New Jersey Evaluation Guidelines:

Net-to-Gross (NTG) Guidance for Downstream Rebate Programs

May 2023

Guidelines for Clean Energy Program Evaluations
Sector: Residential and Commercial Evaluation Studies – Downstream Rebate Programs
Evaluation Type: Net-to-Gross Estimation

Prepared by Statewide Evaluators (SWE) as part of Assignments for NJ BPU

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Abstract

This document focuses on net-to-gross (NTG) studies for downstream programs offered in the NJ Clean Energy Program and primarily applies to downstream rebate programs. Downstream programs are new equipment programs targeted for delivery directly to utility customer responsible for paying the bill associated with the building utility meter, as compared to upstream programs targeted to the manufacturer of an efficient product, or midstream program targeted to product distributors, retailers and trade allies. The statewide evaluator (SWE) is grateful for the work conducted by Cadmus and PSE&G[1] in developing the approach approved by the SWE and presented in this guidance document.

Determining Type of Evaluation Study Required

Table 1: Summary of Evaluation Study Expectations

	Process	Impact	Notes
Basic Guidelines	One (or more) per year, as long as the program remains "new" or changing	One per year, as long as it remains "new" or changing	No program should be "basic" for 2 years without discussion with SWE. Most are 1 year maximum.
Enhanced Guidelines, before and during Tri2	Minimum 2 per triennium per program	Minimum 2 per Triennium; may be 1 if program is well-established and is low percent of savings.	Need robust NJ data for TRM; lighting going away and need updated numbers and values for "newer" measures that will increasingly be the core of programs; most programs did not get strong-sample process evaluations in completed first-year evaluations.
Enhanced Guidelines, after Tri2	Minimum 1 per Triennium	Minimum 1 per Triennium unless PJM has more frequent requirements	Mature programs and TRM values will be more settled. This keeps up with some of the program changes.
Behavioral	Annual, unless discussed with SWE	Annual, unless discussed with SWE	It is assumed that the randomized control group is arranged and evaluations are straightforward.
Net-To-Gross	Prefer 1 (or more) for each program and key measures / end uses in a Triennium for all high-priority, high-savings programs. If not conducted at the utility level, Integrated with Basic or Enhanced rigor surveys, the State will conduct the studies.		

Study Delivery Timing:

Studies do not have to be in synch with program years (PYs); however, except for perhaps first year basic guideline process and imipact work, which can be conducted on data that is not a full year, the studies should be based on at least 12 consecutive months of data. It may represent 6 months of one progamr year and 6 months of another, or other configurations that work with efficient evaluations and data availability.

[1] Cadmus 2022. Attribution Study Plan for PSE&G Downstream Rebate Programs. March 7, 2022.

Delivery of the final evaluation studies prior to the deadline for the Evalution Use memo and the next annual or comprehensive update to the TRM (December 1) are expected. Completion prior to preparation of Annual Reports tracking is strongly encouraged (mid-September). For basic studies on new programs, the fastest turnaround possible after data collection is preferred, so the recommendations can be implemented quickly and programs "righted" as may be needed, and the effectiveness of the changes can be verifed through the next rapid-turnaround basic or enhanced evaluation work. Planned schedules will be reviewed with SWE.

1. Introduction

Program savings include both gross savings, and net savings. Gross savings are those savings that result from the installation of energy efficiency measures, net savings are those measured savings that directly attributable to the program. The Independent Program Evaluator (IPE) working for each utility or for the BPU examining state programs will estimate net savings, or the savings directly attributable to the programs, through the application of NTG values. The IPE applies the NTG value to a program's verified gross savings to calculate the estimated net savings as follows:

Net Savings = **Verified Gross Savings** x **NTG**

The NTG values used to adjust the verified gross energy savings estimates account for freeridership and spillover as follows:

NTG = **1** – **Freeridership** + **Participant Spillover**

Freeridership refers to energy savings that would have occurred in the absence of the program. Spillover refers to additional energy savings attributable to the program when no rebates or incentives were paid and are added to program savings. It is important that the IPE follow the calculations and specified approach to question wording for the NTG estimates to be acceptable.

This document includes the proposed self-report methodologies to quantify program net savings for downstream rebate program evaluations. Methodologies are consistent with current best practices as outlined in Appendix F of the CE-05 – New York State EM&V Guidance document[2] and the October 2017 version of U.S. Department of Energy's Uniform Methods Project (UMP) Net-to-Gross Common practices.[3]

Net savings also should include nonparticipant spillover; however, nonparticipant spillover is more difficult to measure than participant spillover. Evaluators typically conduct market level studies to assess

[2] CE-05 – NYS EM&V Guidance Document – Appendix F. http://www3.dps.ny.gov/W/PSCWeb.nsf/96f0fec0b45a3c6485257688006a701a/255ea3546df802b585257e38005460f9/$FILE/CE-05-EMV%20Guidance%20Final%20%2011-1-2016.pdf

[3] Uniform Methods Project (UMP) Chapter 21: Estimating Net Savings – Common Practices. p. 37. https://www.nrel.gov/docs/fy17osti/68578.pdf

nonparticipant spillover. In New Jersey, either statewide studies or regional studies may be used for nonparticipant spillover estimation at the direction of the SWE.

2. Sampling for Self-Report NTG Method

The evaluator should follow sampling guidance in the Enhanced Rigor guidance which is reiterated below for residential and commercial and industrial programs.

Residential Program Sampling for NTG measurement

The SWE recommends that the evaluation include stratification and sample size sufficient to provide information on measures that represent a total of at least 80% of the program savings at the program level, and must include any measures representing more than 5% of the program savings, and that at least two measures beyond lighting must be included (at the program level). Because evaluations are intended to be forward-looking, measures that are expected to increase to more than 5% of savings in the next period should be included. The SWE recommends total end-of-year sample sizes for the NTG estimates should provide at least +/- 10% at 90% confidence overall at the program level (using proper formulae including sample size corrections), and 90/15 for specific measures or targeted subgroups/strata at the program level for each utility (90/10 if the number of sample points in the subgroup is 1000 or more).

Commercial and Industrial Program Sampling for NTG Measurement

Sampling of projects by program is expected in the commercial & industrial (non-residential) sector. The SWE recommends that the evaluation include stratification and sample size for NTG estimates sufficient to provide information on measures that represent a total of at least 80% of the program savings at the program level, include measures representing more than 5% of the program savings. At least two measures beyond lighting must be included (at the program level). Because evaluations are intended to be forward-looking, if there are measures that are expected to increase to more than 5% of savings in the next period, then these measures should also be included. The SWE recommends total end-of-year sample sizes should provide at least +/- 10% at 90% confidence overall at the program level (using proper formulae including sample size corrections) , and 90/15 for specific measures or targeted subgroups/strata at the program level for each utility (90/10 if the number of sample points in the subgroup is 1000 or more).

3. Self-Report NTG Approach

The self-report method will be used for the calculation of NTG ratios and net savings by estimating freeridership and spillover in a single survey.
Freeridership measures the part of savings that would have occurred absent program intervention. A participant can be classified as a:

- Full freerider (would have made no changes to the energy efficient project and/or activity without program intervention, for example would have purchased the exact same measure, at the same time, and in the same quantity)

- Non freerider (would not have completed the energy efficient project and/or activity without the influence of the program)
- Partial freerider (would have partially replicated the program activity, for example, by purchasing a lesser quantity of the program-rebated equipment but in the same timeframe as they purchased the program-rebated equipment)

Participant spillover concerns the program influence on customers' decisions to invest in additional energy efficiency measures not rebated by any of the utility programs or another organization. The IPE will determine whether program participants installed other energy saving measures after participating in the program through the spillover questions. Additional measures purchased by customers after program participation would be considered participant spillover savings if they met the following conditions:

- The program significantly influenced their decisions to purchase additional measures; and
- They did not receive additional incentives for those measures.

If the participant reports installing one or more measures without program incentives, additional questions in the survey will address the quantity they installed and the program's influence on their purchasing decisions and confirm the equipment meets efficiency qualifications.

3.1. Freeridership Estimation

Freeridership is the portion of savings that would have occurred absent program intervention. One of the primary challenges with self-report methods concerns various biases in the response process. The approach used here looks to mitigate the effect of social desirability bias (i.e., answering questions in a manner so that the respondent might be viewed favorably by others).

This approach assesses freeridership in estimating two components:

a) Intention – these questions ask respondents about the likelihood of carrying out the energy efficient measure *without* the DSM program's support and results in a score between 0% – 100%.
b) Influence – this second line of questions seeks to assess the programs direct influence on the customers decision to take the energy efficient action and results in a score between 0% – 100%.

Survey questions are used to calculate intention and influence scores, the two parts of the survey are scored separately and then combined, to estimate one freeridership score for each survey respondent. The final freeridership value for a program or analysis category is calculated as the arithmetic mean of the verified gross savings weighted intention (maximum score 100%) and verified gross savings weighted influence (maximum score 100%) freeridership components, resulting in a value between 0% and 100%, as shown in this equation:

$$Final\ Freeridership\ Ratio = \frac{Intention\ Score\ +\ Influence\ Score}{2}$$

The influence and intention scores contribute equally to the final freeridership score. The higher the final freeridership value, the greater the deduction of savings from the gross savings estimates.

3.1.1 Intention Freeridership Methodology and Scoring

Intention focused freeridership batteries, as standard practice, ask customers to report on their decisions absent the program considering three core elements: timing, quantity and efficiency. The IPE should ask about each of the three elements of intention (timing, quantity and efficiency) independently.

As such, intention will be assessed through a battery of questions to estimate how the respondent's project would have differed in the absence of the program. Responses to the series of questions, taken together, indicate whether the respondent is a full freerider, a non freerider, or a partial freerider. The level of partial freeridership is informed by questions addressing how the program affected decision making related to three core elements: timing, quantity and efficiency. Following is a simplified version of the intention question series; the full questions will be included in the final survey instruments for review:

- Were the participants planning on ordering or installing the measures before learning about the program?
- Would participants have installed measures without the program?
- Would participants have installed the measures at the same efficiency levels without the program?
- In the program's absence, would participants have installed the measures at a different time?
- Would participants have installed the same quantity of measures without the program?
- Was the purchase of the measures in the organization's most recent capital budget prior to learning about the program? (Nonresidential program only)
- Did the incentive help the project receive implementation approval from their organization? (Nonresidential program only)?

The IPE should use a scoring matrix to assign a single intention score to each participant based on his or her responses to the survey questions.[4,5] The IPE should then aggregate all participants' scores into a verified gross savings weighted average intention score for the entire program category.
The process for estimating an intention score is as follows:

- Non Freerider: Customers are categorized as non (0%) intention freeriders in these instances:
    - They had no plans to install the measure in the absence of the program's before learning about the program and would not have installed the measure(s) within a year for residential programs and within two years for commercial programs.
    - They had specific plans to install the measure before learning about the program but would not have done so without program incentives/assistance.
    - In the absence of program incentives, the customer would not have purchased or installed equipment to the same level of efficiency.

[4] Uniform Methods Project (UMP) Chapter 21: Estimating Net Savings – Common Practices. p. 37. https://www.nrel.gov/docs/fy17osti/68578.pdf

[5] Khawaja, M. S. 2007 edition. *The NAPEE Handbook on DSM Evaluation.* p. 5-1. http://www.ieadsm.org/wp/files/Tasks/Task%2021%20-%20Standardisation%20of%20Energy%20Savings%20Calculations/EPA%20(US)/EPA%20model%20evaluation_guide.pdf

- Full Freerider: Customers are categorized as full (i.e., max score 100%) intention freeriders if they would have installed the measure(s) at the same time and at the same efficiency without the program, or if they had installed the measure before learning about the program.
- Partial Freerider: Customers receive a partial intention freeridership score (ranging from 12.5% to 75%) if they had plans to install the measure and their decision was influenced by the program in some way. This influence may have affected installation timing, the efficiency levels of measures installed, or the number of measures installed.

Error! Reference source not found. presents an example of this calculation using PSE&G Residential Online Marketplace program. participant survey responses into being "yes," "no," or "partially" indicative of intention (in parentheses). The values in brackets are the scoring decrement associated with each response choice. Each participant intention score starts at 100%, then decreases based on responses to the survey questions C1 to C6. The initial intention score calculated from questions C1 to C6 is multiplied by the percent of original installed quantity that the participants would most likely have purchased without the PSE&G program rebate (question C7) to arrive at the final intention score for a participant. **Table 2** shows the intention questions and scoring using the example of the PSE&G C&I Prescriptive program

Table 1. Example for PSE&G Residential Online Marketplace Program Raw Survey Responses Translation to Intention Freeridership Scoring Matrix Terminology and Scoring

C1. Before you heard about the PSE&G Online Marketplace, had you already planned to purchase the [MEASURE](s)?	C2. Would you most likely have purchased the same [MEASURE](s) without the instant rebate from PSE&G?	[ASK IF C2=No or DK] C3. Would you most likely have purchased a different [MEASURE] without the PSE&G instant rebate, or would you have decided not to purchase it?	[ASK IF MEASURE≠Smart Thermostat] C4. Without the instant rebate PSE&G, what efficiency level of equipment would you most likely have purchased?	[ASK IF MEASURE=Smart Thermostat] C5. Without the instant rebate from PSE&G, what kind of thermostat would you most likely have purchased?	C6. Thinking about timing, without the PSE&G instant rebate, when would you most likely have purchased the [MEASURE](s)?	[ASK IF QTY > 1] C7. Without the instant rebate from PSE&G, how many [MEASURE](s) would you most likely have purchased?
Yes (Yes) [-0%]	Yes (Yes) [-0%]	I would have purchased a different [MEASURE] (Yes) [-0%]	Same efficiency as purchased or higher (Yes) [-0%]	A smart or learning thermostat (Yes) [-0%]	At the same time (Yes) [-0%]	OPEN ENDED [Final intention freeridership score = Initial intention freeridership score multiplied by (C7 response ÷ installed quantity)]
No (No) [-50%]	No (No) [-25%]	I would have decided not to purchase it (No) [-100%]	Lower efficiency (Partial2) [-50%]	A Wi-Fi thermostat (non-learning) (Partial2) [-50%]	Later, but within the same year (Partial2) [-50%]	
			Lowest efficiency or lowest cost option available (No) [-100%]	A programmable or manual thermostat (No) [-100%]	One to two years out (No) [-100%]	
-	-	-		Would not have purchased a new thermostat (No) [-100%]	More than two years out or Never (No) [-100%]	

Table 2. Example for PSE&G C&I Prescriptive Program Raw Survey Responses Translation to Intention Freeridership Scoring Matrix Terminology and Scoring

D1. Did your organization have specific plans to install the [MEASURE1] BEFORE learning about the PSE&G program incentive?	D2. [ASK IF D1=Yes or DK] Prior to hearing about the program incentive, was the purchase of the [MEASURE] included in your organization's capital budget?	D3. [ASK IF D2=Yes] Had your organization ALREADY ordered or purchased the [MEASURE] BEFORE you heard about the program?	D4. [ASK IF D3=Yes] Just to be clear, is it correct that you installed ordered or purchased the [MEASURE] before you heard anything about the PSE&G program?	D5. Without the incentive and information or education from PSE&G would you most likely have still purchased the [MEASURE]?	D6. [ASK IF D5=No] So, without the incentive and information or education from PSE&G, you would not have installed purchased the [MEASURE] at all. Is that correct?	D7. Without the incentive and information and education from PSE&G, what efficiency level of [MEASURE] would you most likely have purchased?	D8. Without the incentive and program information from PSE&G, when would you have installed this equipment without the program? Would you have installed it …	D9. Did the incentive help the [MEASURE] project receive implementation approval from your organization?	D10. Without the incentive and information or education from PSE&G, how many [MEASURE](s) would you most likely have purchased?
Yes (Yes) [-0%]	Yes (Yes) [-0%]	Yes (Yes) [-0%]	Yes (Yes) [100% Intention FR Score assigned]	Yes (Yes) [-0%]	Yes/correct, would not have installed without the program incentive (No) [-100%]	Same efficiency installed or higher (Yes) [-0%]	In the same year (Yes) [-0%]	Yes (No) [-50%]	OPEN ENDED (Final intention freeridership score = Initial intention freeridership score multiplied by (D10 response ÷ installed quantity).
No (No) [-50%]	No (No) [-50%]	No (No) [-0%]	No (No) [-0%]	No (No) [-50%]	No/not correct, would have installed something without the incentive (Yes) [-0%]	Lower efficiency (Partial2) [-50%]	Within one to two years (Partial2) [-50%]	No (Yes) [-0%]	
						Lowest efficiency or lowest cost option available (No) [-100%]	Within three to five years (No) [-100%]		
-	-	-		-	-		In more than five years or (No) [-100%]	-	
-	-	-		-	-	-	Never (No) [-100%]	-	

3.1.2 Influence Freeridership Methodology and Scoring

To estimate program influence, respondents are asked one question with several options to assess how program elements influenced their decisions about the energy efficiency measure they implemented. The influence of any one of these elements – program incentives or discounts, recommendation from utility staff, and information provided by the utility about energy-savings opportunities, previous participation in a utility energy efficiency program – determines how influential the program was in their decisions to install program-qualifying equipment. The program's influence score is equal to the maximum rating of any single program element, rather than an average, because it if any given element had a substantial influence on the respondent's decision, then the program itself was successful in influencing the respondent's decision. The factor of information from contractor or vendor listed in Table 3 is considered a program factor and included in the influence rating calculation any time the IPE research suggests the contractors or vendors were influenced by the program to stock, promote and upsell high efficiency equipment to customers.

The language in the influence questions ask participants about the importance of the utility program, rebate, and/or product rather than its influence. This avoids and social desirability bias associated with a customer being inclined or disinclined to ascribe influence to the utility. As an example, the survey should include a question such as the one shown in Table 3.

Table 3. General Freeridership Influence Component Question

	1 (Not at all important)	2 - (Slightly important)	3 – (Moderately important)	4 – (Very important)	5 (Extremely important)	Not Applicable
The PSE&G incentive or discount	1	2	3	4	(5)	n/a
Recommendation from PSE&G program staff or program implementer	1	2	3	(4)	5	n/a
Information about energy efficiency that PSE&G provided	1	2	(3)	4	5	n/a
Information from contractor or vendor	1	(2)	3	4	5	n/a
Previous participation in a PSE&G energy efficiency program	1	2	3	4	5	(n/a)

In this example, the highest score, a '5' for the importance of the incentive or discount, is the influence part score of freeridership for the program. High program influence and freeridership have an inverse relationship – the greater the program influence, the lower the freeridership score.

Table 4 presents the freeridership level implied by each influence rating. The score for each influence rating was adapted from recent research that indicates ratios between word ratings are not linear with equal distance between values; rather they have non-linear differences in intensity.[6] If respondents answer "Not applicable" for every program factor then the respondent should be removed from the savings weighted intention score for the program or reporting category.

[6] *See* Vander Vliet and Skumatz, EEDAL 2022, "Taking the Bias out of Likert Scales: Four Examples Using Better Alternatives"

Table 4. Influence Freeridership Implied by Response to Influence Items[7]

INFLUENCE RATING	*INFLUENCE* FREERIDERSHIP SCORE
1 (Not at all important)	100.0%
2 (Slightly important)	88.4%
3 (Moderately important)	58.1%
4 (Very important)	37.2%
5 (Extremely important)	0.0%
Not applicable	REMOVE FROM ANALYSIS

3.1.3 Calculating Program Participant Freeridership

As noted earlier, the final freeridership value for a program or analysis category is calculated as the arithmetic mean of the verified gross savings weighted intention (maximum score 100%) and verified gross savings weighted influence (maximum score 100%) freeridership components, resulting in a value between 0% and 100%, as shown in this equation:

$$Final\ Freeridership\ Ratio = \frac{Intention\ Score\ +\ Influence\ Score}{2}$$

3.1.4. Consistency Check and Adjustments

The survey should include a question to describe in their own words what impact, if any, the program had on their decision to implement or install energy efficient equipment. If a respondent is determined to be a non-freerider (0%) or pure free-rider (100%) and their response to the open-ended consistency check question contradicts the determination of non-freerider or pure freerider, their intention freeridership score and influence freeridership score should be adjusted to 50%.

3.2. Participant Spillover Approach

Participant spillover addresses situations where the participant reports activities, purchases, and/or installations of high-efficiency equipment that is not funded through the program but was influenced by the customer's participation in the program.

The IPE will calculate participant spillover based on the installation and description of non-incented energy efficiency measures taken since program participation, an estimate of the energy savings generated by the measures, and the influence of the utility DSM programs on the decision to make energy efficiency improvements. The IPE should collect data using questions that ask program participants if the program prompted a decision to install other energy-efficient measures or to make other energy-efficient improvements beyond what was specifically rebated through the program, such as:

- Have participants taken any energy efficient actions that enhance their home or facility's level of efficiency without direct program support?
- Did these actions take place after their involvement with the program?
- Were these actions in their view influenced by the program?

[7] Source for values: Vander Vliet and Skumatz, EEDAL 2022, "Taking the Bias out of Likert Scales: Four Examples Using Better Alternatives"

3.2.1 Participant Spillover Survey Questions

The participant self-report survey will assess the purchase and installation of any energy efficient measures, whether eligible for program rebates, in the New Jersey's Clean Energy Program Protocols to Measure Resource Savings but not eligible for rebates, or those measures not included in the New Jersey's Clean Energy Program Protocols to Measure Resource Savings. Data necessary to quantify spillover should be captured through the self-report survey and will include the number and description of non-incented energy efficiency measures purchased and installed since program participation, a rating of the program's influence on the participant's decision and any information needed to inform an estimate of the energy savings for the measure(s). The self-report survey will include questions similar to the following:

"Since participating in the Utility DSM program, have you made any energy-efficiency improvements or installed any other energy-efficiency products in your home (or business) that you did NOT receive for free or a program incentive for from PSE&G or another organization? [If yes] Please select the energy-efficient products or improvements that you purchased (and installed, if applicable) since participating in the Utility DSM program. Select all that apply."

The survey will then ask respondents about the level of influence the program participation had on their decision to install the added measures, using a question similar to the following:

"On a scale from 1 to 5, with 1 meaning not at all important and 5 meaning extremely important, please rate how important your experience with the PSE&G program was in your decision to install this/these energy-efficient products(s)."

Additional measure purchases associated with a "extremely important" program rating will be considered for spillover attribution to the program.

3.2.2 Calculating Participant Spillover

Participant spillover savings is estimated for three categories:

- For program-eligible measures
- For measures in the New Jersey's Clean Energy Program Protocols to Measure Resource Savings but not eligible for incentives for the program in question
- For measures not in the New Jersey's Clean Energy Program Protocols to Measure Resource Savings but for which the IPE Team can provide reasonable documentation of savings

Residential participants should be asked an open-ended question about how they know the added measures they purchased are high efficiency. Commercial participants should be asked measure-specific follow-up questions that provide the IPE with information to determine whether the additional measures they purchased are high-efficiency.

The IPE should also include one open ended question to both residential and commercial participants to gain further insights on the spillover savings, specifically why they did not apply for a utility program incentive if the added activity was similar to a measure rebated through a utility program.
Upon completion of data collection, the IPE should also conduct brief follow-up interviews with a sample of customers who claimed to install spillover-eligible measures, ensuring appropriate

representation across all measure types. The IPE should use these interviews to check the accuracy of customers' self-reported spillover measure installations.

The steps to estimating participant spillover are as follows:

- Calculate total spillover savings for each participant as the product of measure savings and number of units associated with "extremely important" program influence ratings.

Measure Spillover	=	**Measure Savings**	x	**No. of Units**

- Total the savings associated with each program participant, to give the overall participant spillover savings.

Participant Spillover	=	**Sum of Measure Spillover**

- Multiply the mean participant spillover savings for the participant sample by the total number of participants to yield an estimated total participant spillover savings for the program.

Total Participant Spillover Savings (population)	=	**Sum of Participant SPO (sample)**	÷	**Sample n**	x	**Population N**

- Divide that total participant spillover savings by the total gross program savings to yield a participant spillover ratio to be included in the calculation of the NTG ratio.

Participant Spillover Ratio	=	**Total Participant Spillover Savings (population)**	÷	**Total Gross Program Savings**	x	**100%**

4. Example Residential Freerider Questions for PSE&G Program

[SET MEASURE_NTG BASED ON MEASURE PRIORITY DETERMINED DURING SAMPLING]
For the next set of questions, please only think about the **[MEASURE_NTG]** you purchased from PSE&G's Online Marketplace. We realize you may have purchased other products from the Online Marketplace as well, but these questions will only ask about **[MEASURE_NTG]**.
[FORCE RESPONSE FOR ALL SECTION QUESTIONS ACCORDING TO THE PROGRAMMING LOGIC]

11. Before you heard about the PSE&G Online Marketplace, had you already planned to purchase the **[MEASURE_NTG]**(s)?
    1. Yes
    2. No

12. Would you most likely have purchased the same **[MEASURE_NTG]**(s) without the instant rebate from PSE&G?
    1. Yes **[SKIP TO 14]**
    2. No

13. **[ASK IF 12 = NO]** Would you most likely have purchased a different **[MEASURE_NTG]**(s) without the PSE&G instant rebate or would you have decided not to purchase it?
    1. I would have purchased a different **[MEASURE_NTG]**
    2. I would have decided not to purchase it **[SKIP TO 18]**

14. **[SKIP 14 IF MEASURE_NTG = Thermostat]** Without the instant rebate from PSE&G, what efficiency level of equipment would you most likely have purchased?
    1. Same efficiency installed or higher
    2. Lower efficiency
    3. Lowest efficiency or lowest cost option

15. **[ASK 15 IF MEASURE_NTG = Thermostat]** Without the instant rebate from PSE&G, what kind of thermostat would you most likely have purchased?
    1. A smart or learning thermostat
    2. A WiFi thermostat (non-learning)
    3. A programmable or manual thermostat
    4. Would not have purchased a new thermostat **[SKIP TO 18]**

16. Thinking about timing, without the PSE&G instant rebate, when would you most likely have purchased the **[MEASURE_NTG]**(s)?
    1. At the same time
    2. Later, but within the same year
    3. One to two years out
    4. More than two years out or Never

17. **[ASK IF [MEASURE_NTG QTY] IN SAMPLE IS > 1]** Without the instant rebate from PSE&G, how many **[MEASURE_NTG]**(s) would you most likely have purchased?
    1. **[NUMERIC TEXT BOX]**

18. Please rate how important the following factors were on your decision to purchase and install the **[MEASURE_NTG]**(s)**.** If an element is not applicable to you, please select "N/A" Use a scale from 1 to 5, with 1 meaning the factor was "not at all important" and 5 meaning the factor was "extremely important" in your decision to purchase the **[MEASURE_NTG]**(s). [ERROR! R EFERENCE SOURCE NOT FOUND. **TO** ERROR! REFERENCE SOURCE NOT FOUND. **- RANDOMIZE LIST] [DROP DOWN LIST OR RADIO BUTTON SELECTION; "1 – NOT AT ALL IMPORTANT", "2", "3", "4", "5 – VERY IMPORTANT", "NOT APPLICABLE"]]**

Item	Not at all important [1]	Slightly important [2]	Moderately important [3]	Very important [4]	Extremely important [5]	N/A [99]
a. The PSE&G instant rebates for the **[MEASURE_NTG]**(s)						
b. Recommendation from PSE&G program staff or program implementer						
c. Information about energy efficiency that PSE&G provided						

Item	Not at all important [1]	Slightly important [2]	Moderately important [3]	Very important [4]	Extremely important [5]	N/A [99]
d. Information from contractor or vendor						
e. Previous participation in a PSE&G energy efficiency program						

19. In your own words, can you please describe how important the rebate and information or education from PSE&G was on your decision to purchase and install the **[MEASURE_NTG]**(s)?
    1. **[OPEN-ENDED RESPONSE]**

5. Example Nonresidential Freerider Questions for PSE&G Program

[SET MEASURE_NTG BASED ON MEASURE PRIORITY DETERMINED DURING SAMPLING]

For the next set of questions, please only think about the **[MEASURE_NTG]** you purchased through PSE&G's program. We realize you may have purchased other products from the PSE&G program as well, but these questions will only ask about **[MEASURE_NTG]**.

[FORCE RESPONSE FOR ALL SECTION QUESTIONS ACCORDING TO THE PROGRAMMING LOGIC]

A1. Did your organization have specific plans to install the **[MEASURE_NTG]** ***BEFORE*** learning about the PSE&G program incentive? **[FORCED RESPONSE – NO SKIP]**

1. Yes
2. No **[SKIP TO A5]**

A2. **[IF A1= 1, 98]** Prior to hearing about the program incentive, was the purchase of the **[MEASURE1]** included in your organization's capital budget? **[FORCED RESPONSE – NO SKIP]**

1. Yes
2. No **[SKIP TO A5]**

A3. **[ASK IF A2= 1]** Had your organization *ALREADY* ordered or purchased the **[MEASURE_NTG]** *BEFORE* you heard about the program? **[FORCED RESPONSE – NO SKIP]**

1. Yes
2. No **[SKIP TO A5]**

A4. **[ASK IF A3= 1]** Just to be clear, is it correct that you ordered or purchased the **[MEASURE_NTG]** before you heard anything about the PSE&G program? **[FORCED RESPONSE – NO SKIP]**

1. Yes **[SKIP TO A11]**
2. No

A5. Without the incentive and information or education from PSE&G would you most likely have still purchased the **[MEASURE_NTG]**? **[FORCED RESPONSE – NO SKIP]**

1. Yes **[SKIP TO A7]**
2. No

A6. **[ASK IF A5= 2]** So, without the incentive and information or education from PSE&G, you would **not** have installed a **[MEASURE_NTG]** at all. Is that correct? **[FORCED RESPONSE – NO SKIP]**

1. Yes/correct, we would not have installed anything without the program incentive **[SKIP TO A11]**
2. No/not correct, we would have installed something without the incentive

A7. Without the incentive and information or education from PSE&G, would you most likely have purchased a lower efficiency **[MEASURE_NTG]**(s), the same efficiency **[MEASURE_NTG]**(s) or a higher efficiency **[MEASURE_NTG]**(s)**? [FORCED RESPONSE – NO SKIP]**

3. Same efficiency installed or higher
4. Lower efficiency
5. Lowest efficiency or lowest cost option

A8. Without the incentive and information or education from PSE&G, when would you most likely have installed the **[MEASURE_NTG]**(s) without the program? Would you have installed it: **[FORCED RESPONSE – NO SKIP]**

1. In the same year?
2. Within one to two years?
3. Within three to five years?
4. In more than five years?
5. Never

A9. Did the incentive help the **[MEASURE_NTG]**(s) project receive implementation approval from your organization? **[FORCED RESPONSE – NO SKIP]**

1. Yes
2. No

A10. **[QUANTITY_MEAS1 > 0]** Without the incentive and information or education from PSE&G, how many **[MEASURE_NTG]**(s) would you most likely have purchased? **[FORCED RESPONSE – NO SKIP]**

1. **[OPEN-ENDED RESPONSE]**

A11. Please rate how important the following factors were on your decision to purchase and install the high-efficiency **[MEASURE_NTG]**(s). Use a scale from 1 to 5, with 1 meaning the factor was "not at all important", and 5 meaning the factor was "extremely important" in your decision to purchase the **[MEASURE_NTG]**(s). If a factor is not applicable to you, please select "NA". **[FORCED RESPONSE – NO SKIP]** **[DROP DOWN SELECTION 1-4 OR NA: 1-NOT AT ALL IMPORTANT, 2-SLIGHTLY IMPORTANT, 3-MODERATELY IMPORTANT, 4-VERY IMPORTANT, 5-EXTREMELY IMPORTANT, NA-96]**

1. The PSE&G incentive or discount
2. Recommendation from PSE&G program staff or program implementer
3. Information about energy efficiency that PSE&G provided
4. Information from a contractor or vendor
5. Previous participation in a PSE&G energy efficiency program

A12. In your own words, can you please describe how important the rebate and information or education from PSE&G was on your decision to purchase and install the **[MEASURE_NTG]**(s)?

1. **[OPEN-ENDED RESPONSE]**

6. Example Residential Participant Spillover Questions for PSE&G Marketplace Program

For the next set of questions, please think about other energy-saving improvements you may have performed on your home but did not receive a rebate for.

A1. Since purchasing items through the PSE&G Online Marketplace, have you made any energy-efficiency improvements or installed any other energy-efficiency products in your home that you did ***NOT*** receive for free or a rebate from PSE&G or another organization?

1. Yes
2. No

A2. **[ASK IF A1=1]** Please select the energy-efficient products or improvements that you purchased (and installed, if applicable) since you purchased the **[PROGRAM MEASURE]**(s) from the PSE&G Online Marketplace. Select all that apply. **[SELECT ALL THAT APPLY]**

Measure Names	A2a. [Measures mentioned that were installed. Record 1=YES for all measures mentioned.]	A2b. How many / much did you install? [Record Quantity]	A2c. On a scale from 1 to 5, with 1 meaning not at all important and 5 meaning extremely important, please rate how important your experience with the PSE&G program was in your decision to install this/these energy-efficient products(s). [SCALE 1-5] [DROP DOWN LIST OR RADIO BUTTONS] [1. Not at all important 2. Slightly important 3. Moderately important 4. Very important 5. Extremely important]	A2d. Why didn't you apply for and receive a rebate for [A2a RESPONSE]? [For each measure selected in A2a: 1= Did not know rebate was available, 2= product did not quality, 97=Other, Specify]	A2.A2e. How did you know that the [A2a RESPONSE] was energy efficient? [OPEN END]	A2f. In what year was it purchased and installed? [RECORD NUMERIC YEAR: "2021 or later","2020","Before 2020",]
Gas Boiler		N/A – DO NOT ASK				
Gas Furnace		N/A – DO NOT ASK				
Gas Tank-less water heater		N/A – DO NOT ASK				
Gas Storage water heater		N/A – DO NOT ASK				
Electric Tank-less water heater		N/A – DO NOT ASK		N/A – DO NOT ASK		
Insulation)	**[SPECIFY TYPE: 1=Attic/roof/ceiling, 2=Wall]** SELECT ALL THAT APPLY	ASK FOR SQUARE FEET		N/A – DO NOT ASK		
Duct sealing		ASK FOR LINEAR FEET		N/A – DO NOT ASK		
ENERGY STAR Clothes Washer		N/A – DO NOT ASK		N/A – DO NOT ASK		

Measure Names	A2a. [Measures mentioned that were installed. Record 1=YES for all measures mentioned.]	A2b. How many / much did you install? [Record Quantity]	A2c. On a scale from 1 to 5, with 1 meaning not at all important and 5 meaning extremely important, please rate how important your experience with the PSE&G program was in your decision to install this/these energy-efficient products(s). [SCALE 1-5] [DROP DOWN LIST OR RADIO BUTTONS] [1. Not at all important 2. Slightly important 3. Moderately important 4. Very important 5. Extremely important]	A2d. Why didn't you apply for and receive a rebate for [A2a RESPONSE]? [For each measure selected in A2a: 1= Did not know rebate was available, 2= product did not quality, 97=Other, Specify]	A2.A2e. How did you know that the [A2a RESPONSE] was energy efficient? [OPEN END]	A2f. In what year was it purchased and installed? [RECORD NUMERIC YEAR: "2021 or later","2020","Before 2020",]
ENERGY STAR Dishwasher		N/A – DO NOT ASK		N/A – DO NOT ASK		
ENERGY STAR Windows		ASK FOR SQUARE FEET		N/A – DO NOT ASK		
Wi-Fi enabled thermostat or Smart thermostat						
Programmable thermostat						
LED Lighting				N/A – DO NOT ASK		
ENERGY STAR Refrigerator		N/A – DO NOT ASK		N/A – DO NOT ASK		
Heat pump water heater		N/A – DO NOT ASK				
ENERGY STAR Room AC				N/A – DO NOT ASK		
Central AC		N/A – DO NOT ASK				
Heat Pump	**[SPECIFY: 1=Central air source, 2=ground source/geothermal, 3=ductless**	N/A – DO NOT ASK				

Measure Names	A2a. [Measures mentioned that were installed. Record 1=YES for all measures mentioned.]	A2b. How many / much did you install? [Record Quantity]	A2c. On a scale from 1 to 5, with 1 meaning not at all important and 5 meaning extremely important, please rate how important your experience with the PSE&G program was in your decision to install this/these energy-efficient products(s). [SCALE 1-5] [DROP DOWN LIST OR RADIO BUTTONS] [1. Not at all important 2. Slightly important 3. Moderately important 4. Very important 5. Extremely important]	A2d. Why didn't you apply for and receive a rebate for [A2a RESPONSE]? [For each measure selected in A2a: 1= Did not know rebate was available, 2= product did not quality, 97=Other, Specify]	A2.A2e. How did you know that the [A2a RESPONSE] was energy efficient? [OPEN END]	A2f. In what year was it purchased and installed? [RECORD NUMERIC YEAR: "2021 or later","2020","Before 2020",]
	/mini-split] SELECT ALL THAT APPLY					
Heat Pump	[SPECIFY: 1=Central air source, 2=ground source/geothermal, 3=ductless /mini-split] SELECT ALL THAT APPLY	N/A – DO NOT ASK				
ENERGY STAR Dehumidifier				N/A – DO NOT ASK		
ENERGY STAR Air purifier				N/A – DO NOT ASK		
General other, list				N/A – DO NOT ASK		

7. Example Nonresidential Participant Spillover Questions for PSE&G Program

A1. Since participating in the PSE&G Program, have you installed any additional energy efficient equipment or made other changes to improve the energy efficiency of your business, changes for which you did NOT receive a rebate from PSE&G, or another organization? This would include things such as motors, lighting upgrades, and heating and cooling equipment.

1. Yes
2. No [SKIP TO NEXT SECTION]

99.

A2. **[ASK IF A1=1]** Please select the other energy-efficient products that you installed without getting an incentive. Note we are only asking about equipment that is currently installed and operating, and for which you have not received an incentive from PSE&G or another organization.

1. LEDs
2. Lighting controls (i.e. occupancy sensors, daylighting, timers)
3. High efficiency motors
4. Air source heat pumps
5. Ground source heat pumps
6. Central AC
7. VSD (variable speed drives or motors)
8. Water heating equipment
9. Boiler
10. Compressed air equipment
11. Gas furnaces
12. Exit signs
13. Refrigeration equipment (i.e. refrigerators, freezers)
14. HVAC system controls
15. Operational improvements (please specify): [TEXT BOX]
16. Something else (please specify): [TEXT BOX]

99.

A3. **[REPEAT FOR EACH ITEM MENTIONED IN A2]** How important was your experience participating in the PSE&G Program on your decision to do purchase the **[INSERT ITEM FROM A2]**?

1. Not at all important
2. Slightly important
3. Moderately important
4. Very important
5. Extremely important

A4. **[REPEAT FOR EACH ITEM MENTIONED IN A2 IF A2≠1]** How many **[INSERT ITEM FROM A2]** did you install?

[RECORD NUMBER_____, -96 FOR N/A]]

A5. **[REPEAT FOR EACH ITEM MENTIONED IN A2]** In what year was the **[INSERT ITEM FROM A2]** purchased and installed?

[RECORD NUMERIC YEAR: "2021 OR LATER","2020","BEFORE 2020", AND -96 FOR N/A]]

[ASK A6.11-A6.14 IF A3.1=5] {and depending on number of measures asked}

A6.11 **[REPEAT FOR EACH ITEM MENTIONED IN A2]** In what location were the LEDs installed?

1. Wall
2. Ceiling
3. Outdoor
4. Other **[SPECIFY/RECORD RESPONSE]**

A6.12 **[REPEAT FOR EACH LOCATION MENTIONED IN A2.11]** What is the wattage of the new **[A2.11 RESPONSE]** LED lighting installed? **[RECORD RESPONSE,]**

A6.13 **[REPEAT FOR EACH LOCATION MENTIONED IN A2.11]** How many new **[A2.11 RESPONSE]** LEDs did you install? **[RECORD RESPONSE,]**

A6.14 **[REPEAT FOR EACH LOCATION MENTIONED IN A2.11]** What type of **[A2.11 RESPONSE]** lighting equipment was removed or replaced? **[RECORD RESPONSE,]**

[ASK A6.21- A6.22 IF A3.2=5]

A6.21 How many lamps are controlled by the efficient lighting controls installed? [RECORD RESPONSE,]

A6.22 What is the average wattage of the lamps controlled by the lighting controls installed? [RECORD RESPONSE,]

[ASK A6.31-A6.33 IF A3.3=5]

A6.31 How is the high efficiency motor controlled? [RECORD RESPONSE]

1. Always on
2. Manual start/stop
3. VSD / ECM / VFD
4. Other **[SPECIFY/RECORD RESPONSE]**

A6**.33** On what equipment was the high efficiency motor installed? **[RECORD RESPONSE,]**

A6.33 What is the horsepower of the high efficiency motor? **[RECORD RESPONSE,]**

[ASK A6.41 IF A3.4=5 OR A3.5=5] [ASK A6.42 IF A3.4=5 OR A3.5=5 OR A3.6=5] [ASK A6.43 IF A3.4=5 OR A3.5=5 OR A3.6=5]

A6.41 **[REPEAT FOR EACH ITEM MENTIONED IN A2]** What is the heating efficiency rating (HSPF) of the **[INSERT ITEM FROM A2]**? **[RECORD NUMERIC RESPONSE: 0.1 TO 20.0 "HSPF RATING",]**

A6.42 **[REPEAT FOR EACH ITEM MENTIONED IN A2]** What is the cooling efficiency rating (SEER/EER) of the **[INSERT ITEM FROM A2]**? **[RECORD NUMERIC RESPONSE: 0.1 TO 30.0 "SEER/EER RATING",]**

A6.43 **[REPEAT FOR EACH ITEM MENTIONED IN A2]** What is the output capacity in BTUs of the **[INSERT ITEM FROM A2]**? **[RECORD NUMERIC RESPONSE: 0 TO 1,000,000 "BTUS",]**

[ASK A6.51-A6.52 IF A3.7=5]

A6.**51** On what type of equipment was the VSD (variable speed drive) or motor installed? **[RECORD RESPONSE,]**

A6.52 What is the horsepower of the motor? **[RECORD RESPONSE,]**

[ASK A6.61-A6.64 IF A3.8=5]

A6.**61** What type of water heating equipment was purchased and installed? **[READ LIST]**

1. Water heater with storage
2. Tankless water heater
3. Heat pump water heater
4. Condensing water heater
5. Boiler

A6.62 What fuel type is used? **[RECORD RESPONSE,]**

A6.63 What is the thermal efficiency rating of the water heating equipment? **[RECORD NUMERIC RESPONSE: 0.00 TO 0.99 "EFFICIENCY FACTOR (EF)",]**

A6.64 **[ASK IF A6.61 NOT EQUAL TO "TANKLESS WATER HEATER"]** What is the capacity of the equipment in gallons? **[RECORD NUMERIC RESPONSE: 0 TO 10,000 "CAPACITY IN GALLONS",]**

[ASK A6.71-A6.72 IF A3.10=5]

A6.**71** what is the compressed air equipment being used for? **[RECORD RESPONSE,]**

1. Cycling refrigerated air dryers
2. Dewpoint demand controls for desiccant dryers
3. No air-loss condensate drains
4. Pressure/flow controllers
5. Compressed air mist eliminators
6. Air-entraining nozzles
7. Heat recovery
8. Other: **[RECORD RESPONSE]**

A6.72 What is the horsepower of the compressor motor? **[RECORD RESPONSE,]**

[ASK A6.81-A6.82 IF A3.9=5 OR A3.11=5]

A6.81 What is the annual fuel utilization efficiency (AFUE) rating of the gas furnace? **[RECORD RESPONSE,]**

A6.82 What is the output capacity in BTUs of the gas furnace? **[RECORD RESPONSE,**

[ASK A6.91 IF A3.13=5]

A6.**91** What type of refrigeration equipment was purchased and installed? **[RECORD RESPONSE,]**

[ASK A6.101-A6.102 IF A3.14=5]

A6**.101** What type of HVAC system controls was purchased and installed? **[RECORD RESPONSE,]**

1. Smart thermostat
2. Building automation system
3. Other: **[RECORD RESPONSE]**

A6.102 What type of heating and cooling equipment are controlled by the HVAC system controls? **[RECORD RESPONSE,]**

[ASK A6.11 IF A3.15=5]

A6**.11** How do you know the **[INSERT A2**.15 TEXT RESPONSE**]** is energy efficient? **[RECORD RESPONSE,]**

8. Reporting

The results of the NTG assessment is part of the impact evaluation and includes TRM relevant results. The following are requirements for all evaluation reports that will be submitted to the SWE.

- A 1–2-page abstract including list of all recommendations and all the TRM update values (not just a list of what was investigated). This is separate from and in addition to the executive summary. The 1–2-page abstract focuses only on why the evaluation was conducted, all quantitative results of any kind relevant for the TRM, and all program-related recommendations (without detailed explanation/context).[8]
- The Executive summary chapter includes more detail than the abstract. It provides a traditional abbreviated summary of methods, and results and recommendations that include explanation and context enough to provide the reader with an understanding of the key elements and forward-looking results from the study.
- A chapter must be included that provides impact values and process / design / delivery comparisons for multiple similar programs elsewhere, and comparisons to impact and key process values from the program for prior years in New Jersey if available. These values should be used as a basis for best practices recommendations, trends in improving results, etc. The chapter and comparisons are required, but these results should also be referenced liberally elsewhere in the report as relevant, so that the reader can understand the context for the impact and process evaluation findings, and for recommended improvements.
- The report must also include a section that provides documentation of any data that are missing or needed in order to complete a standard impact or process evaluation as an assessment of the evaluability of the program going forward. Associated specific recommendations to address gaps should be included.
- It is required that all data purchased for the project becomes the property of or accessible to all other NJ evaluations.[9]
- For each evaluation project, several stages of data must be saved, with adequate documentation, and under proper compliant security. This includes at a minimum: initial data requests from the utilities; raw and cleaned, weighted survey or interview data; several stages of processed data; and final analytical data sets. These data must be held by either the IPE or utility in a secure location for a period of 5 years after the First Triennium and be available upon request (and without charge) to the BPU and their consultants.

8.1 Report Timing

The results of the NTG assessment should be included with impact evaluations, which should address 12 months of program activity. Data collection should be completed within 2 months of the end of the 12-month period and a draft should be submitted within 18 weeks of the end of the 12 months addressed by the evaluation.

[8] The TRM-relevant results from the study are then considered and reviewed by the TRM committee and go through the TRM update process.

[9] Utilities should make every effort to include agreement in contracts for purchased data so that it can be shared to other New Jersey evaluation.

9. References

a. CE-05 – NYS EM&V Guidance Document – Appendix F. http://www3.dps.ny.gov/W/PSCWeb.nsf/96f0fec0b45a3c6485257688006a701a/255ea3546df802b585257e38005460f9/$FILE/CE-05-EMV%20Guidance%20Final%20%2011-1-2016.pdf
b. Uniform Methods Project Chapter 21: Estimating Net Savings – Common Practices. https://www.nrel.gov/docs/fy17osti/68578.pdf
c. The NAPEE Handbook on DSM Evaluation. p. 5-1. https://www.epa.gov/sites/default/files/2015-08/documents/evaluation_guide.pdf
d. Evaluation Example of Intention Freeridership Probability Matrix Scoring: Focus on Energy – Wisconsin. Calendar Year 2020 Evaluation Report - Appendices. Appendix K. Net Savings Analysis. https://www.focusonenergy.com/sites/default/files/inline-files/Evaluation_Report-2020-Volume_III.pdf
e. Central Hudson – New York. 2020 Residential HVAC Attribution Study Final Report. https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7BDCF6E19A-D1BB-4B07-8B16-7D968CF0B3AE%7D