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# Plan 2 Summary Report for Ameren Illinois Company's ActOnEnergy Program Electric Program Years 4-6 and Gas Program Years 1-3

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CADMUS

NAVIGANT



**Michael's**Energy

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## 1. Legislative Mandate for Independent Evaluation

The Illinois Public Utilities Act (Act), Section 8-103 (f) (7) and Section 8-104 (f) (8) mandates that AIC:

*“Provide for an annual independent evaluation of the performance of the cost-effectiveness of the utility's portfolio of measures and the Department's portfolio of measures, as well as a full review of the 3-year results of the broader net program impacts and, to the extent practical, for adjustment of the measures on a going-forward basis as a result of the evaluations. The resources dedicated to evaluation shall not exceed 3% of portfolio resources in any given year.”*

In providing this report, AIC has met the Act's requirement for a review of 3-year results.

## 2. Executive Summary

This report documents the performance of Ameren Illinois Company’s (AIC) ActOnEnergy portfolio of energy efficiency programs for residential and commercial and industrial (C&I) customers. The results presented within focus on portfolio energy impacts for the second plan period (Plan 2), which ran from June 1, 2011 through May 31, 2014. This period corresponds to electric program year four through six (EPY4-EPY6) and gas program year one through three (GPY1-GPY3). Appendices to this report contain annual integrated results including process findings and recommendations.

The suite of energy efficiency programs offered by AIC has remained consistent across the Plan 2 period. The C&I portfolio consists of three main programs—Standard, Custom and Retro Commissioning—all of which continued from Plan 1. Within the residential portfolio, AIC offered nine programs for the majority of Plan 2. These programs included Lighting, HVAC, Behavioral Modification, Appliance Recycling, Multifamily, Home Performance with ENERGY STAR (HPwES), Moderate Income, ENERGY STAR New Homes, and Energy Efficient Products.<sup>1</sup> Table 1 presents the annual first year savings for the energy efficiency portfolio of programs.

**Table 1. ActOnEnergy Portfolio Achieved Impacts by Program Year**

| Program Year | Ex Post Gross Impacts <sup>a</sup> |           | Ex Post Net Impacts <sup>a</sup> |           |
|--------------|------------------------------------|-----------|----------------------------------|-----------|
|              | MWh                                | Therms    | MWh                              | Therms    |
| EPY4/GPY1    | 437,383                            | 6,442,499 | 353,664                          | 5,771,819 |
| EPY5/GPY2    | 442,640                            | 7,152,274 | 366,726                          | 6,914,780 |
| EPY6/GPY3    | 469,046                            | 7,237,298 | 304,625                          | 6,296,042 |

<sup>a</sup> Note that the impacts presented within this report are first year savings.

A number of key programs have played a particularly important role in ensuring the achievement of energy savings goals. In particular, both the C&I Standard and Custom programs have provided a steady and significant stream of savings to the portfolio. Further, the Lighting and Behavioral Modification programs have made important contributions to electric savings goals, while the HVAC Program helped AIC to garner gas savings. The evaluation team provides detailed findings for each program in the subsequent sections of this report.

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<sup>1</sup> AIC provided 8-104 funding for a small number of gas saving measures through the Illinois Power Agency (IPA) Energy Efficiency Kits Program in PY6.

### **3. Overarching Evaluation Approach**

Over the second program cycle (Plan 2), the evaluation of AIC's energy efficiency portfolio involved a wide range of evaluation activities including onsite Measurement and Verification (M&V), as well as participant and nonparticipant research among AIC's residential and commercial customer base.

In terms of determining program impacts, the team implemented a combination of approaches including:

- Application of the Illinois Statewide Technical Reference Manual (IL-TRM) and engineering analysis for prescriptive measures
- Onsite measurement and verification (M&V) for custom measures, as well as metering of installed standard equipment
- Analysis of customer energy bills also referred to as billing analysis

Table 2 summarizes where we performed each type of activity and in which years. Note that in some cases, the evaluation team used these methodologies to provide inputs for the IL-TRM update process as opposed to annual program impacts for goal attainment.



**Table 2. Summary of Impact Approach by Program and Year**

| Sector      | Program               | Impact Methodology   |               |               |               |               |               |                  |               |               |
|-------------|-----------------------|----------------------|---------------|---------------|---------------|---------------|---------------|------------------|---------------|---------------|
|             |                       | Engineering Analysis |               |               | Onsite M&V    |               |               | Billing Analysis |               |               |
|             |                       | EPY4/<br>GPY1        | EPY5/<br>GPY2 | EPY6/<br>GPY3 | EPY4/<br>GPY1 | EPY5/<br>GPY2 | EPY6/<br>GPY3 | EPY4/<br>GPY1    | EPY5/<br>GPY2 | EPY6/<br>GPY3 |
| Residential | Lighting              | ●                    | ●             | ●             | ●             | ●             |               |                  |               |               |
|             | HVAC                  | ●                    | ●             | ●             | ◊             |               |               |                  |               |               |
|             | Behavioral Mod        |                      |               |               |               |               |               | ●                | ●             | ●             |
|             | HPwES                 | ●                    | ●             | ●             |               |               |               | ◊                | ◊             |               |
|             | Appliance Recycling   | ●                    | ●             | ●             |               |               |               |                  |               |               |
|             | Multifamily           | ●                    | ●             | ●             |               | ●             |               |                  |               |               |
|             | Moderate Income       | ●                    | ●             | ●             |               |               |               |                  |               |               |
|             | Efficient Products    | ●                    | ●             | ●             |               |               |               |                  |               |               |
|             | ENERGY STAR New Homes | ●                    | ●             | ●             |               |               |               |                  |               |               |
|             | Efficiency Kits       | N/A                  | N/A           | ●             |               |               |               |                  |               |               |
| Business    | Standard              | ●                    | ●             | ●             | ●             | ●             | ●             |                  |               |               |
|             | Custom                | ●                    | ●             | ●             | ●             | ●             | ●             |                  |               |               |
|             | Retro-Commissioning   | ●                    | ●             | ●             |               |               | ●             |                  |               |               |

|   |                                   |
|---|-----------------------------------|
| ● | Gross impact calculation activity |
| ◊ | TRM update activity               |

Overarching Evaluation Approach

In addition to determining program impacts, the evaluation team gathered process and attribution-related information through participant, non-participant and trade ally interviews as summarized in Table 3.

**Table 3. Summary of Process Evaluation Activities by Program and Year**

| Evaluation Activity                        | Program Year | Residential                          |      |                 |       |                     |             |                 |                    |                       |                        | Business               |                |                     |
|--------------------------------------------|--------------|--------------------------------------|------|-----------------|-------|---------------------|-------------|-----------------|--------------------|-----------------------|------------------------|------------------------|----------------|---------------------|
|                                            |              | Lighting                             | HVAC | Behavioral Mod. | HPwES | Appliance Recycling | Multifamily | Moderate Income | Efficient Products | ENERGY STAR New Homes | Energy Efficiency Kits | Standard               | Custom         | Retro-Commissioning |
| Program Material Review                    | All          | Conducted for all programs each year |      |                 |       |                     |             |                 |                    |                       |                        |                        |                |                     |
| Program Manager and Implementer Interviews | All          | Conducted for all programs each year |      |                 |       |                     |             |                 |                    |                       |                        |                        |                |                     |
| Contractor/Program Ally Interviews         | EPY4/GPY1    |                                      |      |                 | •     | •                   |             | •               |                    |                       |                        | •                      | •              | •                   |
|                                            | EPY5/GPY2    |                                      | •    |                 |       |                     |             |                 |                    |                       |                        |                        |                |                     |
|                                            | EPY6/GPY3    |                                      | •    |                 |       |                     |             |                 |                    |                       |                        | •                      | •              | •                   |
| Participant Survey                         | EPY4/GPY1    |                                      | •    |                 | •     | •                   |             | •               | •                  |                       |                        | •                      | • <sup>b</sup> | •                   |
|                                            | EPY5/GPY2    | • <sup>a</sup>                       | •    |                 |       |                     | •           |                 |                    |                       |                        | •                      | •              | -                   |
|                                            | EPY6/GPY3    | • <sup>a</sup>                       | •    | •               | •     |                     | •           |                 |                    | •                     |                        | •                      | •              | •                   |
| Nonparticipant Survey                      | EPY4/GPY1    |                                      |      |                 |       |                     |             |                 |                    |                       |                        |                        |                |                     |
|                                            | EPY5/GPY2    |                                      |      |                 |       |                     |             |                 |                    |                       |                        | Overall C&I Assessment |                |                     |
|                                            | EPY6/GPY3    |                                      |      |                 |       |                     |             |                 |                    |                       |                        |                        |                |                     |

<sup>a</sup> For the Lighting Program, this included in-store intercepts.

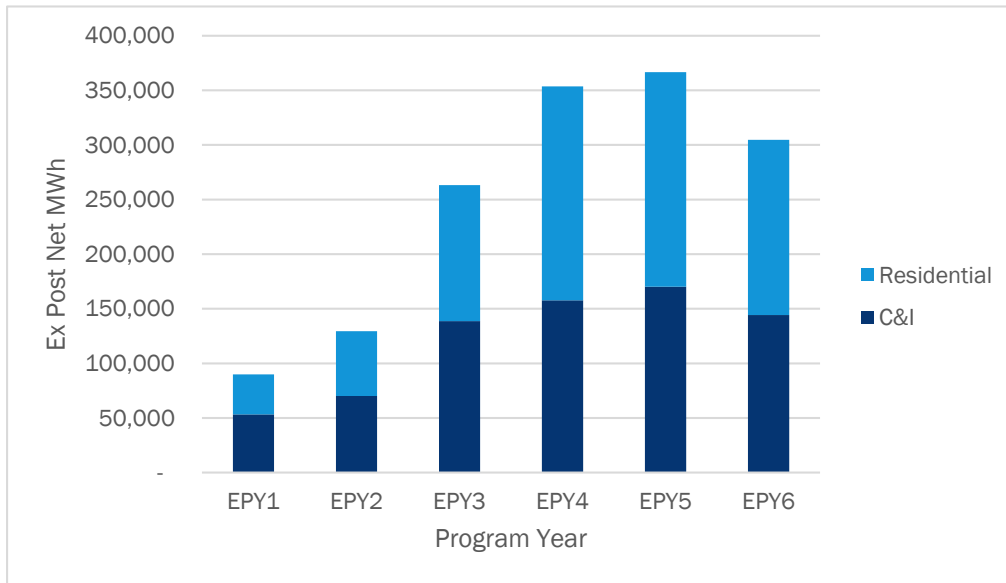
<sup>b</sup> The evaluation team conducted interviews with staffing grant participants only.

## 4. High-Level Impact Findings

### 4.1 Portfolio Performance

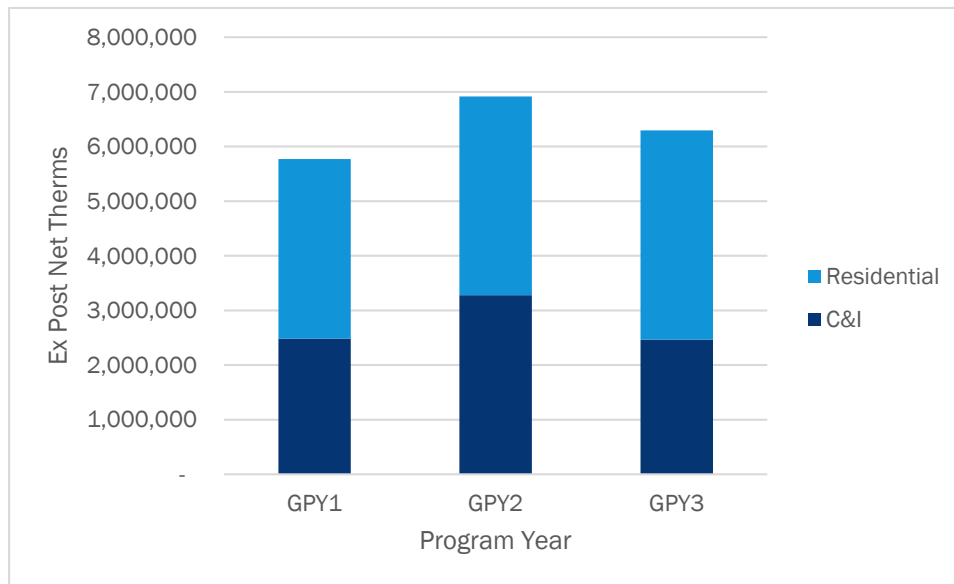
As shown in Figure 1, net electric savings increased significantly in the first two years of Plan 2 compared to the Plan 1 period, which included EPY1-EPY3. Further, the contribution of the residential sector grew notably while the commercial sector continued to achieve electric savings consistent with what was seen in EPY3.

Figure 1. First Year Ex Post Net Electric Savings by Sector and Program Year



Since AIC began offering gas programs in EPY4—also referred to as gas program year 1 (GPY1)—savings have been relatively consistent around six million therms, with the exception of an increase in gas savings within the commercial sector during GPY2 (see Figure 2).

Figure 2. First Year Ex Post Net Gas Savings by Sector and Program Year



The AIC energy efficiency portfolio has consistently exceeded filed goals for both electric and gas savings. As shown in Table 4, performance has ranged from 105% to 149% of the electric goals.

Table 4. Portfolio Electric Savings Goals and Impacts by Program Year

| Program Year | Electric Energy Savings Goals (MWh) <sup>a</sup> | % Increase in Goal over Prior Year | Ex-Post Net Electric Impacts (MWh) | % Increase in Savings over Prior Year | Percent of Electric Savings Goal <sup>b</sup> |
|--------------|--------------------------------------------------|------------------------------------|------------------------------------|---------------------------------------|-----------------------------------------------|
| EPY1         | 62,399                                           | N/A                                | 89,955                             | N/A                                   | 144%                                          |
| EPY2         | 123,483                                          | 98%                                | 129,748                            | 44%                                   | 105%                                          |
| EPY3         | 179,013                                          | 45%                                | 262,568                            | 102%                                  | 147%                                          |
| EPY4         | 273,534                                          | 53%                                | 353,664                            | 35%                                   | 129%                                          |
| EPY5         | 245,871                                          | -10%                               | 366,726                            | 4%                                    | 149%                                          |
| EPY6         | 216,495                                          | -12%                               | 304,625                            | -17%                                  | 141%                                          |

<sup>a</sup> Source: AIC Plan 1 Residential and Business Summary Reports; PY4, PY5 and PY6 Integrated Reports.

<sup>b</sup> Percent of goal=ex post net impacts ÷ goal.

In terms of gas savings, Table 5 shows the achievement of savings equal to between 128% and 159% of savings goals.

Table 5. Portfolio Gas Savings Goals and Impacts by Program Year

| Program Year | Gas Energy Savings Goals (Therms) <sup>a</sup> | % Increase in Goal over Prior Year | Ex-Post Net Gas Impacts (Therms) | % Increase in Savings over Prior Year | Percent of Gas Savings Goal <sup>b</sup> |
|--------------|------------------------------------------------|------------------------------------|----------------------------------|---------------------------------------|------------------------------------------|
| GPY1         | 3,703,119                                      | -                                  | 5,771,819                        | -                                     | 156%                                     |
| GPY2         | 4,355,658                                      | 15%                                | 6,914,780                        | 17%                                   | 159%                                     |
| GPY3         | 4,906,659                                      | 11%                                | 6,296,042                        | -10%                                  | 128%                                     |

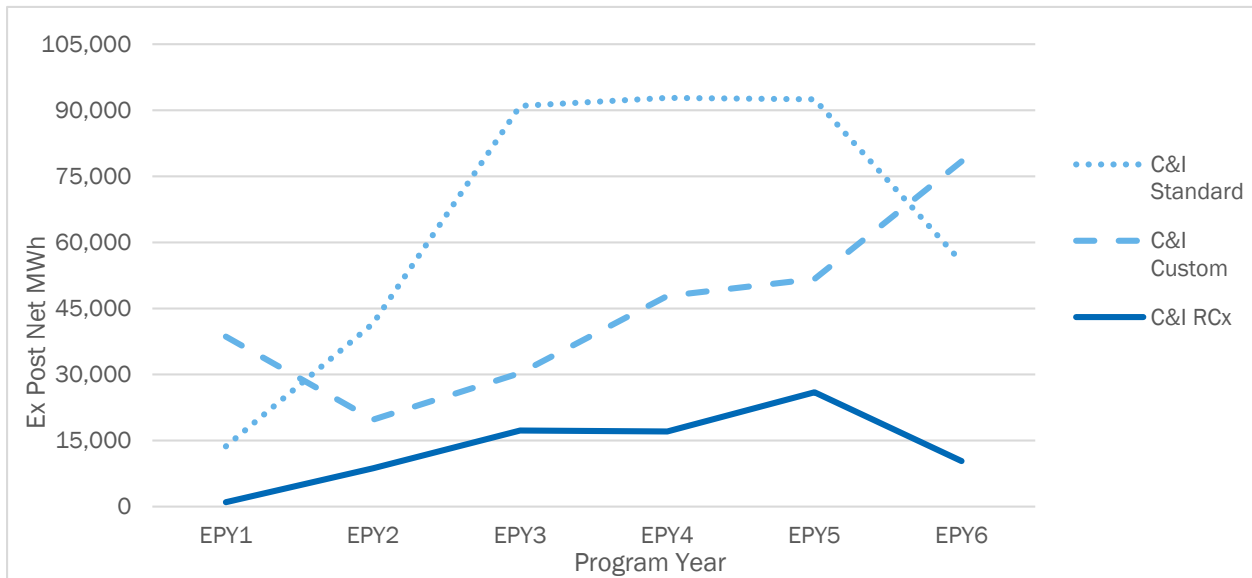
<sup>a</sup> Source: PY4, PY5 and PY6 Integrated Reports.

<sup>b</sup> Percent of goal=ex post net impacts ÷ goal.

## 4.2 C&I Program Performance

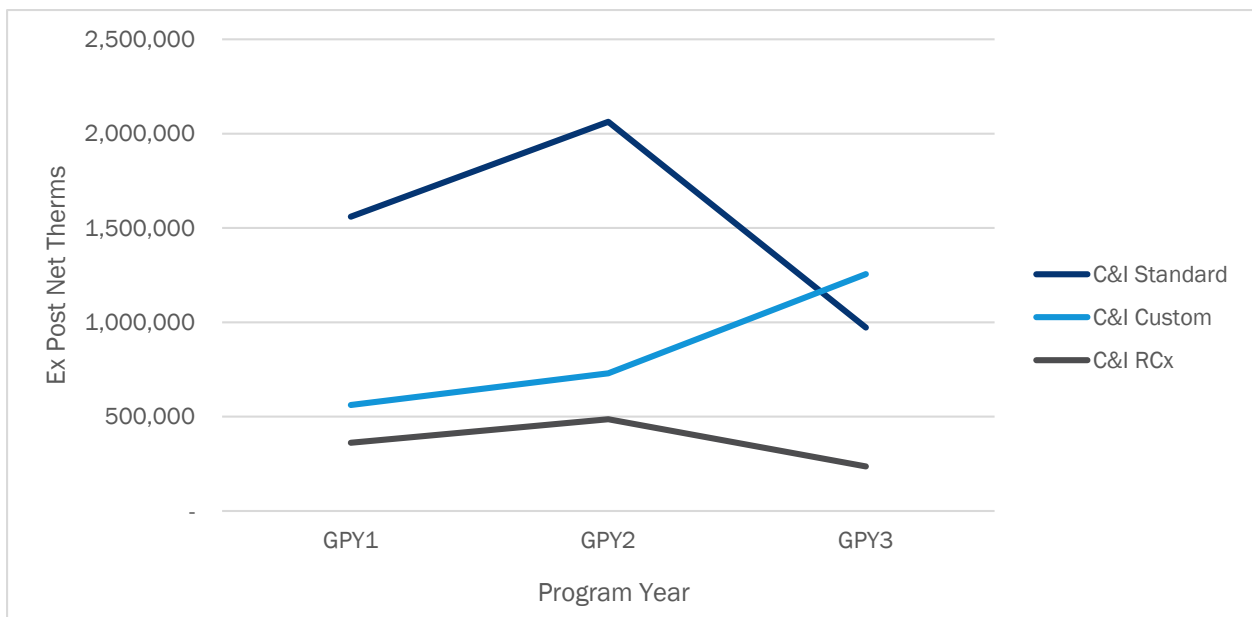
Both the Standard and Custom programs have grown significantly since the first program year, and have both played the role of largest contributor to electric savings (Standard from EPY2 through EPY5 and Custom in EPY6). As shown in Figure 3, the Retro-Commissioning Program has also grown over the past two program cycles despite a decline in PY6.

**Figure 3. Electric Savings by Business Program and Program Year**



Each of the C&I programs make similar relative contributions to gas savings. While Standard and Custom have switched positions as the largest generator of gas savings, the Retro-Commissioning Program has remained a relatively small contributor as shown below.

**Figure 4. Gas Savings by Business Program and Program Year**



### *High-Level Impact Findings*

The following sections provide detailed information on program performance across program years.

#### **4.2.1 C&I Standard**

The following tables summarize Standard Program gross and net energy impacts by program year. In general, while not shown in the table below, lighting has remained the dominant end use for the Standard Program throughout Plan 1 and Plan 2.

Table 6. Standard Program Electric Impacts by Year

| Program Year | Program Component                  | Ex Ante Gross MWh | Ex Post Gross MWh | Gross RR    | Ex Ante NTGR | Ex Post NTGR | Ex Ante Net MWh | Ex Post Net MWh | Net RR      |
|--------------|------------------------------------|-------------------|-------------------|-------------|--------------|--------------|-----------------|-----------------|-------------|
| <b>PY1</b>   | <b>Program Total</b>               | <b>18,706</b>     | <b>22,033</b>     | <b>1.18</b> | <b>1.00</b>  | <b>0.62</b>  | <b>18,706</b>   | <b>13,677</b>   | <b>0.73</b> |
| <b>PY2</b>   | Standard Core                      | 50,288            | 47,599            | 0.95        | 0.76         | 0.76         | 38,219          | 36,132          | 0.95        |
|              | Online Store                       | 2,979             | 2,979             | 1.00        | 0.80         | 0.80         | 2,383           | 2,383           | 1.00        |
|              | Small Bus HVAC                     | 3,092             | 3,092             | 1.00        | 1.00         | 1.00         | 3,092           | 3,092           | 1.00        |
|              | <b>Program Total</b>               | <b>56,359</b>     | <b>53,669</b>     | <b>0.95</b> | <b>0.78</b>  | <b>0.78</b>  | <b>43,694</b>   | <b>41,607</b>   | <b>0.95</b> |
| <b>PY3</b>   | Standard Core                      | 84,062            | 91,695            | 1.09        | 0.76         | 0.77         | 61,668          | 70,127          | 1.14        |
|              | Online Store                       | 32,620            | 32,620            | 1.00        | 0.80         | 0.64         | 26,096          | 20,866          | 0.80        |
|              | Direct Install - Faucet Aerators   | 10                | 10                | 1.00        | 0.76         | 0.76         | 8               | 8               | 1.00        |
|              | <b>Program Total</b>               | <b>116,693</b>    | <b>124,326</b>    | <b>1.07</b> | <b>0.73</b>  | <b>0.75</b>  | <b>87,772</b>   | <b>91,002</b>   | <b>1.04</b> |
| <b>PY4</b>   | Standard Core                      | 70,621            | 70,307            | 1.00        | 0.72         | 0.73         | 50,847          | 51,454          | 1.00        |
|              | Online Store                       | 61,555            | 46,317            | 0.90        | 0.80         | 0.80         | 49,244          | 37,053          | 0.75        |
|              | Green Nozzle                       | 5,087             | 4,629             | 0.91        | 0.82         | 0.82         | 4,171           | 3,796           | 0.91        |
|              | Direct Install - Multiple Measures | 635               | 635               | 1.00        | 0.80         | 0.80         | 508             | 508             | 1.00        |
|              | <b>Program Total</b>               | <b>137,898</b>    | <b>121,888</b>    | <b>0.88</b> | <b>0.76</b>  | <b>0.76</b>  | <b>104,770</b>  | <b>92,811</b>   | <b>0.89</b> |
| <b>PY5</b>   | Standard Core                      | 98,744            | 98,574            | 1.00        | 0.76         | 0.76         | 75,261          | 75,130          | 1.00        |
|              | Online Store                       | 27,115            | 24,309            | 0.90        | 0.64         | 0.69         | 18,710          | 16,773          | 0.90        |
|              | SBDI Pilot                         | 604               | 604               | 1.00        | 0.80         | 0.80         | 483             | 483             | 1.00        |
|              | Green Nozzle                       | 134               | 134               | 1.00        | 0.82         | 0.82         | 110             | 110             | 1.00        |
|              | <b>Program Total</b>               | <b>126,597</b>    | <b>123,621</b>    | <b>0.98</b> | <b>0.75</b>  | <b>0.75</b>  | <b>94,564</b>   | <b>92,496</b>   | <b>0.98</b> |

High-Level Impact Findings

| Program Year | Program Component    | Ex Ante Gross MWh | Ex Post Gross MWh | Gross RR    | Ex Ante NTGR | Ex Post NTGR | Ex Ante Net MWh | Ex Post Net MWh | Net RR      |
|--------------|----------------------|-------------------|-------------------|-------------|--------------|--------------|-----------------|-----------------|-------------|
| PY6          | Standard Core        | 64,725            | 94,768            | 1.00        | 0.65         | 0.65         | 41,860          | 41,737          | 1.00        |
|              | Online Store         | 16,579            | 16,584            | 1.00        | 0.83         | 0.83         | 13,761          | 13,764          | 1.00        |
|              | Green Nozzle         | 26                | 26                | 1.00        | 0.92         | 0.92         | 24              | 24              | 1.01        |
|              | <b>Program Total</b> | <b>81,330</b>     | <b>111,378</b>    | <b>1.00</b> | <b>0.69</b>  | <b>0.69</b>  | <b>55,645</b>   | <b>55,525</b>   | <b>1.00</b> |

Realization rate = ex post savings ÷ ex ante savings.

Table 7 provides a summary of gas savings from the C&I Standard Program. As shown in the table, gas savings increased greatly between GPY1 and GPY2, but declined significantly in GPY3.

**Table 7. Standard Program Gas Impacts by Year**

| Program Year | Program Component    | Ex Ante Gross Therm | Ex Post Gross Therm | Gross RR    | Ex Ante NTGR | Ex Post NTGR | Ex Ante Net Therm | Ex Post Net Therm | Net RR      |
|--------------|----------------------|---------------------|---------------------|-------------|--------------|--------------|-------------------|-------------------|-------------|
| GPY1         | Standard Core        | 507,492             | 572,906             | 1.13        | 0.72         | 0.73         | 405,994           | 458,325           | 1.13        |
|              | Online Store         | 0                   | 0                   | N/A         | N/A          | N/A          | 0                 | 0                 | N/A         |
|              | Direct Install       | 363,731             | 363,731             | 1.00        | 0.80         | 0.80         | 290,985           | 290,985           | 1.00        |
|              | Green Nozzle         | 1,097,600           | 988,971             | 0.90        | 0.82         | 0.82         | 900,032           | 810,956           | 0.90        |
|              | <b>Program Total</b> | <b>1,461,331</b>    | <b>1,352,702</b>    | <b>0.93</b> | <b>0.76</b>  | <b>0.76</b>  | <b>1,597,011</b>  | <b>1,560,266</b>  | <b>0.98</b> |
| GPY2         | Standard Core        | 2,040,058           | 2,040,058           | 1.00        | 1.00         | 1.00         | 2,040,058         | 2,040,058         | 1.00        |
|              | Online Store         | 0                   | 0                   | N/A         | N/A          | N/A          | 0                 | 0                 | N/A         |
|              | SBDI Pilot           | 0                   | 0                   | N/A         | N/A          | N/A          | 0                 | 0                 | N/A         |
|              | Green Nozzle         | 22,923              | 22,923              | 1.00        | 1.00         | 1.00         | 22,923            | 22,923            | 1.00        |
|              | <b>Program Total</b> | <b>2,062,981</b>    | <b>2,062,981</b>    | <b>1.00</b> | <b>1.00</b>  | <b>1.00</b>  | <b>2,062,981</b>  | <b>2,062,981</b>  | <b>1.00</b> |
| GPY3         | Standard Core        | 972,806             | 971,133             | 0.998       | 0.98         | 0.98         | 953,350           | 954,210           | 1.00        |
|              | Online Store         | 0                   | 0                   | N/A         | N/A          | N/A          | 0                 | 0                 | N/A         |
|              | Green Nozzle         | 9,424               | 9,424               | 1.00        | 0.89         | 0.89         | 8,387             | 8,387             | 1.00        |
|              | <b>Program Total</b> | <b>982,230</b>      | <b>980,557</b>      | <b>1.00</b> | <b>0.98</b>  | <b>0.98</b>  | <b>961,737</b>    | <b>962,597</b>    | <b>1.00</b> |

Realization rate = ex post savings ÷ ex ante savings.



## 4.2.2 C&I Custom

Table 8 below presents the program level gross and net energy impacts attributable to the Custom Program over the Plan 1 and Plan 2 periods. After an initial dip in PY2, energy savings from the Custom program have grown steadily. The net realization rate also follows an overall trend upward from PY2 to PY6.

**Table 8. Custom Program Electric Impacts by Year**

| Program Year | Ex Ante Gross MWh | Ex Post Gross MWh | Gross Realization Rate | Ex Ante NTGR | Ex Post NTGR      | Ex Ante Net MWh | Ex Post Net MWh | Net Realization Rate |
|--------------|-------------------|-------------------|------------------------|--------------|-------------------|-----------------|-----------------|----------------------|
| EPY1         | 51,687            | 51,111            | 0.99                   | 1.00         | 0.77              | 51,687          | 38,596          | 0.75                 |
| EPY2         | 33,392            | 28,652            | 0.86                   | 0.77         | 0.69              | 25,712          | 19,770          | 0.77                 |
| EPY3         | 50,032            | 40,455            | 0.81                   | 0.69         | 0.75              | 34,522          | 30,341          | 0.88                 |
| EPY4         | 69,049            | 60,941            | 0.88                   | 0.69         | 0.78              | 46,644          | 47,837          | 1.00                 |
| EPY5         | 74,376            | 63,465            | 0.85                   | 0.75         | 0.81 <sup>a</sup> | 55,782          | 51,674          | 0.93                 |
| EPY6         | 99,277            | 104,507           | 1.05                   | 0.75         | 0.75              | 73,943          | 78,380          | 1.06                 |

Realization rate = ex post savings ÷ ex ante savings.

<sup>a</sup> The NTGR presented here differs from the 0.75 EPY3 Custom NTGR as a result of integrating results from the Staffing Grant participants. However, in general, the team did apply the EPY3 NTG for this program as planned.

Overall, gas savings from the Custom Program have also trended upward since the gas program started in EPY4/GPY1. Both NTGRs and net realization rates have remained high each program year.

**Table 9. Custom Program Gas Impacts by Year**

| Program Year | Ex Ante Gross Therms | Ex Post Gross Therms | Gross Realization Rate | Ex Ante NTGR | Ex Post NTGR      | Ex Ante Net Therms | Ex Post Net Therms | Net Realization Rate |
|--------------|----------------------|----------------------|------------------------|--------------|-------------------|--------------------|--------------------|----------------------|
| GPY1         | 677,297              | 707,954              | 1.05                   | 0.69         | 0.78 <sup>b</sup> | 541,838            | 561,784            | 1.04                 |
| GPY2         | 926,702              | 898,627              | 0.97                   | 0.81         | 0.81              | 750,629            | 729,439            | 0.97                 |
| GPY3         | 1,836,207            | 1,674,147            | 0.91                   | 0.75         | 0.75              | 1,377,155          | 1,255,610          | 0.91                 |

Realization rate = ex post savings ÷ ex ante savings.

<sup>b</sup> The NTGR presented here differs from the 0.69 EPY2 Custom NTGR as a result of integrating results from the staffing grant participants. However, in general, the team did apply the EPY2 NTG for this program as planned.

## 4.2.3 C&I Retro-Commissioning

We present program level gross and net energy impacts attributable to the Retro-Commissioning Program in Table 10 below. The Retro-Commissioning Program has generally grown over the past two program cycles despite a decline in PY6.

**Table 10. Retro-Commissioning Program Electric Impacts by Year**

| Program Year | Ex Ante Gross MWh | Ex Post Gross MWh | Gross Realization Rate | Ex Ante NTGR | Ex Post NTGR | Ex Ante Net MWh | Ex Post Net MWh | Net Realization Rate |
|--------------|-------------------|-------------------|------------------------|--------------|--------------|-----------------|-----------------|----------------------|
| EPY1         | 1,022             | 1,022             | 1.00                   | 1.00         | 1.00         | 1,022           | 1,022           | 1.00                 |
| EPY2         | 12,640            | 10,890            | 0.86                   | 0.80         | 0.80         | 10,112          | 8,712           | 0.86                 |
| EPY3         | 29,819            | 29,819            | 1.00                   | 0.80         | 0.58         | 23,885          | 17,295          | 0.69                 |
| EPY4         | 20,219            | 17,993            | 0.89                   | 0.95         | 0.95         | 16,175          | 17,052          | 1.05                 |
| EPY5         | 29,257            | 27,324            | 0.93                   | 0.95         | 0.95         | 16,969          | 25,958          | 1.53                 |
| EPY6         | 12,091            | 10,892            | 0.90                   | 0.95         | 0.95         | 11,487          | 10,347          | 0.90                 |

Realization rate = ex post savings ÷ ex ante savings.

Gas savings from the Retro-Commissioning Program increased dramatically in PY5 as the program expanded its program offerings to target specific types of customers (i.e., healthcare and commercial buildings). Gross realization rates have also improved over the first three years of the gas program offering.

**Table 11. Retro-Commissioning Program Gas Impacts by Program Year**

| Program Year | Ex Ante Gross Therms | Ex Post Gross Therms | Gross Realization Rate | Ex Ante NTGR | Ex Post NTGR | Ex Ante Net Therms | Ex Post Net Therms | Net Realization Rate |
|--------------|----------------------|----------------------|------------------------|--------------|--------------|--------------------|--------------------|----------------------|
| GPY1         | 450,866              | 383,236              | 0.85                   | 0.80         | 0.95         | 360,693            | 361,966            | 1.00                 |
| GPY2         | 577,834              | 512,116              | 0.89                   | 0.58         | 0.95         | 335,144            | 486,510            | 1.45                 |
| GPY3         | 248,851              | 248,851              | 1.00                   | 0.95         | 0.95         | 236,408            | 236,408            | 1.00                 |

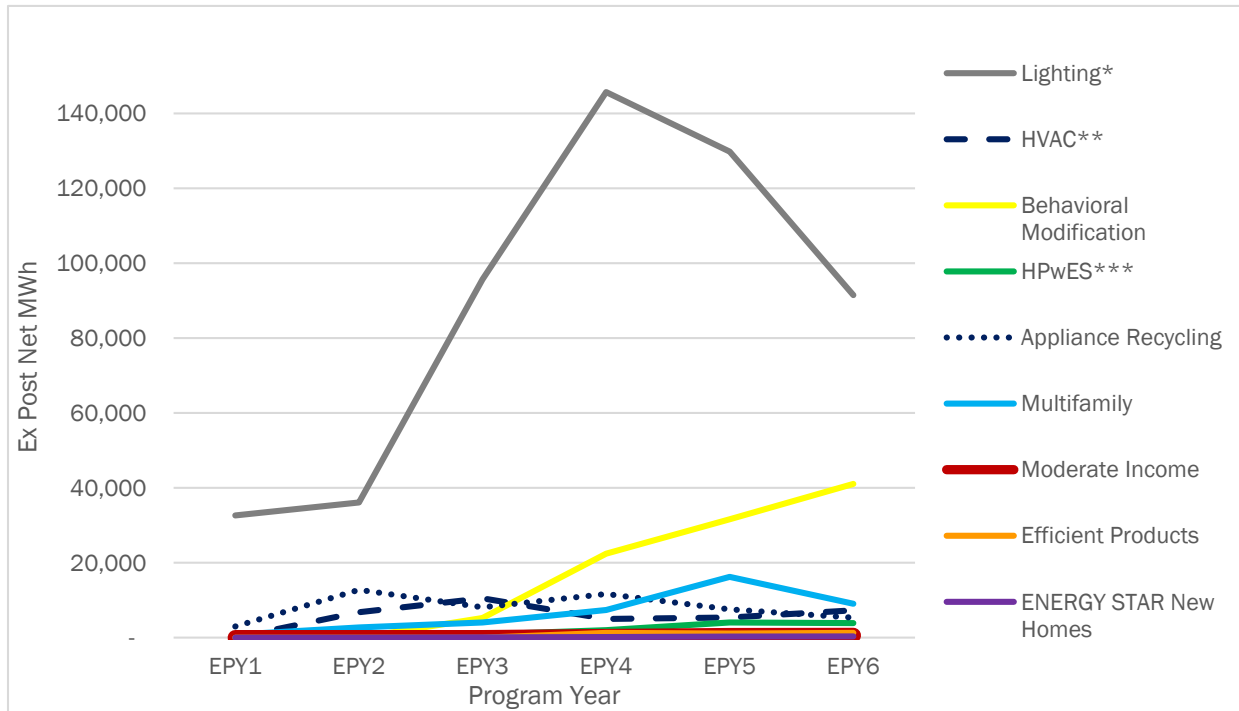
Realization rate = ex post savings ÷ ex ante savings.

### 4.3 Residential Program Performance

Some residential programs have grown significantly since the first electric program year. As shown in Figure 5, the Lighting and Behavior Modification programs have grown the most in terms of their electric savings since EPY1, while Behavior Modification, HVAC, and Home Performance with ENERGY STAR (formerly Home Energy Performance) have grown the most in gas savings (Figure 6).<sup>2</sup>

<sup>2</sup> The evaluation team does not present savings from the Direct Load Control Program because it was not offered during the Plan 2 period. AIC implemented this program only in EPY2 and EPY3.

Figure 5. Electric Savings by Residential Program and Program Year

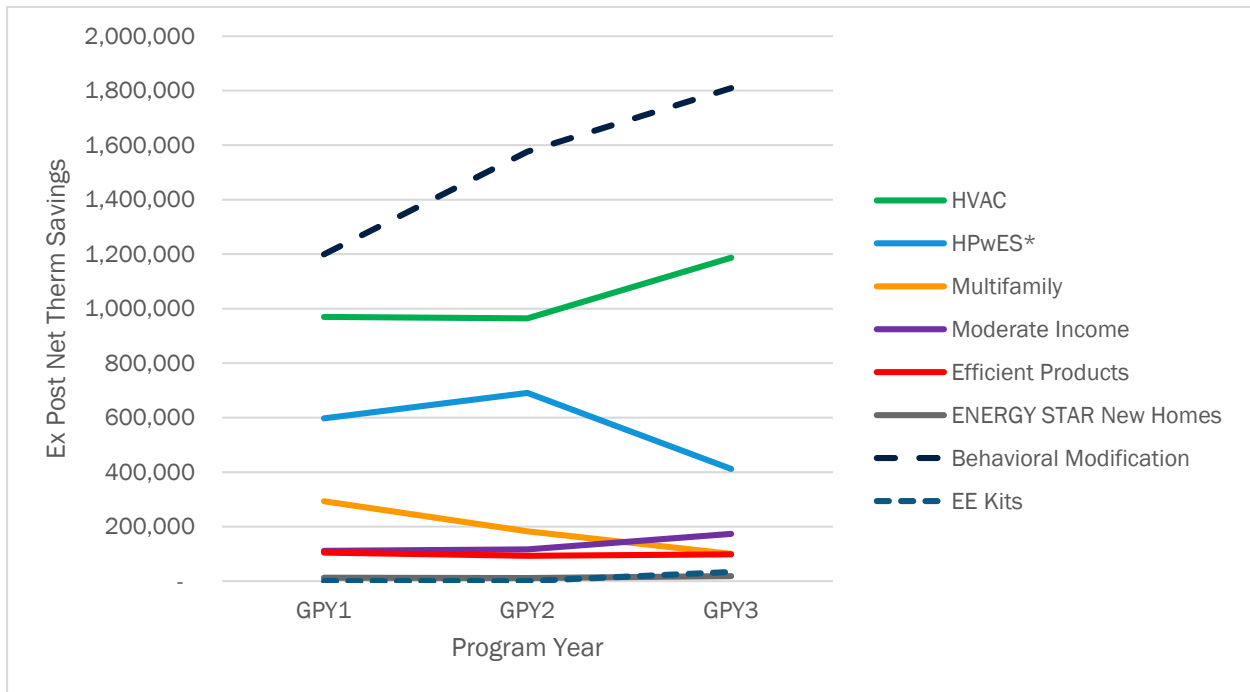


\* From EPY1 through EPY3, this program included both lighting and appliances and was referred to as the Lighting and Appliances Program.

\*\* Moderate income customers were included in the HVAC Program in EPY3.

\*\*\* AIC offered the HEP Program from EPY1 through EPY5 after which it transitioned to HPwES. Between EPY2 - EPY5 period, the HEP Program included the Electric Space Heat Pilot (ESHP).

Figure 6. Gas Savings by Residential Program and Program Year



\* AIC offered the HEP Program in GPY1 and GPY2, but it transitioned to HPwES in GPY3.

The following sections provide detailed information on residential program performance across program years.

### 4.3.1 Lighting

The Lighting Program has grown significantly since EPY1. Electric savings peaked in EPY4, but remain high, and lighting continues to be the dominant electric program within AIC’s residential portfolio.

Table 12. Lighting Program Electric Savings by Program Year

| Program Year | Ex Ante Gross MWh | Ex Post Gross MWh | Gross Realization Rate | Ex Ante NTGR | Ex Post NTGR | Ex Ante Net MWh | Ex Post Net MWh | Net Realization Rate |
|--------------|-------------------|-------------------|------------------------|--------------|--------------|-----------------|-----------------|----------------------|
| EPY1*        | N/A               | 32,631            | N/A                    | 1.00         | 1.00         | N/A             | 32,631          | N/A                  |
| EPY2*        | N/A               | 40,350            | N/A                    | 0.83         | 0.83         | N/A             | 36,124          | N/A                  |
| EPY3*        | N/A               | 115,586           | N/A                    | 0.83         | 0.83         | N/A             | 95,695          | N/A                  |
| EPY4         | 170,736           | 175,587           | 1.03                   | 0.83         | 0.83         | 141,892         | 145,737         | 1.03                 |
| EPY5         | 130,392           | 105,806           | 1.20                   | 0.83         | 0.83         | 108,226         | 129,839         | 1.20                 |
| EPY6         | 187,776           | 194,665           | 1.04                   | 0.44         | 0.47         | 82,621          | 91,493          | 1.11                 |

Note: For EPY1 - EPY3, N/A signifies cases where ex ante savings and realization rates were not available.

\* During the Plan 1 period, the program contained both lighting and appliances.

## High-Level Impact Findings

Realization rate = ex post savings ÷ ex ante savings.

Over the course of the Plan 2 period, the NTGR for the Lighting Program changed dramatically. The updated NTGR developed in EPY5 and applied to EPY6 was based on in-store intercepts with AIC customers, whereas prior values leveraged different methodologies.

### 4.3.2 HVAC

Energy savings from the HVAC Program have remained relatively consistent since EPY1, rising slightly in EPY6. While the HVAC program is not a major contributor to electricity savings, it has consistently represented a major contribution to gas savings.

**Table 13. HVAC Program Electric Savings by Program Year**

| Program Year | Ex Ante Gross MWh | Ex Post Gross MWh | Gross Realization Rate | Ex Ante NTGR | Ex Post NTGR | Ex Ante Net MWh | Ex Post Net MWh | Net Realization Rate |
|--------------|-------------------|-------------------|------------------------|--------------|--------------|-----------------|-----------------|----------------------|
| EPY1         | N/A - Not offered |                   |                        |              |              |                 |                 |                      |
| EPY2         | N/A               | 10,490            | N/A                    | 0.63         | 0.63         | N/A             | 6,608           | N/A                  |
| EPY3         | N/A               | 17,783            | N/A                    | 0.59         | 0.59         | N/A             | 10,492          | N/A                  |
| EPY4         | 8,504             | 8,504             | 1.00                   | 0.59         | 0.59         | 5,017           | 5,268           | 1.05                 |
| EPY5         | 8,101             | 9,106             | 1.12                   | 0.66         | 0.59         | 5,381           | 5,372           | 1.00                 |
| EPY6         | 12,180            | 12,373            | 1.01                   | 0.59         | 0.59         | 7,187           | 7,299           | 1.02                 |

Note: For EPY1 - EPY3, N/A signifies cases where ex ante savings and realization rates were not available.

Realization rate = ex post savings ÷ ex ante savings.

The HVAC Program has consistently contributed a significant portion of the residential portfolio's gas savings (between 25% and 30%) over the Plan 2 period. In addition, net and gross realization rates have held steady at one (Table 14 below).

**Table 14. HVAC Program Gas Savings by Program Year**

| Program Year | Ex Ante Gross Therms | Ex Post Gross Therms | Gross Realization Rate | Ex Ante NTGR | Ex Post NTGR | Ex Ante Net Therms* | Ex Post Net Therms* | Net Realization Rate |
|--------------|----------------------|----------------------|------------------------|--------------|--------------|---------------------|---------------------|----------------------|
| GPY1         | 950,721              | 950,721              | 1.00                   | 1.02         | 1.02         | 969,563             | 969,563             | 1.00                 |
| GPY2         | 950,319              | 945,617              | 1.00                   | 1.02         | 1.02         | 969,127             | 964,664             | 1.00                 |
| GPY3         | 1,538,728            | 1,540,896            | 1.00                   | 0.77         | 0.77         | 1,185,560           | 1,186,946           | 1.00                 |

\* Totals may not match ex ante values multiplied by NTGRs due to rounding.

Realization rate = ex post savings ÷ ex ante savings.

### 4.3.3 Behavioral Modification

Given that the Behavioral Modification Program is evaluated using billing analysis, which yields estimates of net savings, the team does not provide gross energy savings in the tables below. In addition, the program does not have NTGRs associated with it.

**Table 15. Behavioral Modification Program Electric Savings by Program Year**

| Program Year | Ex Ante Gross MWh                            | Ex Post Gross MWh | Gross Realization Rate | Ex Ante NTGR | Ex Post NTGR | Ex Ante Net MWh | Ex Post Net MWh |
|--------------|----------------------------------------------|-------------------|------------------------|--------------|--------------|-----------------|-----------------|
| EPY1         | N/A – No program offered                     |                   |                        |              |              |                 |                 |
| EPY2         | N/A – No program offered                     |                   |                        |              |              |                 |                 |
| EPY3         | N/A – Impact analysis determines net savings |                   |                        |              |              |                 | 5,239           |
| EPY4         | N/A – Impact analysis determines net savings |                   |                        |              |              |                 | 22,412          |
| EPY5         | N/A – Impact analysis determines net savings |                   |                        |              |              |                 | 31,618          |
| EPY6         | N/A – Impact analysis determines net savings |                   |                        |              |              |                 | 41,051          |

Realization rate = ex post savings ÷ ex ante savings.

Since the start of the gas component of the Behavioral Modification Program in EPY4/GPY1, the program has contributed between 36% and 47% of AIC’s residential gas savings. As a result, the program has been critical to the overall performance of AIC’s energy efficiency portfolio.

**Table 16. Behavioral Modification Program Gas Savings by Program Year**

| Program Year | Ex Ante Gross Therms                         | Ex Post Gross Therms | Gross Realization Rate | Ex Ante NTGR | Ex Post NTGR | Ex Ante Net Therms | Ex Post Net Therms |
|--------------|----------------------------------------------|----------------------|------------------------|--------------|--------------|--------------------|--------------------|
| GPY1         | N/A – Impact analysis determines net savings |                      |                        |              |              |                    | 1,199,510          |
| GPY2         | N/A – Impact analysis determines net savings |                      |                        |              |              |                    | 1,576,341          |
| GPY3         | N/A – Impact analysis determines net savings |                      |                        |              |              |                    | 1,809,293          |

Realization rate = ex post savings ÷ ex ante savings.

### 4.3.4 Home Performance with ENERGY STAR®

Electricity savings from the Home Energy Performance (HEP) and subsequently the Home Performance with ENERGY STAR (HPwES) Program have grown significantly since EPY1.

**Table 17. HPwES Program Electric Savings by Program Year**

| Program Year | Ex Ante Gross MWh | Ex Post Gross MWh | Gross Realization Rate | Ex Ante NTGR | Ex Post NTGR | Ex Ante Net MWh | Ex Post Net MWh | Net Realization Rate |
|--------------|-------------------|-------------------|------------------------|--------------|--------------|-----------------|-----------------|----------------------|
| EPY1         | N/A               | 265               | N/A                    | 0.76         | 0.76         | N/A             | 201             | N/A                  |
| EPY2         | N/A               | 1,142             | N/A                    | 0.78         | 0.78         | N/A             | 885             | N/A                  |
| EPY3         | N/A               | 1,014             | N/A                    | 0.83         | 0.83         | N/A             | 841             | N/A                  |
| EPY4         | 1,922             | 1,905             | 0.99                   | 0.80*/0.89** | 0.92         | 1,491           | 1,753           | 1.18*/1.00**         |
| EPY5         | 4,459             | 4,319             | 0.97                   | 0.93         | 0.94         | 4,163           | 4,042           | 0.97                 |
| EPY6         | 4,537             | 4,261             | 0.94                   | 0.91         | 0.91         | 4,108           | 3,883           | 0.95                 |

Note: For EPY1 - EPY3, N/A signifies cases where ex ante savings and realization rates were not available.

\* These values are for the HEP Program.

\*\* These values are for ESHP.

Realization rate = ex post savings ÷ ex ante savings.

**Table 18. HPwES Program Gas Savings by Program Year**

| Program Year | Ex Ante Gross Therms | Ex Post Gross Therms | Gross Realization Rate | Ex Ante NTGR | Ex Post NTGR | Ex Ante Net Therms | Ex Post Net Therms | Net Realization Rate |
|--------------|----------------------|----------------------|------------------------|--------------|--------------|--------------------|--------------------|----------------------|
| GPY1         | 734,950              | 734,310              | 1.00                   | 0.80*/0.89** | 0.92         | 625,749            | 596,680            | 0.95*/0.86*          |
| GPY2         | 713,735              | 714,698              | 1.00                   | 1.00         | 0.97         | 714,454            | 690,883            | 0.97                 |
| GPY3         | 463,638              | 503,875              | 1.09                   | 0.82         | 0.82         | 380,259            | 411,594            | 1.08                 |

\* These values are for the HEP Program.

\*\* These values are for ESHP.

Realization rate = ex post savings ÷ ex ante savings.

### 4.3.5 Appliance Recycling

An electric-only program, savings from the Appliance Recycling Program have fluctuated over the Plan 1 and Plan 2 periods reaching a high in EPY4 (see Table 19 below). AIC anticipated the EPY5 decline in participation, which is typically seen in appliance recycling programs elsewhere as the pool of unused or unnecessary secondary refrigerators and freezers is taken out of the market.

**Table 19. Appliance Recycling Program Electric Savings by Program Year**

| Program Year | Ex Ante Gross MWh | Ex Post Gross MWh | Gross Realization Rate | Ex Ante NTGR | Ex Post NTGR | Ex Ante Net MWh | Ex Post Net MWh | Net Realization Rate |
|--------------|-------------------|-------------------|------------------------|--------------|--------------|-----------------|-----------------|----------------------|
| EPY1         | N/A               | 5,555             | N/A                    | 0.54         | 0.54         | N/A             | 3,011           | N/A                  |
| EPY2         | N/A               | 15,968            | N/A                    | 0.80         | 0.80         | N/A             | 12,757          | N/A                  |
| EPY3         | N/A               | 10,188            | N/A                    | 0.80         | 0.80         | N/A             | 8,121           | N/A                  |
| EPY4         | 20,406            | 18,196            | 0.89                   | 0.80         | 0.54         | 16,264          | 9,779           | 0.60                 |
| EPY5         | 7,729             | 9,461             | 1.22                   | 0.79         | 0.80         | 6,071           | 7,542           | 1.24                 |
| EPY6         | 7,696             | 8,466             | 1.10                   | 0.63         | 0.63         | 4,274           | 5,326           | 1.25                 |

Note: Ex ante savings and realization rates were not available for EPY1 - EPY3.

Realization rate = ex post savings ÷ ex ante savings.

### 4.3.6 Multifamily

Electric savings from the Multifamily Program have increased consistently since EPY1 with a significant increase in EPY5. Further, both gross and net realization rates have stayed close to one. This means that there have been few corrections made to ex ante savings estimates.

**Table 20. Multifamily Program Electric Savings by Program Year**

| Program Year | Ex Ante Gross MWh | Ex Post Gross MWh | Gross Realization Rate | Ex Ante NTGR | Ex Post NTGR | Ex Ante Net MWh | Ex Post Net MWh | Net Realization Rate |
|--------------|-------------------|-------------------|------------------------|--------------|--------------|-----------------|-----------------|----------------------|
| EPY1         | N/A               | 1,073             | N/A                    | 0.76         | 0.76         | N/A             | 817             | N/A                  |
| EPY2         | N/A               | 2,806             | N/A                    | 0.98         | 0.98         | N/A             | 2,742           | N/A                  |
| EPY3         | N/A               | 4,139             | N/A                    | 0.98         | 0.98         | N/A             | 4,062           | N/A                  |
| EPY4         | 6,975             | 7,609             | 1.09                   | 0.94         | 0.94         | 6,548           | 7,126           | 1.09                 |
| EPY5         | 15,754            | 16,754            | 1.06                   | 0.99         | 0.97         | 15,622          | 16,219          | 1.04                 |
| EPY6         | 9,284             | 9,286             | 1.00                   | 1.00         | 0.98         | 9,268           | 9,075           | 0.98                 |

Note: Ex ante savings and realization rates were not available for PY1-PY3.

Realization rate = ex post savings ÷ ex ante savings.

Overall, the gas component of the Multifamily Program performed well during Plan 2, as shown in Table 21. Gross realization rates have always been close to one; further, despite a slight dip in GPY2, net realization rates have also been consistently around one.



**Table 21. Multifamily Program Gas Savings by Program Year**

| Program Year | Ex Ante Gross Therms | Ex Post Gross Therms | Gross Realization Rate | Ex Ante NTGR | Ex Post NTGR | Ex Ante Net Therms | Ex Post Net Therms | Net Realization Rate |
|--------------|----------------------|----------------------|------------------------|--------------|--------------|--------------------|--------------------|----------------------|
| GPY1         | 294,333              | 299,191              | 1.02                   | 0.92         | 0.92         | 271,492            | 275,958            | 1.02                 |
| GPY2         | 205,110              | 207,806              | 1.01                   | 1.01         | 0.88         | 208,099            | 183,061            | 0.88                 |
| GPY3         | 103,314              | 100,815              | 0.98                   | 1.00         | 0.99         | 103,235            | 100,143            | 0.97                 |

Realization rate = ex post savings ÷ ex ante savings.

### 4.3.7 Moderate Income

After officially launching as a stand-alone program in EPY4, electric savings from the Moderate Income Program grew consistently through EPY6. Further, gross and net realization rates were consistently close to one. Note that through an agreement between AIC and the ICC, the NTGR for this program is deemed at 1.00.

**Table 22. Moderate Income Program Electric Savings by Program Year**

| Program Year | Ex Ante Gross MWh                       | Ex Post Gross MWh | Gross Realization Rate | Ex Ante NTGR | Ex Post NTGR | Ex Ante Net MWh | Ex Post Net MWh | Net Realization Rate |
|--------------|-----------------------------------------|-------------------|------------------------|--------------|--------------|-----------------|-----------------|----------------------|
| EPY1         | N/A – Not offered as a distinct program |                   |                        |              |              |                 |                 |                      |
| EPY2         | N/A – Not offered as a distinct program |                   |                        |              |              |                 |                 |                      |
| EPY3         | N/A – Not offered as a distinct program |                   |                        |              |              |                 |                 |                      |
| EPY4         | 288                                     | 285               | 0.99                   | 1.00         | 1.00         | 288             | 286             | 0.99                 |
| EPY5         | 568                                     | 541               | 0.95                   | 1.00         | 1.00         | 568             | 541             | 0.95                 |
| EPY6         | 652                                     | 617               | 0.95                   | 1.00         | 1.00         | 652             | 617             | 0.95                 |

Realization rate = ex post savings ÷ ex ante savings.

The evaluation team has seen a similar pattern on the gas side of the program with growing savings and general consistency between ex ante and ex post estimates of savings as reflected by the net realization rates close to 1.00.

**Table 23. Moderate Income Program Gas Savings by Program Year**

| Program Year | Ex Ante Gross Therms | Ex Post Gross Therms | Gross Realization Rate | Ex Ante NTGR | Ex Post NTGR | Ex Ante Net Therms | Ex Post Net Therms | Net Realization Rate |
|--------------|----------------------|----------------------|------------------------|--------------|--------------|--------------------|--------------------|----------------------|
| GPY1         | 110,434              | 110,908              | 1.00                   | 1.00         | 1.00         | 110,434            | 110,908            | 1.00                 |
| GPY2         | 134,700              | 116,653              | 0.87                   | 1.00         | 1.00         | 134,700            | 116,653            | 0.87                 |
| GPY3         | 162,026              | 173,380              | 1.07                   | 1.00         | 1.00         | 162,026            | 173,380            | 1.07                 |

Realization rate = ex post savings ÷ ex ante savings.

### 4.3.8 Efficient Products

AIC launched the Efficient Products Program as a stand-alone program in EPY4 after running it during the Plan 1 period as an integrated component of the Residential Lighting Program. Over the course of the Plan 2 period, the program achieved consistent levels of savings, but was not a significant contributor to the overall portfolio in terms of electric savings.

**Table 24. Efficient Products Program Electric Savings by Program Year**

| Program Year | Ex Ante Gross MWh                                 | Ex Post Gross MWh | Gross Realization Rate | Ex Ante NTGR | Ex Post NTGR | Ex Ante Net MWh | Ex Post Net MWh | Net Realization Rate |
|--------------|---------------------------------------------------|-------------------|------------------------|--------------|--------------|-----------------|-----------------|----------------------|
| EPY1         | N/A – Implemented as part of the Lighting Program |                   |                        |              |              |                 |                 |                      |
| EPY2         | N/A – Implemented as part of the Lighting Program |                   |                        |              |              |                 |                 |                      |
| EPY3         | N/A – Implemented as part of the Lighting Program |                   |                        |              |              |                 |                 |                      |
| EPY4         | 2,113                                             | 1,560             | 0.74                   | 0.81         | 0.82         | 1,701           | 1,275           | 0.77                 |
| EPY5         | 1,442                                             | 1,354             | 0.94                   | 0.81         | 0.82         | 1,164           | 1,120           | 0.96                 |
| EPY6         | 1,714                                             | 1,545             | 0.9                    | 0.83         | 0.82         | 1,421           | 1,274           | 0.90                 |

Realization rate = ex post savings ÷ ex ante savings.

In contrast, the program made a more significant contribution to savings on the gas side of the portfolio. As shown in Table 25 below, the level of gas savings remained somewhat consistent throughout Plan 2. However, the program’s realization rates varied over time.

**Table 25. Efficient Products Program Gas Savings by Program Year**

| Program Year | Ex Ante Gross Therms | Ex Post Gross Therms | Gross Realization Rate | Ex Ante NTGR | Ex Post NTGR | Ex Ante Net Therms | Ex Post Net Therms | Net Realization Rate |
|--------------|----------------------|----------------------|------------------------|--------------|--------------|--------------------|--------------------|----------------------|
| GPY1         | 212,384              | 115,584              | 0.54                   | 0.86         | 0.90         | 182,911            | 104,440            | 0.57                 |
| GPY2         | 124,750              | 102,990              | 0.83                   | 0.86         | 0.90         | 105,841            | 92,691             | 0.88                 |
| GPY3         | 139,323              | 109,111              | 0.78                   | 0.90         | 0.90         | 125,391            | 98,200             | 0.78                 |

Realization rate = ex post savings ÷ ex ante savings.

### 4.3.9 ENERGY STAR® New Homes

Both the electric and gas savings from the ENERGY STAR New Homes Program have increased slowly since the program’s first year in EPY3. The dramatic decline in the gross and net realization rates in EPY6 are the result of more robust impact analysis approaches that took code adoption within AIC territory into account. In particular, an area not enforcing an energy code had a lower baseline than an area enforcing International Energy Conservation Code (IECC) 2012.

**Table 26. ENERGY STAR New Homes Program Electric Savings by Program Year**

| Program Year | Ex Ante Gross MWh | Ex Post Gross MWh | Gross Realization Rate | Ex Ante NTGR | Ex Post NTGR | Ex Ante Net MWh | Ex Post Net MWh | Net Realization Rate |
|--------------|-------------------|-------------------|------------------------|--------------|--------------|-----------------|-----------------|----------------------|
| EPY1         | N/A – Not offered |                   |                        |              |              |                 |                 |                      |
| EPY2         | N/A – Not offered |                   |                        |              |              |                 |                 |                      |
| EPY3         | N/A               | 127               | N/A                    | 0.80         | 0.80         | N/A             | 101             | N/A                  |
| EPY4         | 236               | 236               | 1.00                   | 0.80         | 0.80         | 189             | 189             | 1.00                 |
| EPY5         | 379               | 379               | 1.00                   | 0.80         | 0.80         | 303             | 303             | 1.00                 |
| EPY6         | 777               | 443               | 0.57                   | 0.80         | 0.80         | 622             | 354             | 0.57                 |

Note: Ex ante savings and realization rates were not available for PY3.  
 Realization rate = ex post savings ÷ ex ante savings.

**Table 27. ENERGY STAR New Homes Program Gas Savings by Program Year**

| Program Year | Ex Ante Gross Therms | Ex Post Gross Therms | Gross Realization Rate | Ex Ante NTGR | Ex Post NTGR | Ex Ante Net Therms | Ex Post Net Therms | Net Realization Rate |
|--------------|----------------------|----------------------|------------------------|--------------|--------------|--------------------|--------------------|----------------------|
| GPY1         | 16,000               | 16,000               | 1.00                   | 0.80         | 0.80         | 12,800             | 12,800             | 1.00                 |
| GPY2         | 14,586               | 14,446               | 0.99                   | 0.80         | 0.80         | 11,669             | 11,557             | 0.99                 |
| GPY3         | 33,826               | 23,193               | 0.69                   | 0.80         | 0.80         | 27061              | 18,554             | 0.69                 |

Realization rate = ex post savings ÷ ex ante savings.

### 4.3.10 School Energy Efficiency Kits

During EPY6/GPY3, AIC used funds from the 8-104 gas portfolio to provide gas saving measures through the Illinois Power Agency’s Energy Efficiency Kits Program. As shown in the table below, the savings generated from these efforts were a relatively small contribution to the portfolio’s GPY3 gas savings.

**Table 28. Energy Efficiency Kits Program Gas Savings**

| Program Year | Ex Ante Gross Therms | Ex Post Gross Therms | Gross Realization Rate | Ex Ante NTGR | Ex Post NTGR | Ex Ante Net Therms | Ex Post Net Therms | Net Realization Rate |
|--------------|----------------------|----------------------|------------------------|--------------|--------------|--------------------|--------------------|----------------------|
| GPY1         | N/A – Not offered    |                      |                        |              |              |                    |                    |                      |
| GPY2         | N/A – Not offered    |                      |                        |              |              |                    |                    |                      |
| GPY3         | 104,683              | 62,574               | 0.60                   | 57%          | 57%          | 96,197             | 33,832             | 35%                  |

Realization rate = ex post savings ÷ ex ante savings.

## A. Appendix – Detailed Ex Post Savings Results

The following tables provide detailed ex post savings results by program and year. We also provide Excel version following the tables.

**Table 29. Plan 2 (PY4-PY6) Detailed Ex Post Savings Results**

| AIC Plan 2 Programs                              | Realization Rate                             | Verified Ex Post Gross           |                                |                  | Deemed/Used        | Verified Ex Post Net      |                                |                  |                                               |                                      | Actual           | Evaluation Estimate (Where Available) | Participation |                   | Weighted Average Measure Life |
|--------------------------------------------------|----------------------------------------------|----------------------------------|--------------------------------|------------------|--------------------|---------------------------|--------------------------------|------------------|-----------------------------------------------|--------------------------------------|------------------|---------------------------------------|---------------|-------------------|-------------------------------|
|                                                  | Energy Savings (Ex Ante Gross/Ex Post Gross) | First Year Annual Energy Savings | First Year Peak Demand Savings | Lifetime Savings | Net-to-Gross Ratio | First Year Annual Savings | First Year Peak Demand Savings | Lifetime Savings | First Year Cost per First Year Annual Savings | First Year Cost per Lifetime Savings | Program Costs    | Net-to-Gross Ratio                    | # Units       | Units Definition  | Years                         |
|                                                  | %                                            | MWh/Therms                       | MW                             | MWh/Therms       | %                  | MWh/Therms                | MW                             | MWh/Therms       | \$/MWh or \$/Therms                           | \$/MWh or \$/Therms                  | \$               | %                                     |               |                   |                               |
| <b>Residential Programs</b>                      |                                              |                                  |                                |                  |                    |                           |                                |                  |                                               |                                      |                  |                                       |               |                   |                               |
| Residential Lighting (Electric)                  | 108%                                         | 526,684                          | 64                             | 2,599,481        | 70%                | 367,069                   | 41                             | 1,773,411        | \$ 59.33                                      | \$ 12.28                             | \$ 21,779,603.62 | N/A                                   | 11,851,528    | Bulbs             | 4.9                           |
| Behavior Modification (Electric)                 | N/A                                          | N/A                              | N/A                            | N/A              | N/A                | 95,081                    | -                              | 95,081           | \$ 31.34                                      | \$ 31.34                             | \$ 2,979,580.34  | N/A                                   | 650,494       | Customers treated | 1.0                           |
| Behavior Modification (Gas)                      | N/A                                          | N/A                              | N/A                            | N/A              | N/A                | 4,585,144                 | -                              | 4,585,144        | \$ 0.65                                       | \$ 0.65                              | \$ 2,979,580.33  | N/A                                   | 690,958       | Customers treated | 1.0                           |
| HVAC (Electric)                                  | 102%                                         | 29,898                           | 12                             | 548,416          | 59%                | 17,679                    | 11                             | 324,299          | \$ 539.10                                     | \$ 29.39                             | \$ 9,530,690.25  | N/A                                   | 22,149        | Program measures  | 18.3                          |
| HVAC (Gas)                                       | 100%                                         | 3,437,234                        | -                              | 67,175,352       | 91%                | 3,121,173                 | -                              | 60,777,047       | \$ 1.94                                       | \$ 0.10                              | \$ 6,041,111.73  | N/A                                   | 23,903        | Program measures  | 19.5                          |
| Residential Energy-Efficient Products (Electric) | 86%                                          | 4,459                            | 1                              | 36,910           | 82%                | 3,669                     | 0                              | 30,376           | \$ 264.62                                     | \$ 31.96                             | \$ 970,904.51    | N/A                                   | 25,380        | Program measures  | 8.3                           |
| Residential Energy-Efficient Products (Gas)      | 72%                                          | 327,684                          | -                              | 2,024,417        | 90%                | 295,331                   | -                              | 1,824,240        | \$ 2.46                                       | \$ 0.40                              | \$ 725,879.93    | N/A                                   | 15,115        | Program measures  | 6.2                           |
| Appliance Recycling (Electric)                   | 102%                                         | 34,391                           | 5                              | 275,081          | 71%                | 24,541                    | 3                              | 196,296          | \$ 256.74                                     | \$ 32.10                             | \$ 6,300,643.93  | N/A                                   | 35,201        | Participants      | 8.0                           |
| Multifamily (Electric)                           | 105%                                         | 33,649                           | 6                              | 366,169          | 97%                | 32,679                    | 6                              | 355,392          | \$ 206.11                                     | \$ 18.95                             | \$ 6,735,584.09  | N/A                                   | 1,954         | Projects          | 10.9                          |
| Multifamily (Gas)                                | 101%                                         | 607,812                          | -                              | 8,532,019        | 95%                | 576,478                   | -                              | 8,086,413        | \$ 3.64                                       | \$ 0.26                              | \$ 2,097,081.77  | N/A                                   | 1,954         | Projects          | 14.0                          |
| HPwES/HEP/ESHP (Electric)                        | 96%                                          | 10,753                           | 5                              | 158,735          | 92%                | 9,925                     | 5                              | 146,555          | \$ 941.27                                     | \$ 63.74                             | \$ 9,341,716.24  | N/A                                   | 11,230        | Participants      | 14.8                          |
| HPwES/HEP/ESHP (Gas)                             | 102%                                         | 1,953,671                        | -                              | 38,794,499       | 87%                | 1,699,785                 | -                              | 33,697,295       | \$ 4.58                                       | \$ 0.23                              | \$ 7,780,355.43  | N/A                                   | 11,230        | Participants      | 19.9                          |
| ENERGY STAR New Homes (Electric)                 | 82%                                          | 1,058                            | 0                              | 30,675           | 80%                | 846                       | 0                              | 24,540           | \$ 1,196.75                                   | \$ 41.27                             | \$ 1,012,689.03  | N/A                                   | 541           | Participants      | 29.0                          |
| ENERGY STAR New Homes (Gas)                      | 86%                                          | 53,639                           | -                              | 1,555,531        | 80%                | 42,911                    | -                              | 1,244,419        | \$ 10.37                                      | \$ 0.36                              | \$ 445,088.12    | N/A                                   | 541           | Participants      | 29.0                          |
| Moderate Income (Electric)                       | 95%                                          | 1,444                            | 1                              | 22,692           | 100%               | 1,444                     | 1                              | 22,692           | \$ 1,067.47                                   | \$ 67.91                             | \$ 1,540,950.60  | N/A                                   | 852           | Participants      | 15.7                          |
| Moderate Income (Gas)                            | 100%                                         | 400,941                          | -                              | 7,774,550        | 100%               | 400,941                   | -                              | 7,774,550        | \$ 4.19                                       | \$ 0.22                              | \$ 1,678,590.54  | N/A                                   | 852           | Participants      | 19.4                          |
| Energy Efficiency Kits (Gas)                     | 60%                                          | 62,574                           | -                              | 490,116          | 54%                | 33,832                    | 0                              | 264,990          | \$ 0.46                                       | \$ 0.06                              | \$ 15,588.72     | N/A                                   | 48,402        | Program measures  | 7.8                           |
| <b>Business Programs</b>                         |                                              |                                  |                                |                  |                    |                           |                                |                  |                                               |                                      |                  |                                       |               |                   |                               |
| Custom (Electric)                                | 95%                                          | 228,913                          | 37                             | 2,943,906        | 78%                | 177,891                   | 29                             | 2,287,825        | \$ 124.70                                     | \$ 9.64                              | \$ 21,362,494    | N/A                                   | 418           | Program measures  | 12.9                          |
| Custom (Gas)                                     | 96%                                          | 3,280,728                        | -                              | 41,245,228       | 78%                | 2,546,833                 | -                              | 31,984,639       | \$ 1.94                                       | \$ 0.15                              | \$ 4,827,801     | N/A                                   | 119           | Program measures  | 12.6                          |
| Standard (Electric)                              | 95%                                          | 326,531                          | 47                             | 3,520,093        | 74%                | 240,834                   | 35                             | 2,588,059        | \$ 147.64                                     | \$ 12.53                             | \$ 29,360,514    | N/A                                   | 201,736       | Program measures  | 10.8                          |
| Standard (Gas)                                   | 99%                                          | 4,979,752                        | -                              | 36,675,516       | 92%                | 4,595,329                 | -                              | 33,399,743       | \$ 1.01                                       | \$ 0.14                              | \$ 4,064,258     | N/A                                   | 40,042        | Program measures  | 7.4                           |
| Retro-Commissioning (Electric)                   | 91%                                          | 56,209                           | 5                              | 278,102          | 95%                | 53,357                    | 5                              | 263,994          | \$ 183.69                                     | \$ 36.74                             | \$ 5,315,120     | N/A                                   | 88            | Projects          | 4.9                           |
| Retro-Commissioning (Gas)                        | 90%                                          | 1,142,892                        | -                              | 4,434,170        | 95%                | 1,084,884                 | -                              | 4,208,145        | \$ 3.17                                       | \$ 0.63                              | \$ 1,511,967     | N/A                                   | 40            | Projects          | 3.9                           |

Table 30. PY6 Detailed Ex Post Savings Results

| AIC PY6 Programs                                 | Realization Rate                             | Verified Ex Post Gross           |                                |                  | Deemed/Used        | Verified Ex Post Net      |                                |                  |                                               |                                      | Actual        | Evaluation Estimate (Where Available) | Participation |                   | Weighted Average Measure Life |
|--------------------------------------------------|----------------------------------------------|----------------------------------|--------------------------------|------------------|--------------------|---------------------------|--------------------------------|------------------|-----------------------------------------------|--------------------------------------|---------------|---------------------------------------|---------------|-------------------|-------------------------------|
|                                                  | Energy Savings (Ex Ante Gross/Ex Post Gross) | First Year Annual Energy Savings | First Year Peak Demand Savings | Lifetime Savings | Net-to-Gross Ratio | First Year Annual Savings | First Year Peak Demand Savings | Lifetime Savings | First Year Cost per First Year Annual Savings | First Year Cost per Lifetime Savings | Program Costs | Net-to-Gross Ratio                    | # Units       | Units Definition  | Years                         |
|                                                  | %                                            | MWh/Therms                       | MW                             | MWh/Therms       | %                  | MWh/Therms                | MW                             | MWh/Therms       | \$/MWh or \$/Therms                           | \$/MWh or \$/Therms                  | \$            | %                                     |               |                   |                               |
| <b>Residential Programs</b>                      |                                              |                                  |                                |                  |                    |                           |                                |                  |                                               |                                      |               |                                       |               |                   |                               |
| Residential Lighting (Electric)                  | 104%                                         | 194,665                          | 24                             | 1,067,116        | 47%                | 91,493                    | 11                             | 501,547          | \$ 104.40                                     | \$ 19.05                             | \$ 9,552,043  | 63% Std./72% Specialty                | 4,659,601     | Bulbs             | 5.3                           |
| Behavior Modification (Electric)                 | N/A                                          | N/A                              | N/A                            | N/A              | N/A                | 41,051                    | 0                              | 41,051           | \$ 29.91                                      | \$ 29.91                             | \$ 1,228,025  | N/A                                   | 215,460       | Customers treated | 1.0                           |
| Behavior Modification (Gas)                      | N/A                                          | N/A                              | N/A                            | N/A              | N/A                | 1,809,293                 | -                              | 1,809,293        | \$ 0.68                                       | \$ 0.68                              | \$ 1,228,025  | N/A                                   | 224,430       | Customers treated | 1.0                           |
| HVAC (Electric)                                  | 101%                                         | 12,289                           | -                              | 227,088          | 59%                | 7,300                     | 4                              | 134,901          | \$ 576.89                                     | \$ 31.22                             | \$ 4,211,303  | 51%                                   | 10,915        | Program measures  | 18.5                          |
| HVAC (Gas)                                       | 100%                                         | 1,540,896                        | -                              | 31,002,352       | 77%                | 1,186,946                 | -                              | 23,880,987       | \$ 2.21                                       | \$ 0.11                              | \$ 2,624,302  | N/A                                   | 12,372        | Program measures  | 20.1                          |
| Residential Energy-Efficient Products (Electric) | 90%                                          | 1,545                            | 0                              | 12,476           | 82%                | 1,274                     | 0                              | 10,287           | \$ 190.50                                     | \$ 23.59                             | \$ 242,692    | N/A                                   | 7,314         | Program measures  | 8.1                           |
| Residential Energy-Efficient Products (Gas)      | 78%                                          | 109,111                          | -                              | 643,282          | 90%                | 98,200                    | -                              | 578,954          | \$ 2.74                                       | \$ 0.46                              | \$ 268,913    | N/A                                   | 7,314         | Program measures  | 5.9                           |
| Appliance Recycling (Electric)                   | 110%                                         | 8,466                            | 1                              | 67,715           | 63%                | 5,326                     | 1                              | 42,600           | \$ 336.97                                     | \$ 42.13                             | \$ 1,794,692  | 52% Ref./62% Freezer                  | 9,277         | Participants      | 8.0                           |
| Multifamily (Electric)                           | 100%                                         | 9,286                            | 1                              | 74,816           | 98%                | 9,075                     | 1                              | 73,116           | \$ 251.96                                     | \$ 31.27                             | \$ 2,286,520  | Varies by measure                     | 518           | Projects          | 8.1                           |
| Multifamily (Gas)                                | 98%                                          | 100,815                          | -                              | 804,864          | 99%                | 100,143                   | -                              | 799,499          | \$ 7.83                                       | \$ 0.98                              | \$ 783,638    | Varies by measure                     | 518           | Projects          | 8.0                           |
| Home Performance with ENERGY STAR (Electric)     | 94%                                          | 4,261                            | 2                              | 61,283           | 91%                | 3,883                     | 2                              | 55,844           | \$ 865.18                                     | \$ 60.15                             | \$ 3,359,268  | Varies by measure                     | 2,863         | Participants      | 14.4                          |
| Home Performance with ENERGY STAR (Gas)          | 109%                                         | 503,875                          | -                              | 9,540,055        | 82%                | 411,594                   | -                              | 7,792,864        | \$ 3.66                                       | \$ 0.19                              | \$ 1,506,209  | Varies by measure                     | 2,863         | Participants      | 18.9                          |
| ENERGY STAR New Homes (Electric)                 | 57%                                          | 443                              | 0                              | 12,847           | 80%                | 354                       | 0                              | 10,266           | \$ 1,528.85                                   | \$ 52.72                             | \$ 541,214    | 42%                                   | 302           | Participants      | 29.0                          |
| ENERGY STAR New Homes (Gas)                      | 69%                                          | 23,193                           | -                              | 672,597          | 80%                | 18,554                    | -                              | 538,066          | \$ 11.00                                      | \$ 0.38                              | \$ 204,004    | 101%                                  | 302           | Participants      | 29.0                          |
| Moderate Income (Electric)                       | 95%                                          | 617,197                          | 1                              | 9,633            | 100%               | 617                       | 1                              | 9,633            | \$ 1,168.76                                   | \$ 74.88                             | \$ 721,357    | N/A                                   | 317           | Participants      | 15.6                          |
| Moderate Income (Gas)                            | 107%                                         | 173,380                          | -                              | 3,271,328        | 100%               | 173,380                   | -                              | 3,271,328        | \$ 3.00                                       | \$ 0.16                              | \$ 519,447    | N/A                                   | 317           | Participants      | 18.9                          |
| Energy Efficiency Kits (Gas)                     | 60%                                          | 62,574                           | -                              | 490,116          | 54%                | 33,832                    | 0                              | 264,990          | \$ 0.46                                       | \$ 0.06                              | \$ 15,589     | N/A                                   | 48,402        | Program measures  | 7.8                           |
| <b>Business Programs</b>                         |                                              |                                  |                                |                  |                    |                           |                                |                  |                                               |                                      |               |                                       |               |                   |                               |
| Custom (Electric)                                | 105%                                         | 104,507                          | 12                             | 1,352,380        | 75%                | 78,380                    | 9                              | 1,014,282        | \$ 124.70                                     | \$ 9.64                              | \$ 9,774,160  | N/A                                   | 121           | Program measures  | 12.9                          |
| Custom (Gas)                                     | 91%                                          | 1,674,147                        | -                              | 21,763,911       | 75%                | 1,255,610                 | -                              | 16,322,930       | \$ 1.94                                       | \$ 0.15                              | \$ 2,435,474  | 83%                                   | 39            | Program measures  | 13.0                          |
| Standard (Electric)                              | 100%                                         | 81,024                           | 16                             | 955,050          | 69%                | 55,525                    | 11                             | 654,487          | \$ 147.64                                     | \$ 12.53                             | \$ 8,197,745  | N/A                                   | 19,599        | Program measures  | 11.8                          |
| Standard (Gas)                                   | 101%                                         | 991,163                          | -                              | 6,987,463        | 98%                | 972,082                   | -                              | 6,852,946        | \$ 1.01                                       | \$ 0.14                              | \$ 983,904    | N/A                                   | 19,599        | Program measures  | 7.0                           |
| Retro-Commissioning (Electric)                   | 90%                                          | 10,892                           | 0                              | 54,460           | 95%                | 10,347                    | 0                              | 51,735           | \$ 183.69                                     | \$ 36.74                             | \$ 1,900,686  | 92%                                   | 22            | Projects          | 5.0                           |
| Retro-Commissioning (Gas)                        | 100%                                         | 248,851                          | -                              | 1,244,255        | 95%                | 236,408                   | -                              | 1,182,040        | \$ 3.17                                       | \$ 0.63                              | \$ 750,420    | 92%                                   | 26            | Projects          | 5.0                           |

Table 31. PY5 Detailed Ex Post Savings Results

| AIC PY5 Programs                                 | Realization Rate                             |                                  |                                |                  | Deemed/Used        | Verified Ex Post Net      |                                |                  |                                               |                                      | Actual        | Evaluation Estimate (Where Available) | Participation |                   | Weighted Average Measure Life |
|--------------------------------------------------|----------------------------------------------|----------------------------------|--------------------------------|------------------|--------------------|---------------------------|--------------------------------|------------------|-----------------------------------------------|--------------------------------------|---------------|---------------------------------------|---------------|-------------------|-------------------------------|
|                                                  | Energy Savings (Ex Ante Gross/Ex Post Gross) | First Year Annual Energy Savings | First Year Peak Demand Savings | Lifetime Savings | Net-to-Gross Ratio | First Year Annual Savings | First Year Peak Demand Savings | Lifetime Savings | First Year Cost per First Year Annual Savings | First Year Cost per Lifetime Savings | Program Costs | Net-to-Gross Ratio                    | # Units       | Units Definition  | Years                         |
|                                                  | %                                            | MWh/Therms                       | MW                             | MWh/Therms       | %                  | MWh/Therms                | MW                             | MWh/Therms       | \$/MWh or \$/Therms                           | \$/MWh or \$/Therms                  | \$            | %                                     |               |                   |                               |
| <b>Residential Programs</b>                      |                                              |                                  |                                |                  |                    |                           |                                |                  |                                               |                                      |               |                                       |               |                   |                               |
| Residential Lighting (Electric)                  | 120%                                         | 156,432                          | 18                             | 669,574          | 83%                | 129,839                   | 15                             | 555,749          | \$ 39.25                                      | \$ 9.17                              | \$ 5,096,149  | 47%                                   | 2,821,350     | Bulbs             | 4.8                           |
| Behavior Modification (Electric)                 | N/A                                          | N/A                              | N/A                            | N/A              | N/A                | 31,618                    | -                              | 31,618           | \$ 32.45                                      | \$ 32.45                             | \$ 1,026,000  | N/A                                   | 204,773       | Customers treated | 1.0                           |
| Behavior Modification (Gas)                      | N/A                                          | N/A                              | N/A                            | N/A              | N/A                | 1,576,341                 | -                              | 1,576,341        | \$ 0.65                                       | \$ 0.65                              | \$ 1,026,000  | N/A                                   | 220,153       | Customers treated | 1.0                           |
| HVAC (Electric)                                  | 100%                                         | 9,105                            | 6                              | 168,264          | 59%                | 5,372                     | 3                              | 99,272           | \$ 511.52                                     | \$ 27.68                             | \$ 2,747,896  | 74%                                   | 6,579         | Program measures  | 18.5                          |
| HVAC (Gas)                                       | 100%                                         | 945,617                          | -                              | 19,025,522       | 102%               | 964,664                   | -                              | 19,408,742       | \$ 1.91                                       | \$ 0.09                              | \$ 1,840,043  | 62%                                   | 5,930         | Program measures  | 20.1                          |
| Residential Energy-Efficient Products (Electric) | 94%                                          | 1,354                            | 0                              | 11,981           | 83%                | 1,120                     | 0                              | 9,910            | \$ 268.51                                     | \$ 30.34                             | \$ 300,727    | Varies by measure                     | 8,211         | Program measures  | 8.8                           |
| Residential Energy-Efficient Products (Gas)      | 83%                                          | 102,989                          | -                              | 751,809          | 90%                | 92,691                    | -                              | 676,635          | \$ 2.57                                       | \$ 0.35                              | \$ 238,426    | 90%                                   | 4,457         | Program measures  | 7.3                           |
| Appliance Recycling (Electric)                   | 122%                                         | 7,729                            | 2                              | 61,827           | 98%                | 7,542                     | 1                              | 60,331           | \$ 277.89                                     | \$ 34.74                             | \$ 2,095,809  | 52% Ref./62% Freezer                  | 11,683        | Participants      | 8.0                           |
| Multifamily (Electric)                           | 106%                                         | 16,754                           | 3                              | 200,589          | 97%                | 16,219                    | 3                              | 194,184          | \$ 172.85                                     | \$ 14.44                             | \$ 2,803,531  | 56% Common Area                       | 835           | Projects          | 12.0                          |
| Multifamily (Gas)                                | 101%                                         | 207,806                          | -                              | 2,894,485        | 88%                | 183,061                   | -                              | 2,549,817        | \$ 2.94                                       | \$ 0.21                              | \$ 538,480    | N/A                                   | 835           | Projects          | 13.9                          |
| HEP/ESHP (Electric)                              | 97%                                          | 4,319                            | 3                              | 65,798           | 94%                | 4,042                     | 3                              | 61,580           | \$ 791.13                                     | \$ 51.93                             | \$ 3,197,601  | N/A                                   | 4,152         | Participants      | 15.2                          |
| HEP/ESHP (Gas)                                   | 100%                                         | 714,698                          | -                              | 13,843,313       | 97%                | 690,883                   | -                              | 13,382,029       | \$ 4.68                                       | \$ 0.24                              | \$ 3,230,760  | N/A                                   | 4,152         | Participants      | 19.4                          |
| ENERGY STAR New Homes (Electric)                 | 100%                                         | 379                              | 0                              | 10,992           | 80%                | 303                       | 0                              | 8,793            | \$ 925.46                                     | \$ 31.91                             | \$ 280,599    | N/A                                   | 174           | Participants      | 29.0                          |
| ENERGY STAR New Homes (Gas)                      | 99%                                          | 14,446                           | -                              | 418,934          | 80%                | 11,557                    | -                              | 335,153          | \$ 9.24                                       | \$ 0.32                              | \$ 106,736    | N/A                                   | 174           | Participants      | 29.0                          |
| Moderate Income (Electric)                       | 94%                                          | 541                              | 0                              | 8,540            | 100%               | 541                       | 0                              | 8,540            | \$ 1,033.39                                   | \$ 65.43                             | \$ 558,724    | N/A                                   | 260           | Participants      | 15.8                          |
| Moderate Income (Gas)                            | 92%                                          | 116,653                          | -                              | 2,192,550        | 100%               | 116,653                   | -                              | 2,192,550        | \$ 5.05                                       | \$ 0.27                              | \$ 589,444    | N/A                                   | 260           | Participants      | 18.8                          |
| <b>Business Programs</b>                         |                                              |                                  |                                |                  |                    |                           |                                |                  |                                               |                                      |               |                                       |               |                   |                               |
| Custom (Electric)                                | 85%                                          | 63,465                           | 18                             | 828,969          | 81%                | 51,674                    | 14                             | 674,957          | \$ 123.24                                     | \$ 9.44                              | \$ 6,368,310  | 74%                                   | 170           | Program measures  | 13.1                          |
| Custom (Gas)                                     | 97%                                          | 898,627                          | -                              | 11,138,936       | 81%                | 729,439                   | 0                              | 9,041,765        | \$ 1.94                                       | \$ 0.16                              | \$ 1,417,686  | N/A                                   | 21            | Program measures  | 12.4                          |
| Standard (Electric)                              | 98%                                          | 123,620                          | 17                             | 1,482,757        | 75%                | 92,498                    | 13                             | 1,109,465        | \$ 118.01                                     | \$ 9.84                              | \$ 10,915,482 | 77% Lighting                          | 76,583        | Program measures  | 12.0                          |
| Standard (Gas)                                   | 100%                                         | 2,062,981                        | -                              | 13,131,434       | 100%               | 2,062,981                 | 0                              | 13,131,434       | \$ 0.79                                       | \$ 0.12                              | \$ 1,632,208  | 90% Steam Traps                       | 799           | Program measures  | 6.4                           |
| Retro-Commissioning (Electric)                   | 93%                                          | 27,324                           | 3                              | 135,795          | 95%                | 25,958                    | 3                              | 129,007          | \$ 54.94                                      | \$ 11.06                             | \$ 1,426,184  | N/A                                   | 35            | Projects          | 5.0                           |
| Retro-Commissioning (Gas)                        | 89%                                          | 512,116                          | -                              | 1,280,290        | 95%                | 486,510                   | 0                              | 1,216,275        | \$ 1.10                                       | \$ 0.44                              | \$ 533,768    | N/A                                   | 9             | Projects          | 2.5                           |

Table 32. PY4 Detailed Ex Post Savings Results

|                                                  | Realization Rate                             |                                  |                                |                  | Deemed/Used        | Verified Ex Post Net      |                                |                  |                                               |                                      | Actual        | Evaluation Estimate (Where Available) | Participation |                   | Weighted Average Measure Life |
|--------------------------------------------------|----------------------------------------------|----------------------------------|--------------------------------|------------------|--------------------|---------------------------|--------------------------------|------------------|-----------------------------------------------|--------------------------------------|---------------|---------------------------------------|---------------|-------------------|-------------------------------|
|                                                  | Energy Savings (Ex Ante Gross/Ex Post Gross) | First Year Annual Energy Savings | First Year Peak Demand Savings | Lifetime Savings | Net-to-Gross Ratio | First Year Annual Savings | First Year Peak Demand Savings | Lifetime Savings | First Year Cost per First Year Annual Savings | First Year Cost per Lifetime Savings | Program Costs | Net-to-Gross Ratio                    | # Units       | Units Definition  | Years                         |
| AIC PY4 Programs                                 | %                                            | MWh/Therms                       | MW                             | MWh/Therms       | %                  | MWh/Therms                | MW                             | MWh/Therms       | \$/MWh or \$/Therms                           | \$/MWh or \$/Therms                  | \$            | %                                     |               |                   |                               |
| <b>Residential Programs</b>                      |                                              |                                  |                                |                  |                    |                           |                                |                  |                                               |                                      |               |                                       |               |                   |                               |
| Residential Lighting (Electric)                  | 103%                                         | 175,587                          | 22                             | 862,791          | 83%                | 145,737                   | 15                             | 716,116          | \$ 48.93                                      | \$ 9.96                              | \$ 7,131,412  | N/A                                   | 4,370,577     | Bulbs             | 4.9                           |
| Behavior Modification (Electric)                 | N/A                                          | N/A                              | N/A                            | N/A              | N/A                | 22,412                    | -                              | 22,412           | \$ 32.37                                      | \$ 32.37                             | \$ 725,555    | N/A                                   | 230,261       | Customers treated | 1.0                           |
| Behavior Modification (Gas)                      | N/A                                          | N/A                              | N/A                            | N/A              | N/A                | 1,199,510                 | -                              | 1,199,510        | \$ 0.60                                       | \$ 0.60                              | \$ 725,555    | N/A                                   | 246,375       | Customers treated | 1.0                           |
| HVAC (Electric)                                  | 105%                                         | 8,504                            | 6                              | 153,064          | 59%                | 5,007                     | 3                              | 90,126           | \$ 513.58                                     | \$ 28.53                             | \$ 2,571,492  | N/A                                   | 4,655         | Program measures  | 18.0                          |
| HVAC (Gas)                                       | 100%                                         | 950,721                          | -                              | 17,147,478       | 102%               | 969,563                   | -                              | 17,487,318       | \$ 1.63                                       | \$ 0.09                              | \$ 1,576,767  | N/A                                   | 5,601         | Program measures  | 18.0                          |
| Residential Energy-Efficient Products (Electric) | 75%                                          | 1,560                            | 0                              | 12,453           | 82%                | 1,275                     | 0                              | 10,178           | \$ 335.28                                     | \$ 42.00                             | \$ 427,486    | Varies by measure                     | 9,855         | Program measures  | 8.0                           |
| Residential Energy-Efficient Products (Gas)      | 57%                                          | 115,584                          | -                              | 629,327          | 90%                | 104,440                   | -                              | 568,652          | \$ 2.09                                       | \$ 0.38                              | \$ 218,541    | Varies by measure                     | 3,344         | Program measures  | 5.4                           |
| Appliance Recycling (Electric)                   | 89%                                          | 18,196                           | 2                              | 145,539          | 64%                | 11,673                    | 1                              | 93,365           | \$ 206.47                                     | \$ 25.81                             | \$ 2,410,143  | 59% Ref./61% Freezer                  | 14,241        | Participants      | 8.0                           |
| Multifamily (Electric)                           | 109%                                         | 7,609                            | 2                              | 90,763           | 97%                | 7,385                     | 2                              | 88,091           | \$ 222.82                                     | \$ 18.68                             | \$ 1,645,534  | N/A                                   | 601           | Projects          | 11.9                          |
| Multifamily (Gas)                                | 102%                                         | 299,191                          | -                              | 4,832,670        | 98%                | 293,274                   | -                              | 4,737,096        | \$ 2.64                                       | \$ 0.16                              | \$ 774,964    | N/A                                   | 601           | Projects          | 16.2                          |
| HEP/ESHP (Electric)                              | 100%                                         | 2,173                            | -                              | 31,655           | 92%                | 2,000                     | 0                              | 29,132           | \$ 1,392.42                                   | \$ 95.59                             | \$ 2,784,847  | N/A                                   | 4,215         | Participants      | 14.6                          |
| HEP/ESHP (Gas)                                   | 100%                                         | 735,098                          | -                              | 15,411,132       | 81%                | 597,308                   | -                              | 12,522,401       | \$ 5.10                                       | \$ 0.24                              | \$ 3,043,386  | N/A                                   | 4,215         | Participants      | 21.0                          |
| ENERGY STAR New Homes (Electric)                 | 100%                                         | 236                              | 0                              | 6,835            | 80%                | 189                       | 0                              | 5,481            | \$ 1,009.93                                   | \$ 34.83                             | \$ 190,876    | N/A                                   | 65            | Participants      | 29.0                          |
| ENERGY STAR New Homes (Gas)                      | 100%                                         | 16,000                           | -                              | 464,000          | 80%                | 12,800                    | -                              | 371,200          | \$ 10.50                                      | \$ 0.36                              | \$ 134,348    | N/A                                   | 65            | Participants      | 29.0                          |
| Moderate Income (Electric)                       | 99%                                          | 286                              | 0                              | 4,519            | 100%               | 286                       | 0                              | 4,519            | \$ 913.14                                     | \$ 57.72                             | \$ 260,870    | N/A                                   | 275           | Participants      | 15.8                          |
| Moderate Income (Gas)                            | 98%                                          | 110,908                          | -                              | 2,310,672        | 100%               | 110,908                   | -                              | 2,310,672        | \$ 5.14                                       | \$ 0.25                              | \$ 569,699    | N/A                                   | 275           | Participants      | 20.8                          |
| <b>Business Programs</b>                         |                                              |                                  |                                |                  |                    |                           |                                |                  |                                               |                                      |               |                                       |               |                   |                               |
| Custom (Electric)                                | 88%                                          | 60,941                           | 8                              | 762,557          | 78%                | 47,837                    | 6                              | 598,586          | \$ 109.12                                     | \$ 8.72                              | \$ 5,220,024  | N/A                                   | 127           | Program measures  | 12.5                          |
| Custom (Gas)                                     | 105%                                         | 707,954                          | -                              | 8,342,381        | 79%                | 561,784                   | -                              | 6,619,944        | \$ 1.73                                       | \$ 0.15                              | \$ 974,641    | N/A                                   | 59            | Program measures  | 11.8                          |
| Standard (Electric)                              | 88%                                          | 121,887                          | 14                             | 1,082,286        | 76%                | 92,811                    | 11                             | 824,107          | \$ 110.41                                     | \$ 12.43                             | \$ 10,247,287 | Varies by measure                     | 105,554       | Program measures  | 8.9                           |
| Standard (Gas)                                   | 98%                                          | 1,925,608                        | -                              | 16,556,620       | 81%                | 1,560,266                 | -                              | 13,415,363       | \$ 0.93                                       | \$ 0.11                              | \$ 1,448,146  | Varies by measure                     | 19,644        | Program measures  | 8.6                           |
| Retro-Commissioning (Electric)                   | 89%                                          | 17,993                           | 2                              | 87,847           | 95%                | 17,052                    | 2                              | 83,253           | \$ 116.60                                     | \$ 23.88                             | \$ 1,988,251  | 95%                                   | 31            | Projects          | 4.9                           |
| Retro-Commissioning (Gas)                        | 85%                                          | 381,925                          | -                              | 1,909,625        | 95%                | 361,966                   | -                              | 1,809,830        | \$ 0.63                                       | \$ 0.13                              | \$ 227,779    | 95%                                   | 5             | Projects          | 5.0                           |





## B. Appendix - NTG Research for Future Application

The following table summarizes the timing of the evaluation team’s NTG research during the Plan 2 period. The specific values developed are included in the team’s recommendations to the Stakeholder Advisory Group (SAG), as well as presented in the individual evaluation reports.

**Table 33. NTG Research by Program and Year**

| Sector      | Program                 | EPY4/GPY1                                   |     | EPY5/GPY2 |     | EPY6/GPY3 |     |
|-------------|-------------------------|---------------------------------------------|-----|-----------|-----|-----------|-----|
|             |                         | Electric                                    | Gas | Electric  | Gas | Electric  | Gas |
| Residential | Lighting                |                                             |     |           |     | •         | N/A |
|             | HVAC                    |                                             |     |           |     | •         | •   |
|             | Behavioral Modification | N/A – Billing Analysis Provides Net Impacts |     |           |     |           |     |
|             | HPwES                   | •                                           | •   |           |     | •         | •   |
|             | Appliance Recycling     |                                             |     |           |     | •         | N/A |
|             | Multifamily             |                                             |     | •         | •   | •         | •   |
|             | Moderate Income         | N/A – Consensus Reached on Deemed Value     |     |           |     |           |     |
|             | Efficient Products      | •                                           | •   |           |     |           |     |
|             | ENERGY STAR New Homes   |                                             |     |           |     | •         | •   |
| Business    | Standard                | •                                           | •   | •         | •   |           |     |
|             | Custom                  | •                                           | •   | •         | •   |           | •   |
|             | Retro-Commissioning     | •                                           | •   |           |     | •         | •   |

Note: The School Energy Efficiency Kits Programs is not included in this table because it was not subject to NTG research in EPY6/GPY3.

## **C. Appendix - PY4 Integrated Report**



AIC PY4 Integrated  
Report FINAL 2014-C

## **D. Appendix - PY5 Integrated Report**



AIC PY5 Integrated  
Report FINAL 2014-C

## **E. Appendix - PY6 Integrated Report**



AIC PY6 Integrated  
Report FINAL 2016-C

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