Memorandum

To: Erin Daughton, ComEd; Elizabeth Horne, ICC

CC: Jeff Erickson, Neil Curtis, Guidehouse; Natasha Herring, Guidehouse

From: Parini Shah, Dave Bluestein, Emilia Kim, Guidehouse

Date: September 24, 2025

Re: ComEd Single Family Upgrades Market Rate CY2025 NTG Memo 2025

1. Executive Summary

This memo presents findings from the net-to-gross (NTG) study of the Single-Family Upgrades (SFU) Program. The ComEd SFU program includes both MR and income-eligible (IE) components and is designed to deliver energy savings through direct installation, assessments, and retrofit services. The current memo focuses on MR customers only covering the following two program components:

- **Market Rate Home Energy Assessment (MR HEA):** Direct-install program where an energy advisor visits the home or performs a virtual walk-through and then installs measures or leaves them behind for self-installation. The MR HEA program was phased out in late 2023 and shifted market rate customers to the SAP component.
- **Self-Assessment Program (SAP):** Program for MR customers where households can complete a virtual self-assessment to identify energy saving opportunities and receive a mailed kit with various energy efficiency measures.

The results for this program are based on the NTG algorithms specified in the Illinois Technical Reference Manual (IL-TRM) version 13.0 and rely on free ridership (FR) and spillover (SO) research gathered via separate online surveys. The FR survey sampled MR participants participating in the program between October 1, 2023, and September 30, 2024. The SO survey was administered over a two-year period and included participants in the program between CY2021 and CY2023.

It is important to note that the surveys included participants who experienced either an in-home assessment from an energy advisor or a self-assessment with direction from the utility, but in October 2023, the program converted to entirely the self-assessment approach. As this change happened during the survey period, the respondents who experienced the in-home assessment were no longer relevant for determining the free ridership for a self-assessment program and those customers were removed from the free ridership analysis. The resulting FR value then, is based on SAP participants only.

However, the team did combine the SO savings over the two-year evaluation cycle using participants in both the HEA and SAP delivery methods, based on the assumption that additional energy efficiency projects can still be attributed to the program regardless of how the program was delivered. The resulting program-level SO value was then applied to each measure offered in the SFU program.

Table 1 summarizes the Single-Family Upgrades Program FR and SO research findings based on the participant research. The NTG ratio of 0.87 for all measures is weighted based on the proportion of energy savings delivered by each measure offered through the program and assessed by the impact evaluation team. Guidehouse expects to recommend to the Illinois Stakeholders Advisory Group (SAG) these values be used for this program's non-income-eligible participants in CY2026.

Table 1. Net-to-Gross Research Results for SFU Program MR (HEA and SAP) Program Components

Program Measure	Free Ridership	Spillover	NTG Ratio	Relative Precision
All other measures †	0.33	0.20	0.87	5%

Note: Numbers may not sum due to rounding.
† Measures covered by their own NTG ratio and therefore not part of "All other measures" include bathroom aerator, kitchen aerator, stationary showerhead, and advanced thermostat. This also does not include advanced thermostat which is based on default NTG values for cooling (0.80) and heating (0.90).
Source: Evaluation team analysis

Table 2 provides an accounting of current (CY2024) and recommended (CY2025) NTG ratios for each of the measures in the program, as well as the specific measures that encompass the "All other measures" line item as indicated in Table 1.

Table 2. SFU Program MR (HEA and SAP) Program Components Current and Recommended NTG Values

Program Measure	Current NTG (CY2024)	Recommended NTG (CY2025)
Advanced (Smart) Thermostat[1]	0.80 (cooling) 0.90 (heating)	0.80 (cooling) 0.90 (heating)
All other measures grouping • DHW Pipe Insulation • Door Sweep • Handheld Showerhead • Programmable Thermostat • Advanced Power Strip Tier 1 • Smart Socket • Air Handler Filter Replacement • Boiler Pipe Insulation • Shower Flow Optimizer	0.80 †	0.87
Bathroom Aerator	1.03	1.20
Kitchen Aerator	1.03	1.20
Stationary Showerhead	1.03	1.20

† The current NTG value is based on prior research conducted in 2023.
Source: Guidehouse analysis

2. Free Ridership and Spillover Research Sample Disposition

Guidehouse fielded the free ridership and spillover web survey using web survey software. The team emailed survey invitations to MR, HEA, and SAP Program Component participants who received program-incentivized measures between CY2022 and CY2024. MR customers who participated between October 1, 2023, and September 30, 2024, received the free-ridership survey. Those who participated between October 1, 2021, and September 30, 2023, received the spillover (SO) survey.

To facilitate responses, a $25 incentive was provided to respondents who qualified for and completed the survey[2]. A survey invitation was sent to a census of eligible program participants with two follow up reminders sent three days and seven days after full launch to encourage completion of the web survey.

[1] NTG Source: 0.80 (cooling) based on Policy Manual default; 0.90 (heating) based on SAG Consensus. TRM savings are between net and gross; therefore, NTG should be between the default value (0.80) and 1.0. See Energy Efficiency Policy Manual, Section 7.2: IL_EE_Policy_Manual_Version_3.0_Final_11-3-2023.pdf (ilsag.info)
[2] Incentive provided as an e-gift card through Tango, an incentive provision platform. Qualification for the survey included answering the initial screener in the affirmative (establishing that they participated in the program in Month and Year based on program tracking data).

Table 3 presents the sample disposition. Note that completes as indicated in these tables also include partial surveys in the event the respondent answered the required questions.

Table 3. Free Ridership Sample Disposition

Category	Sample of Unique Participants	Target Completes	Actual Completes[3]	Analyzed Completes[4]	Response Rate	Respondent Share of Program Savings (kWh)
Participant	Census (2,528)	67	373	372	15%	3%

Source: Evaluation team analysis.

Table 4. Spillover Sample Disposition

Category	Sample of Unique Participants	Target Completes	Actual Completes[5]	Made Additional Efficiency Improvements	Qualified for Spillover	Share of Program Savings (kWh) Represented by Qualified SO Savings
Participant	Census (1,725)	67	137	75	45	0.1%

Source: Evaluation team analysis

3. Free Ridership and Spillover Protocols

The evaluation team applied the participant Free Ridership (FR) and Spillover (SO) protocols from the TRM v13.0, developed by the Illinois SAG NTG Working Group. The program delivery method changed in October 2023 from a process whereby an energy advisor visited the participant's residence to install the measures, to one in which the participant was mailed the measures following a self-assessment. While the FR sample did consist of individuals that participated in the program under both delivery methods (in-home or virtual assessment vs. self-assessment), only participants who went through the self-assessment were included in the analysis. Given the nature of the program and trade allies were not a key aspect of program delivery, a separate survey targeting the trade ally population was not executed.

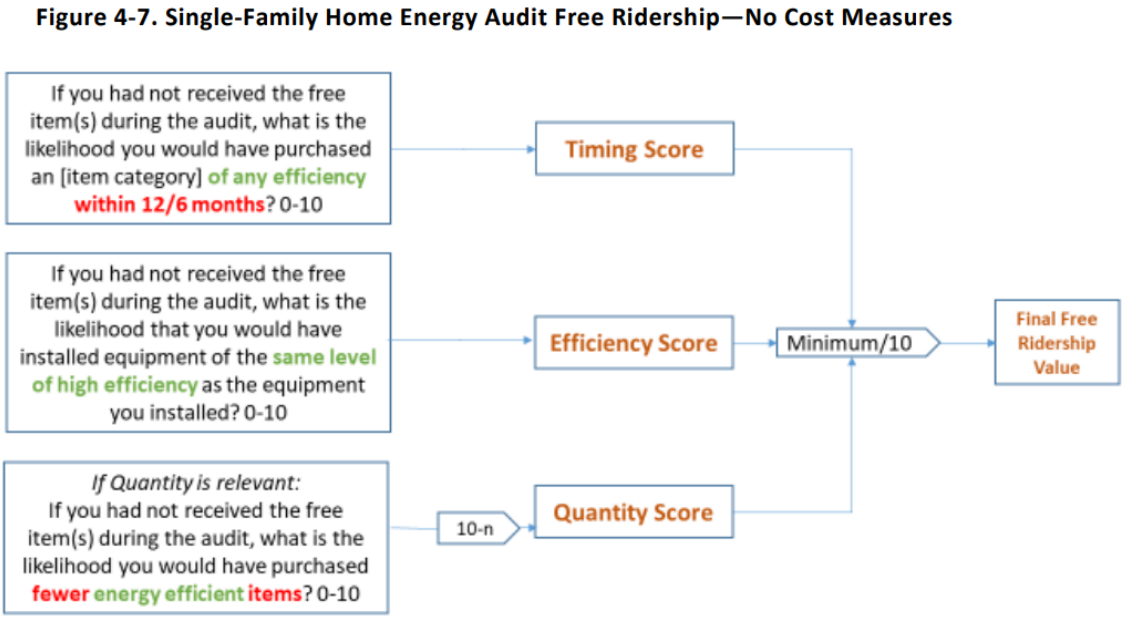
[3] FR survey: 503 program participants began the FR survey but 48 did not finish the entire survey and were not counted in the completes. 82 respondents screened out of the survey either because a) they did not agree with list of measures listed in the tracking data, or b) they had since uninstalled the measure and did were not asked the FR questions.
[4] Guidehouse removed one survey participant who appeared to be either a contractor purchasing multiple equipment for homes or a manager of a multifamily building. The respondent reported getting 6 showerheads, 9 bathroom aerators, 3 kitchen aerators, 6 door sweeps, and 3 advanced power strips. The individual also said it was Extremely Likely they would have purchased the same equipment without the program.
[5] SO survey: 194 program participants began the SO survey but 57 did not finish the entire survey and were not counted in the completes.

3.1 Participant Free Ridership Estimation

The evaluation used the Core FR Algorithm for participant FR from the IL-TRM Section 4.5, "Single-Family Home Energy Audit Protocol" (see Figure 1). The quantity portion of the algorithm was only applied when the respondent received more than one item within a measure category. If the respondent received a single measure of that type, then the final FR value for that measure and respondent combination was selected as the minimum of the Timing and Efficiency scores. Otherwise, the final FR value was calculated as the minimum of the Timing, Efficiency, and Quantity scores.

The measures included in the "All Other Measures" calculation as indicated in Table 1 are Domestic Hot Water (DHW) pipe insulation, door sweep, handheld showerhead, programmable thermostat, Tier 1 advanced power strip, smart sockets, air handler filter replacements, boiler pipe insulation, and shower flow optimizer. According to the program team, savings associated with LEDs are not going to be claimed in CY2026; therefore, the evaluation team removed these measures from the calculations.

Figure 1. Single-Family Core FR Algorithm



Source: 2025 Illinois Statewide TRM for Energy Efficiency Version 13.0, Volume 4: Cross Cutting Measures and Attachments, page 83, Figure 4-7: Single Family Home Energy Audit FR – No Cost Measures.

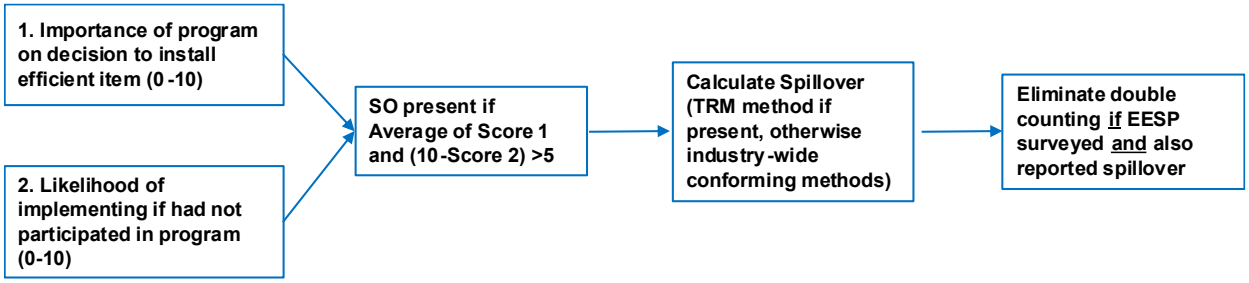
3.2 Participant Spillover Estimation

Guidehouse calculated participant SO based on TRM v13.0 Section 3.2.1, "Core Non-Residential Participant SO Protocol," summarized in Figure 2. Participants qualified for SO if they reported installing measures after they participated in the SFU MR Program, and if they also confirmed they did not receive an incentive from ComEd for the measure. To further verify the existence of SO, participants who installed the

additional equipment that qualified as SO were then asked the attribution questions 1 and 2 as outlined in Figure 2 regarding the influence of the program on their decision to purchase and install the additional equipment.

Respondents that met the spillover criteria were asked follow-up questions about the measures they installed. This information was used to perform savings calculations using v13 of the IL TRM. Guidehouse then calculated the final SO ratio as the proportion of SO savings attributed to qualified measures over the total amount of program savings achieved by SO survey participants.

Figure 2. Single-Family Core SO Algorithm[6]



Source: Guidehouse, Methodology based on guidance in 2025 Illinois Statewide Technical Reference Manual (TRM) for Energy Efficiency Version 13.0, Volume 4: Cross Cutting Measures and Attachments, Section 4.1.2: Participant Spillover, page 64.

The spillover survey received 53 valid responses in CY2023 and another 136 responses in CY2024. Only five respondents (approximately 10%) in CY2023 provided sufficient information and program influence to estimate spillover savings, while 44 respondents (32%) provided sufficient information in CY2024. Of the respondents that qualified for spillover, majority of the savings were due to HVAC and various appliances. This increase in reported spillover resulted in a combined 20% spillover result over the two program years.

3.3 Free Ridership Consistency Check Analysis

The evaluation team checked for consistency in free rider responses. Respondents were asked to describe "In your own words, please tell me the influence the program had on your purchase of the measure." The evaluation team reviewed the open-ended response against the Timing, Efficiency, and Quantity responses and removed data points meeting the following criteria:

- The verbatim response indicated program influence but the Timing, Efficiency, and Quantify scores all indicated no influence (scores >7)
- The team found inconsistencies in responses to multiple measure types and therefore removed all reported measures for that respondent

[6] Note: Energy Efficiency Service Providers (EESP) were not surveyed as these entities play little to no role in the delivery of this program component.

- The team noticed an inconsistent Quantity score compared to the Timing and Efficiency scores[7]

The team removed approximately 13% of the measure-level scores in the consistency check process.

3.4 Final NTG Results and Recommendations

The final NTG value is calculated as 1- FR + SO, using savings-weighted values from participants using the following formula:

$$NTG = 1 - [(Participant\ Measure\ Level\ FR * Program\ Level\ Measure\ Savings)] + Participant\ Spillover$$

The final, combined components of the NTG are shown in Table 5.

Table 5. Summary of FR, SO, and NTG Research Results for the SFU MR (HEA and SAP) Program Components

Program Measure	Participant Free Ridership	Participant Spillover	NTG Ratio	Relative Precision
All other measures†	0.33	0.20	0.87	5%

Note: Numbers may not sum due to rounding.
† Measures covered by their own NTG ratio and therefore are not included in this category include bathroom faucet aerators, kitchen faucet aerators, stationary showerheads, and advanced thermostats.

Source: Evaluation team analysis

[7] Some of the respondents appeared to misread the Quantity question scoring it a "10" after scoring both the Timing and Efficiency questions a "10". The FR algorithm inverts the Quantity score to a "0" and therefore gives full attribution to the program. This result does not align with the Timing and Efficiency scores of "10" so Guidehouse removed the respondent from the final FR analysis.

4. Single-Family Upgrades NTG History

<table>
<tr><td>Effective Year</td><td>Single-Family Upgrades</td></tr>
<tr><td></td><td>(FKA: Single Family Assessments, Home Energy Assessments (HEA), Single Family Retrofit)</td></tr>
<tr><td>EPY1</td><td>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).</td></tr>
<tr><td>EPY2</td><td>NTG 0.87
FR 26%
SO 3.5%
Method: Customer self-reports. 130 surveys completed from a population of 760.
<table>
<tr><th>Measure</th><th>NTG Ratio</th><th>FR</th><th>SO</th></tr>
<tr><td>CFL</td><td>0.72</td><td>34%</td><td>6.4%</td></tr>
<tr><td>Kitchen Aerators</td><td>0.97</td><td>3%</td><td>0.0%</td></tr>
<tr><td>Bathroom Aerators</td><td>0.97</td><td>3%</td><td>0.0%</td></tr>
<tr><td>Showerheads</td><td>0.93</td><td>8%</td><td>0.5%</td></tr>
<tr><td>Pipe Insulation</td><td>1.02</td><td>7%</td><td>9.0%</td></tr>
<tr><td>Total Direct Install</td><td>0.87</td><td>26%</td><td>3.5%</td></tr>
</table></td></tr>
<tr><td>EPY3</td><td>NTG 0.74
FR 27%
SO 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.
<table>
<tr><th>Measure</th><th>NTG</th><th>FR</th><th>SO</th></tr>
<tr><td>Compact Fluorescent Bulbs</td><td>0.68</td><td>34%</td><td>3%</td></tr>
<tr><td>Air Sealing</td><td>0.99</td><td>8%</td><td rowspan="11">7%</td></tr>
<tr><td>Attic Insulation</td><td>0.98</td><td>9%</td></tr>
<tr><td>Floored Attic Insulation</td><td>0.98</td><td>9%</td></tr>
<tr><td>Exterior Wall Insulation</td><td>0.96</td><td>11%</td></tr>
<tr><td>Sloped Insulation</td><td>0.96</td><td>11%</td></tr>
<tr><td>Knee Wall Insulation</td><td>0.96</td><td>11%</td></tr>
<tr><td>Crawl Space Insulation</td><td>0.96</td><td>11%</td></tr>
<tr><td>Duct Insulation</td><td>0.99</td><td>8%</td></tr>
<tr><td>Rim Joist Insulation</td><td>0.96</td><td>11%</td></tr>
<tr><td>Seal and Repair Ducts</td><td>0.93</td><td>-</td></tr>
<tr><td>Overall</td><td>0.74</td><td>27%</td><td>4%</td></tr>
</table></td></tr>
<tr><td>EPY4</td><td>Retroactive application of NTG* 0.83 (Preliminary)</td></tr>
</table>

Effective Year	**Single-Family Upgrades**

Overall FR * 18% (Preliminary)
Overall SO* 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.*

EPY5
EPY6

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	

<table>
<tr><td>Effective Year</td><td>Single-Family Upgrades</td></tr>
<tr><td></td><td>
<table>
<tr><td>Wall Insulation</td><td>0.80</td><td></td></tr>
<tr><td>Floor Insulation (other)</td><td>0.80</td><td></td></tr>
<tr><td>Duct Sealing</td><td>0.80</td><td></td></tr>
<tr><td>Air Sealing</td><td>0.80</td><td></td></tr>
</table>
</td></tr>
<tr><td>EPY7</td><td>Direct Install NTG: 0.80
Weatherization NTG: 1.02
Source: Participant surveys in EPY4 and EPY5, Trade ally surveys in EPY5. For Weatherization FR, trade ally value was weighted 75% and participants 25%.

Supporting Information
<table>
<tr><th></th><th>Free Ridership</th><th>Participant Spillover</th><th>NTG</th></tr>
<tr><td>Direct Install</td><td>0.23</td><td>0.03</td><td>0.80</td></tr>
<tr><td>Weatherization</td><td>0.10</td><td>0.11</td><td>1.02</td></tr>
<tr><td>Program Wide</td><td>0.20</td><td>0.05</td><td>0.85</td></tr>
</table>
</td></tr>
<tr><td>EPY8</td><td>Recommendation (based upon PY7 NTG recommended values):
NTG CFL: 0.79 – (used in PY6 Report based upon PY4 research)
NTG Hot Water Measures with 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.</td></tr>
<tr><td>EPY9</td><td>NTG CFL: 0.80 – (used in PY6 Report based upon PY4 research)
NTG Hot Water Measures with gas: 0.80 – (used in PY6 Report based upon PY4 research)</td></tr>
</table>

Effective Year	**Single-Family Upgrades**
	NTG Direct Install Measures: 0.80 – *(from PY7 Recommendation based upon PY5 research)* NTG Weatherization Measures: 1.01 – *(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 SO CFL: NA SO Hot Water: NA SO Direct Install: 0.03 SO Weatherization: 0.11 SO Thermostat: NA NTG Source: PY6 SAG consensus value (no new research)
CY2018	NTG Lighting: 0.80 – *(used in PY6 Report based upon PY4 research)* NTG Showerheads: 0.80 – *(used in PY6 Report based upon PY4 research)* NTG Faucet Aerators: 1.03 – (*TRM version 6.0 specifies that the FR for faucet aerators be set at zero when estimating gross savings using the TRM specified baseline average water flow rate.)* NTG Other Direct Install Measures: 0.80 – *(from PY7 Recommendation based upon PY5 research)* NTG Programmable Thermostat and Programmable Thermostat Education: 0.90 – *(secondary 2010 MA and VT research)* NTG Advanced Power Strips: 0.95 – *(based on MF Elevate and PY6 Desktop Power Management)* NTG Advanced Thermostat: NA. The savings value in the IL TRM is based on regression analysis on consumption data and thus is a net savings number. FR Lighting: NA FR Showerheads: 0.23 FR Kitchen and Bathroom Faucet Aerator: 0.00 FR Other Direct Install: 0.23 FR Thermostat: 0.23 FR Advanced Power Strips: NA SO Lighting: NA SO Showerheads: 0.03 SO Kitchen and Bathroom Faucet Aerator: 0.03 SO Other Direct Install: 0.03 SO Thermostat: 0.03 SO Advanced Power Strips: NA

Effective Year	**Single-Family Upgrades**
	NTG Source: For faucet aerators: TRM version 6.0 specifies that the FR for faucet aerators be set at zero when estimating gross savings using the TRM specified baseline average water flow rate. For other measures: PY6 SAG consensus value (no new research)
CY2019	NTG Pipe Insulation: 0.80 – *(used in PY6 Report based upon PY4 research)* NTG Showerhead and Kitchen and Bathroom Faucet Aerator: 1.04 NTG Other Direct Install Measures: 0.81 – *(from PY7 Recommendation based upon PY5 research)* NTG Programmable Thermostat and Programmable Thermostat Education: 0.90 – *(secondary 2010 MA and VT research)* NTG Advanced Power Strips: 0.85 – *(based on PY9 participant survey for FR and PY8 participant survey for SO)* NTG Advanced Thermostat: NA. The savings value in the IL TRM is based on regression analysis on consumption data and thus is a net savings number. NTG LEDs – Copay: 0.92 NTG LEDs – Free: 0.84 FR Showerhead and Kitchen and Bathroom Faucet Aerator: 0.00 FR Other Direct Install: 0.23 FR Thermostat: NA FR Advanced Power Strips: 0.19 FR LEDs – Copay: 0.12 FR LEDs – Free: 0.20 SO Showerhead and Kitchen and Bathroom Faucet Aerator: 0.04 SO Other Direct Install: 0.04 SO Thermostat: NA SO Advanced Power Strips: 0.04 SO LEDs – Copay: 0.04 SO LEDs – Free: 0.04 NTG Source: Showerhead and Kitchen and Bathroom Faucet Aerator FR: TRM version 7.0 specifies that the FR for faucet aerators and showerheads be set at zero when estimating gross savings using the TRM specified baseline average water flow rate. LED and APS FR: PY9 participant survey Thermostat: 2010 MA VT Evaluation Research Other Direct Install FR: PY6 SAG consensus value (no new research) SO: PY8 participant survey
CY2020	NTG Pipe Insulation: 0.80 – *(used in PY6 Report based upon PY4 research)* NTG Showerhead and Kitchen and Bathroom Faucet Aerator: 1.04 NTG Other Direct Install Measures: 0.81 – *(from PY7 Recommendation based upon PY5 research)* NTG Programmable Thermostat and Programmable Thermostat Education: 0.90 – *(secondary 2010 MA and VT research)* NTG Advanced Power Strips: 0.85 – *(based on PY9 participant survey for FR and PY8 participant survey for SO)*

Effective Year	**Single-Family Upgrades**
	NTG Advanced Thermostat: NA. The savings value in the IL TRM is based on regression analysis on consumption data and thus is a net savings number. NTG LEDs – Copay: 0.92 NTG LEDs – Free: 0.84 FR Showerhead and Kitchen and Bathroom Faucet Aerator: 0.00 FR Other Direct Install: 0.23 FR Thermostat: NA FR Advanced Power Strips: 0.19 FR LEDs – Copay: 0.12 FR LEDs – Free: 0.20 SO Showerhead and Kitchen and Bathroom Faucet Aerator: 0.04 SO Other Direct Install: 0.04 SO Thermostat: NA SO Advanced Power Strips: 0.04 SO LEDs – Copay: 0.04 SO LEDs – Free: 0.04 NTG Source: Showerhead and Kitchen and Bathroom Faucet Aerator FR: TRM version 7.0 specifies that the FR for faucet aerators and showerheads be set at zero when estimating gross savings using the TRM specified baseline average water flow rate. LED and APS FR: PY9 participant survey Thermostat: 2010 MA VT Evaluation Research Other Direct Install FR: PY6 SAG consensus value (no new research) SO: PY8 participant survey
CY2021	**All but advanced Thermostat Unchanged from CY2020** NTG Pipe Insulation: 0.80 – *(used in PY6 Report based upon PY4 research)* NTG Showerhead and Kitchen and Bathroom Faucet Aerator: 1.04 NTG Other Direct Install Measures: 0.81 – *(from PY7 Recommendation based upon PY5 research)* NTG Programmable Thermostat and Programmable Thermostat Education: 0.90 – *(secondary 2010 MA and VT research)* NTG Advanced Power Strips: 0.85 – *(based on PY9 participant survey for FR and PY8 participant survey for SO)* NTG Advanced Thermostat - cooling: 0.80 NTG Advanced Thermostat - heating: 0.90 NTG LEDs – Copay: 0.92 NTG LEDs – Free: 0.84 FR Showerhead and Kitchen and Bathroom Faucet Aerator: 0.00 FR Other Direct Install: 0.23 NTG Thermostat - Cooling: Policy Manual default NTG Thermostat – Heating: SAG decision. TRM savings are between net and gross therefore NTG should be between the default value (0.8) and 1.0.

Effective Year	**Single-Family Upgrades**
	FR Advanced Power Strips: 0.19 FR LEDs – Copay: 0.12 FR LEDs – Free: 0.20 SO Showerhead and Kitchen and Bathroom Faucet Aerator: 0.04 SO Other Direct Install: 0.04 SO Thermostat: See FR. SO Advanced Power Strips: 0.04 SO LEDs – Copay: 0.04 SO LEDs – Free: 0.04 NTG Source: Showerhead and Kitchen and Bathroom Faucet Aerator FR: TRM version 7.0 specifies that the FR for faucet aerators and showerheads be set at zero when estimating gross savings using the TRM specified baseline average water flow rate. LED and APS FR: PY9 participant survey Other Direct Install FR: PY6 SAG consensus value (no new research) SO: PY8 participant survey
CY2022	**Updates for 2022:** NTG Advanced Power Strips (Tier 1): 0.84 FR 0.19 SO 0.03 NTG Bathroom Faucet Aerator: 1.03 FR 0.00 SO 0.03 NTG Kitchen Faucet Aerator: 1.03 FR 0.00 SO 0.03 NTG LED: 0.77 FR 0.26 SO 0.03 NTG Showerhead: 1.03 FR 0.00 SO 0.03 **Values carried over from 2021:** NTG Pipe Insulation: 0.80 – *(used in PY6 Report based upon PY4 research)* NTG Other Direct Install Measures: 0.81 NTG Programmable Thermostat and Programmable Thermostat Education: 0.90 – *(secondary 2010 MA and VT research)* NTG Advanced Thermostat - cooling: 0.80 NTG Advanced Thermostat - heating: 0.90

Effective Year	**Single-Family Upgrades**
	FR Showerhead and Kitchen and Bathroom Faucet Aerator: 0.00 FR Other Direct Install: 0.23 NTG Thermostat - Cooling: Policy Manual default NTG Thermostat – Heating: SAG decision. TRM savings are between net and gross therefore NTG should be between the default value (0.8) and 1.0. SO Other Direct Install: 0.04 SO Thermostat: See FR. SO Advanced Power Strips: 0.03 **NTG Source:** Advanced Power Strip: FR PY9 participating customer survey; SO, CY2020 participating customer survey Bathroom and Kitchen aerator and Showerhead: FR, TRM v 7; SO, CY2020 participating customer survey LED: FR and SO, CY2020 participating customer survey Advanced thermostat: Cooling: Policy Manual default; Heating: SAG Consensus. TRM savings are between net and gross therefore NTG should be between the default value Hot water pipe insulation, and all other measures: SAG Consensus Other Direct Install: FR, SAG consensus; SO, PY8 participating customer survey Programmable thermostat and education: 2010 MA VT Evaluation research Kitchen faucet aerator: FR, TRM v 7 PY9; SO, PY9 and CY2018 customer survey
CY2023	NTG Advanced Power Strips (Tier 1): 0.84 FR 0.19 SO 0.03 NTG Bathroom Faucet Aerator: 1.03 FR 0.00 SO 0.03 NTG Kitchen Faucet Aerator: 1.03 FR 0.00 SO 0.03 NTG LED: 0.77 FR 0.26 SO 0.03 NTG Showerhead: 1.03 FR 0.00 SO 0.03 **Values carried over from 2021:** NTG Pipe Insulation: 0.80 – *(used in PY6 Report based upon PY4 research)* NTG Other Direct Install Measures: 0.81 NTG Programmable Thermostat and Programmable Thermostat Education: 0.90 – *(secondary 2010 MA and VT research)* NTG Advanced Thermostat - cooling: 0.80

Effective Year	**Single-Family Upgrades**
	NTG Advanced Thermostat - heating: 0.90 FR Showerhead and Kitchen and Bathroom Faucet Aerator: 0.00 FR Other Direct Install: 0.23 NTG Thermostat - Cooling: Policy Manual default NTG Thermostat – Heating: SAG decision. TRM savings are between net and gross therefore NTG should be between the default value (0.8) and 1.0. SO Other Direct Install: 0.04 SO Thermostat: See FR. SO Advanced Power Strips: 0.03 **NTG Source:** Advanced Power Strip: FR PY9 participating customer survey; SO, CY2020 participating customer survey Bathroom and Kitchen aerator and Showerhead: FR, TRM v 7; SO, CY2020 participating customer survey LED: FR and SO, CY2020 participating customer survey Advanced thermostat: Cooling: Policy Manual default; Heating: SAG Consensus. TRM savings are between net and gross therefore NTG should be between the default value Hot water pipe insulation, and all other measures: SAG Consensus Other Direct Install: FR, SAG consensus; SO, PY8 participating customer survey Programmable thermostat and education: 2010 MA VT Evaluation research Kitchen faucet aerator: FR, TRM v 7 PY9; SO, PY9 and CY2018 customer survey
CY2025	**Evaluated measures:** **NTG Advanced Power Strips (Tier 1): 0.92** **FR 0.28** **SO 0.20** **NTG Air Handler Filter Replacement: 1.18** **FR 0.03** **SO 0.20** **NTG Boiler Pipe Insulation: 1.20** **FR 0.00** **SO 0.20** **NTG Domestic Hot Water pipe insulation: 1.06** **FR 0.15** **SO 0.20** **NTG Door Sweep: 0.82** **FR 0.39** **SO 0.20** **NTG Handheld Showerhead: 0.78** **FR 0.42** **SO 0.20** **NTG Programmable Thermostat: 0.70**

Effective Year	**Single-Family Upgrades**
	FR 0.51 **SO 0.20** **NTG Shower Flow Optimizer: 0.99** **FR 0.22** **SO 0.20** **NTG Smart Socket: 0.78** **FR 0.42** **SO 0.20** **Values carried over from 2021:** NTG Advanced Thermostat - cooling: 0.80 NTG Advanced Thermostat - heating: 0.90 FR Showerhead and Kitchen and Bathroom Faucet Aerator: 0.00 per the IL-TRM NTG Thermostat - Cooling: Policy Manual default NTG Thermostat – Heating: SAG decision. TRM savings are between net and gross therefore NTG should be between the default value (0.8) and 1.0. SO Thermostat: See FR. **NTG Source:** Advanced Power Strip: FR PY9 participating customer survey; SO, CY2020 participating customer survey Bathroom and Kitchen aerator and Showerhead: FR, TRM v 7; SO, CY2020 participating customer survey Advanced thermostat: Cooling: Policy Manual default; Heating: SAG Consensus. TRM savings are between net and gross therefore NTG should be between the default value Hot water pipe insulation, and all other measures: SAG Consensus Programmable thermostat and education: 2010 MA VT Evaluation research Kitchen faucet aerator: FR, TRM v 7 PY9; SO, PY9 and CY2018 customer survey