

To: Vince Gutierrez, ComEd
CC: Jennifer Morris, ICC; Randy Gunn, Jeff Erickson, Nishant Mehta, Laura Agapay-Read, Navigant
From: Michael Freed, Navigant
Date: October 1, 2019
Re: Free Ridership Research Results for the ComEd Appliance Rebate Program CY2018

EXECUTIVE SUMMARY

This memo presents researched free ridership results from an online survey that Navigant administered to ComEd Appliance Rebate Program participants throughout CY2018. Navigant offered the survey from April 2018 through December 2018 to ComEd customers who purchased qualifying appliances in 2018. Participants who submitted their rebate application through ComEdRebates.com received a link to the survey immediately after submitting the application. Navigant designed the survey instrument in accordance with Illinois Technical Reference Manual version 7.0 (TRM) protocol 4.4, Prescriptive Rebate (with no audit).

These results will inform Navigant's September 2019 recommendations to Stakeholder Advisory Group (SAG) of net-to-gross (NTG) values to be used for this program in CY2020 (as detailed in Table 4).

The free-ridership results of this study are like those from the most recent (PY8) research for this program. The exception is advanced power strips which also achieved the lowest number of analyzed completes (two of a goal of 68). Navigant recommends the researched free ridership scores shown in Table 1.

Table 1. Free Ridership Research Results for Appliance Rebates CY2018

Measure	Free Ridership
Clothes Washer	0.41
Refrigerator	0.39
Air Purifier	0.25
Freezer	0.41
Clothes Dryer	0.37
Bathroom Exhaust Fan	0.38
Water Dispenser	0.37
Room AC	0.32
Dehumidifier	0.37
Advanced Power Strip*	

* Navigant recommends a Net-to-Gross value of 0.86 for Advanced Power Strips (APS) due to lack of APS completes (2). This value, approved in last year's ARP recommendations, is based on Ameren PY4 research.

Source: Navigant Research CY2018

FREE RIDERSHIP AND SPILLOVER SURVEY DISPOSITION

The evaluation team collected data with a self-report, online survey linked through a pop-up following the submission of a complete rebate application on ComEdRebates.com. Navigant offered the survey to all rebate applicants who applied using this channel (as opposed to receiving the rebate in-store or instantly using the ComEd Online Marketplace.) The team set survey quotas at 68 per measure to meet a 90% confidence and 10% precision interval and ran the survey from April 1, 2018 through December 31, 2018.

Of the 1,047 measure-level responses, the team removed 46 responses in data cleaning due to duplicate entries and removed 203 responses as part of the TRM-guided consistency check process. This resulted in 798 analytically viable completes.

Table 2. Free Ridership Decision Maker Survey Disposition

Measure	Target Completes	Actual Completes	Analyzed Completes
Overall Program*	680	1,047	798
Clothes Washer	68	298	235
Refrigerator	68	148	100
Air Purifier	68	87	67
Freezer	68	48	38
Clothes Dryer	68	132	112
Bathroom Exhaust Fan	68	67	46
Water Dispenser	68	26	23
Room AC	68	95	67
Dehumidifier	68	143	108
Advanced Power Strip	68	3	2

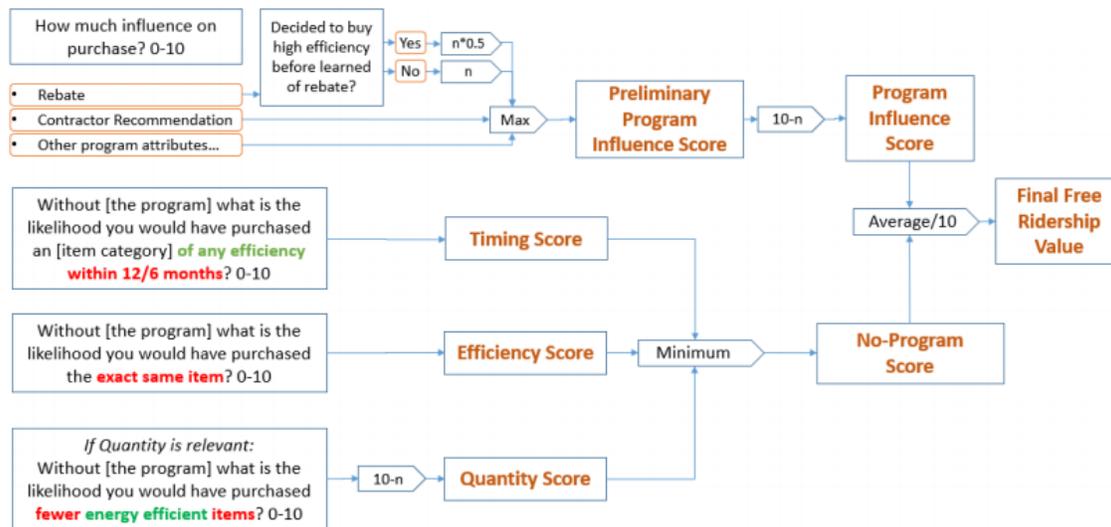
* Navigant provided the survey link to all participants who submitted their application through ComEdRebates.com, thus the sample is the population for that delivery channel. However, in the ARP end of year CY2018 tracking data provided to Navigant, there is no method to distinguish participation channels, thus we cannot determine the population or sample of ComEdRebates.com users as distinct from the total program population. Moreover, customer information was unavailable for instant rebates which include purchases at certain brick and mortar stores and the ComEd Online Marketplace (neither of which was consequentially offered the survey invite link).

Source: Navigant Research CY2018

FREE RIDERSHIP PROTOCOL

The evaluation team conducted the research according to free ridership protocol 4.4, Prescriptive Rebate (with no audit) from Illinois TRM version 7.0. This is shown graphically in Figure 1 below.

Figure 1. Residential Prescriptive Rebate (With No Audit) Free Ridership



Source: IL TRM 7.0 Figure 4-6

DETAILED NET TO GROSS RESULTS

Free Ridership Consistency Check Analysis

As the TRM specifies, our survey asked an open-ended question concerning the extent of program influence if the program influence score and the no-program score were inconsistent (i.e., if they were both less than or equal to three¹, or both greater than or equal to seven²). The inconsistency triggered this question for 487 respondents. Of the 1,001 unique completes left after data cleaning, the evaluation team excluded 203 of the 487 inconsistent responses. Of the 203, the team excluded 177 because they did not answer the open-ended question prompted by the inconsistency. Consequently, independent reviewers were unable to ascertain program influence without this answer. The evaluation team excluded the remaining 26 responses because they were incoherent or irrelevant open-ended replies (e.g. “zzzzzzzz,” or on topics unrelated to the Appliance Rebate Program).

The evaluation team analyzed the remaining 284 verbatim responses to the consistency check question. Of the 284 respondents, Navigant found that, for 125, the verbatim response reflected the duality of the respondent’s numeric responses (most commonly indicating that the rebate had a high influence on them and that they would have bought the energy efficient unit absent the program). Thus, for these 125 respondents, the evaluation team used both the Program Influence score and the Non-Program score to calculate free ridership. For 112 respondents, Navigant found that their verbatim response reflected strong program influence (and, sometimes, confusion with the no-program questions). Thus, for these 112 respondents, the evaluation team excluded their conflicting no-program score in the calculation of their free ridership. For the remaining 47 respondents, the evaluation team found that their verbatim response reflected that they would have purchased the efficient equipment absent the program (most commonly mentioning environmental benefits or energy savings but not elements of the program). Thus, for these 47, Navigant excluded their conflicting program influence score from the calculation of their free ridership. The table below lists the disposition of Navigant’s analysis of inconsistent responses.

¹ This would suggest low program influence and a low likelihood that they would have purchased the energy efficient equipment absent the program.

² This would suggest high program influence and a high likelihood that they would have purchased the energy efficient equipment absent the program.

Table 3. Free Ridership Consistency Check Disposition

Measure Response Disposition	Clothes Washer	Refrigerators	Air Purifiers	Freezer	Clothes Dryer	Bathroom Exhaust Fan	Water Dispenser	Room AC	Dehumidifier	Adv Power Strip	Total
Measure installations covered by interviews	293	143	82	45	125	55	26	89	141	2	1,001
Excluded: Non-response	52	36	14	6	12	9	3	16	29	0	177
Excluded: Triggered and Failed Consistency Check	6	7	1	1	1	0	0	6	4	0	26
Total of Excluded Responses	58	43	15	7	13	9	3	22	33	0	203
Analyzed Sample	235	100	67	38	112	46	23	67	108	2	798
Evaluated to require no change	43	21	0	6	20	2	4	13	16	0	125
Evaluated to exclude NP Score	34	16	14	3	12	3	3	11	16	0	112
Evaluated to exclude PI Score	15	6	4	4	10	3	1	1	3	0	47

Source: Navigant Research CY2018

Spillover Estimation

In 2017 Navigant conducted the most recent spillover research for the Appliance Rebate Program with PY8 participants. The research found a program-level spillover rate of 0.04. We recommend the program use this spillover rate in CY2020 and until new spillover research is conducted.

Free Ridership and Spillover to Create Program Net-to-Gross Ratio

Table 4. Free Ridership and Participant Spillover for ARP Measures

Measure	Free Ridership*	Participant Spillover†	NTG
Clothes Washer	0.41	0.04	0.63
Refrigerator	0.39	0.04	0.65
Air Purifier	0.25	0.04	0.79
Freezers	0.41	0.04	0.63
Clothes Dryer	0.37	0.04	0.67
Bathroom Exhaust Fan	0.38	0.04	0.66
Water Dispenser	0.37	0.04	0.67
Room AC	0.32	0.04	0.72
Dehumidifier	0.37	0.04	0.67
Advanced Power Strip‡			0.86

*Free ridership values are from the self-report, online survey of CY2018 ARP participants applying through ComEdRebates.com from April 1, 2018 through December 31, 2018.

†Participant spillover is from research Navigant conducted in 2017 using a telephone survey of PY8 ARP participants. ‡The NTG value of 0.86 for Advanced Power Strips (APS) comes from Ameren PY4 research. This recommendation is the most recent, accepted value and is used in place of Navigant's researched value due to a statistically insignificant sample of completes (2) for APS.

Source: Navigant Research CY2018 and

http://ilsagfiles.org/SAG_files/NTG/2019_NTG_Meetings/Corrected_NTG_Values/ComEd_NTG_History_and_CY2019_Recommendations_Faucet_Aerator_Showerhead_Correction_2019-04-12.xlsx

APPENDIX: APPLIANCE REBATE PROGRAM NTG HISTORY

	Energy Star Rebate (Appliances)
EPY8	<p>Clothes Washer = 0.68 based upon ComEd PY5 Evaluation Report</p> <p>Refrigerator = 0.86 based upon MA 2012 Home Energy Services Evaluation</p> <p>Air Purifier = 0.78 based upon Ameren IL Residential EE Products PY5</p> <p>Learning Thermostats = 0.90 Navigant researched value for Residential Programs</p> <p>Freezers = 0.86 based upon MA 2012 Home Energy Services Evaluation for refrigerators.</p> <p>Heat Pump Water Heater = 0.86 based upon Ameren IL Res EE Products PY5</p> <p>Clothes Dryer = 0.68 based upon ComEd Clothes Washer PY5 Evaluation Report</p>
EPY9	<p>Clothes Washer = 0.68 – based upon ComEd PY5 Evaluation Report</p> <p>Refrigerator = 0.86 – based upon MA 2012 Home Energy Services Evaluation</p> <p>Air Purifier = 0.78 – based upon Ameren IL Residential EE Products PY5</p> <p>Learning Thermostats = 0.90 – Navigant researched value for Residential Programs</p> <p>Freezers = 0.86 – based upon MA 2012 Home Energy Services Evaluation for refrigerators.</p> <p>Heat Pump Water Heater = 0.86 – based upon Ameren IL Res EE Products PY5</p> <p>Clothes Dryer = 0.68 – based upon ComEd Clothes Washer PY5 Evaluation Report</p> <p>Dehumidifier = 0.78 – based upon Ameren PY4 researched value of 0.78</p> <p>Advanced Power Strips = 0.86 – Ameren primary research in PY4</p> <p>Dishwasher = 0.92 – based upon recent CO study; will be provided to SAG once it is public</p> <p>Pool Pump = 1.00 – based upon recent CO study; will be provided to SAG once it is public</p> <p>Bathroom Exhaust Fan = 0.80 – default value (secondary research didn't support a recommendation)</p> <p>Water Cooler = 0.80 – default value (secondary research didn't support a recommendation)</p> <p>Window AC = 0.80 – default value (secondary research didn't support a recommendation)</p> <p>NTG Source: Based upon EPY8 Recommendations for existing measures and secondary research for new measures.</p>
CY2018	<p>Clothes Washer = 0.58</p> <p>Refrigerator = 0.57</p> <p>Air Purifier = 0.74</p> <p>Freezers = 0.54</p> <p>Heat Pump Water Heater = 0.74</p> <p>Clothes Dryer = 0.62</p> <p>Bathroom Exhaust Fan = 0.66</p> <p>Water Cooler = 0.83</p> <p>Window AC = 0.63</p> <p>Dehumidifier = 0.78 – based upon Ameren PY4 researched value of 0.78</p> <p>Advanced Power Strips = 0.86 – Ameren primary research in PY4</p> <p>Dishwasher = 0.80 – default value</p> <p>Pool Pump = 0.80 – default value</p> <p>Learning Thermostats = NA. The savings value in the IL TRM is based on regression analysis on consumption data and thus is a net savings number.</p> <p>NTG Source: Based upon EPY8 participant self-report survey unless noted otherwise.</p>

	<p style="text-align: center;">Energy Star Rebate (Appliances)</p>
<p>CY2019</p>	<p>NTG Clothes Washer: 0.62 NTG Refrigerator: 0.61 NTG Air Purifier: 0.78 NTG Freezers: 0.58 NTG Heat Pump Water Heater: 0.78 NTG Clothes Dryer: 0.66 NTG Bathroom Exhaust Fan: 0.70 NTG Water Cooler: 0.87 NTG Window AC: 0.67</p> <p>Dehumidifier = 0.78 – based upon Ameren PY4 researched value of 0.78 Advanced Power Strips = 0.86 – Ameren primary research in PY4 Dishwasher = 0.80 – default value Pool Pump = 0.80 – default value Advanced Thermostats = NA. The savings value in the IL TRM is based on regression analysis on consumption data and thus is a net savings number.</p> <p>FR Clothes Washer: 0.42 FR Refrigerator: 0.43 FR Air Purifier: 0.26 FR Freezers: 0.46 FR Heat Pump Water Heater: 0.26 FR Clothes Dryer: 0.38 FR Bathroom exhaust fan: 0.34 FR Water cooler: 0.17 FR Window AC: 0.37</p> <p>SO: 0.04 (clothes washer, refrigerator, air purifier, freezers, heat pump water heater, clothes dryer, bathroom exhaust fan, water cooler, window AC)</p> <p>NTG Source: SO based upon EPY8 participant self-report survey; FR based upon EPY8 unless noted otherwise.</p>

Source:

http://ilsagfiles.org/SAG_files/NTG/2019_NTG_Meetings/Corrected_NTG_Values/ComEd_NTG_History_and_CY2019_Recommendations_Aerator_and_Showerhead_Correction_2019-04-12.pdf