2019 Michigan Public Power Agency Impact Evaluation Report

Report for the 2019 Energy Waste Reduction Programs

Date: May 18, 2020

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1 EXECUTIVE SUMMARY

The Michigan Public Power Agency Energy Efficiency Service Committee (MPPA EE Service Committee) is a group of 18 Michigan municipal electric utilities that was formed to mutually verify the annual savings of similar Energy Waste Reduction (EWR) programs as required by the State of Michigan's 2008 Public Act 295[1] (PA 295) Section 71. PA 342 of 2016.

The evaluation of MPPA EE Service Committee 2019 EWR programs was conducted in the fourth quarter of 2019 through the first quarter of 2020. The evaluation estimated verification rates (i.e., the measures that were installed and operating as planned) using statistical sampling of participants across participating municipal utilities. These estimates were then applied to the participation parameters of specific member utilities.

This report presents the verification of energy savings for the EWR programs implemented by the utilities. Results for each individual utility can be found in the Appendices.

[11] http://www.legislature.mi.gov/documents/2007-2008/publicact/pdf/2008-PA-0295.pdf

2 INTRODUCTION

The MPPA EE Service Committee is a group of 18 Michigan municipal electric utilities (for a list of participating utilities, see Appendix A) that was formed to mutually verify the annual savings of similar EWR programs as required by the State of Michigan's 2008 Public Act 295 (PA 295) Section 71 of PA 342 of 2016 (3)(i), which amended 2008 Public Act of 295. The legislation states the goal of the EWR plan is to "*help the provider's customers reduce energy waste and to reduce the future costs of provider service to customers. In particular, an electric provider's energy waste reduction plan shall be designed to delay the need for constructing new electric generating facilities and thereby protect consumers from incurring the costs of such construction.*"

The goal of the evaluation was specified as the verification of incremental energy (kWh) savings for the MPPA EE Service Committee members' EWR programs. The MPPA EE Service Committee chose to accept the savings estimates from the Michigan Energy Measures Database (MEMD). The MEMD contains values that were current at the time the associated EWR plans were approved by the Michigan Public Service Commission (MPSC or the Commission), or engineering estimates current at the time the EWR plans were approved by the MPSC for measures not included in the MEMD as the source for gross energy savings. Accordingly, the objectives of the evaluation are to verify that measures are installed and operating as planned and to deliver a final annual report that provides the energy savings for each utility.

Each report presents the utility's claimed savings, the verified savings and the verification rate. To develop the verification rates, we request the individual utility databases (partial datasets) and performs the verification processes to develop the verification rate. At the end of the program year we request the final datasets and the individual program claims. For some utility programs, we did not find the final datasets matched their claims. We did however still use these claims and applied the verification rate to those claims. DNV GL did not require the database and claims to match as the primary use of the databases is to develop the verification rates.

This report presents the verification results for the MPPA member utilities. A recapitulation of the estimates of savings for programs implemented by the MPPA member utilities are presented in APPENDIX B through APPENDIX S. APPENDIX T through APPENDIX W provide supporting documentation, analytical approaches, as well as generic descriptions of programs that MPPA EE Service Committee members may have implemented.

3 VERIFICATION OF SAVINGS ESTIMATES

The 2019 verified savings estimates for the residential and commercial programs was prepared for each of the 18 individual utilities. Results are presented in APPENDIX B through APPENDIX S.

APPENDIX A. MPPA ENERGY EFFICIENCY SERVICE COMMITTEE UTILITIES

UTILITIES

The following 18 municipal utilities have EWR programs that are included in the 2019 evaluation:

- Bay City Electric Light & Power
- Charlevoix Electric System
- Chelsea Electric Department
- Croswell Light & Power Department
- City of Eaton Rapids
- Grand Haven Board of Light & Power
- Hart Hydro-Electric
- Holland Board of Public Works
- Lowell Light & Power
- Niles Utility Department
- Village of Paw Paw
- City of Petoskey
- Portland Light and Power Board
- City of St. Louis
- City of Sturgis
- Traverse City Light & Power
- Wyandotte Municipal Services
- Zeeland Board of Public Works

APPENDIX B. BAY CITY ELECTRIC LIGHT & POWER VERIFICATION REPORT

This section presents the verification results for the 2019 Bay City Light & Power Energy Waste Reduction program portfolio. The results specify the claimed or "deemed savings" and the verified gross savings. The verification rate is the percentage of measures that the evaluation determined are installed and operating as planned for each program. The verified gross saving is calculated by applying the verification rate to the claimed savings. Table 1 presents the 2019 results by program for Bay City Electric Light & Power.

Low Income Services Program the program deemed savings estimate is 199,200 kWh. Based on the analysis of the program the verified gross savings estimate is 123,663 kWh. The confidence interval associated with this estimate is ± 11,637 kWh.

Residential Services:

Efficient Lighting Program (lighting kits) deemed savings estimate is 423,456 kWh. Based on the analysis of the program the verified gross savings estimate is 358,709 kWh. The confidence interval associated with this estimate is ± 14,384 kWh.

High-Efficiency Appliances & HVAC Program the deemed savings estimate is 184,897 kWh. Based on the analysis of the program the verified gross savings estimate is 179,739 kWh. The confidence interval associated with this estimate is ± 6,255 kWh.

Appliance Recycling Program the deemed savings estimate is 317,481 kWh. Based on the analysis of the program the verified gross savings estimate is 297,480 kWh. The confidence interval associated with this estimate is ± 31,622 kWh.

Residential Educational Services program has stipulated savings. Accordingly, no verification was required. Therefore, the verified savings are 100%, see Table 1 for the gross savings.

Residential Pilot Program has stipulated savings. Accordingly, no verification was required. Therefore, the verified savings are 100%, see Table 1 for the gross savings.

Business Services:

Prescriptive & Custom Program reported deemed savings estimate was 1,351,547 kWh. Based on the analysis of the program the verified gross savings estimate is 1,248,055 kWh. The confidence interval associated with this estimate is ±5,491 kWh.

Business Educational Services this program has stipulated savings. Accordingly, no verification was required. Therefore, the verified savings are 100%, see Table 1 for the gross savings.

Pilot/Emerging Technology Services this program has stipulated savings. Accordingly, no verification was required. Therefore, the verified savings are 100%, see Table 1 for the gross savings.

Table 1. Bay City Electric Light & Power, EWR Claimed and Verified Savings (kWh)

Program Name	Claimed kWh Savings	Verified Gross	Verification Rate
Low Income Services	199,200	123,663	62.1%
Efficient Lighting	423,456	358,709	84.7%
High Efficiency Appliances & HVAC	184,897	179,739	97.2%
Appliance Recycling	317,481	297,480	93.7%
Multi-family Services	0	-	-
Educational Services	29,948	29,948	100.0%
Pilot Programs	53,718	53,718	100.0%
Subtotal - Residential Solutions	***1,208,700***	***1,043,258***	***86.3%***
Prescriptive Program	1,218,034		
Custom Program	133,613	1,248,055	92.3%
Educational Services	52,124	52,124	100.0%
Pilot/Emerging Technology Programs	86,080	86,080	100.0%
Subtotal - Business Solutions	***1,489,851***	***1,386,259***	***93.0%***
Total Program Portfolio	***2,698,551***	***2,429,516***	***90.0%***

APPENDIX T. PROGRAM DESCRIPTIONS

The utilities and MPPA EE Service Committee municipal utility members offered a variety of residential, commercial and industrial EWR programs. This appendix briefly and generically describes the programs that may have been offered by the individual utilities. The individual utilities determined which of the specific programs were offered to their customers, as well the appropriate implementation approach.

RESIDENTIAL PROGRAMS

Low Income Services Program: This program provides funding to customers living on limited incomes subsidizing the installation of cost-effective energy efficient electric measures. The delivery of the program is coordinated with local weatherization or Low-Income Assistance agencies. It includes primarily a mix of LED lamps and some utilities offer measures like smart power strips, water-saving aerators and pipe wrap insulation.

Efficient Lighting Program: This program promotes the installation of ENERGY STAR LED-based lighting. The program also offers the following: LEDs: A-lamp, globe, flood (PAR-30) interior and exterior bulbs. The light bulbs are primarily distributed in the form of kits however distributions methods vary according to each utility's preference. The distribution methods may include direct-install, mailed, drive-through give-away, rebates in-store promotion; special sales: internet orders; coupons; over the counter at the utility offices; or at events (i.e. home shows). The Efficient Lighting Program is marketed in various ways such as through the utility website and through return cards that were mailed out to customers.

Appliance Recycling Program: This program is offered in 2019 by some of the utilities after a brief one-year lapse in 2016 when there was no service recycling provider. Among the few utilities that are able to operate the program, it is designed to encourage customers to dispose of "second" refrigerators and encourages the accelerated retirement of older, inefficient "primary" refrigerators and freezers. The program also offers turnkey pick up and recycling services for room air conditioners and dehumidifiers.

High-Efficiency Appliances/ High-Efficiency HVAC (High Efficiency Products): This program provides incentives to customers to encourage them to replace their older, inefficient dehumidifiers and room air-conditioners with high-efficiency ENERGY STAR qualified units. This program also promotes heating and cooling technologies that can reduce electric energy use. The program focuses on the promotion of high-efficiency central air-conditioning and premium efficiency furnace motors that have high-efficiency motors (electrically commutated motors – ECMs). ECM motors save electric energy during the heating and cooling seasons.

Multifamily Direct Install Program: The Multifamily program installs complimentary energy saving measures to reduce the amount of energy that is consumed not only in each unit but the property as a whole. The measures include LED light bulbs, aerators, and shower heads. The program is marketed to property managers, communities and property development companies by sending literature, holding events, completing energy assessments and social media marketing.

Education Services: This program provides informative and actionable educational materials to residential customers that educate customers on the benefits of energy efficiency and conservation. Such materials include brochures, fact sheets, workshops, web sites and online energy audits.

Pilot/Emerging Technology Program: Residential pilot programs pursue new initiatives such as residential-sized HVAC equipment optimization, advanced residential water heating technology or promotion of LED lighting technology in residential applications.

APPENDIX U. SAMPLE DESIGN

MPPA Energy Services Committee 2019 Energy Waste Reduction Program Verification Sample Design Report

Methodology: A sample was designed for each MPPA program, except the Multifamily program. Model based statistical sampling (MBSS) was used to guide the sample design. This technique uses a statistical model and its parameters to represent prior information about the population to be sampled. The model describes the nature of the variation in the relationship between a key target variable y of the study (called the dependent variable), in this case the verified amount of program energy savings and an explanatory variable x, in this case the tracking system estimate of savings. The model is used to help choose the sample size ("n") and to help formulate a sample design with near-optimal stratification for stratified ratio estimation. The model describes the trend and the variation around the trend, i.e., the conditional mean and standard deviation of y given x.

Equation 1. Primary and secondary equations

$$y_k = \beta x_k + \varepsilon_k$$
$$\sigma_k = sd(\varepsilon_k) = \sigma_0 x_k^{\gamma}$$

Equation 1 illustrates the primary and secondary equations of the model that are used in the sample design. Here xk>0 is the tracking system estimate of energy savings, and is known for each participant, k, in the population. The residuals are considered to be independent random variables with zero expected value and standard deviations following the secondary equation. There are three parameters in the model: β (beta), σ0 (sigma-naught), and γ (gamma). The coefficient beta is a fixed constant applied to the known tracking estimate xk to predict the verified savings yk. σk is the residual standard deviation of each unit k. Both the expected value σk and residual standard deviation σk generally vary from one unit to another depending on xk, following the primary and secondary equations of the model. In statistical terms, the ratio model is a heteroscedastic regression model with zero intercept. Gamma describes how the standard deviation varies in relationship to the tracking system estimate of savings.

Where:

D is the desired relative precision,

and z corresponds to the desired confidence level.

Equation 2. Initial sample size calculator

$$n_0 \approx \left(\frac{z\ er}{D}\right)^2$$
$$n = \frac{n_0}{1 + n_0 / N}$$

Using MBSS techniques in sample design minimizes the uncertainty of the results by controlling the variation of the sample. Accordingly, for the verification the initial sample size was determined using Equation 2. Sample size is based on an assumed "error ratio".

The true beta terms and true error ratios are not known. However, the sample can be designed using estimates of these parameters based on last years' evaluation results that determined "gross" verified savings. Last year's results were examined, and subjectively adjusted to be conservative when establishing this year's sample sizes.

Sample Design: Table 19 presents a recap of the sample design parameters and expected confidence intervals.

Table 19. Sample design parameters, sample sizes and expected confidence intervals

Program	Beta β	Error Ratio ER	Assumed Population N	Sample Size 90/10 Confidence Level n	Study Sample Size and Confidence Interval n	Gross CI
Residential						
Appliance Recycling	0.96	0.21	1,060	12	25	8.3%
High Efficiency Appliances	0.95	0.10	481	3	24	3.0%
High Efficiency HVAC	0.95	0.10	876	3	24	4.0%
Low Income Services	0.80	0.21	480	12	24	6.5%
Efficient Lighting	0.95	0.10	3,733	3	24	3.7%
Business Services						
Prescriptive/Custom	0.95	0.10	383	3	15	4.5%

Table 20 shows that to achieve a ±10% confidence interval at the 90% confidence level the sample sizes range from 3 to 12. Due to the uncertainty of the assumptions, the sample sizes were increased to assure adequate coverage. The Multifamily program had a minimal activity this year and did not merit a sample design.

The increase in sample sizes for all programs manifests itself in lower expected confidence intervals for each sample. Table 20 shows the expected confidence intervals range from ±3.0% to ±6.5%

The next step in the sample design was to choose the number of strata. Typically, in evaluations such as these three strata are chosen (small, medium and large). Stratum boundaries are determined so there is approximately equal amount of confidence interval in each stratum. To do this the tracking estimates of savings are sorted. The participant savings are raised to the assumed (xγ) gamma. This is a proxy for σi = σo xγ. The relative cumulative sum of the (xγ) is then calculated. The strata cut points identified as the multiples of the cumulative sum divided by the number of strata. For the sample design for all programs, the value of gamma was assumed to be 0.8.

Table 20. Final 2019 sample design

Strata	N	weight	n	kWh Savings Max	Total
Residential					
Appliance Recycle Program					
1	684	0.860	12	1,135	632,162
2	111	0.140	13	12,103	239,584
Total	**795**	**1.00**	**25**		**871,746**
High Efficient Appliances					
1	298	0.825	10	488	35,117
2	57	0.158	8	1,176	58,066
3	6	0.017	6	55,263	78,504
Total	**361**	**1.00**	**24**		**171,687**
High Efficient HVAC					
1	428	0.651	8	730	162,944
2	127	0.193	8	1,015	107,364
3	102	0.155	8	20,076	172,214
Total	**657**	**1.00**	**24**		**442,522**
Efficient Lighting					
1	1971	0.704	8	158	205,885
2	571	0.204	8	430	155,720
3	258	0.092	8	7,802	262,189
Total	**2800**	**1.00**	**24**		**623,794**
Low Income Services					
1	261	0.725	7	429	45,888
2	74	0.206	8	1,011	62,402
3	24	0.067	8	5,086	37,111
4	1	0.003	1	63,200	63,200
Total	**360**	**1.00**	**24**		**208,601**
Commercial and Industrial					
Custom/Prescriptive					
1	223	0.777	5	40,787	3,015,127
2	50	0.174	5	188,409	4,123,387
3	14	0.049	5	1,043,588	5,773,299

APPENDIX V. ANALYSIS METHODOLOGY

Model Based Statistical Sampling and analysis was the basis of the analysis. For each of the programs, an appropriate evaluation approach was developed. This section describes the methodologies used for each program's analysis approach.

Model Based Statistical Sampling and Analysis

This technique used a statistical model and its parameters to represent prior information about the population to be sampled. The model describes the nature of the variation in the relationship between a key target variable y of the study (called the dependent variable), in this case the actual amount of program energy savings and an explanatory variable x, in our case the tracking system estimate of savings. The model is used to help choose the sample size n and to help formulate a sample design with near-optimal stratification for stratified ratio estimation. The model describes the trend and the variation around the trend, i.e., the conditional mean and standard deviation of y given x.

The model is used as a guide to the sample design, but the results of the study itself are not strongly dependent on the accuracy of the model. Once the sample design is selected, the subsequent analysis of the data is usually based only on the sample design and not on the model used to develop the sample design. In particular, conventional stratified-sampling techniques can be used to analyze the sample data collected from an MBSS sample design. The resulting estimates will be almost unbiased in repeated sampling and the confidence intervals will also be valid, provided that the sample design is followed.

This technique used a statistical model and its parameters to represent prior information about the population to be sampled. The model describes the nature of the variation in the relationship between a key target variable y of the study (called the dependent variable), in this case the actual amount of program energy savings and an explanatory variable x, in our case the tracking system estimate of savings. The model is used to help choose the sample size n and to help formulate a sample design with near-optimal stratification for stratified ratio estimation. The model describes the trend and the variation around the trend, i.e., the conditional mean and standard deviation of y given x.

Equation 1. Primary and secondary equations

$$y_i = \beta\, x_i + \varepsilon_i$$

$$\sigma_i = sd(\varepsilon_i) = \sigma_0\, x_i^{\gamma}$$

Using MBSS techniques in sample design minimizes the uncertainty of the results by controlling the variation of the sample. Accordingly, for the verifications the initial sample size was determined using Equation 2. Sample size is based on an assumed "error ratio".

The true error ratios were not known. However, based on past experience, a high level of compliance should be expected.

The next step in the sample design is to choose the number of strata. Typically, in evaluations such as these three strata are chosen (small medium and large). Next, stratum boundaries are determined so there is approximately equal amount of confidence interval in each stratum. To do this the tracking estimates of savings are sorted. The participant savings are raised to the assumed (xγ) gamma. This is a proxy for σi = σo xγ. The relative cumulative sum of the xγ is then calculated. The strata cut points identified as the multiples of the cumulative sum divided by the number of strata.

Equation 2. Initial sample size calculation

$$n_0 \approx \left(\frac{z\ er}{D} \right)^2$$

$$n_0 \approx \left(\frac{z\ er}{D} \right)^2 \quad n = \frac{n_0}{1 + n_0 / N}$$

Where:

D is the desired relative precision, and
z corresponds to the desired confidence level.

Equation 3. Combined ratio estimation

Ratio Estimate Mean Total

$$\hat{B}_0 = \frac{\sum_{i=1}^{n_0} w_i\ y_i}{\sum_{i=1}^{n_0} w_i\ x_i} \qquad \bar{y}_0 = \hat{B}_0\ \mu_{x0} \qquad \hat{Y}_0 = \hat{B}_0\ X_0$$

where $w_i = N_h / n_h$

Equation 4. Calculating the statistical precision

1. Calculate the residuals $e_i = y_i - \hat{B}_0\ x_i$
2. Calculate $se\left(\hat{B}_0\right) = \left(\frac{1}{\hat{X}_0} \right) \sqrt{\sum_{I=1}^{n_0} w_i \left(w_i - 1 \right) e_i^2}$

   with $\hat{X}_0 = \sum_{i=1}^{n_0} w_i\ x_i$
3. Then $se\left(\bar{y}_0\right) = se\left(\hat{B}_0\right) \mu_{x0}$ and $se\left(\hat{Y}_0\right) = se\left(\hat{B}_0\right) X_0$

APPENDIX W. VERIFICATION METHODOLOGY AND SURVEY INSTRUMENTS

This section describes the verification approach for the following programs:

- Appliance Recycling
- Residential Efficient Lighting Program
- High-Efficiency Appliances/ High-Efficiency HVAC Program (High Efficiency Products)
- Low Income Services Program

Customer verification data were collected for the Residential Efficient Lighting, High Efficiency Products and Income Qualified through the use of a CATI-telephone based surveys. A random sample was selected from all known and available participating efficient lighting and high efficiency product customers. The responses from the sampled customers determined the compliance rate (i.e., the percentage of measures that are installed and operating as planned) for each program.

The participants were asked:

- To verify if they participated in the program
- How many measures the customer received
- If they are using all the measures, and if not, how many are not in use

From the returned surveys, proportions of the measures that were installed and operating as intended were estimated to produce a verification rate at the measure level.

As described in Appendix D, Equation 3 was used to determine the verified savings, and Equation 4 was used to estimate the statistical precision of the estimate.

Commercial and Industrial Prescriptive and Custom Programs

For the verification, an energy engineer conducted a quality control inspection of commercial and industrial participants of the C&I Prescriptive and Custom Program. The engineer physically inspected all measures and commented on both the quality and the appropriateness for the participant. The inspector noted any problems with measure installation and recorded any customer comments expressing either satisfaction or dissatisfaction with the program, measures, and contractor services. The engineer inspected all of the measures or activities recorded in the participant's program file. A copy of the on-site inspection form can be found in APPENDIX BB.

The information gathered on site was used to verify the savings of the measures that were installed and operating as intended. The verified estimate of savings and the tracking system estimate of savings were used to develop a stratified ratio estimate of program savings.

APPENDIX X. APPLIANCE RECYCLING TELEPHONE SURVEY

MPPA Residential Appliance Recycling Program Survey

Survey house instructions

1. Text in bold should be read.

2. Text in brackets [ ] are instructions for interviewer, minor programming such as skips, or answer choices and should NOT be read.

3. Text in carrots < > are database variables that should be filled in on a case-by-case basis.

4. Text in double-carrots << >> are larger blocks of text that will change on a case-by-case basis depending on database variables.

5. Text in gray boxes is major programming instruction.

6. Unless specifically noted, do NOT read answer choices. [Don't know] and [Refused] should NEVER be read.

Programming Notes

1. Code multiple response questions as a series of variables that have a 0 or 1 value. One variable for each answer option. For example, R5_1 = 1 if the respondent answers "internet" to R5. R5_1 = 0 if the respondent does not answer "internet. Make separate 0/1 variables for the [Don't know] and [Refused] options as well.

Database variables

Variable Definition

(Unless otherwise noted, the database can contain more than one of each variable per respondent)

Customer_Name Contact name(s).

Utility Name Utility name(s): Bay City Electric Light & Power, Charlevoix Electric System, Chelsea Electric Department, Grand Haven Board of Light & Power Hart Hydro-Electric, Holland Board of Public Works, Lowell Light & Power, Niles Utility Department, City of Petoskey, Portland Light & Power Board, City of St. Louis, City of Sturgis, Village of Paw Paw, Zeeland Board of Public Works

Program Names Appliance Recycling (Pick up Program) Appliance Recycling (drop off only offered in the City of Sturgis)

AddressAddress where equipment was recycled from

Phone Number

Phone number

MeasName1, MeasName2

MeasName3

Text summarizing equipment type that was (Refrigerator, Freezer, Air Conditioning Unit, Dehumidifier)

MeasNameCount1,… X Text summarizing quantity of that equipment that was recycled

Recycling service provider Michigan Energy Options or Padnos or Arca

Stratum The strata each participant is assigned to either one or two,

INTRODUCTION

Intro1. May I speak with <Customer_Name>? Hello, my name is _____, and I'm calling on behalf of the Appliance Recycling Program offered through <utility>I'm calling to speak with you about some appliances your household recently recycled.

[IF NEEDED:] I'm not selling anything; I'd just like to ask your opinions. Your responses will be kept confidential and your individual responses will not be revealed to anyone.

[IF ASKED] You can verify the legitimacy of this research by calling Patrick Devon (517) 323-8919 Ext. 114

1 [AGREES TO PARTCIPATE] Intro2

2 [DOES NOT AGREE TO PARTCIPATE] TERMINATE

Intro2. Our records show that your household recycled some appliances through <utility>'s Appliance Recycling program services. Are you familiar with having appliances recycled in 2019?

Prompt if needed: They may have been picked by a company or dropped off at a recycling event back on <date of pick up>

1 [Yes] VG0

2 [No] Intro3 97 [Don't know]

98 [Refused]

Intro3. Who could I speak to that would be familiar with the recycling process?

[RECORD FIRST and LAST NAME] Intro4

97 [Don't know]

98 [Refused]

Intro4. Could I speak with <Intro3> now?

1 [Yes] Intro1 97 [Don't know]

2 [No] Intro5 98 [Refused]

Intro5. When is a good time I could call back to reach <Intro3>?

[RECORD DAY and TIME] Call back later

98 [Refused] 97 [Don't know]

Intro6. What is your name?

[RECORD FIRST and LAST NAME] VG0

98 [Refused] 97 [Don't know]

VERIFY GROSS INSTALLATION

VG0. I have some questions about the equipment you recycled.

[IF MeasNameX=NULL GOTO A1]

VG1. Our records show your household had <Total_Measure_Cnt > < Measure_Name1>, Measure_Name2, Measure_Name3> recycled. Is that correct number of recycled appliances?

1 [Yes] GOTO VG2c 97 [Don't know] GOTO Intro3 or T&T

2 [No] VG2a 98 [Refused]

VG2a. How many <MeasNameX> were recycled?

[RECORD VERBATIM] If ≠ <MeasNameCountX > the go to GOTO VG2b.

97 [Don't know] VG2c. 98 [Refused]

VG2b. Why were a different number of <MeasNameX> recycled?

[RECORD VERBATIM] VG2c

97 [Don't know] 98 [Refused]

VG2c. Before being recycled, was the <MeasNameX> being stored or used at < Address>?

1 [Address is incorrect – Record correct address] VG2d

2 [Address is correct] R0

97 [Don't know] 98 [Refused]

VG2d. Why were they recycled from a different address?

[RECORD VERBATIM]

RO

97 [Don't know] 98 [Refused]

OPERATIONAL

[Repeat for each <MeasNameX>]

RO. Was/were the <MeasNameCountX or VG2a# > <MeasNameX> you recycled in working condition?

1 [Yes –All] R1 97 [Don't know] R1

2 [No – none/or only some] R0a. 98 [Refused]

R0a. How many <MeasNameX> were in working condition?

[RECORD VERBATIM] R1

97 [Don't know] 98 [Refused]

R1. If the program had not offered the recycling service when it did, would you have still gotten rid of the <MeasNameCountX > <MeasNameX>, or would you have kept it/them?

[PROMPT FOR RESPONSE – READ OPTIONS IF NEEDED]

1 [Gotten rid of it or both] R2

2 [Kept one and got rid of one]

3 [Kept it or both] REPEAT VG0-R2 for each MeasNameX ELSE GO

97 [Don't know]

98 [Refused]

R2. How would you have gotten rid of it/them? [PROMPT FOR RESPONSE – READ OPTIONS IF NEEDED, ACCEPT MULTIPLES IF <MeasNameCountX >=1]

1 [Threw away / Took to Landfill] REPEAT VG0-R2 for each MeasNameX ELSE GO TO RO

2 [Took to recycling center]

3 [Donated to charity]

4 [Taken by installer of new one]

5 [Sold to used appliance dealer]

6 [Sold to private individual]

7 [Given it to friend/relative/private individual]

8 [Kept it - plugged in]

9 [Kept it - not plugged in]

10 [Disassembled it myself]

11 [Abandon it]

77 [Other (specify)]

97 [Don't know]

98 [Refused]

ATTRIBUTION

A1. What is the main reason you chose this recycling service to dispose of your appliance(s)? [ALLOW ONLY ONE RESPONSE]

1 [To get the program rebate] S1

2 [To save energy]

3 [Service was free]

4 [Proper disposal (recycled)]

5 [Convenience]

6 [Unwanted equipment]

7 [Old and outdated equipment]

8 [No longer needed]

9 [It came recommended]

77 [Other - SPECIFY]

97 [Don't Know] S1

98 [Refused]

Satisfaction

S1. How satisfied or dissatisfied were you with the recycling program?

1	1 – Very Dissatisfied	3	3
2	2	4	4
5	5- Very Satisfied	98	[Refused]
97	[Don't know]		

S5a. Why do you say that? [ALLOW MULTIPLE RESPONSES]

1	[Pick up times were inconvenient] FE1	6	[Shorter follow up survey]
2	[Equipment should not have to be working properly to quality for free service]	7	[Scheduling pickup was inconvenient]
3	[Increase the incentive]	77	[Other - SPECIFY] ()
4	[Drop the incentive/incentive not needed]	78	None
5	[Incentive check should be more timely]	97	[Don't Know]
		98	[Refused]

Closing statement

Those are all the questions I have for you today, unless you have something you would like to tell us regarding your experience with this program we are finished. Thank you for your time.

1	Record: D1	97	[Don't know]
2	No Comments		

D1. RECORD GENDER [DO NOT ASK.]

1	Male END_1	97	[Don't know]
2	Female		

APPENDIX Y. EFFICIENT LIGHTING TELEPHONE SURVEY

MPPA – Efficient Lighting Program CATI Survey

Survey house instructions

1. Text in bold should be read.

2. Text in brackets [ ] are instructions for interviewer, minor programming such as skips, or answer choices and should NOT be read.

3. Text in carrots < > are variables that should be filled in on a case-by-case basis.

4. Text in gray boxes is major programming instruction.

5. Unless specifically noted, do NOT read answer choices. [Don't know] and [Refused] should NEVER be read.

THIS TABLE MAY BE UPDATED ONCE THE SAMPLE DESIGN IS FINALIZED

Database variables

Variable Definition

Name Customer name

Address Address where equipment was installed

City City where equipment was installed

Municipal_Name Customer Utility

Program_Name Utility program name

MeasType1, MeasType2.

...10..x Original measure description (do not use) e.g., "17-101, LED 60w Equivalent"

MeasDesc1,

MeasDesc2..

…10 Cleaned measure description (do use).e.g., "LED 60w Equivalent"

Meas_qty1 Quantity of measures distributed by measure description.

Distributor Name Source that gave-away or installed the light bulbs.

** not all utilities provided this information.**

LED_QTY This is the sum of all LEDs (A-lamp and PAR) distributed to customers that need to be verified. If QTY is greater than 0, the LED battery should be delivered.

LED Night_QTY This is the sum of all LED nightlights distributed to customers that need to be verified. If QTY is greater than 0, the LED nightlight battery should be delivered.

CFL_QTY This is the sum of all CFLs distributed to customers that need to be verified. If QTY is greater than 0, the CFL battery should be delivered.

Program Name "Efficient Lighting Program" is the program name.

INTRODUCTION

Intro1. May I speak with < Name_2, Name_1>? Hello, my name is _____, and I'm calling on behalf of the Efficient Lighting Program run by your utility, <UTILITY>. I'm calling to talk to you about some energy efficient LED light bulbs that were purchased through a mail-in rebate, given to you at an event or directly installed at your home this year. [PROMPT IF NEEDED: You may have received things like LED light bulbs, LED night lights, etc. at <distributor name>]

[IF NEEDED] I'm not selling anything; I'd just like to ask your opinions. Your responses will be kept confidential and your individual responses will not be revealed to anyone.

[IF ASKED] You can verify the legitimacy of this research by calling Patrick Devon (517) 323-8919 Ext. 114

Intro2. Are you familiar with the LED light bulbs, distributed, or installed by the program? [PROMPT IF NEEDED: You may have received things like LED light bulbs, LED night lights, etc. from <Distributor name>]

1	[Yes]	Intro6		97	[Don't know]
2	[No]	Intro3		98	[Refused]

Intro3. Who could I speak to that would be familiar with that process?

[RECORD FIRST and LAST NAME] Intro4

97 [Don't know]

98 [Refused]

Intro4. Could I speak with <Intro3> now?

1	[Yes]	Intro1		97	[Don’t know]
2	[No]	Intro5		98	[Refused]

Intro5. When is a good time I could call back to reach <Intro3>?

	[RECORD DAY and TIME]		Call back later		
97	[Don’t know]			98	[Refused]

[If <intro3> ≠ <name>, else skip to L1]

Intro6. What is your name?

	[RECORD FIRST and LAST NAME]		V1		
97	[Don’t know]			98	[Refused]

LED_ASK – Sample LED bulb

1 = 'LED 5 watt candelabra base'

2 = 'LED 40 watt Equivalent'

3 = 'LED 60 watt Equivalent'

4 = 'LED 75 watt Equivalent'

5 = 'LED 100 watt Equivalent'

6 = 'LED Exterior Fixture - 1 Lamp'

7 = 'LED Exterior Fixture - 2 Lamp'

8 = 'LED Globe'

9 = 'LED Indoor Downlights'

10 = 'LED Indoor Flood/PAR'

11 = 'LED Lamp less than 7 watts'

12 = 'LED Lamp 7 watts or greater'

13 = 'LED Outdoor Flood/PAR' ;

START LED BLOCK:

IF LED_QTY>0 then ask L1

IF LED = 0then skip to next section (LED Night Lights)

Verification –LED bulbs

[IF LED_QTY > 0, ask L1-L4, else END LED Block]

L1. To verify, did you receive one or more LED light bulbs from <UTILITY> this year?

1	Yes	L2	97	[Don't know]	L1a
2	No	L1a	98	[Refused]	

L1a. Just to confirm, you did NOT receive any LED bulbs from <UTILITY> this year?

1	We received LEDs	L1a.	97	[Don't know]	
2	We did NOT receive any LEDS	END LED Block	98	[Refused]	

L2. Our records show that you received <LED_QTY> LED light bulbs. Is this correct?

1	[Yes]	L3	97	[Don't know]	
2	[No]	L2a	98	[Refused]	

L2a. How many LED light bulbs did you receive?

#	[Enter quantity]	L3	97	[Don't know]	L3
0	[None]	END LED block	98	[Refused]	
3	[Did receive the quantity stated previously] L3				

L3. Are you using these LED light bulbs at <address>?

1	[Yes]	L4	97	[Don't know]	
2	[No]				

L4. How many of the LEDs provided by the program have been removed, burnt out, given away, or are not being used?

#	[Enter quantity]	L5	9997	[Don’t know]
9999	[All of them]		9998	[Refused]
0	[None of them]			

L5. How many of the LEDs provided by the program replaced another type of light bulb such as an incandescent, CFL or LED bulb? [IF NEEDED, “AS OPPOSED TO BEING INSTALLED IN A NEW LIGHT FIXTURE OR SOCKET”

#	[Enter quantity]	L6.	0	[None of them, all installed in new sockets] End LED block
9999	[All of them]		9997	[Don’t know]
			9998	[Refused]

L6. What type of light bulb(s) were you using before you installed the program provided LED(s)? [Prompt if needed: Was it the least efficient incandescent (or halogen) bulbs, the lesser efficient CFL bulbs or did you remove an LED?] Circle all that apply

1	[Incandescent or halogen]	L7.	50	[Other]
2	[CFL]		97	[Don’t know] End LED block
3	[LED]		98	[Refused]
4	[Mix of INC and CFL]			

L7. What was the approximate wattage of bulb(s) that you removed? (Prompt if needed: 100W, 75W, 60W or 40w or less?) Circle all that apply.

1	[100w or more]End LED Block	4	[20w or below]
2	[75w]	50	[Other]
3	[60w]	97	[Don’t know]
4	[40w]	98	[Refused]

Verification – LED NIGHT LIGHTS

[IF LED Night_QTY> 0, ask NL1-NL3, else END LED Night Lights Block]

[IF <LED> = Y, ask L1-L4, else END Lighting Block]

NL1. Our records show that you received <LED Night_QTY> LED nightlight(s). Is this correct?

1	[Yes]	NL2	97	[Don't know]	
2	[No]	NL1a	98	[Refused]	

NL1a. How many LED night lights did you receive?

#	[Enter quantity]	NL2	9997	[Don't know]	NL2
0	[None]	End LED Night Light Block	9998	[Refused]	
3	[Did receive the quantity stated previously] NL2				

NL2. Are you using these LED nightlights at your address?

1	Yes	NL3	97	[Don't know]	
2	No		98	[Refused]	

NL3. Have the <LED Night_QTY> nightlight(s), provided by the program, been removed, given away or is not in use? Circle all that apply.

1	[Yes removed, given away, not used] End NL block		97	[Don't know]	End NL block
			98	[Refused]	
2	[No still installed]	NL4			

NL4. How many of the LED nightlights replaced another type of nightlight bulb? [If needed, or did you install them in new sockets?]

#	[Enter quantity]	NL5	9997	[Don't know]
9999	[All of them]		9998	[Refused]
0	[None of them, all installed in new sockets] End NL block			

NL5. What type of nightlights were you using before you installed the LED nightlights? [Prompt if needed: Was it the least efficient incandescent (or halogen) bulbs, the lesser efficient CFL bulbs or did you remove an LED?] Circle all that apply.

1	[Incandescent or halogen]	4	[Mix of INC and CFL]
End NL block		50	[Other]
2	[CFL]	97	[Don't know]
3	[LED]	98	[Refused]

Verification –CFL bulbs

[IF CFL_QTY > 0, ask C1-C4, else END CFL Block]

C1. To verify, did you receive one or more CFL bulbs from <UTILITY> this year?

1	Yes	C2	97	[Don't know]	C1a
2	No	C1a	98	[Refused]	

C1a. Just to confirm, you did not receive any CFL bulbs from <UTILITY> this year?

1	We received CFLs	C2	97	[Don't know]
2	We did NOT receive any CFLS	END CFL Block	98	[Refused]

C2. Our records show that you received <CFL_QTY> CFL bulbs. Is this correct?

1	[Yes]	C3	97	[Don't know]
2	[No]	C2a	98	[Refused]

C2a. How many CFLs did you receive?

1	[Enter quantity]	C3	97	[Don't know]	L3
2	[None] END CFL block		98	[Refused]	
3	[Did receive the quantity stated previously] L3				

C3. Are you using these CFL light bulbs at <address>?

1 [Yes] C4 2 [No]

97 [Don't know]

C4. How many of the CFL bulbs provided by the program have been removed, burnt out, given away, or are not being used?

1 [Enter quantity] End CFL Block 97 [Don't know]

2 [All of them] 98 [Refused]

3 [None of them]

C5. How many of the LEDs installed replaced another type of light bulb such as an incandescent, CFL or LED bulb?

1 [Enter quantity] C6. block

2 [All of them] 97 [Don't know]

3 [None of them, all installed in new sockets] 98 [Refused]
End CFL

C6. What type of light bulbs were you using before you installed the LEDs? [Prompt if needed: Was it the least efficient incandescent (or halogen) bulbs, the lesser efficient CFL bulbs or did you remove an LED?] Circle all that apply

1 [Incandescent or halogen] C7. 50 [Other]

2 [CFL] 97 [Don't know] End CFL block

3 [LED] 98 [Refused]

4 [Mix of INC and CFL]

C7. What was the wattage of bulbs that you removed? (Prompt if needed: 100W, 75W, 60W or 40w or less?) Circle all that apply.

1 [100w or more]End CFL Block 3 [60w]

2 [75w] 4 [40w]

4	[20w or below]	97	[Don’t know]
50	[Other]	98	[Refused]

THANK & TERMINATE

END_1. Those are all the questions I have for you today. Thank you for your time.

APPENDIX Z. HIGH EFFICIENCY PRODUCTS TELEPHONE SURVEY

MPPA - Residential High Efficiency Products CATI Survey

Survey house instructions

1. Text in bold should be read.

2. Text in brackets [ ] are instructions for interviewer, minor programming such as skips, or answer choices and should NOT be read.

3. Text in carrots < > are database variables that should be filled in on a case-by-case basis.

4. Text in gray boxes is major programming instruction.

5. Unless specifically noted, do NOT read answer choices. [Don't know] and [Refused] should NEVER be read.

Database variables

Variable Definition

(Unless otherwise noted, the database can contain more than one of each variable per respondent)

Name_1 Customer last name. Some implementer records include both first and last name in Name_1.

Name_2 Customer first name

Site_Address Address where equipment was installed

City City where equipment was installed

Utility Customer Utility

MEAS_QTY1, MEAS_QTY2, etc. Equipment type (non-lighting) and quantity of measure. These measures should be verified when QTY > 0. The individual measure names are included in the column header. Measures include efficient air-conditioners, AC tune-up, ceiling fans, clothes washers and dryers, computers, dehumidifiers, dishwashers, freezers, furnaces, heat pump water heaters, low-flow aerators and showerheads, monitors, pipe wrap, pool pumps, power strips, programmable thermostats, refrigerators and TVs.

Lighting Y/N indicates whether the recipient received lighting measures (primarily LEDs, although a few CFLs).

LED_QTY This is the sum of all LEDs (A-lamp and PAR) distributed to customers that need to be verified. If QTY is greater than 0, the LED battery should be delivered.

Program Name "High Efficiency Products"

Introduction

Intro1. May I speak with < Name_2, Name_1>? Hello, my name is _____, and I'm calling on behalf of the High Efficiency Products Program run by your utility, <UTILITY>. The program provides rebates for efficient appliances and heating and cooling equipment. I'm calling to talk to you about your experience with the rebate program. Is now a good time to speak to you?

[IF NEEDED:] I'm not selling anything; I'd just like to ask your opinions. Your responses will be kept confidential and your individual responses will not be revealed to anyone.

[IF ASKED] You can verify the legitimacy of this research by calling Patrick Devon (517) 323-8919 Ext. 114

1	[AGREES TO PARTCIPATE]	Intro2
2	[DOES NOT AGREE TO PARTCIPATE]	END_1

Intro2. Our records show that you received rebates for a/an

<Equipment> you recently purchased. Are you familiar with the decision to purchase this equipment?

1	[Yes]	V1	97	[Don't know]
2	[No]	Intro3	98	[Refused]

Intro3. Who could I speak to that would be familiar with that process?

	[RECORD FIRST and LAST NAME] Intro4	97	[Don't know]
		98	[Refused]

Intro4. Could I speak with <Intro3> now?

1	[Yes]	Intro1	97	[Don't know]
2	[No]	Intro5	98	[Refused]

Intro5. When is a good time I could call back to reach <Intro3>?

	[RECORD DAY and TIME]	Call back later	
97	[Don't know]	98	[Refused]

[If <intro3> ≠ <cont1>, else skip to V1]

Intro6. What is your name?

[RECORD FIRST and LAST NAME] V1 98 [Refused]

97 [Don't know]

Verification

START EQUIPMENT BLOCK: Repeat V1 to V3 for each measure that was installed (MEAS_TYPE1, MEAS_TYPE2….MEAS_TYPEx). Programmer note, max repeats = 4.

V1. Just to verify, did you purchase or receive and the following equipment: <MEAS_TYPE1, MEAS_TYPE2, MEAS_TYPE3,..7 etc.> this year?

[If Meas_TYPE X = Air Conditioner Tune-up ONLY then read: <UTILITY> records show you had a/an AC tune-up that was rebated by <UTILITY>. Just to verify, did you have your air conditioner tuned up?]

1	Yes	V2	97	[Don't know]	Intro3
2	No	V1a	98	[Refused]	

V1a. Just to confirm, you did not receive a rebate for < MEAS_TYPE1 to MEAS_TYPEx> from <UTILITY> this year?

1	We received equipment	V2	97	[Don't know]	Intro3
2	We did NOT receive any equipment END Equipment Block		98	[Refused]	

V2. Our records show that the equipment was installed at <site address, city>, is this correct?

1	Yes	V3	97	[Don't know]
2	No		98	[Refused]

V3. Is/are this/these <MEAS_TYPE1 to MEAS_TYPEx> still operational?

1	Yes	END Equipment Block	97	[Don't know]
2	No		98	[Refused]

START LED BLOCK

IF Lighting = Y and LED_QTY>0 then ask L1 Else IF LED="0", end survey.

Next I would like to ask you about the various types of light bulbs you received through the program.

Verification –LED bulbs

[IF LED_QTY > 0, ask L1-L4, else END LED Block]

L1. To verify, did you receive one or more LED light bulbs from <UTILITY> this year?

1	Yes	L2	97	[Don't know]	L1a
2	No	L1a	98	[Refused]	

L1a. Just to confirm, you did not receive any LED bulbs from <UTILITY> this year?

1	We received LEDs	L1a.	97	[Don't know]	
2	We did NOT receive any LEDS	END LED Block	98	[Refused]	

L2. Our records show that you received <LED_QTY> LED light bulbs. Is this correct?

1	[Yes]	L3	97	[Don't know]	
2	[No]	L2a	98	[Refused]	

L2a. How many LED light bulbs did you receive?

1	[Enter quantity]	L3	97	[Don't know]	L3
2	[None]	END LED block	98	[Refused]	
3	[Did receive the quantity stated previously] L3				

L3. Are you using these LED light bulbs at <address>?

1	[Yes]	L4	97	[Don't know]	
2	[No]				

L4. How many of the LED bulbs provided by the program have been removed, burnt out, given away, or are not being used?

1	[Enter quantity]	End LED Block	97	[Don't know]
2	[All of them]		98	[Refused]
3	[None of them]			

L5. How many of the LEDs installed replaced another type of light bulb such as an incandescent, CFL or LED bulb?

1	[Enter quantity]	L6.	97	[Don't know]
2	[All of them]		98	[Refused]
3	[None of them, all installed in new sockets] End LED block			

L6. What type of light bulb(s) were you using before you installed the LED(s)? [Prompt if needed: Was it the least efficient incandescent (or halogen) bulbs, the lesser efficient CFL bulbs or did you remove an LED?] Circle all that apply

1	[Incandescent or halogen]	L7.	50	[Other]
2	[CFL]		97	[Don't know] End LED block
3	[LED]		98	[Refused]
4	[Mix of INC and CFL]			

L7. What was the wattage of bulb(s) that you removed? (Prompt if needed: 100W, 75W, 60W or 40w or less?) Circle all that apply.

1	[100w or more]End LED Block		4	[20w or below]
2	[75w]		50	[Other]
3	[60w]		97	[Don't know]
4	[40w]		98	[Refused]

Verification –Recycled Small Appliances

[IF MeasType1: "Dehumidifier Recycling or Room AC Recycling or Freezer Recycling" then ask otherwise skip this section (none exist in MeasType2 though 7)

VG0. I have some questions about the equipment you had recycled.

VG1. Our records show your household had <Total_Measure_Cnt > < Measure_Name1>, Measure_Name2, Measure_Name3> recycled. Is that correct number of recycled appliances?

1 [Yes] GOTO VG2c

2 [No] VG2a

97 [Don't know] GOTO Intro3 or T&T

98 [Refused]

VG2a. How many <MeasNameX> were recycled?

[RECORD VERBATIM] If ≠ <MeasNameCountX > the go to GOTO VG2b.

97 [Don't know] VG2c.

98 [Refused]

VG2b. Why were a different number of <MeasNameX> recycled?

[RECORD VERBATIM] VG2c

97 [Don't know]

98 [Refused]

VG2c. Before being recycled, was the <MeasNameX> being stored or used at < Address>?

1 [Address is incorrect – Record correct address] VG2d

2 [Address is correct] R0

97 [Don't know]

98 [Refused]

VG2d. Why were they recycled from a different address?

[RECORD VERBATIM]

RO

97 [Don't know]

98 [Refused]

[Repeat for each <MeasNameX>]

RO. Was/were the <MeasNameCountX or VG2a# > <MeasNameX> you recycled in working condition?

1 [Yes –All] R1

2 [No – none/or only some] R0a.

98 [Refused]

97 [Don't know] R1

R0a. How many <MeasNameX> were in working condition?

[RECORD VERBATIM] R1 98 [Refused]

97 [Don't know]

R1. If the program had not offered the recycling service when it did, would you have still gotten rid of the <MeasNameCountX > <MeasNameX>, or would you have kept it/them?

[PROMPT FOR RESPONSE – READ OPTIONS IF NEEDED]

1 [Gotten rid of it or both] R2

2 [Kept one and got rid of one]

3 [Kept it or both] REPEAT VG0-R2 for each MeasNameX ELSE GO

97 [Don't know]

98 [Refused]

R2. How would you have gotten rid of it/them? [PROMPT FOR RESPONSE – READ OPTIONS IF NEEDED, ACCEPT MULTIPLES IF <MeasNameCountX >=1]

1 [Thrown away / Taken to Landfill] REPEAT VG0-R2 for each MeasNameX ELSE GO TO RO

2 [Taken to recycling center]

3 [Donated to charity]

4 [Have removed by installer of new one]

5 [Sold to used appliance dealer]

6 [Sold to private individual]

7 [Given it to friend/relative/private individual]

8 [Kept it - plugged in]

9 [Kept it - not plugged in]

10 [Disassembled it myself]

11 [Abandon it]

77 [Other (specify)]

97 [Don't know]

98 [Refused]

END_1. Those are all the questions I have for you today.

THANK & TERMINATE

Thank you for your time.

APPENDIX AA. INCOME QUALIFIED TELEPHONE SURVEY

MPPA - Income Qualified Program CATI Survey

Survey house instructions

1. Text in bold should be read.

2. Text in brackets [ ] are instructions for interviewer, minor programming such as skips, or answer choices and should NOT be read.

3. Text in carrots < > are variables that should be filled in on a case-by-case basis.

4. Text in gray boxes is major programming instruction.

5. Unless specifically noted, do NOT read answer choices. [Don't know] and [Refused] should NEVER be read.

THIS TABLE MAY BE UPDATED ONCE THE SAMPLE DESIGN IS FINALIZED

Database variables

Variable	Definition
	(Unless otherwise noted, the database can contain more than one of each variable per respondent)
ID	DNVGL Unique Identifier
Utility	Customer Utility Name; often same name as the City where they live or presented as an acronym.
Name_1	Customer first name. Some implementer records include both first and last name in Name_1.
Name_2	Customer last name
Site_Address	Address where equipment was installed
City	City where equipment was installed
Phone	If Null – Okay to skip this record.
MeasCount	Sum of measure types given away per household
Other	Y/N indicates whether the recipient received non-lighting measure(s). These may include, Advanced/Smart Power Strip, aerators, pipe wrap. This field will drive the decision to ask the non-lighting battery of questions.

MEAS_QTY1, MEAS_QTY2, etc. Equipment type (non-lighting) and quantity of measure. These measures should be verified when "other" flag = Y and QTY > 0. The individual measure names are included in the column header.

LED_1; LED_2 This is the sum of all LEDs (A-lamp and PAR) distributed to customers that need to be verified. If QTY is greater than 0, the LED battery should be delivered.

NL This is the sum of all LED nightlights distributed to customers that need to be verified. If QTY is greater than 0, the LED nightlight battery should be delivered.

LED Holiday_QTY This is the sum of all LED holiday lights distributed to customers that need to be verified. If QTY is greater than 0, the LED holiday lights battery should be delivered.

Program Name "Income Qualified Program" is the program name. This is primarily a Giveaway (kit/box) that is given or mailed to customers. Some utilities do direct installation performed by the utility's contactor Michigan Energy Options.

NL ENERGY STAR LED Night Light

L1-L3 only

LED Bulb (60 W); (40); (75W); Globe LEDs

LED Holiday Light Strings

V1-V3

Advanced/Smart Power Strip

Bathroom Faucet -Aerator

Shower Head-Aerator

Kitchen-Aerator

Pipe Wrap Insulation

INTRODUCTION

Intro1. May I speak with < Name_1, Name_2>? Hello, my name is _____, and I'm calling on behalf of your electric utility company <Utility>. I would like to ask to you about some energy saving LED light bulbs that were either given to you, mailed to you or previously installed in your home last year.

[IF NEEDED] You may have received a box of energy saving light bulbs either by mail or they could have been given to you in person or installed directly in your home. These were distributed sometime in 2019.

[IF NEEDED] I'm not selling anything; I'd just like to ask your opinions. Your responses will be kept confidential and your individual responses will not be revealed to anyone.

[IF ASKED] You can verify the legitimacy of this research by calling Patrick Devon (517) 323-8919 Ext. 114

1	[AGREES TO PARTCIPATE]	Intro2
2	[DOES NOT AGREE TO PARTCIPATE]	TERMINATE

Intro2. <Utility> records show the program gave away or directly installed energy saving LED light bulbs and may have provided other energy savings improvements to your home. Are you familiar with having received the free light bulbs or other equipment?

[PROMPT IF NEEDED: You may have received LED light bulbs, night lights, low-flow faucet aerators or smart power strips.

1	[Yes]	Intro6	97	[Don’t know]
2	[No]	Intro3	98	[Refused]

Intro3. Who could I speak to that would be familiar with the program’s offering?

1	[RECORD FIRST and LAST NAME]	Intro4	97	[Don’t know]
			98	[Refused]

Intro4. Could I speak with <Intro3> now?

1	[Yes]	Intro1	97	[Don’t know]
2	[No]	Intro5	98	[Refused]

Intro5. When is a good time I could call back to reach <Intro3>?

1 later	[RECORD DAY and TIME]	Call back	97	[Don't know]
			98	[Refused]

[If <intro3> ≠ <name>, else skip to V1]

Intro6. What is your name?

	[RECORD FIRST and LAST NAME]	V1	98	[Refused]
97	[Don't know]			

START "OTHER" EQUIPMENT BLOCK:

IF Other="Y" then Repeat V1 to V4 for each measure that was installed (M1, M2, … Mx)

IF Other="N" then skip to LED Block (L1)

Verification –Other equipment (non-lighting)

V1. Just to verify, did representatives on behalf of <UTILITY> give you or directly install the following equipment <measX>? in 2019?

1	Yes	V2	97	[Don't know]	Intro3
2	No	V1a	98	[Refused]	

V1a. Just to confirm, you did not receive a/an <measX> on behalf of <UTILITY> in 2019?

1	We received equipment	V2	97	[Don't know]	Intro3
2	We did NOT receive any equipment END Equipment Block		98	[Refused]	

V2. Our records show that you received <measX qty>. Is this correct?

1	Yes	V3V4	97	[Don't know]
2	No	V3	98	[Refused]

V3. How many <measX> did you receive?

#	[Enter quantity]	L3VL4	-97	[Don't know]	L3VL4
0	[None]	END LED block	-98	[Refused]	
-96	[Did receive the quantity stated previously]	L3VL4			

V4. Are you using <measX> at this address?

1	[Yes]	V5	97	[Don't know]
2	[No]			

V5. How many of the <measX> provided by the program have been removed, given away, or are not being used?

Check all that apply.

#	[Enter quantity NOT USED]	V6	-97	[Don't know]	END Equipment Block
0	[All of them ARE NOT USED]	V6	-98	[Refused]	

V65. What did you do with the <measX> that are not being used? [IF NEEDED: Check all that apply.

1	Failed/ no longer work	END Equipment Block	4	Thrown away
2	Gave them away		[50[	Other
3	Stored in house		[97]	[Don't know]
			[98]	[Refused]

END Other (non-lighting) measures Block

Repeat other block for all non-lighting measures installed (M1, M2, … Mx)

START LED BLOCK

IF LED_QTY>0 then ask L1

Else IF LED="0", skip to next section (LED Night Lights)

Next I would like to ask you about the various types of LED light bulbs you received through the program.

Verification –LED bulbs

[IF LED_QTY > 0, ask L1-L4, else END LED Block]

[IF MULTIPLE TYPE OF LEDS THEN REPEAT L2-L7

L1. To verify, did you receive one or more LED light bulbs from <UTILITY> in 2019?

1	Yes	L2	97	[Don't know]	L1a
2	No	L1a	98	[Refused]	

L1a. Just to confirm, you did not receive any LED bulbs from <UTILITY> in 2019?

1	We received LEDs	L2.	97	[Don't know]
2	We did NOT receive any LEDS	END LED Block	98	[Refused]

L2. Our records show that you received <LED_QTY/TYPE> light bulbs. Is this correct?

1	[Yes]	L3	97	[Don't know]
2	[No]	L2a	98	[Refused]

L2a. How many LED light bulbs did you receive?

#	[Enter quantity]	L3	-97	[Don't know]	L3
0	[None]	END LED block	-98	[Refused]	
-96	[Did receive the quantity stated previously] L3				

L3. Are you using these LED light bulbs at your address?

1	[Yes]	L4	97	[Don't know]
2	[No]			

L4. How many of the LED bulbs provided by the program have been removed, burnt out, given away, or are not being used?

[IF NEEDED: Those that are removed, burnt out, given away, or are not being used?] Check all that apply.

			0	[All of them ARE NOT USED]	L5
#	[Enter quantity NOT USED]	L5	-97	[Don't know]	END LED block

-98 [Refused]

L5. What did you do with the LEDs provided by the program that are not being used?

[IF NEEDED: Those that are removed, burnt out, given away, or are not being used?] Check all that apply.

1 [Removed] L6
2 [Burned out]
3 [Gave away]
4 [Storage]
50 [Other]
97 [Don't know]
98 [Refused]

L6. How many of the LEDs installed replaced another type of light bulb such as an incandescent, CFL or LED bulb?

[Enter quantity] L7
-90 [All of them]
0 [None of them, all installed in new sockets]
End LED block
97 [Don't know]
98 [Refused]

L7 What type of light bulb(s) were you using before you installed the LED(s)? [Prompt if needed: Was it an incandescent (or halogen) bulb(s), CFL bulb(s) or did you remove an LED (LEDs) ?] Circle all that apply

1 [Incandescent or halogen] End LED block
2 [CFL]
3 [LED]
4 [Mix of INC and CFL]
50 [Other]
97 [Don't know]
98 [Refused]

Verification – LED NIGHT LIGHTS

[IF LED Night_QTY> 0, ask NL1-NL3, else END LED Night Lights Block]

[IF <LED> = Y, ask L1-L4, else END Lighting Block]

NL1. Our records show that you received <LED QTY/ NIGHTLIGHTS>. Is this correct?

1 [Yes] NL2
2 [No] NL1a
97 [Don't know]
98 [Refused]

NL1a. How many LED night lights did you receive?

#	[Enter quantity]	NL2	-97	[Don't know]	NL2
0	[None]	End LED Night Light Block	-98	[Refused]	
-960	[Did receive the quantity stated previously] NL2				

NL2. Are you using these LED nightlights at this address?

1	Yes	NL3	97	[Don't know]
2	No		98	[Refused]

NL3. How many of the <LED Night_QTY> night light(s), provided by the program, have been removed, given away or are not being used?

#	[Enter quantity NOT USED]	NL45
-960	[All of them ARE NOT USED][None of them]	End Block
-97	[Don't know]	

NL45. What did you do with the night light(s) provided by the program that are not being used?

[IF NEEDED: Those that are removed, burnt out, given away, or are not being used?] Check all that apply.

1	[Removed]	End LED Block	50	[Other]
2	[Burned out]		97	[Don't know]
3	[Gave away]		98	[Refused]
4	[Storage]			

Verification – LED HOLIDAY LIGHTS

[IF LED Holiday_QTY> 0, ask HL1-HL2, else END LED Holiday Lights Block]

HL1. Our records show that you received < QTY /LED Holiday_QTY> strands. Is this correct?

1	[Yes]	HL2	97	[Don't know]
2	[No]	HL1a	98	[Refused]

HL1a. How many strands of LED holiday lights did you receive?

#	[Enter quantity]	HL2	97	[Don't know]	HL2
0	[None]	End LED Holiday Block	98	[Refused]	
90	[Did receive the quantity stated previously]	HL2			

HL2. During the holidays, did you use these at your <address>?

1	Yes	HL3	97	[Don't know]	HL3
2	No	HL3	98	[Refused]	

HL3. During the holidays, were the holiday light(s), provided by the program, removed, given away or not used?

1	[Yes all removed, given away, not used]	HL4HL45	-97	[Don't know]	HL4END
			-98	[Refused]	
2	[No, all were installed]	HL4end			
3	[Some removed some installed]	HL45			

HL45. What did you do with the holiday light(s) provided by the program that were not used?

1	[Removed]	End LED Block	50	[Other]
2	[Burned out]		97	[Don't know]
3	[Gave away]		98	[Refused]
4	[Storage]			

END SURVEY

THANK & TERMINATE

END_1. Those are all of the questions I have for you today. Thank you for your time.

APPENDIX BB. COMMERCIAL ONSITE SURVEY

Utility Name:	«Program_Name__Program_Name»
Project Name:	
Account_Name	
Site_Address	
Primary_Project_Contact__Full_Na	
Primary_Project_Contact__Phone	
Primary_Project_Contact__Email	

Scheduled Date/time	Scheduled Site Contact	Scheduling Notes
		«Site_Notes»

DNV GL Signature: Date Time

DNVqty	Measure Type: «RetroType1»/«RetroRetroType1»	Measure or Model Detail
«DNVQty1»	**«RetroName1»**	**«DNVDesc1»**
Qty Verified:		
Qty Operational:		
Measure Verified	YES NO	
(comment any notes if any discrepancy from tracking)		
Notes:		

DNVqty	Measure Type: **«RetroType2»/«RetroRetroType2»**	Measure or Model Detail
«DNVqty2»	**«RetroName2»**	**«DNVDesc2»**
Qty Verified:		
Qty Operational:		
Measure Verified	YES NO	
(comment any notes if any discrepancy from tracking)		
Notes:		

DNVqty	Measure Type: **«RetroType3»/«RetroRetroType3»**	Measure or Model Detail
«DNVqty3»	**«RetroName3»**	**«DNVDesc3»**
Qty Verified		
Qty Operational		
Measure Verified	YES NO	
(comment any notes if any discrepancy from tracking)		
Notes:		

DNV GL

Driven by our purpose of safeguarding life, property and the environment, DNV GL enables organizations to advance the safety and sustainability of their business. We provide classification and technical assurance along with software and independent expert advisory services to the maritime, oil and gas, and energy industries. We also provide certification services to customers across a wide range of industries. Operating in more than 100 countries, our 16,000 professionals are dedicated to helping our customers make the world safer, smarter and greener.