**ComEd Programs NTG Approach for EPY8**

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Business Programs

|  | Business Standard Incentive |
| --- | --- |
| EPY1 | **NTG 0.67****Free-ridership 33**%**Participant Spillover** 0% (qualitative evidence observed, not quantified)**Method**: Customer self-report. 95 interviews completed covering 101 projects from a population of 455 projects. |
| EPY2 | **NTG 0.74****Free-ridership 27**%**Participant Spillover** 1%**Method**: Customer self-report. 90 interviews completed covering 114 projects from a population of 1,739 projects.Enhanced method. Ten trade allies called for 11 participants and their responses factored in to the customer free ridership calculation. |
| EPY3 | **NTG 0.72****Free-ridership 28**%**Participant Spillover** 0% (qualitative evidence observed, not quantified)**Method**: Customer self-report. 108 interviews completed covering 292 projects from a population of 3,794 projects.Enhanced method. Two trade allies and three account managers were called for five participants and their responses factored in to the customer free ridership calculation. |
| EPY4 | **Deemed using PY2 values.****PY4 Research NTG 0.70****Free-ridership 31**%**Participant Spillover** 1%**Method**: Customer self-report. 110 interviews completed covering 166 projects from a population of 4,603 projects.Enhanced method. Two trade allies called for two participants and their responses factored in to the customer free ridership calculation.NTGR (free-ridership only): All lighting =0.70 (90/±5%); Lighting, no T12s reported in base case 0.66 (90/±9%); Lighting, T12s reported in base case 0.80 (90/±14%) Non-Lighting = 0.63 (90/±16%). |
| EPY5 | SAG Consensus:* Lighting: 0.74
* Non-Lighting: 0.62
 |
| EPY6 | SAG Consensus:* Lighting: 0.70
* Non-Lighting: 0.63
 |
| EPY7 |  **Lighting****NTG: 0.81**Free Ridership: Measured and equal to 0.26Justification: EPY5 ComEd Standard Program research, 63 participantsTotal Recommended Spillover = 0.07Participant and Non-Participant Spillover Identified by Participating Standard Program Trade Allies: Measured and equal to 0.05Justification: EPY5 ComEd Standard Program research, participating trade ally sample 55Participant and Non-Participant Spillover Identified by Non-Participating Standard Program Trade Allies: Not measured for ComEd; a value of 0.02 is recommendedJustification: Based on GPY2 results from Nicor Gas (0.02), and Peoples Gas and North Shore Gas (0.02).**Non-Lighting****NTG: 0.77**Free Ridership: Measured and equal to 0.31Justification: EPY5 ComEd Standard Program research, 64 participantsTotal Recommended Spillover = 0.08Participant and Non-Participant Spillover Identified by Participating Standard Program Trade Allies: Measured and equal to 0.06Justification: EPY5 ComEd Standard Program research, participating trade ally sample 10.Participant and Non-Participant Spillover Identified by Non-Participating Standard Program Trade Allies: Not measured for ComEd; a value of 0.02 is recommendedJustification: Based on GPY2 results from Nicor Gas (0.02), and Peoples Gas and North Shore Gas (0.02).  |
| EPY8 | **Recommendation (based upon PY6 research):** **NTG Lighting: 0.74** **NTG Non-Lighting: 0.63** **Free-Ridership, Lighting: 0.27****Free-Ridership, Non-Lighting: 0.38****SO: 0.01** Free Ridership was estimated in PY6 as 0.27 for lighting Free Ridership = 0.38 for non-lightingBoth based on customer self-report data collected through phone interviews (n=59).In PY6, trade allies and business customers were interviewed in a separate study to estimate spillover broadly across the C&I market. The results of the cross-cutting C&I spillover study will be reported separately. |

|  | Business Custom  |
| --- | --- |
| EPY1 | **NTG** 0.72**Free-ridership** 28%**Spillover** 0%**Method**: Customer self-reports. 24 surveys completed from a population of 88. |
| EPY2 | **NTG** 0.76**Free-ridership** 24%**Spillover** 0%**Method**: Customer self-reports. 20 surveys completed from a population of 345. |
| EPY3 | **NTG** 0.56 for kWh and 0.46 for kW**Free-ridership** 44%**Spillover** 0%**Method**: Customer self-reports. 67 surveys completed from a population of 887. |
| EPY4 | **Deemed using PY2 = 0.76****PY4 Research NTG** 0.61 for kWh and 0.64 for kW**Free-ridership** 39%**Spillover** 0%**Method**: Customer self-reports. 63 surveys completed from a population of 367. |
| EPY5 | SAG Consensus:* 0.56
 |
| EPY6 | SAG Consensus:* 0.61 kWh (deemed by SAG for PY6)
* 0.64 kW (deemed by SAG for PY6)

Values for kWh and kW are derived from PY4 evaluation research results and are based on the SAG-approved values. |
| EPY7 | **Custom NTG: 0.64****Free-ridership: 0.36****Participants Spillover: Negligible****Nonparticipants Spillover: Negligible****Data Centers NTG: 0.48****Free-ridership 0.52****Participants Spillover: Negligible****Nonparticipants Spillover: Negligible**Source: Participant self-report telephone survey. The spillover effects were examined in this evaluation and their magnitude was found to be quite small as discussed below in the spillover section. Therefore, a quantification of spillover was not included in the calculation of NTGR for EPY5.Notes: In PY5, Data Centers was combined with Custom, while in PY6, Data Centers was managed separately from with Custom.Interviews were completed with 5 of 11 Data Center projects. |
| EPY8 | **Recommendation (based upon PY6 research):** **Custom NTG: 0.67** **Custom Free Ridership: 0.33****Custom Spillover: 0.005**Custom: The above values are from the PY6 research results. NTG research methods in PY6 consisted of participant and trade allies survey data collection and analysis (n=32). NTG research methods in PY6 combined participant and service provider survey results.The existence of participant spillover was examined in PY6 but no significant spillover activity was reported by participants, and, therefore, quantification was not warranted. |
|  | Data Centers  |
| EPY7 | **Data Centers NTG: 0.48****Free-ridership 0.52****Participants Spillover: Negligible****Nonparticipants Spillover: Negligible****See EPY7 Custom Program** |
| EPY8 | **Recommendation (based upon PY6 research):** **Data Center NTG kWh: 0.60****Data Center NTG kW: 0.57Data Center Free Ridership kWh: 0.40****Data Center Free Ridership kW:0.43****Data Center Spillover: Negligible**NTGR results were based on self-reported data from surveys of a census of PY6 projects. For PY6, the net program impacts were quantified solely on the estimated level of free-ridership. Information regarding participant spillover was also collected, but ultimately did not support a finding of any spillover – spillover was very small. |

|  | Industrial Systems (Compressed Air in EPY4) |
| --- | --- |
| EPY1 | Program did not exist |
| EPY2 | Program did not exist |
| EPY3 | Program did not exist |
| EPY4 | **Retroactive application of NTG** of 0.67 for kWh and 0.72 for kW (EPY4 Compressed Air)**Free-ridership** 33% kWh and 0.28 kW**Spillover** 0%**Method**: Customer self-report. 7 surveys completed from a population of 9. |
| EPY5 | SAG Consensus:* 0.67
 |
| EPY6 | SAG Consensus:* 0..67
 |
| EPY7 | **NTG: 0.68****Free-ridership: 0.33** **Participant Spillover: 0.01****Nonparticipant Spillover: Negligible**Free Ridership and participant spillover was measured in a participant survey on 35 projects. Interviews were completed with 5 of 11 Data Center projects. |
| EPY8 | **Recommendation (based upon PY6 research):** **NTG, kWh: 0.74****Free Ridership, kWh: 0.26****Spillover, kWh: Negligible****NTG, kW: 0.83****Free Ridership, kW: 0.17****Spillover, kW: Negligible** NTG research methods in PY6 consisted of participant and technical service provider survey data collection and analysis(n=17).The net program impacts were quantified solely on the estimated level of free-ridership. Information regarding participant spillover was also collected, but ultimately did not support a finding of any spillover. |

|  | Retro-Commissioning (Joint) |
| --- | --- |
| EPY1 | **NTG** 0.8**Free-ridership** 0%**Spillover** 0%**Method**: Program *ex ante* assumption.Customer self-report. Two completed surveys from a population of four participants bracketed the assumed NTG. Basic method.  |
| EPY2 | **NTG** 0.916**Free-ridership** 8.4%**Spillover** 0%**Method**: Customer self-report. Five surveys completed from an attempted census of a population of thirteen. Basic method.  |
| EPY3 | **NTG** 0.71**Free-ridership** 28.7%**Spillover** 0%**Method**: Customer self-report. Eight surveys completed from an attempted census of a population of 34 participants. Basic method.  |
| EPY4 | **Deemed NTG of 0.916 from EPY2****Research NTG** 1.04**Free-ridership 0.097****Spillover 0.136****Method**: Program *ex ante* assumption and stipulated for EPY4. NTG based on EPY2 research. EPY3 research rejected due to small ratio of completed surveys. |
| EPY5 | SAG Consensus:* 0.71
 |
| EPY6 | SAG Consensus:* 1.04
 |
| EPY7 | **NTG: 1.04** There was no new NTG research in EPY5. The most recent NTG research is from PY4. **Free-ridership: 0.10.** The PY4 free-ridership ratio is an equally weighted average of savings-weighted participant and service provider free-ridership scores.**Participant spillover: 0.14.** Source: Participant and trade ally surveys.(Includes spillover from trade allies that account for 94% of program participation)**Nonparticipant spillover: Negligible.** There is no evidence of non-participant spillover. Service providers are dropped from the program if they are not generating projects. If they are not generating projects in the program, they are probably not generating them outside the program. |
| EPY8 | **Recommendation (based upon PY6 research):** **NTG: 0.95 (electric)****Free Ridership: 0.09 (electric)****Spillover: 0.04 (electric)**Spillover and free-ridership were calculated from self-report interviews with participants and service providers (n=18). The final EPY6 free-ridership ratio is an equally weighted average of savings-weighted participant and RSP free-ridership. Interviewed service providers account for 92% of electric savings.NTG research was not conducted for the gas companies. |

|  | Business New Construction Service (Joint) |
| --- | --- |
| EPY1 | NTG was not evaluated for EPY1 because program began in EPY2. |
| EPY2 | **NTG** 0.59**Free-ridership** 41%**Spillover** 0%**Method**: Customer self-report. 14 projects were assessed from a population of 16.Enhanced method. NTG scores were adjusted for standard design national retail stores.  |
| EPY3 | **NTG** 0.65 (0.69 for Systems Track and 0.54 for Comprehensive Track)**Free-ridership** 35%**Spillover** 0%**Method**: Customer self-report. 13 interviews with individuals representing 15 projects out of population of 37 projects.Enhanced method. NTG scores were adjusted for standard design national retail stores.  |
| EPY4 | **Compressive Track - Retroactive application of NTG of 0.54** **Systems Track used PY2 value of 0.59****NTG** **0.57** (based on weighted avg. of 0.59 for Systems Track and 0.54 for Comprehensive Track)**EPY4 Research Comprehensive Track 0.54****EPY4 Research Systems Track 0.59****Free-ridership** 43%**Spillover** 0%**Method**: EPY3 deemed value for Systems Track projects. Customer self-report for Comprehensive Track projects. Interviews with individuals representing 5 of 6 Comprehensive Track projects.Enhanced method. NTG scores were adjusted for standard design national retail stores and LEED projects.  |
| EPY5 | SAG Consensus:* 0.65
 |
| EPY6 | SAG Consensus:* 0.52
 |
| EPY7 | **Full Program NTG: 0.59****Comprehensive NTG: 0.59****Systems Projects NTG: 0.64****Free-ridership 0.43****Spillover (all types) 0.05****Source**. The NTG from estimate is from the EM&V EPY4 participant survey.Spillover is an EM&V estimate based on our literature review. In 50 participant interviews from EPY2-4 we found 2 spillover projects. Some of those interviews were early in the program’s life when spillover is less likely. We also looked at existing literature on past studies and a wide range of spillover values. For example, in September of 2012, National Grid Rhode Island published a study: "2011 Commercial and Industrial Programs Free-ridership and Spillover Study." For commercial new construction, they found 78% participant spillover and 0% non-participant spillover. Southern California Gas recently did a study to estimate spillover for its 2013 and 2014 Savings By Design program by looking at past studies. They only found a couple of older California studies relevant to commercial new construction. The 2003 BEA reported 11% participant spillover and 1% non-participant spillover. A 2002 study by the same evaluator showed 13% participant spillover and 5% non-participant spillover. Finally, they also looked at the NYSERDA New Construction Program Impact Evaluation Report from 2007-2008, which found participant spillover of 20% and non-participant spillover of 61%. This study has been questioned and we understand that NYSERDA is reevaluating its validity.Our conclusion is that, given the ComEd program design and implementation approach, it is reasonable to expect that a meaningful amount of spillover is being created and should be credited to the program. Given the range of spillover amounts we found in our literature review, we believe a spillover amount of 5% is probably a realistic and probably conservative estimate. That spillover is probably occurring through the action of architects, engineers, and builders who have had exposure to the program and, to a lesser degree, building owners who had a building go through the program. Given that mix, we have not tried to differentiate between participant and nonparticipant spillover. |
| EPY8 | **Recommendation (based upon PY6 research):****Full Program NTG: 0.80 – Preliminary, updated number to be provided later****Free-ridership: 0.20****Spillover: 0.00**The researched NTGRs are being developed using a “real-time” approach where the evaluation team conducts interviews with program participants both after each project passes the reservation phase, and again after it passes the verification phase.  |

|  | BILD and MidStream Incentives  |
| --- | --- |
| EPY1 | N/A No Program |
| EPY2 | N/A No Program |
| EPY3 | N/A Pilot Program – no data collection |
| EPY4 | **Retroactive application of NTG** of 0.63**Free-ridership** 39%**Spillover** 2%**Method**: Customer self-report. 51 surveys completed from a population of about 5,000 (contact information available for only a small subset of participants).11 Trade ally surveys also conducted resulting in a NTG of 0.56 but this result was not factored in to the customer free ridership calculation.  |
| EPY5 | SAG Consensus:* 0.74
 |
| EPY6 | SAG Consensus:* 0.63
 |
| EPY7 | **NTG CFL: 0.64** (EPY4 and EPY5 weighted average. EPY5 CFL NTG is 0.66)**NTG LED/HID: 0.70****NTG Linear FL: 0.56****NTG Other: 0.67****Free Ridership:** CFLs 0.41; LEDs 0.38; Linear Fluorescents 0.47; other 0.40.**Participant Spillover:** CFLs 0.07; LEDs 0.08; Linear Fluorescents 0.03; Other 0.07**Nonparticipant Spillover:** Negligible.There are very few (perhaps as few as 1 or 2) midstream lighting programs offered around the country and the others are very small and new, have not yet been evaluated, and thus provide no research on nonparticipant spillover. Given how this program is administered it is likely that nonparticipant spillover would be very small.Source: PY5 participant and distributor self-report surveys.Notes: In PY5, Midstream Incentive Lighting was renamed BILD. |
| EPY8 | **Recommendation (based upon PY6 research):****NTG CFL: 0.68****NTG LED/HID: 0.77****NTG Linear FL: 0.61****NTG Other: 0.68*****Research NTG ratios calculated from PY6 participants:***PY6 NTG CFL: 0.68Free Ridership CFL: 0.39Spillover CFL: 0.07PY6 NTG LED/HID: 0.77Free Ridership: 0.30Spillover LED/HID: 0.07PY6 NTG Linear FL: 0.61Free Ridership: 0.45Spillover Linear FL: 0.07PY6 NTG Other: 0.67Free Ridership: 0.40Spillover: 0.07In PY6, two primary methods were used to estimate the NTGR:1. Customer self-report approach based on the end-user telephone surveys of 282 participants and in-depth interviews with 9 BILD end-user participants.
2. Supplier self-reports based on in-depth interviews with program lighting distributors.
 |

|  | Small Business Energy Savings (Joint) |
| --- | --- |
| EPY1 | No Program |
| EPY2 | No Program |
| EPY3 | No Program |
| EPY4 | **Retroactive application of NTG** of 0.95**Free-ridership** 5%**Spillover** 0%**Method**: Customer self-report. 84 NTG surveys completed from a population of 181. Basic method of NTG analysis was used. No spillover was found. Customer participant self-reported free-ridership was 17 percent for ComEd. Individual trade ally responses to free-ridership questions were weighted by their respective fuel-specific program savings contributions and combined for a fuel-specific overall free-ridership rate. This approach resulted in an evaluation estimate of 5 percent free-ridership for electric measures and was used to calculate the NTG of 0.95 for this ComEd program. |
| EPY5 | SAG Consensus: 0.90 |
| EPY6 | SAG Consensus: 0.95 |
| EPY7 | **NTG: 0.95**No new NTG research in PY5.**Free Ridership: 5%.** Customer self-report survey.**Participant Spillover: 0%** Customer and trade ally self-report survey. **Nonparticipant Spillover: 0%** Trade ally surveyThree small participant spillover projects were included in the ComEd NTGR, but the impact (about 0.003 added) was not significant at the two-digit level. Trade allies provided anecdotal evidence of non-participant spillover for electric measures, but they did not provide enough information to quantify it. |
| EPY8 | **Recommendation (based on average of PY7 Participant Survey & PY4 TA Interviews):** **NTG: 0.91****Free-ridership: 0.11** (based upon average of PY7 Participant Survey of FR 0.16 and PY4 TA Interviews FR 0.05)**Participant Spillover: 0.02** (based upon PY7 SO research)**Nonparticipant spillover: 0.0** |

Residential Programs

|  | Residential Lighting – Smart Lighting Discounts |
| --- | --- |
| EPY1 | **NTG** 0.69**Free-ridership** 38%**Spillover** 7%**Method**: Customer self-report. Based on phone surveys with 100 coupon participants and 56 identified participants identified in a general population survey.  |
| EPY2 | **NTG** 0.58**Free-ridership** 48%**Spillover** 6%**Method**: Average of two customer self-report methods (based on general population survey [201 completes] and in-store intercept surveys [381 completes]). A supplier self-report method (22 surveys) and a revealed preference demand model method were also employed and resulted in lower NTGR estimates but were believed to be less accurate methods. |
| EPY3 | **NTG** 0.71**Free-ridership** 31%**Spillover** 2%**Method**: A customer self-report method based on in-store intercept surveys [496 completes]. A supplier self-report method (13 surveys) and a multi-state regression model was also employed and resulted in lower NTGR estimates but were believed to be less accurate methods. |
| EPY4 | **Deemed using PY2 values****EPY4 Research NTG** 0.54 Total, 0.55 Standard, 0.44 Specialty, 0.54 Other - Fixture/LEDs**Free-ridership** 47% Standard, 58% Specialty, 48% Other - Fixture/LEDs**Spillover** 2%**Method**: Customer self-report method based on in-store intercept surveys (719 intercept surveys).  |
| PY5 | SAG Consensus:* Standard CFL: 0.72
* Specialty CFL: 0.80
* CFL Fixtures: 0.79
 |
| EPY6 | SAG Consensus:* Standard CFL: 0.54
* Specialty CFL: 0.80
* CFL Fixtures: 0.54
 |
| EPY7 | **NTG (*based upon 3 year weighted average*):** **Standard CFL: 0.60****Specialty CFL: 0.55****CFL Fixtures: 0.75****LED Bulbs: 0.48****LED Fixtures: 0.54****Coupon: 0.55** **Source:** EPY5 in-store intercept surveys. 3 year average NTG for Standard and Specialty CFLs. EM&V estimate for CFL Fixtures, LED Bulbs, and LED Fixtures. Rationale: They are higher priced and less common products so the barrier to adoption is higher, meaning the incentive has relatively more impact on the purchase decision than for the more common standard and specialty CFLs.**Participant Spillover:** 0.01 all bulb types. Source: EPY5 in-store intercept surveys.**Nonparticipant Spillover:** 0.003 all bulb types. Source: EPY5 in-store intercept surveys. 477 nonparticipants interviewed.Table E-1. 3-Year Average Standard and Specialty NTGR for ComEd

|  |  |  |
| --- | --- | --- |
| **Program Year** | **Standard CFLs** | **Specialty CFLs** |
| **Bulbs** | **NTGR** | **Bulbs** | **NTGR** |
| EPY3 | 9,893,196 | 71% | 1,217,723 | 71% |
| EPY4 | 11,419,752 | 55% | 1,097,670 | 44% |
| EPY5 | 9,633,227 | 55% | 1,197,896 | 48% |
| 3-year Weighted Average for EPY7 |  -  | 60% |  -  | 55% |

Source: Navigant team analysis.**Table 11 – PY5 FR, Spillover and NTGR Estimates Compared to Prior Program Years (From NTG Memo)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Net Impact Parameters** | **Population** | **PY5** | **PY4** | **PY3** | **PY2** |
| **Free-ridership** | Standard CFLs | 0.47 | 0.47 | -- | -- |
| Specialty CFLs | 0.53 | 0.58 | -- | -- |
| All Program Bulbs | 0.48 | 0.48 | 0.31 | 0.46 |
| **Spillover** | Standard CFLs | 0.02 | 0.02 |  |  |
| Specialty CFLs | 0.02 | 0.02 |  |  |
| All Program Bulbs | 0.02 | 0.02 | 0.02 | 0.05 |
| **NTGR** | Standard CFLs | 0.54 | 0.55 |  |  |
| Specialty CFLs | 0.48 | 0.44 |  |  |
| All Program Bulbs | 0.54 | 0.54 | 0.71 | 0.60 |

 |
| EPY8 | **Recommendation (based upon PY6 research):****NTG Standard CFL: 0.59****NTG Specialty CFL: 0.54****NTG CFL Fixtures: 0.56****NTG LED Bulbs: 0.73****NTG LED Fixtures: 0.73****NTG Coupon: As above****PY6 NTG Research:**NTG Standard CFL: 0.59Free Ridership Standard CFL: 0.41Spillover Standard CFL: 0.01PY6 NTG Specialty CFL: 0.54Free Ridership Specialty CFL: 0.47Spillover Specialty CFL: 0.01PY6 NTG CFL Fixtures: 0.54 (no research in PY6CFL Fixtures FR: noneCFL Fixtures SO: nonePY6 NTG LED Bulbs: 0.73FR LED Bulbs: 0.44SO LED Bulbs: 0.17PY6 NTG LED Fixtures: 0.73FR LED Fixtures: 0.44SO LED Fixtures: 0.17 |

|  | Fridge Freezer Recycling Rewards |
| --- | --- |
| EPY1 | **NTG** 0.70 for refrigerators, 0.83 for freezers, 1.0 for Room AC units**Free-ridership** 30% for refrigerators, 17% for freezers, 0% for Room AC units**Spillover** 0% for all measure types**Method**: Customer self-report. 100 surveys completed (70 refrigerator respondents, 30 freezers), from attempted calls with 498 respondents |
| EPY2 | **NTG** 0.73 for refrigerators, 0.82 for freezers, 0.72 for Room AC units**Free-ridership** 27% for refrigerators, 18% for freezers, 28% for Room AC units**Spillover** 0% for all measure types**Method**: Customer self-report. 152 surveys completed – 114 Refrigerator, 38 Freezer, 30 Room AC Recyclers, from attempted calls with 744 respondents |
| EPY3 | **NTG** 0.67 for refrigerators, 0.75 for freezers, 0.70 for Room AC units**Free-ridership** 33% for refrigerators, 25% for freezers, 30% for Room AC units**Spillover** 0% for all measure types**Method**: Customer self-report. 202 surveys completed – 151 Refrig., 51 Freezer, 30 Room AC Recyclers, from attempted calls with 1,369 respondents |
| EPY4 | **Deemed using PY2 values NTG** 0.73 for refrigerators, 0.77 for freezers, and 0.58 for Room AC units**EPY4 Research NTG of 0.77 for refrigerators and freezers, 0.58 for Room AC.****Free-ridership** 27% for refrigerators, 23% for freezers, 42% for Room AC units**Spillover** 0% for all measure types**Method**: Customer and participating retailer self-reports. Weighted average from combining results from both sources. 200 surveys completed with participating customers –150 Refrig., 50 Freezer, 19 Room AC Recyclers, from attempted calls with 2,225 respondents |
| EPY5 | SAG Consensus:* Refrigerators: 0.67
* Freezers: 0.75
* Room AC: 0.70
 |
| EPY6 | SAG Consensus:* Refrigerators: 0.73
* Freezers: 0.82
* Room AC: 0.72
 |
| EPY7 | **NTG:**

|  |  |  |
| --- | --- | --- |
| **Unit Type** | **Non-Retailer** | **Retailer** |
| Refrigerator | 79% | 17% |
| Freezer | 59% | 21% |
| Room ACs | 50% |   |

Source: EPY5 participant surveys, participating retailer surveys, nonparticipating retailer surveys **Participant Spillover: Negligible****Nonparticipant spillover: Negligible**No spillover primary research done in EPY5. A literature review of other research does not support meaningful spillover.*Note: ODC-Ameren accepted the ComEd values.* |
| EPY8 | **Recommendation (based upon PY6 research):****NTG Fridge, Retailer: *0.29 w/out Vendor #1*****NTG Fridge, Non-Retailer: 0.77****NTG Fridge, Weighted Average Retailer and Non Retailer: 0.53****NTG Freezer, Retailer: *0.30 NTG w/out Vendor #1*****NTG Freezer, Non-Retailer: 0.58****NTG Freezer, Weighted Average Retailer and Non Retailer: 0.57****NTG Room ACs: 0.50****NTG Room AC, Non-Retailer: 0.50****FR Fridge, Retailer: 0.71****FR Fridge, Non-Retailer: 0.23****FR Fridge, Weighted Average: 0.47****FR Freezer, Retailer: 0.70****FR Freezer, Non-Retailer: 0.58****FR Freezer, Weighted Average: 0.43**Based upon PY6 Participant and Retailer Surveys. PY6 data sources include telephone surveys with participating customers, telephone surveys with nonparticipating customers, in-depth interviews with participating retailers and telephone surveys with non-participating retailers associated with unit replacements. Information regarding participant spillover was also collected, but ultimately did not support a finding of any spillover. |

|  | Multi-Family Comprehensive (Joint) |
| --- | --- |
| EPY1 | **NTG** 0.80**Free-ridership** n/a**Spillover** n/a**Method**: ComEd planning documents. (No EMV NTG analysis).  |
| EPY2 | **Program NTG 0.88****Measure Specific:****CFLs NTG 0.81****CFLs Free Ridership 27%****CFLs Spillover 18%****Water Efficient Showerheads NTG 0.93****Water Efficient Showerheads Free Ridership 9%****Water Efficient Showerheads Spillover 2%****Water Efficient Aerators NTG 0.94****Water Efficient Aerators Free Ridership 6%****Water Efficient Aerators Spillover 0%****Method**: Participant Self-Report. CATI telephone survey with 75 participating tenants (90/9). |
| EPY3 | **Program NTG 0.90****Measure Specific:****CFLs NTG 0.81****CFLs Free Ridership 20%****CFLs Spillover 1%****Water Efficient Showerheads NTG 0.93****Water Efficient Showerheads Free Ridership 7%****Water Efficient Showerheads Spillover 0%****Water Efficient Aerators NTG 0.94****Water Efficient Aerators Free Ridership 6%****Water Efficient Aerators Spillover 0%****Method**: Participant self-report. CATI telephone survey with 140 participating tenants (90/10). |
| EPY4 | **Deemed using EPY2 values:****Program NTG** **0.83****Measure Specific:****CFLs NTG 0.81****Water Efficiency Measures (Aerators + Showerheads) NTG 0.93****Verification Method**: Applied EPY2 evaluation findings according to NTG Framework.**EPY4 Research Findings:****Program NTG** **0.97****CFLs NTG 0.98****Water Efficiency Measures (Aerators + Showerheads) NTG 0.92****Water Efficient Showerheads NTG 0.91****Water Efficient Aerators NTG 0.93****Research Method**: Participant self-report. CATI telephone survey with participating decision-makers (37 property managers) |
| EPY5 | SAG Consensus:

|  |  |
| --- | --- |
| Multi-Family – Lighting  | 0.81 |
| Multi-Family – Water Measures | 0.93 |

 |
| EPY6 | SAG Consensus:

|  |  |
| --- | --- |
| Multi-Family – CFLs | 0.98 |
| Multi-Family - Showerhead | 0.92 |
| Multi-Family – Common Areas | 0.80 |

 |
| EPY7 | **Evaluation used EPY4 research finding**s**:****Program NTG** **0.98****CFLs NTG 0.98****Water Efficient - Showerheads NTG 0.92****Water Efficient – Bath Aerators NTG 0.94****Water Efficient – Kitchen Aerators NTG 1.00****Other measures: 0.95** (programmable thermostats and water temperature turndown) **Participant spillover:** Comprehensive spillover is in the estimated NTG. Other measures: No participant spillover is likely for any measures given the program approach and program theory.**Nonparticipant spillover:** No nonparticipant spillover is likely for any measures given the program approach and program theory.**Research Method**: Participant self-report. CATI telephone survey with participating decision-makers (37 property managers).For EPY7 comprehensive projects, Navigant recommends a NTGR of 0.95. These are new measures, and Navigant’s research indicates that the target market for this program is unlikely to install these measures without the existence of the program, similar to PY4 ComEd Small Business Energy Savings program evaluation research findings.For EPY7 CFL direct install free-ridership, Navigant recommends the PY4 evaluation research finding NTGR of 0.98, based on survey self-report data from participating property managers. Navigant recommends the PY4 values for each of the water efficient measures (showerheads, bath aerators and kitchen aerators).  |
| EPY8 | **Recommendation (based upon PY7 NTG recommended values):** **NTG Direct Install CFLs and LED Lighting: 0.98****NTG Hot Water Measures (showerhead, bath aerators, kitchen aerator): 0.92, 0.94 and 1.00** **NTG Unit Measures: 0.95****NTG Common Areas Measures: 0.95****NTG Thermostat: 0.90** EPY6 research on thermostat NTG was based on secondary research. There was no EPY6 research for other measures, thus the evaluation team recommends using the EPY7 values – see detail above for EPY7.  |

|  | Home Energy Savings (Single Family Retrofit) (Joint) |
| --- | --- |
| EPY1 | **NTG** 0.80**Free-ridership** 0.20**Spillover** NA**Method**: ComEd Program Assumption. The EPY1 evaluation did not estimate the net to gross ratio. The value of 80% is drawn from the program plan presented in ComEd’s 2008-2010 Energy Efficiency and Demand Response Plan (November 15, 2007). Page D-2 of the ComEd plan provides a footnote stating the net to gross ratio of 80% is drawn from the California Energy Efficiency Policy Manual, version 2 (2003). |
| EPY2 | **NTG** 0.87**Free-ridership** 26%**Spillover** 3.5%**Method**: Customer self-reports. 130 surveys completed from a population of 760.

|  |  |  |  |
| --- | --- | --- | --- |
| Measure | NTG Ratio | FR | SO |
|  CFL |  0.72  | 34% | 6.4% |
|  Kitchen Aerators |  0.97  | 3% | 0.0% |
|  Bathroom Aerators |  0.97  | 3% | 0.0% |
|  Showerheads |  0.93  | 8% | 0.5% |
|  Pipe Insulation |  1.02  | 7% | 9.0% |
| **Total Direct Install** |  0.87  | 26% | 3.5% |

 |
| EPY3 | **NTG** 0.74**Free-ridership** 27%**Spillover** 4%**Method**: Customer self-reports. 122 full participant (direct install and weatherization measures) and direct install-only participant surveys completed from a population of 413 full participants and 962 direct install-only participants.

|  |  |  |  |
| --- | --- | --- | --- |
| Measure  | NTG | FR | SO |
| Compact Fluorescent Bulbs | 0.68 | 34% | 3% |
| Air Sealing  | 0.99 | 8% | 7% |
| Attic Insulation  | 0.98 | 9% |
| Floored Attic Insulation  | 0.98 | 9% |
| Exterior Wall Insulation  | 0.96 | 11% |
| Sloped Insulation  | 0.96 | 11% |
| Knee Wall Insulation  | 0.96 | 11% |
| Crawl Space Insulation  | 0.96 | 11% |
| Duct Insulation  | 0.99 | 8% |
| Rim Joist Insulation  | 0.96 | 11% |
| Seal and Repair Ducts  | 0.93 | - |
| **Overall** | 0.74 | 27% | 4% |

 |
| EPY4 | **Retroactive application of NTG\*** 0.83 (Preliminary)**Overall Free-ridership\*** 18% (Preliminary)**Overall Spillover\*** 1% (Preliminary)*\*A final draft of the report has not been submitted yet, thus these values may change.***Method**: Customer self-reports. 54 full-participant (direct Install and weatherization measures) surveys completed from a population of 1,081 audits and 320 full-participants.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|   | Measure | NTG\* | Free Ridership\* | Spillover\* |
| Direct- Install Measures | 9 Watt CFL | 0.79 | 0.25 | 0.04 |
| 14 Watt CFL | 0.79 | 0.25 | 0.04 |
| 19 Watt CFL | 0.79 | 0.25 | 0.04 |
| 23 Watt CFL | 0.79 | 0.25 | 0.04 |
| 9 Watt Globe CFL | 0.79 | 0.25 | 0.04 |
| Low Flow Shower Head | 0.93 | 0.07 | 0.00 |
| Kitchen Aerator | 1.00 | 0.01 | 0.01 |
| Bathroom Aerator | 1.00 | 0.01 | 0.01 |
| Hot Water Temperature Setback | 0.88 | 0.12 | 0.00 |
| Pipe Insulation | 0.89 | 0.18 | 0.07 |
| Programmable Thermostat | 0.85 | - | - |
| Programmable Thermostat Education | 0.85 | - | - |
| Retrofit Measures | Attic Insulation | 0.75 | 0.27 | 0.02 |
| Wall Insulation | 0.78 | 0.22 | 0.00 |
| Floor Insulation (Other) | 0.76 | 0.24 | 0.00 |
| Duct Insulation & Sealing | 0.80 | - | - |
| Air Sealing | 0.84 | 0.16 | 0.00 |
| **Overall Program** |  | 0.83 | 0.18 | 0.01 |

*\*A final draft of the report has not been submitted yet, thus these values may change.* |
| EPY5EPY6 | Sag Consensus:

|  |  |  |
| --- | --- | --- |
|  | EPY5 | EPY6 |
| Lighting | 0.89 | 0.79 |
| Single Family with Gas \_ Showerhead | 0.94 | 0.75 |
| Single Family with Gas\_ Kitchen Aerator | 0.94 |   |
| Single Family with Gas \_ Bath Aerator | 0.94 |   |
| Single Family with Gas \_ Water Heater Temp Setback | 0.94 |   |
| Single Family with Gas \_ Pipe Insulation | 0.94 |   |
| Weatherization Measures  | 0.80 | 0.80 |
| Attic Insulation | 0.80 |   |
| Wall Insulation | 0.80 |   |
| Floor Insulation (other) | 0.80 |   |
| Duct Sealing  | 0.80 |   |
| Air Sealing | 0.80 |   |

 |
| EPY7 | **Direct Install NTG: 0.80****Weatherization NTG: 1.02****Source:** Participant surveys in EPY4 and EPY5, Trade ally surveys in EPY5. For Weatherization free ridership, trade ally value was weighted 75% and participants 25%.**Supporting Information**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Free Ridership | Participant Spillover | NTG |
| Direct Install | 0.23 | 0.03 | 0.80 |
| Weatherization | 0.10 | 0.11 | 1.02 |
| Program Wide | 0.20 | 0.05 | 0.85 |

 |
| EPY8 | **Recommendation (based upon PY7 NTG recommended values):****NTG CFL: 0.79 - *(used in PY6 Report based upon PY4 research)*****NTG Hot Water Measures w/gas: 0.75 - *(used in PY6 Report based upon PY4 research)*****NTG Direct Install Measures: 0.80 - *(from PY7 Recommendation based upon PY5 research)*****NTG Weatherization Measures: 1.02 - *(from PY7 Recommendation based upon PY5 research)*****NTG Thermostat: 0.90 - *(secondary 2010 MA and VT research)*****FR CFL: NA****FR Hot Water: NA****FR Direct Install: 0.23** **FR Weatherization: 0.10** **FR Thermostat: NA MA/VT secondary research****SO CFL: na****SO Hot Water: NA****SO Direct Install: 0.03** **SO Weatherization: 0.11****SO Thermostat: NA MA/VT secondary research**EPY6 research on thermostat NTG was based on secondary research. There was no EPY6 research for other measures, thus the evaluation team recommends using the EPY7 values – see detail above for EPY7.  |

|  | Complete System Replacement (HEER) (Joint) |
| --- | --- |
| EPY1 | CSR program not offered in EPY1 |
| EPY2 | CSR program not offered in EPY1 |
| EPY3 | CSR program not offered in EPY1 |
| EPY4 | **Retroactive application of** NTG of 59%Free-ridership: 41%Spillover: 0%Method: Customer self-report.  |
| EPY5 | SAG consensus: Retrospective evaluation |
| EPY6 | SAG consensus:* 0.59
 |
| EPY7 | **NTG: 0.99****Free Ridership:** **Participant 0.41; Trade ally 0.25; Average = 0.33** **(**EPY4 participant survey and EPY5 participating trade ally surveys)**Participant Spillover:** **0.12** from participating trade ally survey**Nonparticipant Spillover: 0.20** from nonparticipant trade ally survey.**Ameren HVAC.** Very similar values for spillover. (0.1 and 0.22). Free-ridership varies from 44% to 69%.The overall program NTG was calculated by averaging the EPY4 participant and the EPY5 trade ally free-ridership rates, and then adding the EPY4 participant spillover, and EPY5 participating trade ally and non-participating trade ally spillover, as follows: $$NTG\_{Program = }1-\frac{\left(FR\_{Part.}+ FR\_{TA}\right)}{2}+SO\_{Part.}+ SO\_{Part. TA}+ SO\_{Non-Part. TA}$$Where NTGProgram = Program NTG FRPart. = Participant Free-Ridership FRTA = Trade Ally Free-Ridership SOPart. = Participant Spillover SOPartTA = Participating TA Spillover SONon-PartTA = Non-Participating TA Spillover Finding: The NTG rate found in this evaluation is 99% combining participant free ridership (0.41), trade ally free ridership (0.25), and spillover (0.12 participating trade ally and 0.20 nonparticipating trade ally)**.**Participating Trade Ally Free Ridership and Spillover

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Sales Weighted Free-Ridership** | **Sales Weighted Spillover** | **N** |
| Highest Volume Trade Allies | 0.21 | 0.12 | 13 |
| Medium Volume Trade Allies | 0.34 | 0.10 | 18 |
| Lowest Volume Trade Allies | 0.35 | 0.20 | 18 |
| **All Participating Trade Allies** | **0.25** | **0.12** | **49** |

Source: Evaluation Team analysis.Non-Participant Trade Ally Spillover

|  |  |  |
| --- | --- | --- |
| **Non-Part TA SO Savings (kWh)** | **Program Savings** | **Non-Part TA SO Rate** |
| 598,288 | 3,011,855 | 0.20 |

 |
| EPY8 | **Recommendation (based upon PY7 NTG recommended values):****NTG: 0.99****Free-ridership w/Gas Participant: 0.41****Free-ridership w/Gas TA: 0.25****TA Spillover (Participant): 0.12****TA Spillover (Non-Participant): 0.20**There was no additional NTG research conducted for EPY6. The recommended value is the same as the PY7 recommendation. |

|  | Residential New Construction (Joint) |
| --- | --- |
| EPY1 | No Program |
| EPY2 | No Program |
| EPY3 | No Program |
| EPY4 | NTG not evaluated. Program just launched. No impact evaluation. No kWh savings |
| EPY5 | SAG Consensus: Retrospective evaluation |
| EPY6 | SAG Consensus* 0.80
 |
| EPY7 | **NTG: 0.80** **Free-ridership 0.20****Participants Spillover: negligible****Nonparticipants Spillover: negligible**Source: Planning value used in each prior year. There are no evaluation NTG has been conducted yet. The program is so young it is unlikely to be creating meaningful spillover. |
| EPY8 | **Recommendation (Secondary research: National Grid, CPS Energy, CPUC and Market Effects):****NTG: 1.0**Based upon secondary research including MA Res NC (NTG=1.18), National Grid RI (NTG=1.0), CPS Energy Savers (NTG=1.0), CPUC (NTG=-0.80) and market effects IEPEC paper. |

|  | Elementary Energy Education (Joint) |
| --- | --- |
| EPY4 |

| **Measure** | **Research Findings Nicor Gas-only** **FR** | **Research Findings Nicor Gas-only** **SO** | **Research Findings Nicor Gas-only NTG** | **Research Findings Nicor Gas-ComEd FR** | **Research Findings Nicor Gas-ComEd SO** | **Research Findings Nicor Gas-ComEd NTG** |
| --- | --- | --- | --- | --- | --- | --- |
| Showerheads | 39% | 7% | **68%** | 22% | 19% | **96%** |
| Kitchen Aerators | 33% | 2% | **69%** | 18% | 14% | **97%** |
| Bathroom Aerators | 35% | 7% | **71%** | 22% | 9% | **87%** |
| CFLs | NA | NA | **NA** | 53% | 31% | **78%** |

**Retroactive application of NTG** of 0.68 - 0.96 (varies by measure and participant group)**Free-ridership** 18-53%**Spillover** 7-19%**Method**: Customer self-report, 223 surveys completed from a population of 9,972. |
| EPY5 | SAG Consensus* 0.76
 |
| EPY6 | SAG Consensus* 0.76
 |
| EPY7 | **NTG: 0.76** **Free-ridership: See EPY4 table****Participant spillover: see EPY4 table****Nonparticipant spillover: negligible**Source: EPY4 participant survey. No new evaluation research in EPY5.No material changes to market or program. |
| EPY8 | **Recommendation (Avg.: NIPSCO, Nicor Rider 29 and PG/NSG GPY1 EEE program values):****CFL NTG: 0.83****Showerheads NTG: 1.05****Aerators NTG: 1.04**Based upon averaging NIPSCO, Nicor Rider 29, and Nicor Gas GPY1  |

|  | Energy Star Rebate (Appliances) |
| --- | --- |
| EPY8 | Clothes Washer = 0.68 based upon ComEd PY5 Evaluation Report |
| EPY8 | Refrigerator = 0.86 based upon MA 2012 Home Energy Services Evaluation |
| EPY8 | Air Purifier = 0.78 based upon Ameren IL Residential EE Products PY5 |
| EPY8 | Learning Thermostats = 0.90 Navigant researched value for Residential Programs |
| EPY8 | Freezers = 0.86 based upon MA 2012 Home Energy Services Evaluation for refrigerators. |
| EPY8 | Heat Pump Water Heater = 0.86 based upon Ameren IL Res EE Products PY5 |
| EPY8 | Clothes Dryer = 0.68 based upon ComEd Clothes Washer PY5 Evaluation Report |

|  | Direct To Consumer Kits |
| --- | --- |
| EPY8 | NTG = 0.94 based upon Ameren MO, Home Energy Kits (May 2014)  |

IPA and Third-Party Programs

# Regression Based EM&V Analysis

EM&V impact analysis (regression) will create net savings, not adjusted gross therefore EM&V does not calculate a NTG ratio that could be applied prospectively for the following programs:

* C&I Behavioral (Agentis)
* Home Energy Report
* CUB C3 (third party)
* Great Energy Stewards (third party)

# Third-Party Programs

The calculated NTG values from PY6 and evaluator recommendations are as follows:

* Willdan Sustainable Schools: 0.95, FR: 0.05
* RLD C&I Thermostats (ended in PY6): 1.0
* RSG Computer (ended in PY6): 0.95, FR: 0.05
* One Change (ended in PY6): 0.60, FR: 0.40

# IPA Programs for PY8

| **IPA Program:** | **PY8 NTG** | **Reasoning** |
| --- | --- | --- |
| Home Energy Reports | NA | Behavioral |
| Small Business Energy Savings | 0.95 | Based upon past research on this program |
| Great Energy Stewards | NA | Behavioral |
| Small Comm. HVAC Tune-Up | 0.90 | Secondary research by Navigant last year |
| CUB Energy Saver | NA | Behavioral |
| Elevate All-Electric Heat Multifamily | See Below | See values below |
| CLEAResult Schools DI | 0.95 | Based upon Wildan  |
| Matrix Demand-Based Fan Control |  0.80 | DEER 2011 – Commercial Kitchen Demand Ventil. Controls –Electric |
| LED Street Lighting | 1.00 | Participants have no ability to implement without ComEd’s assistance |
| Matrix K through 12 Private Schools | 0.95 | Based upon Wildan |
| NTC Middle School Take Home Kits - CFL | 0.83 | Based upon EEE |
| NTC Middle School Take Home Kits – Showerheads | 1.05 | Based upon EEE |
| NTC Middle School Take Home Kits - Aerators | 1.04 | Based upon EEE |
| NTC Middle School Take Home Kits – Power Strips | 0.95 |  |
| NTC Middle School Take Home Kits – Hot Water Temp Gauge | 0.93 |  |
| NTC Middle School Take Home Kits – Flow Rate Test Bags | 0.93 |  |
| Sodexo DCV | 0.87 | National Grid, RI Tech. Resource Manual 2014, p. B-7 |
| Weidt Group New Construction | 1.00 | Based upon Res. New Construction |
| Small Commercial HVAC Tune-Up | 0.90 | Evaluation research using secondary sources |
| Multi-Family Elevate DI CFL Common Areas | 0.95 | Evaluation research using secondary sources |
| Multi-Family Elevate CFL Non-Common Areas | 0.98 | Evaluation research using secondary sources |
| Multi-Family Elevate CFL Public Event | 0.62 | Evaluation research using secondary sources |
| Multi-Family Elevate Power Strip DI | 0.95 | Evaluation research using secondary sources |
| Multi-Family Elevate Programmable Thermostat | 0.95 | Evaluation research using secondary sources |
| Multi-Family Elevate Power Strip Public Event | 0.86 | Evaluation research using secondary sources |
| Multi-Family Elevate Water Measures | 0.93 | Evaluation research using secondary sources |
| Multi-Family Elev. Wall Mounted Occupancy Sensor | 0.95 | Evaluation research using secondary sources |
| Multi-Family Elevate T12 | 0.95 | Evaluation research using secondary sources |
| Multi-Family Elevate Insulation | 0.95 | Evaluation research using secondary sources |
| Multi-Family Elevate Comprehensive Non-CFL | 0.95 | Evaluation research using secondary sources |