End Use Type         | Research Category                            | Ex Ante Gross Savings (kWh) | Verified Gross Realization Rate | Verified Gross Savings (kWh)* | NTG†      | Verified Net Savings (kWh) |
|----------------------|--|-----------------------------|---------------------------------|-------------------------------|-----------|----------------------------|
| Lighting             | PAR30 LED 14 W - Other/General               | 869,671                     | 1.77                            | 1,541,047                     | 0.92      | 1,417,763                  |
| Lighting             | BR30 LED 8 W - Other/General                 | 696,594                     | 2.06                            | 1,435,790                     | 0.92      | 1,320,927                  |
| Lighting             | PAR30 LED 14 W - Restaurant                  | 479,947                     | 1.73                            | 829,437                       | 0.92      | 763,082                    |
| Hot Water            | Pre-rinse Spray Valve - Restaurant           | 2,454,608                   | 0.97                            | 2,390,514                     | 0.92      | 2,199,273                  |
| Lighting             | LED 9W - Other/General                       | 311,060                     | 1.69                            | 525,914                       | 0.92      | 483,841                    |
| Lighting             | LED 9W - Restaurant                          | 244,113                     | 1.62                            | 396,198                       | 0.92      | 364,502                    |
| Lighting             | BR30 LED 8 W - Small Office                  | 205,250                     | 1.39                            | 285,178                       | 0.92      | 262,363                    |
| Hot Water            | Kitchen Aerator - Low Flow - Restaurant      | 460,455                     | 2.75                            | 1,267,303                     | 0.92      | 1,165,919                  |
| Hot Water            | Bath Aerator - Low Flow - Restaurant         | 377,706                     | 2.71                            | 1,025,219                     | 0.92      | 943,201                    |
| Hot Water            | Bath Aerator - Low Flow - Other/General      | 266,463                     | 2.10                            | 558,999                       | 0.92      | 514,279                    |
| Lighting             | LED 9W - Small Office                        | 57,832                      | 1.82                            | 105,435                       | 0.92      | 97,000                     |
| Consumer Electronics | Advanced Smart Strip - Tier 1 - Small Office | 63,312                      | 1.49                            | 94,398                        | 0.92      | 86,846                     |
| Hot Water            | Bath Aerator - Low Flow - Small Office       | 33,558                      | 4.04                            | 135,479                       | 0.92      | 124,641                    |
| Hot Water            | Kitchen Aerator - Low Flow - Small Office    | 33,059                      | 2.40                            | 79,389                        | 0.92      | 73,038                     |
| Lighting             | PY9 & CY2018 Carryover                       | NR                          | NA                              | 512,297                       | 0.90      | 461,067                    |
|                      | <b>Total‡</b>                                | <b>6,553,628</b>            | <b>1.71</b>                     | <b>11,182,598</b>             | <b>NA</b> | <b>10,277,744</b>          |

NA = Not applicable

NR = Not reported

\* The gross values in this table differ from Table 3-1. The values in this table include gross carryover savings, whereas the values in Table 3-1 include net carryover only.

† A deemed value. Source: is to be found on the Illinois SAG web site here: [https://www.ilsag.info/ntg\\_2019](https://www.ilsag.info/ntg_2019).

‡The total includes the electric equivalent of the total therms.

Source: *ComEd tracking data and evaluation team analysis*

The SB Kits Program includes water-conservation measures that produce secondary kWh savings from water supply and wastewater treatment. Table 5-6 shows the secondary measure level savings. The savings in this table are included within the electricity savings in the previous tables in this section.

**Table 5-6. Secondary Energy Savings from Water Reduction by Measure – Electric**

| End Use Type         | Research Category                            | Ex Ante Annual Water Savings (gallons) | Ex Ante Gross Savings (kWh) | Verified Gross Realization Rate (RR <sub>water</sub> ) | Verified Gross Savings (kWh) | NTG*      | Verified Net Savings (kWh) |
|----------------------|--|--|-----------------------------|--|------------------------------|-----------|----------------------------|
| Lighting             | PAR30 LED 14 W - Other/General               | NA                                     | NA                          | NA   | NA                           | 0.92      | NA                         |
| Lighting             | BR30 LED 8 W - Other/General                 | NA                                     | NA                          | NA   | NA                           | 0.92      | NA                         |
| Lighting             | PAR30 LED 14 W - Restaurant                  | NA                                     | NA                          | NA   | NA                           | 0.92      | NA                         |
| Hot Water            | Pre-rinse Spray Valve - Restaurant           | NR                                     | NA                          | NA   | 44,145                       | 0.92      | 40,613                     |
| Lighting             | LED 9W - Other/General                       | NA                                     | NA                          | NA   | NA                           | 0.92      | NA                         |
| Lighting             | LED 9W - Restaurant                          | NA                                     | NA                          | NA   | NA                           | 0.92      | NA                         |
| Lighting             | BR30 LED 8 W - Small Office                  | NA                                     | NA                          | NA   | NA                           | 0.92      | NA                         |
| Hot Water            | Kitchen Aerator - Low Flow - Restaurant      | NR                                     | NA                          | NA   | 36,268                       | 0.92      | 33,366                     |
| Hot Water            | Bath Aerator - Low Flow - Restaurant         | NR                                     | NA                          | NA   | 33,781                       | 0.92      | 31,078                     |
| Hot Water            | Bath Aerator - Low Flow - Other/General      | NR                                     | NA                          | NA   | 18,438                       | 0.92      | 16,963                     |
| Lighting             | LED 9W - Small Office                        | NA                                     | NA                          | NA   | NA                           | 0.92      | NA                         |
| Consumer Electronics | Advanced Smart Strip - Tier 1 - Small Office | NR                                     | NA                          | NA   | 0                            | 0.92      | 0                          |
| Hot Water            | Bath Aerator - Low Flow - Small Office       | NR                                     | NA                          | NA   | 4,654                        | 0.92      | 4,282                      |
| Hot Water            | Kitchen Aerator - Low Flow - Small Office    | NR                                     | NA                          | NA   | 2,251                        | 0.92      | 2,071                      |
| Lighting             | PY9 & CY2018 Carryover                       | NA                                     | NA                          | NA   | NA                           | NA        | NA                         |
| <b>Total</b>         |  | <b>0</b>                               | <b>0</b>                    | <b>NA</b>  | <b>139,537</b>               | <b>NA</b> | <b>128,374</b>             |

NA = Not applicable

NR = Not reported

Note: The savings in this table reflects only secondary electric energy (kWh) savings from water supply and wastewater treatment plants for measures claimed by ComEd, not those claimed by gas utilities.

\* A deemed value. Source: is to be found on the Illinois SAG web site here: [https://www.ilsag.info/ntg\\_2019](https://www.ilsag.info/ntg_2019).

Source: ComEd tracking data and evaluation team analysis

## 6. IMPACT ANALYSIS FINDINGS AND RECOMMENDATIONS

### 6.1 Impact Parameter Estimates

Table 6-1 details all the custom and deemed inputs used for calculating the energy and demand savings for each measure, as well as their source. The evaluation team calculated savings for each measure based on the savings algorithms noted in the TRM v7.0. The evaluation team calculated the custom inputs using the telephone participant survey data supplied by the implementer. The lifetime energy savings are estimated by multiplying the verified savings by the effective useful life for each measure, except for LED lamp measures. The evaluation team adjusts the annual savings for the LED measures following the guidance in TRM v7.0.

**Table 6-1. Savings Parameters**

| Measure                | Custom Input Parameters                                      | Deemed Input Parameters  | Deemed* Input Data Source                       |
|------------------------|--|--|---|
| 9W LEDs                | WattsEE, ISR   | Wattbase, Hours, WHFe, WHFd, CF, NTG <sup>†</sup>  | TRM v7.0* – Section 4.5.4                       |
| BR30 8W LEDs           | WattsEE, ISR   | Wattbase, Hours, WHFe, WHFd, CF, NTG <sup>†</sup>  | TRM v7.0 – Section 4.5.4                        |
| PAR30 14W LEDs         | WattsEE, ISR   | Wattbase, Hours, WHFe, WHFd, CF, NTG <sup>†</sup>  | TRM v7.0 – Section 4.5.4                        |
| Bathroom Aerators      | ISR, Usage, %Electric DHW, %FossilDHW, %CookCounty, %NotCook | GPM_base, GPM_low, EPG_electric, CF, Hours, EWaterCook, EWaterNotCook, NTG <sup>†</sup>      | TRM v7.0 – Section 4.3.2, TRM v7.0 Errata Memo  |
| Kitchen Aerators       | ISR, Usage, %Electric DHW, %FossilDHW, %CookCounty, %NotCook | GPM_base, GPM_low, EPG_electric, CF, Hours, EWaterCook, EWaterNotCook, NTG <sup>†</sup>      | TRM v7.0 – Section 4.3.3, TRM v7.0 Errata Memo  |
| Pre-Rinse Spray Valves | ISR, FLOee, %Electric DHW, %FossilDHW, %CookCounty, %NotCook | Tout, Tin, EEF_Elec, FLObase, HOURSDay, DAYYear, EWaterCook, EWaterNotCook, NTG <sup>†</sup> | TRM v7.0 – Section 4.2.11, TRM v7.0 Errata Memo |
| Advanced Power Strips  | ISR  | Verified Gross kWh, Hours, CF, NTG <sup>†</sup>  | TRM v7.0 – Section 4.8.7                        |

\* TRM is the State of Illinois Technical Reference Manual version 7.0 from <http://www.ilsag.info/technical-reference-manual.html>.

†The NTG values can be found on the Illinois SAG web site here: [https://www.ilsag.info/ntg\\_2019](https://www.ilsag.info/ntg_2019).

## 6.2 CY2020 Carryover Savings Estimates

The evaluation team calculated the CY2020 carryover savings estimates using the TRM (v6, v7, and v8) and the CY2018 and CY2019 Impact Evaluation reports. Currently, all these data sources are available and thus it is possible to estimate the gross and net carryover energy savings that the evaluation team recommends for CY2020. The energy and demand savings from these CY2018 and CY2019 late installed bulbs are calculated based on the following parameters:

- Delta Watts – Verified savings estimate from the year of installation (source: TRM v8)
- Quantity – Number of bulbs from the year of distribution (source: Impact Evaluation Reports)
- HOU and Peak CF – Verified savings estimate from the year of installation (source: TRM v8)
- Energy and Demand IE – Verified savings estimate from the year of installation (source: TRM v8)
- Installation Rate – Verified savings estimate from the year of distribution (CY2018 and CY2019 program survey data). The Guidehouse team subtracted the custom ISR from the lifetime ISR found in the TRM (v6.0 for CY2018 and v7.0 for CY2019) and split the remaining installs between the second and third years using the same ratio found in the TRM.
- NTG – Evaluation research from the year of distribution (source: Impact Evaluation Reports)

Table 6-2 shows that in CY2020 a total of 3,469 bulbs distributed during CY2018 and CY2019 are expected to be installed within ComEd's service territory. The table below provide the gross and net energy and demand savings from these carryover bulbs attributable to CY2020. Total CY2020 net carryover savings are estimated to be 493,006 kWh, 177 demand kW, and 113 peak demand kW.

**Table 6-2. CY2020 Verified Savings Carryover Estimate**

| CY2020 Verified Savings Carryover Estimate      | CY2018 Bulbs | CY2019 Bulbs | CY2020 Carryover |
|---|--------------|--------------|------------------|
| Carryover Bulbs Installed During CY2019         | 2,055        | 1,414        | 3,469            |
| Average Delta Watts                             | 29.2         | 43.7         | 35.1             |
| Average Annual Hours of Use                     | 3,200        | 3,516        | 3,328.8          |
| Energy Interactive Effects                      | 1.257        | 1.212        | 1.239            |
| Demand Interactive Effects                      | 1.464        | 1.404        | 1.439            |
| Summer Peak Load Coincidence Factor             | 0.637        | 0.625        | 0.632            |
| Carryover Gross Energy Savings (kWh)            | 237,182      | 255,824      | 493,006          |
| Carryover Gross Demand Savings (kW)             | 89           | 88           | 177              |
| Carryover Gross Summer Peak Demand Savings (kW) | 57           | 55           | 113              |
| Net-to-Gross Ratio                              | 0.90         | 0.92         | 0.91             |
| Carryover Net Energy Savings (kWh)              | 213,464      | 235,358      | 448,822          |
| Carryover Net Demand Savings (kW)               | 80           | 81           | 161              |
| Carryover Net Summer Peak Demand Savings (kW)   | 52           | 51           | 103              |
| Effective Useful Life                           | 14.5         | 12.7         | 13.7             |

Source: ComEd tracking data and evaluation team analysis

## 6.3 Other Impact Findings and Recommendations

The evaluation team developed several recommendations based on findings from the CY2019 evaluation.

### 6.3.1 Program Level

**Finding 1.** The evaluation team verified that three customer names and addresses in the program tracking data belonged to commercial business located outside of Illinois. All three customers received general kits. The evaluation team removed these three kits from the verified quantities of measures.

**Recommendation 1.** Carefully check that the zip codes entered during kit requests are in Illinois.

**Finding 2.** The program tracking data from CY2019 tracked net peak demand savings for each kit instead of gross peak demand.

**Recommendation 2.** The evaluation team recommends that the values recorded in the program tracking data are gross energy, demand, and natural gas savings for the SB Kits Program.

**Finding 3.** The program tracking data from CY2019 used ex ante therm estimates which were inconsistent with the number of measures included in each kit. The values used in the program tracking system assumed one of each applicable measure was included in the kit. The program implementer calculations correctly calculated the therm savings for each measure.

**Recommendation 3.** The evaluation team recommends verifying that the appropriate quantity of each measure distributed in the different types of kits is included when calculating the therm savings for each kit.

**Finding 4.** The ex ante savings for the SB Kits Program did not include savings for carryover from PY9 and CY2018 distributed lamps.

**Recommendation 4.** The evaluation team recommends tracking carryover savings on an ongoing basis and including carryover savings estimates in the ex ante energy and demand savings.

**Finding 5.** The ISRs for all measures from CY2019 were higher than was seen during CY2018. On average, the ISR improved by 23 percentage points from the previous year. Increases in the ISR values are the most significant reason for the increase in energy, demand, and natural gas savings for the SB Kits Program across all measures.

**Recommendation 5.** The evaluation team recommends monitoring the installation rates during CY2020 to evaluate their consistency. CY2019 was the first year the program was expanded from rural areas to ComEd’s entire service territory. The evaluation team will provide an updated ISR analysis during the CY2020 reporting to potentially recommend an update to add kit ISRs to the TRM.

**Table 6-3. ISR Comparison from CY2018 to CY2019**

| Measure                       | CY2018 ISR   |            |                 | CY2019 ISR   |            |                 | Change (CY2018-PY9) |            |                 |
|-------------------------------|--------------|------------|-----------------|--------------|------------|-----------------|---------------------|------------|-----------------|
|                               | Small Office | Restaurant | Other / General | Small Office | Restaurant | Other / General | Small Office        | Restaurant | Other / General |
| 9W LED                        | 53%          | 61%        | 72%             | 76%          | 82%        | 90%             | 23%                 | 21%        | 18%             |
| 8W BR30                       | NA           | NA         | 59%             | 72%          | NA         | 87%             | NA                  | NA         | 28%             |
| 14W PAR30                     | NA           | NA         | NA              | NA           | 84%        | 87%             | NA                  | NA         | NA              |
| Bath Aerator - Low Flow       | 32%          | 49%        | 43%             | 74%          | 78%        | 82%             | 42%                 | 29%        | 39%             |
| Kitchen Aerator - Low Flow    | 32%          | 49%        | NA              | 72%          | 80%        | NA              | 39%                 | 31%        | NA              |
| Pre-rinse Spray Valve         | NA           | 45%        | NA              | NA           | 65%        | NA              | NA                  | 20%        | NA              |
| Advanced Power Strip - Tier 1 | 55%          | NA         | NA              | 83%          | NA         | NA              | 28%                 | NA         | NA              |

NA = Not applicable

Source: ComEd tracking and customer survey data and evaluation team analysis

### 6.3.2 Bathroom Aerator, Kitchen Aerator, Pre-Rinse Spray Valve

**Finding 6.** The ex ante calculations used the custom fuel split for domestic hot water fuels calculated during the CY2018 evaluation. The verified savings used the survey data collected during CY2019 to update the fuel split percentages. Customers who knew their fuel type were allocated to electric and natural gas accordingly. Customers who responded they “didn’t know” or had “unknown” fuel types were allocated to electric or natural gas following the fuel split found in the TRM v7.0 (0.16 electric and 0.84 natural gas). This analysis resulted in an updated hot water split of 0.24 for electric and 0.76 for gas, which the evaluation team used to calculate the verified savings.

**Recommendation 6.** The evaluation team recommends monitoring the survey data to determine if the domestic hot water fuel split should be updated during the program year. The evaluation team will continue to use the survey responses to determine the verified savings. Examining the survey responses during the program year would allow the program implementer the ability to better align the ex ante to the verified savings during evaluation.

**Finding 7.** The tracking data provides the gallons of water saved but does not calculate the secondary electric energy (kWh) savings from water supply and wastewater treatment plants for measures claimed by ComEd. The additional verified savings increased the gross savings realization rates for the bathroom aerator, kitchen aerator, and pre-rinse spray valve measures.

**Recommendation 7.** The tracking data should produce the eligible secondary ex ante kWh savings from gallons of water reported in the tracking data using the TRM guidelines and algorithm on the conversion of gallons of water to kWh.

### 6.3.3 9W LED, 8W BR30, 14W PAR30

**Finding 8.** The verified savings accounted for heating penalty reduction from electric resistance heating interactive effects due to projects or measures installed in electrically heated buildings. This approach is consistent with the TRM v7.0 instructions. The heating system type was not recorded in the tracking data submitted for evaluation.

**Recommendation 8.** The tracking data should include a field to track the whether the facility heating system is electric or gas. Also, considering that the evaluation process is now reporting electric heating penalties, we recommend that the program tracks electric heating penalties for affected measures and account for those in ex ante gross and net savings.

## 7. APPENDIX 1. IMPACT ANALYSIS DETAIL

The tables below show the comparison between the inputs assumptions that were used by the evaluation team and the implementation contractor in the ex ante and verified calculations for each measure.

**Table 7-1. 9W LED Custom and Deemed Values Comparison**

| Value, Guidehouse                    | Value, Implementer | Variable  | Source         | Deemed / Custom | Discrepancy |
|--------------------------------------|--------------------|-----------|----------------|-----------------|-------------|
| <b>9W LED Office</b>                 |                    |           |                |                 |             |
| 29                                   | 29                 | Wattsbase | TRM 4.5.4      | Deemed          |             |
| 9                                    | 9                  | WattsEE   | Specifications | Actual          |             |
| 0.76                                 | 0.53               | ISR       | Survey         | Custom          | Yes         |
| 3,088                                | 3,088              | Hours     | TRM 4.5.4      | Deemed          |             |
| 1.11                                 | 1.11               | WHFe      | TRM 4.5.4      | Deemed          |             |
| 1.31                                 | 1.31               | WHFd      | TRM 4.5.4      | Deemed          |             |
| 0.52                                 | 0.52               | CF        | TRM 4.5.4      | Deemed          |             |
| 0.016                                | 0.016              | IFTherms  | TRM 4.5.4      | Deemed          |             |
| <b>9W LED Restaurant</b>             |                    |           |                |                 |             |
| 29                                   | 29                 | Wattsbase | TRM 4.5.4      | Deemed          |             |
| 9                                    | 9                  | WattsEE   | Specifications | Actual          |             |
| 0.82                                 | 0.61               | ISR       | Survey         | Custom          | Yes         |
| 4,784                                | 4,784              | Hours     | TRM 4.5.4      | Deemed          |             |
| 1.17                                 | 1.17               | WHFe      | TRM 4.5.4      | Deemed          |             |
| 1.31                                 | 1.31               | WHFd      | TRM 4.5.4      | Deemed          |             |
| 0.68                                 | 0.68               | CF        | TRM 4.5.4      | Deemed          |             |
| 0.021                                | 0.021              | IFTherms  | TRM 4.5.4      | Deemed          |             |
| <b>9W LED Low-Use Small Business</b> |                    |           |                |                 |             |
| 29                                   | 29                 | Wattsbase | TRM 4.5.4      | Deemed          |             |
| 9                                    | 9                  | WattsEE   | Specifications | Actual          |             |
| 0.90                                 | 0.72               | ISR       | Survey         | Custom          | Yes         |
| 2,954                                | 2,954              | Hours     | TRM 4.5.4      | Deemed          |             |
| 1.31                                 | 1.31               | WHFe      | TRM 4.5.4      | Deemed          |             |
| 1.53                                 | 1.53               | WHFd      | TRM 4.5.4      | Deemed          |             |
| 0.66                                 | 0.66               | CF        | TRM 4.5.4      | Deemed          |             |
| 0.023                                | 0.023              | IFTherms  | TRM 4.5.4      | Deemed          |             |

Source: ComEd tracking data and evaluation team analysis

**Table 7-2. 8W BR30 Custom and Deemed Values Comparison**

| Value, Guidehouse                         | Value, Implementer | Variable  | Source         | Deemed / Custom | Discrepancy |
|---|--------------------|-----------|----------------|-----------------|-------------|
| <b>8W BR30 LED Office</b>                 |                    |           |                |                 |             |
| 65  | 65                 | Wattsbase | TRM 4.5.4      | Deemed          | Yes         |
| 8   | 8                  | WattsEE   | Specifications | Actual          |             |
| 0.72                                      | 0.66               | ISR       | Survey         | Custom          | Yes         |
| 3,088                                     | 3,088              | Hours     | TRM 4.5.4      | Deemed          |             |
| 1.11                                      | 1.11               | WHFe      | TRM 4.5.4      | Deemed          |             |
| 1.31                                      | 1.31               | WHFd      | TRM 4.5.4      | Deemed          |             |
| 0.52                                      | 0.52               | CF        | TRM 4.5.4      | Deemed          |             |
| 0.016                                     | 0.016              | IFTherms  | TRM 4.5.4      | Deemed          |             |
| <b>8W BR30 LED Low-Use Small Business</b> |                    |           |                |                 |             |
| 65  | 65                 | Wattsbase | TRM 4.5.4      | Deemed          | Yes         |
| 8   | 8                  | WattsEE   | Specifications | Actual          |             |
| 0.87                                      | 0.59               | ISR       | Survey         | Custom          | Yes         |
| 2,954                                     | 2,954              | Hours     | TRM 4.5.4      | Deemed          |             |
| 1.31                                      | 1.31               | WHFe      | TRM 4.5.4      | Deemed          |             |
| 1.53                                      | 1.53               | WHFd      | TRM 4.5.4      | Deemed          |             |
| 0.66                                      | 0.66               | CF        | TRM 4.5.4      | Deemed          |             |
| 0.023                                     | 0.023              | IFTherms  | TRM 4.5.4      | Deemed          |             |

Source: ComEd tracking data and evaluation team analysis

**Table 7-3. 14W PAR30 Custom and Deemed Values Comparison**

| Value, Guidehouse                           | Value, Implementer | Variable  | Source         | Deemed / Custom | Discrepancy |
|---|--------------------|-----------|----------------|-----------------|-------------|
| <b>14W PAR30 LED Restaurant</b>             |                    |           |                |                 |             |
| 75  | 75                 | Wattsbase | TRM 4.5.4      | Deemed          |             |
| 14  | 14                 | WattsEE   | Specifications | Actual          |             |
| 0.84  | 0.66               | ISR       | Survey         | Custom          | Yes         |
| 4,784                                       | 4,784              | Hours     | TRM 4.5.4      | Deemed          |             |
| 1.17  | 1.17               | WHFe      | TRM 4.5.4      | Deemed          |             |
| 1.31  | 1.31               | WHFd      | TRM 4.5.4      | Deemed          |             |
| 0.68  | 0.68               | CF        | TRM 4.5.4      | Deemed          |             |
| 0.021                                       | 0.021              | IFTherms  | TRM 4.5.4      | Deemed          |             |
| <b>14W PAR30 LED Low-Use Small Business</b> |                    |           |                |                 |             |
| 75  | 75                 | Wattsbase | TRM 4.5.4      | Deemed          |             |
| 14  | 14                 | WattsEE   | Specifications | Actual          |             |
| 0.87  | 0.72               | ISR       | Survey         | Custom          | Yes         |
| 2,954                                       | 2,954              | Hours     | TRM 4.5.4      | Deemed          |             |
| 1.31  | 1.31               | WHFe      | TRM 4.5.4      | Deemed          |             |
| 1.53  | 1.53               | WHFd      | TRM 4.5.4      | Deemed          |             |
| 0.66  | 0.66               | CF        | TRM 4.5.4      | Deemed          |             |
| 0.023                                       | 0.023              | IFTherms  | TRM 4.5.4      | Deemed          |             |

Source: ComEd tracking data and evaluation team analysis

**Table 7-4. Bathroom Aerator Custom and Deemed Values Comparison**

| Value, Guidehouse                                     | Value, Implementer | Variable      | Source          | Deemed/Custom | Discrepancy |
|---|--------------------|---------------|-----------------|---------------|-------------|
| <b>Bathroom Faucet Aerator Office</b>                 |                    |               |                 |               |             |
| 0.23  | 0.31               | %Electric DHW | Survey          | Custom        | Yes         |
| 0.77  | 0.68               | %FossilDHW    | Survey          | Custom        | Yes         |
| 1.39  | 1.39               | GPM_base      | TRM 4.3.1       | Deemed        |             |
| 0.94  | 0.94               | GPM_low       | TRM 4.3.1       | Deemed        |             |
| 2,500   | 2,500              | Usage         | TRM 4.3.1       | Deemed        |             |
| 0.0795  | 0.0795             | EPG_electric  | TRM 4.3.1       | Deemed        |             |
| 0.00397   | 0.00397            | EPG_gas       | TRM 4.3.1       | Deemed        |             |
| 0.74  | 0.32               | ISR           | Survey          | Custom        | Yes         |
| 0.0064  | 0.0064             | CF            | TRM 4.3.1       | Deemed        |             |
| 24  | 24                 | Hours         | TRM 4.3.1       | Deemed        |             |
| 0.57  | NA                 | %CookCounty   | Survey          | Custom        | Yes         |
| 0.43  | NA                 | %NotCook      | Survey          | Custom        | Yes         |
| 2,937   | NA                 | EWaterCook    | TRM v7.0 Errata | Deemed        | Yes         |
| 5,010   | NA                 | EWaterNotCook |                 | Deemed        | Yes         |
| <b>Bathroom Faucet Aerator Restaurant</b>             |                    |               |                 |               |             |
| 0.26  | 0.32               | %Electric DHW | Survey          | Custom        | Yes         |
| 0.74  | 0.68               | %FossilDHW    | Survey          | Custom        | Yes         |
| 1.39  | 1.39               | GPM_base      | TRM 4.3.1       | Deemed        |             |
| 0.94  | 0.94               | GPM_low       | TRM 4.3.1       | Deemed        |             |
| 12,675  | 12,675             | Usage         | TRM 4.3.1       | Deemed        |             |
| 0.0795  | 0.0795             | EPG_electric  | TRM 4.3.1       | Deemed        |             |
| 0.00397   | 0.00397            | EPG_gas       | TRM 4.3.1       | Deemed        |             |
| 0.78  | 0.49               | ISR           | Survey          | Custom        | Yes         |
| 0.0134  | 0.0134             | CF            | TRM 4.3.1       | Deemed        |             |
| 123   | 123                | Hours         | TRM 4.3.1       | Deemed        |             |
| 0.66  | NA                 | %CookCounty   | Survey          | Custom        | Yes         |
| 0.34  | NA                 | %NotCook      | Survey          | Custom        | Yes         |
| 2,937   | NA                 | EWaterCook    | TRM v7.0 Errata | Deemed        | Yes         |
| 5,010   | NA                 | EWaterNotCook |                 | Deemed        | Yes         |
| <b>Bathroom Faucet Aerator Low-use Small Business</b> |                    |               |                 |               |             |
| 0.23  | 0.33               | %Electric DHW | Survey          | Custom        | Yes         |
| 0.77  | 0.65               | %FossilDHW    | Survey          | Custom        | Yes         |
| 1.39  | 1.39               | GPM_base      | TRM 4.3.2       | Deemed        |             |
| 0.94  | 0.94               | GPM_low       | TRM 4.3.2       | Deemed        |             |
| 5,000   | 5,000              | Usage         | TRM 4.3.2       | Deemed        |             |
| 0.0795  | 0.0795             | EPG_electric  | TRM 4.3.2       | Deemed        |             |
| 0.00397   | 0.00397            | EPG_gas       | TRM 4.3.2       | Deemed        |             |
| 0.82  | 0.43               | ISR           | Survey          | Custom        | Yes         |
| 0.0128  | 0.0128             | CF            | TRM 4.3.2       | Deemed        |             |
| 49  | 49                 | Hours         | TRM 4.3.2       | Deemed        |             |
| 0.64  | NA                 | %CookCounty   | Survey          | Custom        | Yes         |
| 0.36  | NA                 | %NotCook      | Survey          | Custom        | Yes         |
| 2,937   | NA                 | EWaterCook    | TRM v7.0 Errata | Deemed        | Yes         |
| 5,010   | NA                 | EWaterNotCook |                 | Deemed        | Yes         |

NA = Not applicable

Source: ComEd tracking data and evaluation team analysis

**Table 7-5. Kitchen Aerator Custom and Deemed Values Comparison**

| Value, Guidehouse                        | Value, Implementer | Variable      | Source          | Deemed / Custom | Discrepancy |
|--|--------------------|---------------|-----------------|-----------------|-------------|
| <b>Kitchen Faucet Aerator Office</b>     |                    |               |                 |                 |             |
| 0.23                                     | 0.31               | %Electric DHW | Survey          | Custom          | Yes         |
| 0.77                                     | 0.68               | %FossilDHW    | Survey          | Custom          | Yes         |
| 1.39                                     | 1.39               | GPM_base      | TRM 4.3.2       | Deemed          |             |
| 0.94                                     | 0.94               | GPM_low       | TRM 4.3.2       | Deemed          |             |
| 2,500                                    | 2,500              | Usage         | TRM 4.3.2       | Deemed          |             |
| 0.0969                                   | 0.0969             | EPG_electric  | TRM 4.3.2       | Deemed          |             |
| 0.00484                                  | 0.00484            | EPG_gas       | TRM 4.3.2       | Deemed          |             |
| 0.72                                     | 0.32               | ISR           | Survey          | Custom          | Yes         |
| 0.0064                                   | 0.0064             | CF            | TRM 4.3.2       | Deemed          |             |
| 24                                       | 24                 | Hours         | TRM 4.3.2       | Deemed          |             |
| 0.57                                     | NA                 | %CookCounty   | Survey          | Custom          | Yes         |
| 0.43                                     | NA                 | %NotCook      | Survey          | Custom          | Yes         |
| 2,937                                    | NA                 | EWaterCook    | TRM v7.0 Errata | Deemed          | Yes         |
| 5,010                                    | NA                 | EWaterNotCook |                 | Deemed          | Yes         |
| <b>Kitchen Faucet Aerator Restaurant</b> |                    |               |                 |                 |             |
| 0.26                                     | 0.32               | %Electric DHW | Survey          | Custom          | Yes         |
| 0.74                                     | 0.68               | %FossilDHW    | Survey          | Custom          | Yes         |
| 1.39                                     | 1.39               | GPM_base      | TRM 4.3.2       | Deemed          |             |
| 0.94                                     | 0.94               | GPM_low       | TRM 4.3.2       | Deemed          |             |
| 12,675                                   | 12,675             | Usage         | TRM 4.3.2       | Deemed          |             |
| 0.0969                                   | 0.0969             | EPG_electric  | TRM 4.3.2       | Deemed          |             |
| 0.00484                                  | 0.00484            | EPG_gas       | TRM 4.3.2       | Deemed          |             |
| 0.80                                     | 0.49               | ISR           | Survey          | Custom          | Yes         |
| 0.0134                                   | 0.0134             | CF            | TRM 4.3.2       | Deemed          |             |
| 123.00                                   | 123                | Hours         | TRM 4.3.2       | Deemed          |             |
| 0.57                                     | NA                 | %CookCounty   | Survey          | Custom          | Yes         |
| 0.43                                     | NA                 | %NotCook      | Survey          | Custom          | Yes         |
| 2,937                                    | NA                 | EWaterCook    | TRM v7.0 Errata | Deemed          | Yes         |
| 5,010                                    | NA                 | EWaterNotCook |                 | Deemed          | Yes         |

Source: ComEd tracking data and evaluation team analysis

**Table 7-6. PRSV Custom and Deemed Values Comparison**

| Value, Guidehouse | Value, Implementer | Variable      | Source         | Deemed / Custom | Discrepancy |
|-------------------|--------------------|---------------|----------------|-----------------|-------------|
| 0.26              | 0.32               | %Electric DHW | TRM 4.2.11     | Deemed          |             |
| 0.74              | 0.68               | %FossilDHW    | TRM 4.2.11     | Deemed          |             |
| 124.1             | 124.1              | Tout          | TRM 4.2.11     | Deemed          |             |
| 54.1              | 54.1               | Tin           | TRM 4.2.11     | Deemed          |             |
| 0.97              | 0.97               | EFF_Elec      | TRM 4.2.11     | Deemed          |             |
| 0.8               | 0.8                | EFF_Gas       | TRM 4.2.11     | Deemed          |             |
| 1.9               | 1.9                | FLObase       | TRM 4.2.11     | Deemed          |             |
| 1.1               | 1.1                | FLOee         | Specifications | Actual          |             |
| 1.25              | 1.25               | HOURSday      | TRM 4.2.11     | Deemed          |             |
| 312               | 312                | DAYSyear      | TRM 4.2.11     | Deemed          |             |
| 1                 | 1                  | FLAG          | TRM 4.2.11     | Deemed          |             |
| 0.65              | 0.45               | ISR           | Survey         | Custom          | Yes         |
| 0.57              | NA                 | %CookCounty   | Survey         | Custom          | Yes         |
| 0.43              | NA                 | %NotCook      | Survey         | Custom          | Yes         |

|       |    |               |                 |        |     |
|-------|----|---------------|-----------------|--------|-----|
| 2,937 | NA | EWaterCook    | TRM v7.0 Errata | Deemed | Yes |
| 5,010 | NA | EWaterNotCook |                 | Deemed | Yes |

NA = Not applicable

Source: ComEd tracking data and evaluation team analysis

**Table 7-7. APS Custom and Deemed Values Comparison**

| Value, Guidehouse | Value, Implementer | Variable       | Source    | Deemed / Custom | Discrepancy |
|-------------------|--------------------|----------------|-----------|-----------------|-------------|
| 0.0315            | 0.0315             | K_wkday        | TRM 4.8.7 | Deemed          |             |
| 0.00617           | 0.00617            | KW_wkend       | TRM 4.8.7 | Deemed          |             |
| 106               | 106                | Hrs_wkay       | TRM 4.8.7 | Deemed          |             |
| 62                | 62                 | Hrs_wkend      | TRM 4.8.7 | Deemed          |             |
| 50                | 50                 | Hrs_wkday-open | TRM 4.8.7 | Deemed          |             |
| 0                 | 0                  | Hrs_wkend-open | TRM 4.8.7 | Deemed          |             |
| 52.2              | 52.2               | Weeks per year | TRM 4.8.7 | Deemed          |             |
| 0.83              | 0.56               | ISR            | Survey    | Custom          | Yes         |

Source: ComEd tracking data and evaluation team analysis



## 8. APPENDIX 2. TOTAL RESOURCE COST DETAIL

Table 8-1 shows the Total Resource Cost (TRC) cost-effectiveness analysis inputs available at the time of finalizing this impact evaluation report. Additional required cost data (e.g., measure costs, program level incentive and non-incentive costs) are not included in this table and will be provided to the evaluation team later.

**Table 8-1. Total Resource Cost Savings Summary**

| End Use Type         | Research Category                            | Units | Quantity  | EUL (years)* | ER Flag† | Verified Gross Electric Energy Savings (kWh) | Verified Gross Peak Demand Reduction (kW) | Verified Gross Gas Savings (Therms) | Gross Heating Penalty (kWh) | Gross Heating Penalty (Therms) | NTG (kWh) | NTG (Therms) | NTG (Therms) | Verified Net Electric Energy Savings (kWh) | Verified Net Peak Demand Reduction (kW) | Verified Net Gas Savings (Therms) | Net Heating Penalty (kWh) | Net Heating Penalty (Therms) |
|----------------------|--|-------|-----------|--------------|----------|--|---|-------------------------------------|-----------------------------|--------------------------------|-----------|--------------|--------------|--|---|-----------------------------------|---------------------------|------------------------------|
| Lighting             | PAR30 LED 14 W - Other/General               | Lamp  | 7,510     | 15.0         | No       | 1,541,047                                    | 402.13                                    | 0                                   | 0                           | -27,057                        | 0.92      | 0.92         | 0.92         | 1,417,763                                  | 369.96                                  | 0                                 | 0                         | -24,892                      |
| Lighting             | BR30 LED 8 W - Other/General                 | Lamp  | 7,510     | 15.0         | No       | 1,435,790                                    | 374.67                                    | 0                                   | 0                           | -25,209                        | 0.92      | 0.92         | 0.92         | 1,320,927                                  | 344.69                                  | 0                                 | 0                         | -23,192                      |
| Lighting             | PAR30 LED 14 W - Restaurant                  | Lamp  | 2,890     | 10.5         | No       | 829,437                                      | 132.00                                    | 0                                   | 0                           | -14,887                        | 0.92      | 0.92         | 0.92         | 763,082                                    | 121.44                                  | 0                                 | 0                         | -13,696                      |
| Hot Water            | Pre-rinse Spray Valve - Restaurant           | Each  | 1,445     | 5.0          | No       | 523,940                                      | 0.00                                      | 62,178                              | 0                           | 0                              | 0.92      | 0.92         | 0.92         | 482,025                                    | 0.00                                    | 57,204                            | 0                         | 0                            |
| Lighting             | LED 9W - Other/General                       | Lamp  | 7,510     | 15.0         | No       | 525,914                                      | 137.24                                    | 0                                   | 0                           | -9,234                         | 0.92      | 0.92         | 0.92         | 483,841                                    | 126.26                                  | 0                                 | 0                         | -8,495                       |
| Lighting             | LED 9W - Restaurant                          | Lamp  | 4,335     | 10.5         | No       | 396,198                                      | 63.05                                     | 0                                   | 0                           | -7,111                         | 0.92      | 0.92         | 0.92         | 364,502                                    | 58.01                                   | 0                                 | 0                         | -6,542                       |
| Lighting             | BR30 LED 8 W - Small Office                  | Lamp  | 2,018     | 15.0         | No       | 285,178                                      | 56.67                                     | 0                                   | 0                           | -4,111                         | 0.92      | 0.92         | 0.92         | 262,363                                    | 52.14                                   | 0                                 | 0                         | -3,782                       |
| Hot Water            | Kitchen Aerator - Low Flow - Restaurant      | Each  | 2,890     | 9.0          | No       | 236,815                                      | 25.80                                     | 33,921                              | 0                           | 0                              | 0.92      | 0.92         | 0.92         | 217,870                                    | 23.74                                   | 31,207                            | 0                         | 0                            |
| Hot Water            | Bath Aerator - Low Flow - Restaurant         | Each  | 2,890     | 9.0          | No       | 190,759                                      | 20.78                                     | 27,318                              | 0                           | 0                              | 0.92      | 0.92         | 0.92         | 175,498                                    | 19.12                                   | 25,132                            | 0                         | 0                            |
| Hot Water            | Bath Aerator - Low Flow - Other/General      | Each  | 3,755     | 9.0          | No       | 90,595                                       | 23.67                                     | 15,352                              | 0                           | 0                              | 0.92      | 0.92         | 0.92         | 83,348                                     | 21.77                                   | 14,124                            | 0                         | 0                            |
| Lighting             | LED 9W - Small Office                        | Lamp  | 2,018     | 15.0         | No       | 105,435                                      | 20.95                                     | 0                                   | 0                           | -1,520                         | 0.92      | 0.92         | 0.92         | 97,000                                     | 19.28                                   | 0                                 | 0                         | -1,398                       |
| Consumer Electronics | Advanced Smart Strip - Tier 1 - Small Office | Each  | 1,009     | 7.0          | No       | 94,398                                       | 0.00                                      | 0                                   | 0                           | 0                              | 0.92      | 0.92         | 0.92         | 86,846                                     | 0.00                                    | 0                                 | 0                         | 0                            |
| Hot Water            | Bath Aerator - Low Flow - Small Office       | Each  | 2,018     | 9.0          | No       | 22,275                                       | 5.94                                      | 3,703                               | 0                           | 0                              | 0.92      | 0.92         | 0.92         | 20,493                                     | 5.46                                    | 3,407                             | 0                         | 0                            |
| Hot Water            | Kitchen Aerator - Low Flow - Small Office    | Each  | 1,009     | 9.0          | No       | 13,132                                       | 3.50                                      | 2,184                               | 0                           | 0                              | 0.92      | 0.92         | 0.92         | 12,081                                     | 3.22                                    | 2,009                             | 0                         | 0                            |
| Carryover            | PY9 & CY2018 Carryover                       | Total | 4,659     | 14.0         | No       | 512,297                                      | 121.79                                    | 0                                   | 0                           | -8,095                         | 0.9       | 0.9          | 0.9          | 461,067                                    | 109.61                                  | 0                                 | 0                         | -7,285                       |
| <b>Total</b>         |  |       | <b>NA</b> |              |          | <b>6,803,210</b>                             | <b>1,388</b>                              | <b>144,655</b>                      | <b>0</b>                    | <b>-97,222</b>                 | <b>NA</b> | <b>NA</b>    | <b>NA</b>    | <b>6,248,708</b>                           | <b>1,275</b>                            | <b>133,083</b>                    | <b>0</b>                  | <b>-89,283</b>               |

NA = Not applicable

Note: To avoid double counting, the verified gross kWh and net kWh used in the TRC analysis excludes secondary energy savings from water reduction measures. Table 9-1 represents the kWh savings from Table 5-1 minus those shown in Table 5-6)

\* The total of the EUL column is the weighted average measure life (WAML) and is calculated as the sum product of EUL and measure savings divided by total program savings.

† Early Replacement (ER) measures are flagged as YES, otherwise a NO is indicated in the column.

‡ The EUL for this measure varies over time. See the CPAS tables (Table 4-1 to Table 4-3).

Source: ComEd tracking data and evaluation team analysis