NORTH CAROLINA
PUBLIC STAFF
UTILITIES COMMISSION

August 29, 2023

Ms. A. Shonta Dunston, Chief Clerk
North Carolina Utilities Commission
4325 Mail Service Center
Raleigh, North Carolina 27699-4300

Re: Docket No. E-2, Sub 1322 – Application of Duke Energy Progress, LLC, for Approval of Demand-Side Management and Energy Efficiency Cost Recovery Rider

Dear Ms. Dunston:

Attached for filing on behalf of the Public Staff in the above-referenced docket is the public version of the testimony of Warren Hirons, Project Manager at GDS Associates, Inc. Hirons Exhibit 2 is confidential.

By copy of this letter, I am forwarding a copy to all parties of record by electronic delivery.

Sincerely,

Electronically submitted
/s/ Anne Keyworth
Staff Attorney
anne.keyworth@psncuc.nc.gov

Attachment

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CERTIFICATE OF SERVICE

I certify that I have served a copy of the following testimony on all parties of record in accordance with Commission Rule R1-39, by United States mail, postage prepaid, first class; by hand delivery; or by means of facsimile or electronic delivery upon agreement of the receiving party.

This the 29th day of August, 2023.

Electronically submitted
/s/ Anne Keyworth

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This the 29th day of August, 2023.

Electronically submitted
/s/ Anne Keyworth

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-2, SUB 1322

In the Matter of Application of Duke Energy Progress, LLC, for Approval of Demand-Side Management and Energy Efficiency Cost Recovery Rider Pursuant to N.C.G.S. § 62-133.9 and Commission Rule R8-69	))))))	**TESTIMONY OF WARREN HIRONS PUBLIC STAFF – NORTH CAROLINA UTILITIES COMMISSION**

August 29, 2023

Q. Please state your name, title, business affiliation and business location.

A. My name is Warren Hirons. I am a Project Manager at GDS Associates, Inc. (GDS), an engineering and management consulting firm. My business address is 1850 Parkway Place, Marietta, Georgia 30067.

Q. Briefly state your educational background and qualifications.

A. I graduated from North Carolina State University with a Bachelor's degree in Environmental Engineering in 2009. Previously, I graduated from the University of Georgia with a Bachelor's degree in Environmental Economics and Management in 2006. I am a licensed professional engineer in the State of Georgia. I also hold Certified Energy Manager (CEM) and Certified Measurement and Verification Professional (CMVP) certifications from the Association of Energy Engineers. My education and work experience is provided in my detailed resume which is attached as Hirons Exhibit 1.

Q. Have you ever testified before a state regulatory commission?

A. Yes. I filed joint testimony before the North Carolina Utilities Commission (Commission) ion August 7, 2013, in Docket E-7, Sub 1032.

Q. Please describe your experience preparing testimony on energy efficiency issues for GDS.

A. I have aided with drafting testimony and performing research to support testimony on Evaluation, Measurement, and Verification (EM&V) related items filed with the North Carolina Utilities Commission (Commission). I served as a consultant in natural gas rate case proceedings on behalf of various municipalities in the state of Texas and helped draft testimony in these proceedings, though no testimony was ultimately filed. I have helped prepare testimony on behalf of the Connecticut Office of Consumer Counsel, the Indiana Michigan Power Company, and the Office of the People's Counsel for the District of Columbia.

Q. Please summarize your experience working on energy efficiency issues in North Carolina.

A. I have provided the Public Staff - North Carolina Utilities Commission (Public Staff) with oversight and review of EM&V work performed by evaluation contractors on behalf of the investor-owned utilities in North Carolina. I have provided this review and oversight assistance to the Public Staff in more than 30 Demand-Side Management (DSM) and Energy Efficiency (EE) rider proceedings. I have served in this capacity since 2012 in my role with GDS.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to address concerns that I have related to the calculation of the program savings for Duke Energy Progress, LLC's (DEP or the Company) Non-Residential Smart $aver Custom (Custom Program) program contained in the Custom Program's 2018-2019 Evaluation Report (Report) filed as Company witness Casey Q. Fields' Fields Exhibit E in this proceeding. The Report was created by Nexant (now known as Resource Innovations) in partnership with Tetra Tech (together, the Evaluator) for DEP and Duke Energy Carolinas, LLC (DEC and, together with DEP, Duke Energy). More specifically, my concerns are related to the calculation of non-participant spillover (NPSO), which is used in the calculation of net program savings.

Q. Please summarize your concerns and final recommendations.

A. My general concerns regarding the Company's EM&V analysis on the NPSO issue are summarized as follows:

1. The analysis contains the double-counting of projects included in response to one of the Evaluator's survey questions.

2. The calculation fails to appropriately weight the savings by measure and project type.

3. The results of the analysis are highly sensitive to only a few data points.

4. The analysis credits NPSO to projects which were likely to have been ineligible for the program as well as to projects that were likely to have been installed by opt-out customers who were ineligible for the program.

5. The NPSO estimates are substantially greater than results from similar evaluations in other states.

I believe that the evidence related to these concerns indicates that the Report's evaluation of NPSO is speculative at best and should not be accepted at this time. I recommend that Duke Energy be required to remove these savings from the analysis and submit a revised evaluation report reflecting this change.[1] As explained in my testimony, this change would decrease the program-level net savings for both DEC and DEP as shown in the table below, with a total reduction in Duke Energy's savings of 19,260,350 kWh for the reporting timeframe of 2018 through 2019.

[1] Alternatively, an addendum to the Report reflecting revised net verified kWh and kWh savings for the program with NPSO removed would suffice.

Hirons Table 1. Revised Net Savings for DEC and DEP

Utility	Net Verified kWh Savings (as reported)	Non-Participant Spillover kWh Savings	Revised Net Verified kWh Savings (non-participant spillover removed)
DEC	83,427,570	12,505,161	70,922,409
DEP	25,685,459	6,755,189	18,930,270
Total	109,113,029	19,260,350	89,852,679

Q. Do you have any Exhibits?

A. Yes. I have seven exhibits. A brief description of each is provided below:

1. Hirons Exhibit 1: Resume of Warren Hirons.

2. Confidential Hirons Exhibit 2: This file provides a three-page explanation of the how the Evaluator determined NPSO and was provided by Resource Innovations to the Public Staff through informal communications.

3. Hirons Exhibit 3: I developed this database using the Company's response to data requests to demonstrate the data inputs and both intermediate and overall calculations of NPSO for Duke Energy.

4. Hirons Exhibit 4: I developed this database using the Company's response to data requests to demonstrate the

data inputs and both intermediate and overall calculations of NPSO for DEC and DEP, respectively.

5. Hirons Exhibit 5: The Evaluator submitted this Smart $aver Custom Program evaluation plan to Duke Energy in November of 2020, which was provided to the Public Staff through informal communications with the Company.

6. Hirons Exhibit 6: This file provides the questions used by the Evaluator to collect data used to calculate NPSO. This file was provided by Duke Energy to the Public Staff in response to a Public Staff data request.

7. Hirons Exhibit 7: This file provides a demonstration of an NPSO methodology previously used by the Evaluator in a different state which used a validity check to address potentially ineligible projects being included in the NPSO. This file can be located through an internet search and be found on the National Grid website.

Q. Please explain the significance of net program savings in a rider proceeding.

A. Net program savings are used in DSM/EE rider calculations for purposes of determining net lost revenues and performance incentives, so it is essential for evaluations to clearly and accurately

articulate the estimated program net savings and how these estimates are developed.

Q. Please describe the elements of the evaluation used to estimate net savings as shown in the Report.

A. The evaluation estimated net savings, which are changes in energy use attributable to the program,[2] using the following elements:

i. Free-ridership (FR): an estimate of the proportion of a program's savings attributable to customers who would have installed energy efficient products or measures even in the absence of the program, but who choose to participate in the utility's EE program anyway. In other words, these participants take advantage of program incentives or other consideration, but the program itself had no impact on the participant's ultimate decision to engage in the particular energy efficiency associated with the program.

ii. Spillover: an estimate of savings resulting from the installation of energy efficient products or services without program participation, which is comprised of either:

[2] *See* Chapter 17: Estimating Net Savings: Common Practices, The Uniform Methods Project: Methods for Determining Energy Efficiency Savings for Specific Measures, page 3, available at: https://www.energy.gov/sites/prod/files/2015/01/f19/UMPChapter17-Estimating-Net-Savings.pdf.

a. Participant spillover (PSO), which attributes savings to the program for equipment that participants subsequently installed outside the program, because of the program's influence; or

b. NPSO, an estimate of additional energy savings achieved when a program non-participant implements energy efficiency measures or practices attributable to the program's influence.

The FR, PSO, and NPSO elements are combined to calculate the net-to-gross (NTG) ratio in the following manner, as illustrated on page 50 of the Report:

Hirons Figure 1. Net-to-Gross Equation

$$NTG_p = (1 - FR_p) + PSO_p + NPSO_p$$

Where:

NTG_p	=	*the program-level net-to-gross ratio*
FR_p	=	*the program-level free-ridership ratio*
PSO_p	=	*the program-level participant spillover ratio.*
$NPSO_p$	=	*the program-level nonparticipant spillover ratio.*

Q. What issues arose in your reviw of the net program savings in this rider?

A. As discussed in more detail below, the Report provides incomplete, misleading, and at times contradictory information regarding the magnitude of net program savings.

Q. What in the Report did you find to be incomplete, misleading or contradictory?

A. Tables 1-1 and 1-4 of the Report provide the respective DEC and DEP reported and verified gross savings as shown in the table below. However, the main body of the report does not provide a corresponding table or other presentation of the study results showing net savings for DEC and DEP.

Hirons Table 2. Gross Verified kWh Savings for DEC and DEP

Utility	Gross Verified kWh Savings	Source
DEC	99,722,174	Table 1-1
DEP	28,111,481	Table 1-4
Total	127,833,655	

Table 1-7 of the Report (reproduced below from the Report) provides the NTG ratios for DEC and DEP and provides a DEC/DEP combined NTG ratio.[3]

Hirons Figure 2. Reproduction of Table 1-7 from Report

Measurement	DEC	DEP	Combined[1]
Free-ridership (FR)	29.16%	32.67%	29.99%
Net of Free-ridership (1-FR)	70.84%	67.33%	70.01%
Program-influenced Participant Spillover (PSO)	0.28%	0.01%	0.22%
Program-influenced Nonparticipant Spillover (NPSO)	12.54%	24.03%	12.95%
Net-to-Gross* (1-FR) +PSO+NPSO	**83.66%**	**91.37%**	**83.18%**

[1] The combined results are weighted using the same kWh-based weights used for DEC and DEP results, since this accounts for individual project sizes as well as the relative size of the programs across the two jurisdictions.

The main body of the Report does not show how the gross verified savings for each utility are multiplied by the NTG ratios to determine program-level net savings.

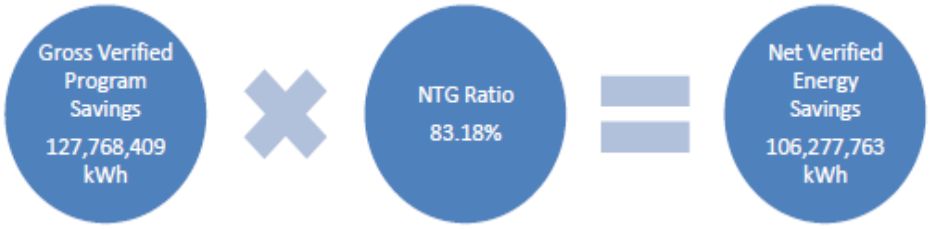
Furthermore, based on the information provided in Figure 5-3 of the Report, the data provided in Appendix A and Appendix B of the Report, and additional information provided by Duke Energy in response to a Public Staff data request, I find the Report to be

[3] The footnote to Table 1-7 indicates that the combined results are "weighted using the same kWh-based weights used for DEC and DEP results, since this accounts for individual project sizes as well as the relative size of the programs across the two jurisdictions." However, this statement is not true for how NPSO is combined, which is demonstrated in Hirons Exhibit 3 and subsequent discussion below.

misleading or contradictory regarding whether program-level net savings are estimated using an overall NTG ratio or a utility-specific NTG ratio.

Figure 5-3 of the Report, reproduced below, provides a visual demonstration of multiplying gross program verified savings by a NTG ratio to yield net verified energy savings.

Hirons Figure 3. Reproduction of Figure 5-3 from Report



The NTG ratio in Figure 5-3 utilizes the DEC-DEP combined value of 83.18% as listed in Table 1-7 of the Report.

However, the information provided in both Appendix A and Appendix B of the Report indicates that utility-specific NTG ratios, rather than the combined ratio, were used in the determination of program-level net savings for DEC and DEP.

Appendix A provides separate Fact Sheets for DEC and DEP. These Fact Sheets list separate Net-to-Gross ratios for each utility as well

as DEC's and DEP's annual kWh net savings amounts, as shown in the table below.

Hirons Table 3. NTG Ratio and Net Verified kWh Savings for DEC and DEP

Utility	Gross Verified kWh Savings	NTG Ratio	Net Verified kWh Savings
DEC	99,722,174	83.66%	83,427,570
DEP	28,111,481	91.37%	25,685,459
Total	127,833,655		109,113,029

These values are properly based on multiplying the territory-specific gross verified energy savings by the territory-specific NTG ratios, rather than the combined NTG ratio shown in Figure 5-3.

Appendix B provides DSMore input summary data for DEC and DEP, respectively. Tables B-1 and B-2 provide the utility-specific FR, spillover, and NTG ratio values used to evaluate program cost-effectiveness with the DSMore model as shown below.

Hirons Table 4. Free Ridership, Spillover and NTG Ratios for DEC and DEP

Utility	Free Ridership	Spillover	NTG Ratio
DEC	29.16%	12.54%	83.66%
DEP	32.67%	24.03%	91.37%

Lastly, in response to a Public Staff data request, Duke Energy indicated that the NTG Ratio used in the Company's DSM/EE rider is 91.37%, which aligns with the DEP-specific value.

Thus, the main body of the Report does not indicate the utility-specific program-level net savings, which is pertinent information to include in the body of the Report. The Report also implies (in Figure 5-3) that a DEC-DEP combined NTG ratio was used for program-level net savings estimates, when in fact, as shown in Appendices A and B and in response to a Public Staff data request, that utility-specific NTG ratios were used in the Company's DSM/EE Rider. Understanding that utility-specific NTG ratios were used in the Company's DSM/EE Rider is necessary to support one of my concerns above that the analysis contains the double-counting of projects in the Evaluator's calculation of NPSO.

Q. Please describe the surveying method and variables used by the Evaluator to estimate NPSO for the Custom Program.

A. The Evaluator estimated NPSO using the results of surveys with participating implementation contractors about the contractors' sales of program-eligible equipment that was not associated with Duke Energy incentives.

Through the course of discussions with Duke Energy, the Evaluator, the Public Staff, and GDS, the Evaluator provided a document that clarifies and expands upon the discussion of the calculation of NPSO provided in the Report. I have appended this document as Confidential Hirons Exhibit 2 to my testimony.

Through discussion with Duke Energy, the Public Staff learned that the Evaluator surveyed contractors on the variables described below, as detailed in the Report, to determine NPSO in each utility's service area:[4]

i. Variable P1: The number of program-eligible projects sold/installed for Duke Energy's nonresidential customers over the last 12 months (at the time of the survey);

ii. Variable P3: The proportion of the sales/projects identified in response to P1 that involved an incentive through Duke Energy's program; and

iii. Variable NS2: A scale of 1 to 5 evaluation (with 1 being "not at all influential" and 5 "extremely influential") regarding the influence of Duke Energy's custom program on the

[4] While the survey included other questions, only the responses to the questions assessing the P1, P3, and NS2 variables were used in the calculation of the NPSO estimates.

contractor's sales of energy saving projects that did not receive an incentive.

In response to discovery, Duke Energy provided a data file that shows the responses to the P1, P3, NS2 variables and other contractor survey questions. While the contractor-level calculations were not provided in the responses to data requests, I was able to recreate the requisite contractor-level calculations using the data file provided in conjunction with the methodology explanation provided by Duke Energy shown in Hirons Exhibit 2. These contractor-level calculations, along with the calculation of the total service-territory level NPSO, are provided in Hirons Exhibit 3.

Q. Please demonstrate how the NPSO is calculated for DEC and DEP.

A. In response to discovery, the Public Staff learned that the Evaluator utilized a five-step approach to determine how the NPSO was calculated by the Evaluator.[5] Hirons Exhibit 3 has 40 rows of contractor (or "vendor") response data used in the Evaluator's NPSO calculation.[6] For each of the 40 vendors included, there are four vendor-level calculations, the results of which were combined to

[5] The source data needed to apply the five steps are in Hirons Exhibit 3.

[6] Twenty-five rows of contractor response data contained in the database provided by Duke Energy were omitted in Hirons Exhibit 3 on the basis that this data was not used in the Evaluator's NPSO calculation.

calculate the overall utility-specific NPSO. A description of the five-step approach including the four vendor-level calculations and how that data is demonstrated in Hirons Exhibit 3 is provided below.

1. **Calculate vendor-level NS2 Score.** This is shown in column 6 and was provided by Duke Energy (already calculated).
2. **Calculate vendor-specific NPSO ratio.** This is shown in column 7 using data provided by Duke Energy (already calculated), and in column 12 using the methodology described in Confidential Hirons Exhibit 2, which incorporates both the results of the vendor responses to variable P3 (column 3) and the vendor-level NS2 Score (column 6).
3. **Calculate vendor-level incentivized projects.** This is shown in column 8 as an already calculated value provided by Duke Energy and is also shown in column 13 using the methodology described in Confidential Hirons Exhibit 2, which incorporates both the results of the vendor responses to variable P3 (column 3) and variable P1 (column 2).
4. **Calculate vendor-level unincentivized projects influenced by program.** This is shown in column 9 as provided and calculated by Duke Energy and is also shown in column 14 using the methodology described in Confidential

Hirons Exhibit 2, which incorporates the vendor-specific results to Steps 2 and 3 as described above.

5. **Calculate program-level NPSO.** As noted in Confidential Hirons Exhibit 2, the final step is to calculate the "weighted average" NPSO for the program, which is the average proportion of unincentivized projects across all responding contractors. This weighted average is calculated by dividing the total number of unincentivized projects influenced by the program (sum of column 9) by the total number of projects incentivized through the program (sum of column 8). The result is a "weighted mean," which is the total number of inferred projects installed in the Duke Energy service territory that did not receive an incentive divided by the total number of projects installed in the Duke Energy service territory that did receive an incentive. This equation can be written as follows: (number of unincentivzed projects influenced by program) divided by (total number of projects incentivized by the program).

Q. What were the results of the program-level NPSO calculation based on the five-step process described above?

A. The results of the calculation described yield a program-level NPSO of 12.95%, as noted several times in the Report. However, as noted

herein, this percentage was not used by the Evaluator in the calculation of either the DEC or DEP program's net savings.

Q. Please provide the inputs and results to the DEC-specific and DEP-specific NPSO calculations.

A. Using the data provided by Duke Energy, I was able to determine which vendors in the survey were associated with the DEC and DEP territories, respectively. Calculating the territory-specific NPSO followed the five-step approach outlined above using utility-specific inputs. The results of step five at the service-territory level are shown below. These values match those shown in the main body of the Report, as well as Appendices A and B of the Report.

$$DEC\ NPSO = \frac{119.3}{951.2} = 0.1254$$

$$DEP\ NPSO = \frac{66.6}{277.3} = 0.2403$$

Q. Please elaborate on your concern that the Evaluator's analysis contains double-counting of projects included in response to the P1 questions.

A. Five vendors have customer bases that include both DEC and DEP territories and are therefore listed as being associated with both DEC and DEP. The results of these five vendor responses to the contractor surveys (DEC and DEP combined) are applied in their

entirety for each individual utility-specific NPSO calculation; the Evaluator did not attempt to apportion these projects between the two utilities. For example, the vendor identified as "DC90" by the NewID variable in Hirons Exhibit 4 provided a response of 105 to the P1 question, which is used in both utility's NPSO calculation. This double-counting of projects exposes a flaw in the calculation of utility-specific NPSO, which will be discussed in more detail later in my testimony.

For two of the five vendor responses, this double counting has a substantial impact on the overall results; these two vendor responses are responsible for 23.9% and 82.0% of the respective DEC and DEP spillover weights (step 3 of the calculation – total number of projects incentivized by the program) and for 48.4% and 86.7% of the respective DEC and DEP spillover (step 4 of the calculation – total number of unincentivized projects influenced by the program). The two tables below illustrate this in tabular form for DEC and DEP, respectively.

Hirons Table 5. Contribution of Double Counted Projects to DEC NPSO

NewID	DEC Step 3	DEC Step 4	DEC (% of NPSO weight)	DEC (% of NPSO)
DC90	47.3	57.8	5.0%	48.4%
DC575	180.0	0.0	18.9%	0.0%
DC90+DC575	227.3	57.8	23.9%	48.4%
DEC Total	951.2	119.3	-	-

Hirons Table 6. Contribution of Double Counted Projects to DEP NPSO

NewID	DEP Step 3	DEP Step 4	DEP (% of NPSO weight)	DEP (% of NPSO)
DC90	47.3	57.8	17.0%	86.7%
DC575	180.0	0.0	64.9%	0.0%
DC90+DC575	227.3	57.8	82.0%	86.7%
DEP Total	277.3	66.6	-	-

The lack of information regarding the relative proportion of program-eligible projects sold/installed between the DEC and DEP territories by just these two vendors creates an extraordinary level of uncertainty. For instance, as a hypothetical situation, if the relative share of projects identified by the response to P1 were allocated according to the shares noted in the table below, the DEC NPSO would drop to 7.56%, yet the DEP NPSO would more than double and rise to 55.04%.

Hirons Table 7. Demonstration of NPSO Sensitivity to Double Counted Projects

NewID	P1 (DEC share)	P1 (DEP share)	DEC NPSO	DEP NPSO
DC90	0.1	0.9	7.56%	55.04%
DC575	0.9	0.1		

This hypothetical situation is a plausible representation of the true share of P1 projects by service territory for these two vendor responses, but since the evaluation did not attempt to determine how the P1 projects should be allocated for vendors serving both DEC and DEP, the actual share of P1 projects by service territory is unknown. Ultimately, the evaluation incorrectly assigns full value to the P1 responses to both DEC and DEP, as is demonstrated in Hirons Exhibit 4.

Q. Please explain your concern with the failure to appropriately weight the savings by measure and project type in the calculation of NPSO.

A. To begin with, the evaluation plan provided by Duke Energy to the Public Staff in November of 2020[7] (2020 Plan) indicated that NPSO savings would be weighted using stratum-level and record-level weights. Page 13 of the 2020 Plan states that:

[7] Provided as Hirons Exhibit 5.

> Spillover scores will be weighted to the program level using a combination of stratum-level weights and record-level weights. Stratum-level weights account for disproportionate sampling and survey response at a stratum level. Record-level weights account for the differences in savings between projects.

The 2020 Plan also notes that Duke Energy would use the Pennsylvania Evaluation Framework[8] (Pennsylvania Framework) to evaluate NTG. The Pennsylvania Framework provides sampling requirements if NPSO is being assessed. Page D-1 of the Pennsylvania Framework states that:

> [The] sampling approach should produce a sample that is representative of the target population (nonparticipants or trade allies) or capable of producing results that can be made representative through appropriate weighting of data. In the case of trade ally surveys, the sampling plan should take trade ally size (e.g., total sales, total program savings) and type of equipment sold and installed (e.g., lighting or non-lighting) into consideration.

The Report did not follow the methodology discussed in its 2020 Plan and did not follow the guidance provided by the Pennsylvania Framework with respect to the weighting of savings.

In addition, as page 59 of the Report notes, each project in response to the P1 question in the NPSO analysis was weighted equally, which

[8] *See* Evaluation Framework for Pennsylvania Act 129 Phase III Energy Efficiency and Conservation Programs, prepared by the Statewide Evaluation Team (May 8, 2018), available at: http://www.puc.pa.gov/Electric/pdf/Act129/SWE_PhaseIII-Evaluation_Framework050818.pdf.

would be reasonable if most projects were of equal size as it relates to a savings per project metric. However, in this Report, the savings per project is highly variable based on whether the project is lighting or non-lighting, as well as whether the project is considered large or small. As noted in the Pennsylvania Framework, it is standard practice to appropriately weigh data based on the type of equipment sold (e.g. lighting or non-lighting) and total program savings (e.g. project size).

Tables 8 and 9 below provide a measure category and strata-level breakdown of the total number of projects, verified gross energy savings, and savings per project.[9]

Hirons Table 8. DEC Project Savings by Measure and Strata

DEC		Projects	Savings	
Measure Category	Strata	Total	Gross Verified kWh	Savings per Project kWh
Lighting	Small	359	26,104,266	72,714
Lighting	Large	58	41,723,000	719,362
Non-Lighting	Small	99	11,544,202	116,608
Non-Lighting	Large	13	20,350,706	1,565,439
Total	-	**529**	**99,722,174**	**188,511**

[9] These tables were developed using data available in Table 1-1, Table 1-4, Table 2-1, and Table 2-4 of the Report.

Hirons Table 9. DEP Project Savings by Measure and Strata

DEP		Projects	Savings	
Measure Category	Strata	Total	Gross Verified kWh	Savings per Project kWh
Lighting	Small	211	6,803,085	32,242
Lighting	Large	33	11,978,543	362,986
Non-Lighting	Small	35	3,402,256	97,207
Non-Lighting	Large	13	5,927,597	455,969
Total	-	**292**	**28,111,481**	**96,272**

Tables 8 and 9 above indicate that the projects have vastly different savings based on whether the measure is lighting or non-lighting and whether the strata is small or large. For example, the large non-lighting projects for DEP are more than 14 times larger, on average, than its small lighting projects. There are 16 times more small lighting projects than large non-lighting projects (211 vs. 13), but due to the much smaller average project size, the small lighting projects account for only 15% more savings than the large non-lighting projects (6,803,085 kWh vs 5,927,597 kWh). By weighing all projects equally in the NPSO analysis, the Evaluator implies that each project is an average project, or a project characterized as having the mean of the gross verified energy savings across all projects. As the two tables above show, this is clearly not the case.

This disparity in project size by measure and project numbers, in conjunction with lack of information as to which measures and project sizes are associated with the vendor responses in the NPSO survey, creates highly uncertain results and renders them inappropriate for use in this type of analysis.

Q. Please explain your concern that the results are highly sensitive to only a few data points.

A. Tables 10 and 11 below show the total number of unincentivized projects influenced by the Custom Program by service territory, as well as the proportion of the NPSO associated with those projects, for two highly influential vendor responses, as well as all other remaining vendor responses.[10]

Hirons Table 10. DEC – Sensitivity of NPSO on Two Vendor Responses

NewID	DEC Step 4	DEC (% of NPSO)
DC90	57.8	48.4%
DC1375	50.0	41.9%
DC90+DC1375	107.8	90.3%
29 other responses combined	11.6	9.7%
Total	119.3	100.0%

[10] As noted earlier, the contractor identified as "DC90" appears in both tables because this vendor's survey responses are double counted in the NPSO analysis.

Hirons Table 11. DEP – Sensitivity of NPSO on Two Vendor Responses

NewID	DEP Step 4	DEP (% of NPSO)
DC90	57.8	86.7%
13 other responses combined	8.9	13.3%
Total	66.6	100.0%

For DEC, two vendor responses account for 90.3% of the NPSO (numerator in the utility-specific program-level calculation), while the remaining 29 responses account for just 9.7% of the NPSO. For DEP, one vendor response accounts for 86.7% of the NPSO, while the remaining 13 responses account for just 13.3% of the of the NPSO.

The population of participating contractors was 199 according to Section 6.1.2 of the Report, only 67 of which completed the survey (33.7% response rate). Of those 67 responses, only ten had an NPSO of greater than zero. From those ten with NPSO greater than zero, two account for over 90% of the DEC NPSO and nearly 87% of the DEP NPSO.

In conversations with Duke Energy and its Evaluator, the Evaluator stated that the reason for weighting projects in the NPSO analysis by number of projects, rather than by measure type and project size as

the 2020 Plan indicated would happen, was to limit the impact of any single vendor response from being overly influential. Clearly, this approach did not work. The extremely high influence of just two vendor responses – one of which came from a contractor that served both the DEC and DEP territory and had its responses double counted – and the lack of information concerning measure type or project size makes it impossible for me to conclude that the evaluated NPSO results are reliable estimates.

Q. Please explain your concern that potentially invalid responses were utilized in the calculation of NPSO.

A. The contractor survey included a follow-up question (NS1) regarding why some of the contractors' sales did not involve a Duke Energy incentive. Among the vendors whose responses contributed towards NPSO, DEC had five responses indicating that the main reason for not pursuing an incentive was either that the projects were not eligible or the customers themselves were not eligible because they were not opted into the program. For DEP, there was one such response. Table 12 below lists the five responses (emphasis added).

Hirons Table 12. Vendor Responses Indicative of Ineligible Projects and Customers

NewID	NS1 Responses	GDS comments
DC90	They've already issued a PO before a custom incentive was approved. Where lighting is installed in apartments in tenants apartment **no longer qualify**. The payback period was too soon so **they weren't eligible.**	Two of the three statements are indicative of non-qualifying projects that should not count as NPSO
DC820	The customers were **not opted into the rebate program.**	The response indicates that the projects being credited with NPSO may have been installed by customers who have opted out and are therefore not eligible. This creates a concern that rate payers are subsidizing non-rate payers (or customers who are on a rate schedule which precludes participating in Duke Energy programs.
DC850	They were such a big consumer they had a very low KWh rate; **Duke would have had them opt into the program**, which would have cost them to do.	Same opt-out concern as above
DC1375	Negotiated electrical rates. If a customer (like a factory) has a rate that is lower than normal, **if they receive a rebate they have the possibility of losing the lower rate.**	Same opt-out concern as above
DC245	**Most of the time they opted out in the past and took other incentives** so they could not get the rebate.	Same opt-out concern as above

Tables 13 and 14 below indicate the relative amount of NPSO these five vendor responses contribute towards utility-specific NPSO.

Hirons Table 13. DEC – Share of NPSO from Vendors with Responses Indicating Ineligible Projects or Customers

NewID	DEC Step 4	DEC (% of NPSO weight)
DC90	57.8	48.4%
DC820	3.5	2.9%
DC850	2.5	2.1%
DC1375	50.0	41.9%
DC245	0.3	0.3%
Sub-total	114.1	95.6%

Hirons Table 14. DEP – Share of NPSO from Responses Indicating Ineligible Projects or Customers

NewID	DEP Step 4	DEP (% of NPSO weight)
DC90	57.8	86.7%

Q. Should a customer that has opted out of the Company's DSM/EE rider be eligible to be counted in the surveys submitted into the EM&V reports?

A. No. An opted out customer should be marked as an ineligible project and should not be credited with an ability to influence the NPSO. The installation of EE projects by Duke Energy customers who are ineligible to participate in the program (i.e., a customer who is not paying the DSM/EE Rider) should not contribute to the NPSO because this creates a cross-subsidization in which DSM/EE rider ratepayers are reimbursing Duke Energy for ineligible lost revenues attributable to opted-out customers.

For DEC, the five vendors whose responses indicated that one of the main reasons their customers did not receive incentives was because they were either ineligible projects or the customers themselves were ineligible because they were opted out of the program account for 95.6% of NPSO. For DEP, the one such vendor response accounts for 86.7% of the DEP NPSO. These projects should not have been fully credited with NPSO, as the responses clearly indicate that the main reason the customers did not receive an incentive is that the projects in question were ineligible.

Duke Energy's Evaluator indicated that the NS1 question was a process evaluation question to be used for the purpose of making program improvements and not for assessing NPSO, even though it is listed in the NPSO section of the contractor survey (attached as Hirons Exhibit 6). The NS1 survey question is nearly identical to a question asked by Tetra Tech in a previous Rhode Island evaluation finalized in 2019 in which the question was characterized as a "consistency check" and was used to reduce NPSO, if the vendor indicated projects did not qualify for the program.[11] It is not clear to me why the Duke Energy evaluation did not include any consistency

[11] *See* Hirons Exhibit 7 for an excerpt from this evaluation. *See also* 2019 Commercial and Industrial Programs Free-Ridership and Spillover Study, National Grid Road Island, at 35, F-5 (Jan. 18, 2021), available at: http://rieermc.ri.gov/wp-content/uploads/2021/01/national-grid-rhode-island-2020-ci-fr-so-report_final.pdf.

check questions for the NPSO analysis,[12] when it is clear that there is an inconsistency between the P1 and NS1 responses, which call into question the legitimacy of the vast majority of the claimed NPSO for both DEC and DEP.

Q. Please discuss your concern that the DEC and DEP NPSO estimates are substantially greater than results of evaluation reports in other states.

A. Table 15 below provides results from 12 spillover estimates in recent evaluations of custom non-residential electric programs across the country.

[12] The FR analysis uses consistency checks.

Hirons Table 15. Benchmarking of NPSO Results for Other Non-Residential Custom Programs

State	Utilities	Total Spillover	PSO	NPSO	Notes
NC	Duke Energy Progress	24.04%	0.01%	24.03%	
NC	Duke Energy Carolinas	12.82%	0.28%	12.54%	
MA	Mass Save	5.00%	1.10%	3.90%	
NY	NYSEG / RG&E	2.20%	0.70%	1.50%	Section 4.2
RI	National Grid	1.20%	0.50%	0.70%	Table 1
PA	Penelec[13]	0.40%	-		Combined
IN	NIPSCO	0.00%	0.00%	N/A	
IN	Indiana Michigan	0.00%	0.00%	0.00%	
PA	Met-Ed	0.00%	-		PSO / NPSO combined
PA	Penn Power	0.00%	-		PSO / NPSO combined
PA	WPP	0.00%	-		PSO / NPSO combined
PA	PPL	0.00%	-		PSO / NPSO combined

Of the six programs that assessed NPSO, the highest estimate in the benchmarking analysis other than the Duke Energy programs is 3.9% for Massachusetts' "Mass Save" program. Four programs had a total spillover estimate of between 0.4% and 5%. Six programs had a combined spillover of 0%.

[13] The five Pennsylvania utilities listed are also shown in the Report. The MA, NY, RI, and IN utilities listed are based on my separate research into other custom program NPSO estimates.

Clearly, the results for DEC and DEP are significantly out of line with other recent NPSO estimates, which also calls the Report's NPSO estimate into question.

Q. What are your recommendations?

A. Based on my concerns set out above, the Report's evaluation of NPSO is unreliable and should not be accepted. I recommend that Duke Energy be required to remove these savings from the analysis and submit a revised report.

Concerning future evaluations of Company's Non-Residential custom program's NPSO assessment, I make the following recommendations to strengthen the results of future evaluations and to reduce the likelihood of the Public Staff being compelled to contest the program savings estimates used in subsequent DSM/EE Rider filings.

1. Future NPSO evaluation reports should clearly state how net program savings are calculated for each service territory and should clearly disclose the magnitude of the estimated program net savings in the main body of the report.

2. If future evaluations leverage vendor survey responses to estimate NPSO, the methodology should include a method to ensure that projects are not double counted and are, instead,

apportioned to the respective DEC and DEP service-territories in a manner which reflects the best available information. Additional questions on the vendor survey can gather this information or other reasonable proxy data can be used.

3. If future evaluations leverage vendor survey responses to estimate NPSO, Duke Energy's evaluator should include a method to ensure that projects appropriately weigh the savings by measure and project type. This method is industry standard practice and should be used when evaluating Duke Energy programs.

4. Future evaluations of NPSO for any program type, regardless of methodology used, should include a reasonableness check to assess whether the results are overly sensitive to a small number of data points. This reasonableness check should be discussed in the report to help provide the Commission with confidence that the results are not overly influenced by outlier data points.

5. If future evaluations leverage vendor survey responses to estimate NPSO, Duke Energy's evaluator should include a method to ensure that projects that were ineligible for the

program and projects completed by customers who were ineligible to participate are removed from the calculation of NPSO.

6. Future evaluations of NPSO for any program type, regardless of methodology used, should include a benchmarking analysis of the results of the NPSO in comparison to other programs of similar type (e.g. non-residential custom, non-residential prescriptive, etc.). The results of this benchmarking analysis should be discussed in the report. If an evaluation estimates NPSO to be substantially greater, the benchmarking analysis should provide an explanation of why that is the case.

Q. Does this conclude your testimony?

A. Yes.

WARREN HIRONS

PROJECT MANAGER, P.E., CEM, CMVP

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EDUCATION

Murdoch University, coursework in Renewable Energy

B.S. Environmental Engineering, N.C. State University, May 2009

B.S.E.S. Environmental Economics & Management, University of Georgia, May 2006

PROFESSIONAL AFFILIATIONS/ CERTIFICATIONS

Licensed Professional Engineer (PE) in the state of Georgia

Certified Energy Manager (CEM)

Certified Measurement & Verification Professional (CMVP)

Experienced user of REM/Rate and BEopt building energy simulation modeling software

EXPERTISE

Engineering Feasibility Studies

Energy Systems Modeling

Market Research

Cost-Effectiveness Analyses

DSM Potential Assessments

Regulatory Support

PROFILE

Mr. Hirons has more than 14 years' experience as a consultant in the fields of energy and engineering. He joined GDS in early 2012, and works out of the Marietta, GA office. While at GDS he has worked on projects focusing on several different facets of energy efficiency. He has worked on energy efficiency potential studies, and he has provided consulting services to the North Carolina Utilities Commission (NCUC), serving as the lead consultant reviewing the evaluation, measurement and verification (EM&V) reports submitted by the electricity utilities to the NCUC as part of their application for cost recovery in various electricity rate case proceedings. He has helped prepare affidavits and data requests on behalf of the NCUC in these proceedings. He has also served on a team of advisors to help the Office of Consumer Counsel (CT) represent the state's utility customers in energy efficiency proceedings. He has provided analysis to clients in regarding proposed utility performance incentive mechanisms. He has provided analysis of utility DSM plans in several states. He has performed research into best practices for providing DSM programs and developed evaluation plans for a utility in Canada. He has also served as a consultant in natural gas rate case proceedings for municipalities in Texas. Mr. Hirons previously worked as an engineer for more than 2 years at Brown and Caldwell, an environmental consulting company, out of the Virginia Beach office.

PROFESSIONAL EXPERIENCE

GDS Associates, Inc., Marietta, Georgia, 2012 to Present

Project Manager

Mr. Hirons performs project management and conducts quantitative and qualitative data collection and analysis, engineering feasibility studies, modeling of energy systems and program evaluation for GDS clients (e.g., utilities, government agencies, and regulatory agencies). He is also experienced in the areas of codes and standards, technical reference manuals (TRM), evaluation, and measurement and verification (M&V). Mr. Hirons performs the following tasks as they relate to performing potential studies and advising clients in EM&V related matters:

- Collects data on the costs, savings, useful lives and saturation of energy efficiency and demand response measures.
- Estimates energy efficiency and demand response potential in various regions of North America.
- Completes baseline studies including sample design, survey design, collect onsite data in the field
- Conducts interviews for evaluation studies
- Constructs building energy simulation models and billing and metering data analysis to support savings estimates developed for energy efficiency potential studies and evaluation analysis.
- Conducts benefit/cost analysis of energy efficiency and demand response measures and programs.
- Conducts statistical and uncertainty/sensitivity analysis of data.
- Conducts economic feasibility studies of energy efficiency and demand response measures and programs.
- Develops and reviews engineering estimates of energy use and savings for energy efficiency and demand response measures and programs using simple and complex engineering models

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PROFESSIONAL EXPERIENCE [continued]

- Reviews utility EM&V reports and prepares data requests in an effort to require the utilities show sufficient evidence of reported savings in cost recovery proceedings. Reviews include impact, process, market effects (net-to-gross), educational, and marketing programs evaluations.
- Provides regulatory support and testimony support in cost recovery proceedings
- Develops program theory models
- Reviews EM&V plans for future programs to advise clients on the adequacy of the plans

Brown and Caldwell, Virginia Beach, VA
Engineer II – Business Consulting Practice
Mr. Hirons worked with multiple contractors and the City of Virginia Beach Department of Public Utilities (DPU) to complete an investigation of the City's sanitary sewer infrastructure. The job required supervising contractor fieldwork activities, analyzing fieldwork data, compiling data and generating condition assessment reports. He also worked on a project to re-write the City's DPU design standards manual, and led an investigation into the stormwater infrastructure serving a portion of the Ft. Eustis military base in Newport News, VA.

Southern Energy Management, Morrisville, NC
Building Science Plan Review Analyst
Mr. Hirons worked on residential energy savings efforts by helping builders construct homes that earned Energy Star certification. His duties included conducting plan reviews by analyzing construction design drawings and entering the results of the analysis along with builder supplied specifications into the REM/*Rate* software program to estimate the energy efficiency of new homes. Mr. Hirons consulted with builders to help them make decisions regarding cost effective upgrades in energy efficiency.

United States Department of Agriculture-Agricultural Research Service, Raleigh, NC
Biological Science Aide
Mr. Hirons provided support to the plant physiologist in charge of completing tasks associated with conducting air quality experiments designed to investigate the effects of carbon dioxide and ozone on crop yield.

PROJECT EXPERIENCE

PROGRAM EVALUATION. Mr. Hirons has worked on impact and process program evaluation projects for state utility commissions and other GDS clients. He is a Certified Measurement and Verification Professional (CMVP) as well as a licensed professional engineer. He worked on the Pennsylvania Statewide Evaluator Team from 2012 to 2017 and assisted with preparing reports to the Pennsylvania PUC on gross and verified savings from the energy efficiency programs of seven investor-owned utilities in Pennsylvania. He has served as a consultant for the North Carolina Utilities Commission (NCUC) since 2012 and is responsible for reviewing the evaluation, measurement and verification (EM&V) reports submitted by the North Carolina electric utilities to the NCUC as part of their application for cost recovery in various electric rate case proceedings. He has helped prepare affidavits and data requests on behalf of the NCUC in these proceedings. Other evaluation projects include the following:

- Developed program evaluation plans for a utility in Canada.
- Reviewed utility EM&V reports and prepared data requests to collect information in order to examine the basis for reported kWh, kW and therm savings filed in utility cost recovery proceedings. Reviews included impact, process, market effects (net-to-gross), educational, and marketing programs evaluations

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PROJECT EXPERIENCE [continued]

- Provided regulatory support and testimony support in cost recovery proceedings
- Developed program theory models
- Reviewed EM&V plans for future programs to advise clients on the adequacy of the plans

MARKET RESEARCH. Mr. Hirons has assisted with the development of telephone, web-based and on-site survey instruments and conducted on-site assessments for energy efficiency studies in several states, including Maine, Indiana, Pennsylvania and Mississippi. These market research projects also included data cleansing, data analysis, and drafting the final market assessment and baseline reports.

COST-EFFECTIVENESS ANALYSIS. Mr. Hirons has assessed the cost-effectiveness of many energy efficiency and demand response resources for a wide variety of GDS clients. This includes assessment of measures, programs, and DSM portfolios for planning, reporting, and evaluation purposes.

DSM POTENTIAL ASSESSMENT. Mr. Hirons has completed assessments of electric and natural gas DSM potential across all customer sectors. He specializes in developing estimates of residential sector energy efficiency potential in utility service areas or states. He has completed numerous residential sector energy efficiency potential assessments for GDS clients, including the following recent studies:

- Ameren Missouri (2023)
- Montana-Dakota Utilities (2023)
- Kentucky Power (2023)
- CenterPoint Indiana (2022)
- Vermont Department of Public Service: electric and natural gas service territories (20022)
- Indiana Michigan Power (2021)
- AES Indiana (2021)
- City of New Orleans (2021)
- East Kentucky Power Cooperative (2021)
- California Municipal Utilities Association (2020)
- Northern Indiana Public Service Company (2020)

He performs the following tasks as they relate to performing energy efficiency and demand response potential studies:

- Collects data on the costs, savings, useful lives and saturation of energy efficiency and demand response measures
- Estimates energy efficiency and demand response potential in various regions of North America
- Conducts building energy simulation models and billing and metering data analysis to support energy and demand savings estimates developed for energy efficiency potential studies and evaluation analysis
- Conducts benefit/cost analysis of energy efficiency and demand response measures and programs
- Conducts statistical and uncertainty/sensitivity analysis of data
- Develops and reviews engineering estimates of energy use and savings for energy efficiency and demand response measures and programs using simple and complex engineering models and formulas

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PROJECT EXPERIENCE [continued]

REGULATORY SUPPORT. Mr. Hirons has provided regulatory support services to GDS government and utility clients:

- Served on a team of advisors to help the Connecticut (CT) Office of Consumer Counsel represent the state's utility customers in energy efficiency proceedings.
- Provided analysis to utility and government clients regarding proposed utility shareholder incentive mechanisms
- Provided analysis of utility DSM plans in several states
- Performed research into best practices for providing DSM program
- Served as a consultant in natural gas rate case proceedings for municipalities in Texas
- Reviews utility EM&V reports and prepares data requests in an effort to require the utilities show sufficient evidence of reported savings in cost recovery proceedings. Reviews include impact, process, market effects (net-to-gross), educational, and marketing programs evaluations.
- Provides regulatory support and testimony support in cost recovery proceedings
- Develops program theory models
- Reviews EM&V plans for future programs to advise clients on the adequacy of the plans

DOCKET NO. E-2, Sub 1322

HIRONS CONFIDENTIAL EXHIBIT 2

Hirons Exhibit 3. Database Showing Duke Energy NPSO Calculation

Column / Row #	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	NewID	P1	P3	NS1	NS2	NS2Score	NPSO	NPSO_weight	calc	WM1	Service Territory	NPSO (P3, NS2Score)	NPSO_weight (P1, P3)	calc (NPSO, NPSO_weight)
1	DC1110	2	100	-6 Programmed skip	-6	0.0	0.0	2.0	0	0.1295	DEP	0.0	2.0	0.00
2	DC55	130	3	Lack of awareness of incentive availability.	1	0.0	0.0	3.9	0	0.1295	DEC	0.0	3.9	0.00
3	DC510	8	3	The customer was not signed up for the Duke Energy program.	3	0.5	16.2	0.2	3.88	0.1295	DEP	16.2	0.2	3.88
4	DC550	3	100	-6 Programmed skip	-6	0.0	0.0	3.0	0	0.1295	DEP	0.0	3.0	0.00
5	DC855	2	5	They have their own central power plant	2	0.5	9.5	0.1	0.95	0.1295	DEC	9.5	0.1	0.95
6	DC1285	3	3	The site is not opted in to the program, there is not enough energy savings to qualify for the program	1	0.0	0.0	0.1	0	0.1295	DEC	0.0	0.1	0.00
7	DC80	1	100	-6 Programmed skip	-6	0.0	0.0	1.0	0	0.1295	DEC	0.0	1.0	0.00
8	DC90	105	45	They've already issued a PO before a custom incentive was approved. Where lighting is installed in apartments in tenets apartment no longer qualify. The payback period was too soon so they weren't eligible.	5	1.0	1.2	47.3	57.75	0.1295	DEC/DEP	1.2	47.3	57.75
9	DC195	2	10	New construction were not asked to offer them any type of incentive or rebate for new construction	4	1.0	9.0	0.2	1.8	0.1295	DEC	9.0	0.2	1.80
10	DC240	1	100	-6 Programmed skip	-6	0.0	0.0	1.0	0	0.1295	DEC	0.0	1.0	0.00
11	DC515	1	100	-6 Programmed skip	-6	0.0	0.0	1.0	0	0.1295	DEC	0.0	1.0	0.00
12	DC565	3	100	-6 Programmed skip	-6	0.0	0.0	3.0	0	0.1295	DEC	0.0	3.0	0.00
13	DC575	200	90	The customer opted out. One project they did a study of being opted in and opted out and they decided to opt out - it would be less of a financial burden.	1	0.0	0.0	180.0	0	0.1295	DEC/DEP	0.0	180.0	0.00
14	DC630	50	100	-6 Programmed skip	-6	0.0	0.0	50.0	0	0.1295	DEC	0.0	50.0	0.00
15	DC660	130	100	-6 Programmed skip	-6	0.0	0.0	130.0	0	0.1295	DEC	0.0	130.0	0.00
16	DC730	1	20	The project wasn't large enough to deem it necessary and we do a lot of new construction	1	0.0	0.0	0.2	0	0.1295	DEC	0.0	0.2	0.00
17	DC775	1	100	-6 Programmed skip	-6	0.0	0.0	1.0	0	0.1295	DEC	0.0	1.0	0.00
18	DC795	3	100	-6 Programmed skip	-6	0.0	0.0	3.0	0	0.1295	DEC	0.0	3.0	0.00
19	DC805	50	90	none	2	0.5	0.1	45.0	2.5	0.1295	DEC	0.1	45.0	2.50
20	DC815	3	100	-6 Programmed skip	-6	0.0	0.0	3.0	0	0.1295	DEP	0.0	3.0	0.00
21	DC820	7	50	The customers were not opted into the rebate program.	4	1.0	1.0	3.5	3.5	0.1295	DEC	1.0	3.5	3.50
22	DC850	20	75	They were such a big consumer they had a very low KWh rate; Duke would have had them opt into the program, which would have cost them to do.	3	0.5	0.2	15.0	2.5	0.1295	DEC	0.2	15.0	2.50
23	DC895	2	100	-6 Programmed skip	-6	0.0	0.0	2.0	0	0.1295	DEP	0.0	2.0	0.00
24	DC900	1	100	-6 Programmed skip	-6	0.0	0.0	1.0	0	0.1295	DEC	0.0	1.0	0.00
25	DC955	175	75	-8 Don't know	1	0.0	0.0	131.3	0	0.1295	DEC	0.0	131.3	0.00
26	DC995	4	100	-6 Programmed skip	-6	0.0	0.0	4.0	0	0.1295	DEC/DEP	0.0	4.0	0.00
27	DC1020	1	100	-6 Programmed skip	-6	0.0	0.0	1.0	0	0.1295	DEP	0.0	1.0	0.00
28	DC1055	2	10	Type of light fixture we were installing or the incentive was not going to be worth it for the paperwork.	1	0.0	0.0	0.2	0	0.1295	DEC	0.0	0.2	0.00
29	DC1065	4	100	-6 Programmed skip	-6	0.0	0.0	4.0	0	0.1295	DEC	0.0	4.0	0.00
30	DC1105	5	100	-6 Programmed skip	-6	0.0	0.0	5.0	0	0.1295	DEC/DEP	0.0	5.0	0.00
31	DC1120	3	100	-6 Programmed skip	-6	0.0	0.0	3.0	0	0.1295	DEC	0.0	3.0	0.00
32	DC1135	400	64	Not having eligibility.	1	0.0	0.0	256.0	0	0.1295	DEC	0.0	256.0	0.00
33	DC1160	2	100	-6 Programmed skip	-6	0.0	0.0	2.0	0	0.1295	DEP	0.0	2.0	0.00
34	DC1375	100	50	Negotiated electrical rates. If a customer (like a factory) has a rate that is lower than normal, if they receive a rebate they have the possibility of losing the lower rate.	5	1.0	1.0	50.0	50	0.1295	DEC	1.0	50.0	50.00
35	DC1385	12	90	A lot of the new designs they don't request or expect that.	1	0.0	0.0	10.8	0	0.1295	DEP	0.0	10.8	0.00
36	DC1410	6	70	One customer had opted out, they couldn't get any benefits.	1	0.0	0.0	4.2	0	0.1295	DEC	0.0	4.2	0.00
37	DC245	1	35	Most of the time they opted out in the past and took other incentives so they could not get the rebate	2	0.5	0.9	0.4	0.325	0.1295	DEC	0.9	0.4	0.33
38	DC70	5	100	-6 Programmed skip	-6	0.0	0.0	5.0	0	0.1295	DEC	0.0	5.0	0.00
39	DC430	2	100	-6 Programmed skip	-6	0.0	0.0	2.0	0	0.1295	DEC/DEP	0.0	2.0	0.00
40	DC905	20	75	Not offered	5	1.0	0.3	15.0	5	0.1295	DEP	0.3	15.0	5.00
										NPSO		39.4	990.3	128.2
							39.37	990.28	128.21	0.1295				12.95%

Hirons Exhibit 4. Database Showing DEC and DEP NPSO Calculations

Column / Row #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	NewID	P1	P3	NS1	NS2	NS2Score	Service Territory	NPSO (P3, NS2Score)	NPSO_weight (P1, P3)	calc (NPSO, NPSO_weight)	(DEC) NPSO (P3, NS2Score)	(DEC) NPSO_weight (P1, P3)	(DEC) calc (NPSO, NPSO_weight)	(DEP) NPSO (P3, NS2Score)	(DEP) NPSO_weight (P1, P3)	(DEP) calc (NPSO, NPSO_weight)
1	DC1110	2	100	-6 Programmed skip	-6	0.0	DEP	0.0	2.0	0.00				0.0	2.0	0.00
2	DC55	130	3	Lack of awareness of incentive availability.	1	0.0	DEC	0.0	3.9	0.00	0.0	3.9	0.0			
3	DC510	8	3	The customer was not signed up for the Duke Energy program.	3	0.5	DEP	16.2	0.2	3.88				16.2	0.2	3.88
4	DC550	3	100	-6 Programmed skip	-6	0.0	DEP	0.0	3.0	0.00				0.0	3.0	0.00
5	DC855	2	5	They have their own central power plant	2	0.5	DEC	9.5	0.1	0.95	9.5	0.1	1.0			
6	DC1285	3	3	The site is not opted in to the program, there is not enough energy savings to qualify for the program	1	0.0	DEC	0.0	0.1	0.00	0.0	0.1	0.0			
7	DC80	1	100	-6 Programmed skip	-6	0.0	DEC	0.0	1.0	0.00	0.0	1.0	0.0			
8	DC90	105	45	They've already issued a PO before a custom incentive was approved. Where lighting is installed in apartments in tenets apartment no longer qualify. The payback period was too soon so they weren't eligible.	5	1.0	DEC/DEP	1.2	47.3	57.75	1.2	47.3	57.8	1.2	47.3	57.75
9	DC195	2	10	New construction were not asked to offer them any type of incentive or rebate for new construction	4	1.0	DEC	9.0	0.2	1.80	9.0	0.2	1.8			
10	DC240	1	100	-6 Programmed skip	-6	0.0	DEC	0.0	1.0	0.00	0.0	1.0	0.0			
11	DC515	1	100	-6 Programmed skip	-6	0.0	DEC	0.0	1.0	0.00	0.0	1.0	0.0			
12	DC565	3	100	-6 Programmed skip	-6	0.0	DEC	0.0	3.0	0.00	0.0	3.0	0.0			
13	DC575	200	90	The customer opted out. One project they did a study of being opted in and opted out and they decided to opt out - it would be less of a financial burden.	1	0.0	DEC/DEP	0.0	180.0	0.00	0.0	180.0	0.0	0.0	180.0	0.00
14	DC630	50	100	-6 Programmed skip	-6	0.0	DEC	0.0	50.0	0.00	0.0	50.0	0.0			
15	DC660	130	100	-6 Programmed skip	-6	0.0	DEC	0.0	130.0	0.00	0.0	130.0	0.0			
16	DC730	1	20	The project wasn't large enough to deem it necessary and we do a lot of new construction	1	0.0	DEC	0.0	0.2	0.00	0.0	0.2	0.0			
17	DC775	1	100	-6 Programmed skip	-6	0.0	DEC	0.0	1.0	0.00	0.0	1.0	0.0			
18	DC795	3	100	-6 Programmed skip	-6	0.0	DEC	0.0	3.0	0.00	0.0	3.0	0.0			
19	DC805	50	90	none	2	0.5	DEC	0.1	45.0	2.50	0.1	45.0	2.5			
20	DC815	3	100	-6 Programmed skip	-6	0.0	DEP	0.0	3.0	0.00				0.0	3.0	0.00
21	DC820	7	50	The customers were not opted into the rebate program.	4	1.0	DEC	1.0	3.5	3.50	1.0	3.5	3.5			
22	DC850	20	75	They were such a big consumer they had a very low KWh rate; Duke would have had them opt into the program, which would have cost them to do.	3	0.5	DEC	0.2	15.0	2.50	0.2	15.0	2.5			
23	DC895	2	100	-6 Programmed skip	-6	0.0	DEP	0.0	2.0	0.00				0.0	2.0	0.00
24	DC900	1	100	-6 Programmed skip	-6	0.0	DEC	0.0	1.0	0.00	0.0	1.0	0.0			
25	DC955	175	75	-8 Don't know	1	0.0	DEC	0.0	131.3	0.00	0.0	131.3	0.0			
26	DC995	4	100	-6 Programmed skip	-6	0.0	DEC/DEP	0.0	4.0	0.00	0.0	4.0	0.0	0.0	4.0	0.00
27	DC1020	1	100	-6 Programmed skip	-6	0.0	DEP	0.0	1.0	0.00				0.0	1.0	0.00
28	DC1055	2	10	Type of light fixture we were installing or the incentive was not going to be worth it for the paperwork.	1	0.0	DEC	0.0	0.2	0.00	0.0	0.2	0.0			
29	DC1065	4	100	-6 Programmed skip	-6	0.0	DEC	0.0	4.0	0.00	0.0	4.0	0.0			
30	DC1105	5	100	-6 Programmed skip	-6	0.0	DEC/DEP	0.0	5.0	0.00	0.0	5.0	0.0	0.0	5.0	0.00
31	DC1120	3	100	-6 Programmed skip	-6	0.0	DEC	0.0	3.0	0.00	0.0	3.0	0.0			
32	DC1135	400	64	Not having eligibility.	1	0.0	DEC	0.0	256.0	0.00	0.0	256.0	0.0			
33	DC1160	2	100	-6 Programmed skip	-6	0.0	DEP	0.0	2.0	0.00				0.0	2.0	0.00
34	DC1375	100	50	Negotiated electrical rates. If a customer (like a factory) has a rate that is lower than normal, if they receive a rebate they have the possibility of losing the lower rate.	5	1.0	DEC	1.0	50.0	50.00	1.0	50.0	50.0			
35	DC1385	12	90	A lot of the new designs they don't request or expect that.	1	0.0	DEP	0.0	10.8	0.00				0.0	10.8	0.00
36	DC1410	6	70	One customer had opted out, they couldn't get any benefits.	1	0.0	DEC	0.0	4.2	0.00	0.0	4.2	0.0			
37	DC245	1	35	Most of the time they opted out in the past and took other incentives so they could not get the rebate	2	0.5	DEC	0.9	0.4	0.33	0.9	0.4	0.3			
38	DC70	5	100	-6 Programmed skip	-6	0.0	DEC	0.0	5.0	0.00	0.0	5.0	0.0			
39	DC430	2	100	-6 Programmed skip	-6	0.0	DEC/DEP	0.0	2.0	0.00	0.0	2.0	0.0	0.0	2.0	0.00
40	DC905	20	75	Not offered	5	1.0	DEP	0.3	15.0	5.00				0.3	15.0	5.00
								39.4	990.3	128.2	22.9	951.2	119.3	17.7	277.3	66.6
										12.95%			12.54%			24.03%

PLAN

Nexant
Reimagine tomorrow.

Duke Energy Carolinas and Progress Smart $aver® Custom Program Evaluation Plan

Submitted to Duke Energy
October 14, 2020

1 Program Description

Duke Energy's Non-Residential Smart $aver® Custom Incentives offers financial assistance to qualifying commercial, industrial and institutional customers (that have not opted-out) in the Duke Energy Carolinas (DEC) and Duke Energy Progress (DEP) service territories to enhance their ability to adopt and install cost-effective electrical energy efficiency projects.

The Program is designed to meet the needs of Duke Energy's (the company's) non-residential customers with electrical energy saving projects involving more complicated or alternative technologies, or those measures not covered by the non-residential Smart $aver Prescriptive Program. The intent of the Program is to encourage the implementation of energy efficiency projects that would not otherwise be completed without the company's technical or financial assistance. The program requires pre-approval prior to the project implementation. Proposed energy efficiency measures may be eligible for customer incentives if they clearly reduce electrical consumption and/or demand.

The two approaches for applying for incentives for this Program are Classic Custom and Custom-to-Go. The difference between the two approaches focuses on the method by which energy savings are calculated. The documents required as part of the application process vary slightly.

The custom applications forms are located on the company's website under the Smart $aver® Incentives (Business and Large Business tabs). The application forms are offered in Microsoft Word (doc) and Adobe (pdf) format with the designated worksheet in Microsoft Excel format for projects saving more than 700,000 kWh annually. Customers can utilize provided calculation tools (Custom-to-Go, now Smart $aver Tools) for projects savings less than 700,000 kWh annually or submit worksheets in another format if preferred. Customers or their vendors submit the forms with supporting documentation. Forms are designed for multiple projects and multiple locations. Custom incentive application (doc or pdf) is submitted with one or more of the following worksheets:

- Classic Custom approach (> 700,000 kWh or no applicable Custom-to-Go calculator)
- Lighting worksheet (Excel)
- Variable Speed Drive (VFD) worksheet (Excel)
- Compressed Air worksheet (Excel)
- Energy Management System (EMS) worksheet (Excel)
- General worksheet (Excel), to be used for projects not addressed by or not easily submitted using one of the other worksheets
- Custom-to-Go Calculators, now Smart $aver Tools (< 700,000 kWh and applicable Custom-to-Go calculator)
- Lighting

- HVAC
- Compressed Air
- Fan
- Pump

The Company contracts with AESC to perform technical review of applications. Duke Energy contractors process applications as well as train and provide technical support to the Trade Ally (TA) network. All other analysis is performed internally at Duke Energy, including DSMore runs for every custom measure that is recorded by the program. Table 1-1 outlines the actual reported energy savings value for 2018 and 2019 program years.

Table 1-1: Actual and Expected Energy Savings

Utility	Energy Savings (Annual KWh)		
	2018	2019	Total
Duke Energy Carolinas	40,783,282	59,611,349	100,394,630
Duke Energy Progress	12,807,197	13,960,959	26,768,156

2 Key Research Objectives

Nexant, along with subcontractor Tetra Tech, (the Evaluation Team) has been retained to perform impact and process evaluations of Duke Energy Carolina's and Progress's Non-Residential Smart $aver® Custom Incentive programs for the 2018 and 2019 program years[1]. The evaluation team has identified the following key researchable questions and objectives for the process and impact evaluations.

2.1 Impact Evaluation Objectives

Over-arching project evaluation goals will follow the standard industry protocols and definitions, where applicable, and may include the Department of Energy Uniform Methods Protocol (DOE-UMP), as a likely example. As part of project goal setting, we have outlined the following activities to be completed for the program evaluation:

- Quantify accurate and supportable energy impacts (kWh) and summer and winter demand (kW) savings for energy efficient measures and equipment implemented in participants' facilities;

[1] This is further defined as January 1, 2018 through December 31, 2019.

- Assess the rate of free riders from customer and contractor perspective and determine spillover effects; and,
- Consider and verify measure installation vintage aligns with measure baseline definitions, i.e. early replacement, burnout on failure, etc.

2.2 Process Evaluation Objectives

The Smart $aver Custom Incentive program provides incentives for projects outside the standard prescriptive rebates available. The complexity and time required to identify eligible projects, obtain pre-approval, construct, and verify projects introduces a number of specific researchable issues. Table 2-1 contains a preliminary list of potential researchable issues and the data sources used to investigate each one. These will be further refined and prioritized based on our discussions with program staff.

Table 2-1: Process Evaluation Research Objectives and Data Sources

Preliminary Research Questions	Document Review	Interviews with Key Contacts	Participant Survey	Trade Ally Survey
How is the program promoted? What role do Duke Energy account representatives (i.e., account executives, business energy advisors, energy efficiency engineers and trade ally outreach representatives) play in helping customers identify and complete projects? Are contractors or vendors identifying potential projects?	✓	✓	✓	✓
Understand participant experience. What steps are involved in identifying and scoping projects and obtaining pre-approval? What issues emerge during the process? How are these addressed?		✓	✓	✓
Why do potential projects drop out? Are there opportunities to make the process simpler or more streamlined while maintaining robust quality control (QC)?		✓		✓
Is the uptake of custom vs. custom-to-go projects as expected? How do the projects and/or the customer experience differ between the two participation paths?	✓	✓	✓	✓
What is the customer's decision-making process regarding energy efficiency upgrades or equipment? How influential were various aspects of the program in their decision? How influential was the contractor they worked with?	✓		✓	✓

3 Impact Evaluation

For the impact evaluation, the Evaluation Team will use a variety of techniques to develop independent assessments of gross and net energy savings for each sampled project in Duke Energy's Carolinas and Progress Smart $aver Custom Programs. In order to estimate gross energy savings, all sampled custom projects will receive a desk review; project specific data collection, measurement and/or verification; and custom data analysis of savings.

Data collection will involve a combination of several activities, including: verifying equipment installation and operation; interviewing site contacts; deploying metering equipment; and collecting building automation system/energy management system (BAS/EMS) data. The level of rigor conducted for the data analysis will reflect the level of project documentation available prior to the evaluation (such as the data collected from existing metering and monitoring equipment), the uncertainty of the savings estimate, and the magnitude of the project savings.

3.1 Data Collection and Analysis Methods

Desk reviews are a critical pre-cursor to determining the project specific variables to be collected during subsequent data collection activities. The desk review for each sampled project will seek to answer questions such as: are the data files of the sampled projects complete, well documented, and adequate for calculation and reporting of savings; and, are the calculation methods used correctly applied, appropriate, and accurate?

Nexant is employing alternative data collection methods during the Covid-19 pandemic to manage the risk of exposure to the virus for the safety of the Duke Energy customers and Nexant staff. These alternative data collection methods are defined as the following three tiers:

Tier 1 – In-person Site Visits - A Nexant engineer visits the project site and meets with the site contact to review the project and collect data first hand. This allows the Nexant engineer to take spot measurements, install metering equipment and visually verify the installations. This tier will be reserved for projects with a large number variables and higher magnitudes of uncertainty that can be better defined and/or reduced by collecting specific information on-site that would not be available using the other two tiers.

Tier 2 – Virtual Site Visits - A virtual site visit uses software to connect the site contact's mobile device to the Nexant engineer's computer. This software enables the Nexant engineer to see live video and audio as the site contact walks through their facility. The Nexant engineer is able to direct the site contact to the specific areas and equipment associated with the efficiency project. The Nexant engineer is able to capture pictures from the participant's mobile device camera and ask questions of the site contact. This tier is used for visually verifying equipment installs over the virtual software and directing the participant to collect specific

equipment information (name plate info, counts, BMS schedules, etc.) that can be identified and collected with the help of the site contact.

Tier 3 – Enhanced Desk Reviews - An enhanced desk review will use phone interviews and/or teleconferences (with screen sharing) with the participant or site contact to review the project documentation and collect answers to the Nexant engineer's questions. This tier will be used for simple projects that can be verified using project documentation and information collected from the site participant (schedules, fixture counts, run times, etc.)

The choice of which tier is used will be based on many factors including the complexity of the efficiency project, the comfort level of the participant with conducting in-person site visits or the virtual site visit technology.

The data collection and analysis activities will be conducted at one of two levels of rigor for each sampled project—basic or verification-only (V) and enhanced or measurement and verification (M&V). The rigor and method will be selected based on the measure type and the uncertainty and the magnitude of the reported savings estimate. For projects selected for enhanced level of rigor, an M&V approach will be developed based on our review of the calculation methods and assumptions used for determining project level energy savings (if available). The evaluation team will submit site specific M&V plans to Duke Energy prior to implementation. The basic and enhanced levels of rigor associated with IPMVP[2] protocols are described here.

Basic Rigor: Simple Engineering Model (SEM) —This level of rigor is equivalent to IPMVP Option A Retrofit Isolation: Key Parameter Measurement. This method uses engineering calculations, along with a limited number of important parameters, to verify the savings resulting from specific measures. SEMs are often used for calculating impacts for measures such as lighting, appliances, motors, and cooking equipment. Based on a review of historical and current program participation, lighting energy efficiency measures are most prevalent, so this method is expected to be utilized often.

Enhanced Rigor: Retrofit Isolation Engineering Models —This level of rigor is executed in accordance with IPMVP Option B Retrofit Isolation: All Parameter Measurement. This method uses engineering calculations, along with time series data, to verify the savings resulting from specific measures. One example where this method could be used is a lighting retrofit where both power draw and hours of operation are logged.

Enhanced Rigor: Billing Analysis —The approach to billing analyses follows the protocol detailed in IPMVP Option C Whole Facility. The regression analysis is performed on

[2] Efficiency Valuation Organization (EVO) "International Performance Measurement and Verification Protocol (IMPVP) Concepts and Options for Determining Energy and Water Savings Volume 1", April 2007, page 19.

consumption data and statistically adjusts for key variables that change over time (e.g., weather) and are correlated with consumption (e.g., occupancy and schedule changes).

Enhanced Rigor: Whole Building Simulation —The final enhanced level of rigor follows the IPMVP Option D protocol where computer energy models are employed to calculate savings as a function of the important independent variables. The models must include verified inputs that accurately characterize the project and must be calibrated to match actual energy usage. This method can be applicable to many types of measures affecting the HVAC end use and is often used for new construction and building shell upgrades.

Nexant will also utilize the Department of Energy Uniform Methods Project protocol for the applicable measure categories. The protocols that have been developed to-date include:

- Commercial and Industrial Lighting Evaluation Protocol
- Commercial and Industrial Lighting Controls Evaluation Protocol
- Commercial New Construction Evaluation Protocols
- Compressed Air Evaluation Protocols
- Chiller Evaluation Protocols
- HVAC Controls (DDC/EMS) Evaluation Protocols
- Variable Frequency Drives Evaluation Protocols

Through our data collection and analysis activities, Nexant will verify the energy and demand savings that result through the normal operation of the implemented measures. Nexant acknowledges the disruptions the COVID-19 pandemic has had on business operations but we are assuming these disruptions are temporary in the context of the number of years the majority of the measures deliver savings. Nexant will attempt to quantify the impacts these temporary disruptions are having on the performance of the implemented measures and assess the likelihood they would continue for a significant amount of the measure useful life.

3.1.1 Site-Specific M&V Plans

Nexant will generate written site-specific M&V plans (SSMVPs) for each project in the evaluation sample. Each SSMVP will include the following sections:

- Project description and explanation of how the project saves energy.
- Selected data collection tier and level of rigor for project analysis.
- Explanation of Nexant's intended energy analysis methodology.
- Definition of on-site M&V activities and data collection requirements.

SSMVPs will be provided to Duke Energy for review and feedback at least two weeks prior to the on-site visit.

3.1.2 Peak Period Definition

Demand savings will be evaluated based on the definition of the peak period provided by Duke Energy, as summarized in Table 3-1.

Table 3-1: Definition of Peak Demand Periods

	Summer	Winter
Month	July	January
Hour	4pm – 5pm	7am – 8am

3.2 Sampling Plan

3.2.1 Sampling Plan for DEC

Table 3-2 outlines the final proposed sampling plan for Duke's Carolinas service territory based on data collection activity (verification and/or M&V) and the program delivery stream method (Classic versus Custom to Go). Impact sample sizes target a 90/10 confidence / precision based on the participation counts of the evaluation period and an assumed coefficient of variation (Cv) or 0.5. The sampling plan shown in Table 3-2 is based upon program participation levels for the combined 2018 and 2019 program years.

Table 3-2: Duke Energy Carolinas Final Custom Sampling Plan

Utility	Data Collection Activity	Custom to Go	Classic	Total
Duke Energy Carolinas	Share of Participation	28%	72%	100%
	Site Visits – On-site Measurement	11	29	40
	Site Visits – On-site Verification	5	13	18
	Total	**16**	**42**	**58**

3.2.2 Sampling Plan for DEP

Table 3-2 outlines the proposed sampling plan for Duke Energy Progress's service territory based on data collection activity (verification and M&V) and the program delivery stream methods (Classic versus Custom to Go). Impact sample sizes target a 90/10 confidence precision based on the participation counts of the evaluation period and an assumed coefficient of variation (Cv) or 0.5. The sampling plan shown in Table 3-3 is based upon program participation levels for the combined 2018 and 2019 program years.

Table 3-3 : Duke Energy Progress Final Custom Sampling Table

Jurisdiction	Data Collection Activity	Custom to Go	Classic	Total
Duke Energy Progress	Expected Share of Participation	19%	81%	100%
	Site Visits – On-site Measurement	10	29	39
	Site Visits – On-site Verification	4	13	17
	Total	**14**	**42**	**56**

3.2.3 Planned Sampling Stratification Approach

The Evaluation Team recommends stratifying the participant populations by technology category (lighting vs. non-lighting) and relative magnitude of savings (kWh) to ensure that the evaluated sample represents the population make-up of the total program-level savings and in order to achieve higher statistical precision by reducing the variability within the sample. Our proposed stratification approach and sample targets for DEC are summarized in Table 3-4 and for DEP are summarized in Table 3-5.

Table 3-4: Stratified Sampling Plan for DEC

Strata	Population	Pop Reported Savings (kWh)	Proposed Sample Size
L-Large (≥360 MWh)	59	41,747,348	9
L-Small (<360 MWh)	369	25,107,218	23
NL-Large (≥538 MWh)	13	21,106,809	10
NL-Small (<538 MWh)	101	12,433,255	16
Total	542	100,394,630	58

For the DEC jurisdiction, the Evaluation Team recommends using a savings threshold of 360 MWh for determining whether a project is assigned to the Large vs. Small stratum for Lighting (L) projects and 538 MWh for Non-lighting (NL) projects. These thresholds were calculated based on an analysis of the DEC 2018-2019 population using the Dalenius-Hodges methodology.

Table 3-5: Stratified Sampling Plan for DEP

Strata	Forecasted Population	Forecast Pop Reported Savings (kWh)	Proposed Sample Size
L-Large (≥123 MWh)	33	10,478,150	8
L-Small (<123 MWh)	211	6,301,713	21
NL-Large (≥259 MWh)	13	6,371,065	11
NL-Small (<259 MWh)	35	3,617,228	16
Total	292	26,768,156	56

For the DEP jurisdiction, the Evaluation Team recommends using a savings threshold of 123 MWh for determining whether a project is assigned to the Large vs. Small stratum for Lighting (L) projects and 259 MWh for Non-lighting (NL) projects. These thresholds were calculated based on an analysis of the DEP 2018-2019 population using the Dalenius-Hodges methodology.

3.3 Verification and Quality Control

Nexant's quality control procedures for the Non-Residential Custom program evaluation includes careful monitoring of the quality of work and deliverables to ensure production of the highest quality product consistent with demand side management energy evaluation industry practices and standards and the terms of the SOW and Agreement. Our current QC processes that are in place includes:

- Creation of the Quality Assurance Checklist to ensure potential risks are identified and mitigated, the quality plan is effectively communicated and understood, and periodic review of the Checklist to confirm adherence
- Introduction of standardized analysis tools to all staff involved in the project and discussions on how the evaluation will collect data applied during the analysis phase
- Discussions about confidentiality and how to handle personal identifiable information (PII)
- Careful planning and training for site inspections. Because of the importance of the site inspection to the evaluation findings, site inspections are carefully planned, ensuring that site inspectors have the appropriate experience, training, and equipment to conduct comprehensive inspections that collect all relevant data and customer satisfaction is maintained.
- Designated checklists, staff and time to review the quality, prior to delivery to Duke Energy, of:
    - Each Site Specific Measurement and Verification Plan (SSMVP)

    - Each Measurement and Verification Report, and
    - The final results of the evaluation for each territory
- The analysis of final impact results and the calculation of strata and program realization rates will be reviewed by the Project Manager and a second staff member to ensure results are correctly calculated and free of errors. This second staff member will not have been involved in the analysis so they may provide and fresh perspective on the data and algorithms. The review will cover each sample project result and follow those results up to the calculation of each strata realization rate, NTG ratios, and the application of these parameters to the population data sets.
- Integration of Nexant's sub-contractors (Tetra Tech) into quality control processes. Nexant's approach in working with subcontractors is to them as full partners in the evaluation process including QC development and implementation, including the following:
- Include TetraTech in the development of initial Evaluation Plan and Quality Control Checklist, and provide final Plan to TetraTech to follow during evaluation.
- Prior to delivery of process evaluation surveys, analysis results, and deliverables prepared by TetraTech to Duke Energy, Nexant conducts an independent quality control review. This includes all NTG scores and their application of the score to the gross verified results.

3.4 Recording and Data Exchange Format

Nexant will perform the impact analysis of the Smart $aver Custom Program in MS-Excel. Duke can provide consumption data and program tracking data in the electronic format of its choosing. All results and findings, including regression output and goodness of fit statistics, will be documented in a MS Word report. Any supporting data files requested by Duke will be transmitted in MS Excel for review.

4 Net-to-Gross Analysis

Customers have made the decision to participate in the program and are aware of the program services they received and could answer questions about their decisions to participate. Thus, we propose using self-report surveys to collect data needed to determine net savings for the Smart $aver Custom Program.

A well-designed self-report survey is very cost-effective to implement. Our team members have used the same types of questions and methods for implementing, analyzing, testing, and documenting self-reports as the most rigorous evaluations performed across the U.S. It is a best practice to use set-up questions to assist respondents in recalling their decision-making process and any issues they were having with the old equipment. It is also important to ask questions that rule out rival hypotheses and mitigate the effects of self-report bias.

The evaluation team plans to utilize the net-to-gross approach described in the Pennsylvania Evaluation Framework[3] since the states where Duke operates do not have similar guidance documents, and Pennsylvania is regional to Duke's territories. The framework provides an established approach to estimating freeridership and participant spillover. We will also incorporate trade ally feedback into freeridership results and use the trade ally survey to gather information to estimate nonparticipant spillover. A draft version of the net-to-gross questions and scoring approach are attached to this plan, but the final version of the survey might result in changes to scoring.

The participant net-to-gross approach involves two component scores: intention and influence. To assess intention, respondents are asked about the likelihood of carrying out the energy efficient measure *without* the program's support (also known as counterfactual). Responses are scored on a scale from 0 to 50. To assess influence, participants are asked a second line of questions that require the respondent to rate the influence of various program aspects on their decision to complete the program-qualifying project. Again, responses are scored from 0 to 50. The freeridership score is the sum of the intention and influence scores. These resulting freeridership scores range from 0% to 100%, where 0% indicates the program was highly influential in the customer doing the project and 100% indicates the program was not influential and the customer was likely to do the project without the program. The use of equally-weighted component scores is consistent with several other net-to-gross methodologies, as identified in a net-to-gross methodology study completed in Massachusetts, although the component scores differ across approaches.[4]

In addition to the core NTG questions, we will include one or more consistency check questions. When responses to the influence and intention questions are inconsistent, we will review the answers to the consistency check questions. If the consistency check responses clearly support lower freeridership, we will divide the initial freeridership score in half. If the consistency check responses clearly support higher freeridership, we will increase the initial freeridership score by half the difference from 100%. For example, if the initial freeridership score is 50, and the consistency check questions support *lower* freeridership, the final score for the respondent would be 25. Conversely, if the consistency check questions suggest *higher* freeridership, the final score would be 75.

The self-reporting surveys are also a useful means of collecting information on participant spillover. Spillover is an estimate of savings resulting from installing energy efficient equipment without a program incentive but that still were influenced by the program. Information is collected on the type of energy-efficiency equipment that was installed, but for which an incentive was not received, to estimate energy savings. Participant spillover may be either like

[3] http://www.puc.pa.gov/Electric/pdf/Act129/SWE_PhaseIII-Evaluation_Framework050818.pdf

[4] http://ma-eeac.org/wordpress/wp-content/uploads/Net-to-Gross-Methodology-Research.pdf

spillover (the same equipment that received an incentive through the program) or unlike spillover (other types of equipment). For like spillover, we ask the respondent to estimate the size of the non-program project in relation to the program project and calculate spillover savings by applying the respondent's estimate to the program project's savings. For example, if the respondent reports a lighting project that was 10% the size of the program project, the spillover savings is 10% of the program project's savings. Following this, we ask respondents to rate the influence of the program on their decision to install the equipment despite not receiving an incentive. That rating, ranging from 0% to 100%, is multiplied by the spillover savings. The result of this calculation is program-attributable spillover. This number is divided by the total verified gross energy savings for the program to produce a program spillover ratio.

For unlike spillover, we ask the respondent to describe the type of equipment they installed, including the efficiency level and number installed. Due to the uncertainty around estimating savings for commercial customers based on the limited information we can gather through the survey, we will report the types of unlike spillover but will not calculate savings for these measures.

We will also conduct trade ally interviews to support net-to-gross in two ways. First, for customers who rate their contractor as highly influential on project decisions, we will ask that trade ally to rate the influence of various aspects of the program on the customer's project. These ratings get incorporated directly into that customer's freeridership analysis. In addition to freeridership questions, we will also ask trade allies questions to estimate nonparticipant spillover. This nonparticipant spillover is "like spillover" (the same type of equipment as the trade ally installed through the program), but it is installed by program nonparticipants. We ask the trade ally to estimate the number of projects completed outside of the program, compared to the number of projects completed through the program, and also ask the trade ally to rate the influence of the program on these non-program projects.

The net-to-gross research will be conducted in coordination with the process evaluation. We will implement a combined customer survey that includes both process and net-to-gross questions. Similarly, we will ask trade allies both process and net-to-gross questions. The sample design for the survey will be driven by net-to-gross requirements. We will design the sample to achieve +/- 10% relative precision at 90% confidence. The sample will be stratified as described in the Impact Evaluation section above to ensure that we account for differences between technologies and project sizes.

The net-to-gross sample will be independent of the gross impact sample, however due to the stratification approach and stratum sizes, we expect some overlap in the samples. We will coordinate between the net-to-gross and impact evaluations to identify this overlap and manage customer interaction between these activities to respect Duke Energy's customer relationships.

Customer-level freeridership and spillover scores will be weighted to the program level using a combination of stratum-level weights and record-level weights. Stratum-level weights account for disproportionate sampling and survey response at a stratum level. Record-level weights account for the differences in savings between projects.

5 Process Evaluation

Process evaluation activities are designed to support continuous program improvement by identifying successful program elements that can be expanded or built upon as well as underperforming or inefficient program processes that could be holding back program performance. Data collection for process evaluations can include a variety of sources, but typically involves interviews or surveys with key contacts involved in program operations, participating customers, and contractors and trade allies that identify project opportunities.

We will develop data collection instruments designed to explore the research questions identified in Table 2-1, and propose one wave of data collection for participant and trade ally surveys. Responses will be reviewed against the prior evaluation to further identify areas of success or opportunities for improvement. Table 5-1 summarizes the combined process evaluation data collection activities for Duke Energy Carolinas and Duke Energy Progress by program year.

Table 5-1: Summary of Process Evaluation Data Collection Activities

Target Group	2018 and 2019
Staff Interviews[5]	Up to 6 In-Depth Interviews
Participant Surveys[6]	Up to 80 Telephone Surveys
Drop Out Interviews[7]	Up to 10 Interviews

[5] Staff in-depth interviews will be conducted with the Duke Energy Carolinas/Progress program manager, account manager, trade ally outreach team manager, and implementer. The programs two application processing sub-contractors will also be interviewed.

[6] Participant surveys will be designed to gather information for up to two technologies per site. Surveys will be conducted to study changes in participant awareness, behavior, and decision making. The actual number of surveys to be completed will depend on the number of program participants. Sample will also be stratified by DEC and DEP jurisdictions to ensure we received feedback from each territory.

[7] Drop out interviews will depend on the availability of sample. Interviews will be used to understand why customers did not move forward with the project through the program and identify any barriers to program participation.

Trade Ally Surveys	~20 Telephone Surveys[8]

5.1 Program Staff Interviews

In-depth interviews with program staff including the program manager, account manager, trade ally outreach team manager, and vendor staff are essential components of the evaluation and establish a foundation for all evaluation activities. The Evaluation Team will conduct qualitative interviews early in the evaluation with program staff to understand the programs as they are being offered in Duke Energy's Carolinas/Progress territories. The interviews assess the background, intended operations, and processes of the program's stated (and unstated) goals and objectives. The interviews also identify the perceived barriers to program up-take, previous experience with the program, and modifications to any program components based on the previous program cycle as well as the rationale for those modifications. This information provides the context necessary to develop and implement all other process and impact evaluation efforts. Information from these interviews can also highlight issues that should inform the development of customer surveys and trade ally interviews.

5.2 Customer Surveys

Collecting survey data from program participants provides data suitable for quantitative analyses and will support process, impact and net-to-gross activities. Analyses for the process evaluation will focus on participant characteristics, satisfaction with key aspects of the program, effects of the program on decisions to install measures, program awareness and preferred sources of information, and barriers to participation. Modules will be created for customers who utilized different program offerings such as the Fast Track.

We will develop questionnaires for participating customers for the Duke Energy Carolina/Progress territories by building off those from the prior evaluation. To the extent possible, we will maintain a consistent set of core questions across surveys that will ensure comparable measures and support portfolio-level analysis for both process and net-to-gross. Consistent questions are also essential for comparative analyses of participants: differences in question wording, question order, or response format will reduce reliability and undermine comparisons between groups over time. Establishing a set of core questions that remain unchanged will also make pre- and post-field activities, such as programming surveys or preparing data cleaning more efficient by eliminating or minimizing the need for additional programming at each execution. The core set of questions also allows for a longitudinal review

[8] Reaching the stated target will be dependent upon the total number of trade allies active in the DEC and DEP jurisdiction during the evaluation period.

of results across evaluation years. Each survey will be developed in collaboration with Duke Energy program staff.

Knowing that these large customers are important relationships for Duke Energy, we will also coordinate with key account and program managers to ensure that they are aware of all communications occurring with these key customers and we will send advance notification letters on Duke Energy letterhead alerting the customer that they have been randomly selected to participate in evaluation efforts to support program improvement. The letter will include contact information they can use to nominate an appropriate survey contact or to schedule a call. Within three days we will follow up with phone outreach and schedule a convenient time for project contacts.

5.3 Trade Ally Surveys

Custom programs include a variety of types of trade allies and encompass large and complex projects that require pre-approval. For these programs to be successful, trade allies must be able to access and use calculation tools, navigate pre-approval processes, and communicate the steps involved to project representatives. The importance of these market actors in large custom programs requires understanding their experience with program processes, pre-approvals, customer decision making, and persistent barriers to additional projects. We will develop a survey instrument, utilizing the prior evaluation form to dive into these program areas. Duke Energy program staff will review and provide feedback on the survey prior to any survey efforts.

6 Evaluation Schedule

Table 6-1 outlines the draft evaluation schedule with general timelines for each activity. Exact dates will be discussed and agreed upon with Duke Energy as the evaluation activities progress. Sampling and impact evaluation activities will occur in multiple rounds or ‘batches’, as needed. Project documentation (TRIFs) will be requested for each sampled project, and SSMVPs will be generated following documentation review and delivered to Duke Energy for review at least two weeks prior to going on-site.

Table 6-1 Duke Energy Carolinas and Progress Non-Residential Smart $aver® Custom Incentives Program Proposed Evaluation Schedule

Activity	Timeline
Impact Sampling	Mid - March 2020
Request project documentation	April 2020
Process Interviews with Program Staff	September 2020
Process Interviews with Implementer Staff	September 2020
Impact SSMVPs for Review	October - November 2020
Process Participant Survey for Review	October 2020
Impact Onsite Data Collection Activities	November - February 2020
Impact On-site reports, Spreadsheet and Summary Chart	March 2020
Process Participant Telephone Survey	November - January 2020
Process Trade Ally Survey	November - January 2020
Presentation of Results (Impact and Process)	April 2021
Draft Report	April 2021
Final Report	May 2021

Appendix A Standard Quality Checklist for Smart$aver Custom Program Evaluation Plan

Nexant adopted the following checklist to include quality assurance steps which are applicable to specific activities and risks involved in the Evaluation Plan that the quality checklist accompanies.

- Evaluation Plan is shared with project team members and review specific deliverables, Milestones, and the timeline of activities to meet deliverables' dates.
- Date Completed: 5/19/2020
- Completed By: Ron Shaw
- Work product risks are identified.
- Items:
- COVID-19 risks and restrictions
- Baseline Data performance?
- Not finding decision maker for NTG survey
- Limited metering allowed by customer
- Lack of project documentation
- Lack of program population to meet target sample sizes
- Date Completed: 5/19/2020
- Completed By: Ron Shaw
- Periodic client progress update meeting schedule is established.
- Date Completed: 5/19/2020
- Completed By: Jim Herndon
- Senior manager is designated to oversee quality plan and check deliverables prior to submission to Client. Jim Herndon
- Date Completed: 5/19/2020
- Completed By: Jim Herndon
- Standardized tools and templates are identified and distributed to all applicable team members.
- "MV Plan Template.doc" (See Appendix B for Examples of Site Specific M&V Plans)
- Date Completed: 5/19/2020
- Completed By: Ron Shaw
- All team members review applicable best practices.

- DOE Uniform Methods Project protocols for “Small Commercial and Residential Unitary and Split System HVAC Cooling Equipment-Efficiency Upgrade”, “Commercial and Industrial Lighting”, “Commercial and Industrial Lighting Controls”, “Chillers”, “Variable Frequency Drive”, “HVAC Controls”, “Compressed Air”
- Date Completed: 6/11/20
- Completed By: Ron Shaw
- Confidentiality and non-disclosure guidelines for project are reviewed with team members.
- Date Completed: 6/4/20
- Completed By: Ron Shaw
- Team member training gaps are identified and training plan(s) established.
- Date Completed: 6/11/20
- Completed By: Ron Shaw
- Product quality check lists are created and reviewed with team members for each deliverable.
- Date Completed: 6/11/20
- Completed By: Ron Shaw

Appendix B M&V Plan Template - Examples

The attached two documents are examples of Site Specific Measurement and Verification Plans (SSMVP) that will be created for each applicable sampled project for the Smart $aver® Custom program impact evaluation activities.


SSMVP Example - Nonlighting.pdf


SSMVP Example - Lighting.pdf

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TETRA TECH

Duke Energy
Smart $aver Custom Incentives Program
2020 Influential Vendor, Contractor Spillover and Process Survey

Objective

This survey instrument will be used for computer assisted telephone interviews (CATI) with participating contractors and customer-identified influential vendors in Duke Energy's Smart $aver Custom Incentives program to support the net-to-gross and process evaluations of the programs.

The survey will also ask non-influential vendor contractors about their sales practices to identify any nonparticipant spillover.

Sample Variables

CASEID Contractor case identification number

VEND_COMPANY Contractor company name
VEND_CONTACT Contractor contact name
VEND_CITY Contractor city
VEND_STATE Contractor state
VEND_ZIP Contractor zip

Phone_NUM Contractor contact phone number

VEND_EMAIL

VEND_KW
VEND_KWH
VEND_Incentive
VEND_QTY
VEND_PROJECT
VEND_ACCTS

IV Flag if the contractor is an influential vendor
- 0 Not an influential vendor
- 1 Influential vendor

MEASURE Summary of project measure implemented
- 1 lighting
- 2 process equipment
- 3 compressed air
- 4 HVAC
- 5 food service equipment
- 6 new construction

MEASURE_Desc Summary description of sampled measure category

MEASURE_TYPE Detailed description of sampled project, including specific measures installed

NC Sampled project is a new construction project
1 New construction
2 Not new construction

Custom_flag
0 Specific equipment
1 Custom project

Introduction

INT01 Hello, my name is _____, calling on behalf of Duke Energy. We are talking with design professionals and contractors participating in Duke Energy's SmartSaver energy efficiency programs for businesses. I'm not selling anything; I'd just like to ask you about your firm's recent experiences with this program.

[IF CONTACT NAME AVAILABLE] May I speak with <**VEND_CONTACT**>?

[IF CONTACT NAME NOT AVAILABLE] May I speak with the person who would be most knowledgeable about your firm's involvement with Duke Energy's programs?

01 Yes
02 No, R not knowledgeable [OTHER_R]

FAQ (**Why are you conducting this study**: Studies like this will help Duke Energy to continuously improve their business energy efficiency programs).

(**Timing:** This survey should take about 20 minutes. IF NOT A GOOD TIME, SET UP CALL BACK APPOINTMENT OR OFFER TO LET THEM CALL US BACK AT 1-800-454-5070.)

(**Sales concern**: This is not a sales call; we would simply like to learn about your organization's experiences with Duke Energy's energy efficiency programs. Your responses will be kept confidential.)

MULTCHK [ASK IF MULTFLAG=1] [INTERVIEWER QUESTION: Is this the first case of a multiple?

01 Yes, first case
02 No, subsequent case [SKIP TO INF1]

PREAMBLE I'm with Tetra Tech, an independent research firm. We have been hired by Duke Energy to evaluate their programs. I would like to assure you that your responses will be kept confidential and your name will not be revealed to anyone. For quality and training purposes, this call will be recorded.

01 Continue

Influential Vendor Screener

[IF IV = 0 SKIP TO NEXT SECTION, C1]

INF1 [ASK IF NC=0] Our records show that your firm specified, sold, or installed a <**MEASURE**> project for <**CUST_COMPANY**> at <**PREMISE_ADDR**> in **<PREMISE_CITY>** around <**INSTALLDATE**> that qualified for a Duke Energy incentive. This project would have included <**DESC_DETAIL**>. Do you recall this project? (Select one)

01	Yes, does recall	[SKIP TO INF4]
02	No, does not recall	
88	Don't know	
99	Refused	

INF1NC [ASK IF NC=1] Our records show that your firm was involved with designing or specifying a new construction project for <**CUST_COMPANY**> at <**PREMISE_ADDR**> in **<PREMISE_CITY>** around <**INSTALLDATE**> that qualified for a Duke Energy incentive. This project would have included <**MEASURE_TYPE**>. Do you recall this project? (Select one)

01	Yes, does recall	[SKIP TO INF4]
02	No, does not recall	
88	Don't know	
99	Refused	

OTHER_R1 Is there someone else at your firm who would be more familiar with this project? (Select one)

01	Yes	[RECORD CONTACT INFO FOR CALL NOTES]
02	No	[SKIP TO C1]
88	Don't know	[SKIP TO C1]
99	Refused	[THANK AND TERMINATE 91]

AVAILABLE_R1 May I please speak with that person? (Select one)

01	Yes, currently available	[SKIP TO INT01]
02	Yes, but R is not currently available	[INT15 – CALLBACK]
03	No	[SKIP TO C1]
88	Don't know	[INT15 – CALLBACK]
99	Refused	[THANK AND TERMINATE 91]

INF4 <**CUST_COMPANY**> indicated that you were influential in their decision to implement the < **MEASURE** > project through the program. Just to confirm, were you involved in the decision-making process at the design stage when the <**MEASURE** > project was specified and agreed upon for this facility? (Select one)

01	Yes	[SKIP TO C_MULT_SKIP2]
02	No	[SKIP TO OTHER_R1]
88	Don't know	[SKIP TO OTHER_R1]

Non-Influential Vendor Screener

[IF MULTCHK=2 SKIP SECTION, C_MULT_SKIP2]

C1 [ASK IF NC=0] Our records show that your firm specified, sold, or installed <**MEASURE**> equipment that qualified for incentives through Duke Energy's Smart Saver Custom program.

Is that correct? (Select one)

01	Yes	
02	No	[THANK AND TERMINATE 82]
88	Don't know	[THANK AND TERMINATE 81]
99	Refused	[THANK AND TERMINATE 91]

C1NC [ASK IF NC=1] Our records show that your firm was involved in designing or specifying new construction projects that qualified for incentives through Duke Energy's Smart Saver Custom program.

Is that correct? (Select one)

01	Yes	
02	No	[THANK AND TERMINATE 82]
88	Don't know	[THANK AND TERMINATE 81]
99	Refused	[THANK AND TERMINATE 91]

C2 Are you the person who would be most knowledgeable about your firm's <**MEASURE**> projects completed through Duke Energy's Smart Saver Custom program? (Select one)

01	Yes	[SKIP TO C_MULT_SKIP2]
02	No	
88	Don't know	

OTHER_R2 Is there someone else at your firm who would be more familiar with your firm's involvement in <**MEASURE**> projects completed through Duke Energy's Smart Saver Custom program? (Select one)

01	Yes	[RECORD CONTACT INFO FOR CALL NOTES]
02	No	[THANK AND TERMINATE 81]
88	Don't know	[THANK AND TERMINATE 81]
99	Refused	[THANK AND TERMINATE 91]

AVAILABLE_R2 May I please speak with that person? (Select one)

01	Yes, currently available	[SKIP TO INT01]
02	Yes, but R is not currently available	[INT15 – CALLBACK]
03	No	[THANK AND TERMINATE 91]
88	Don't know	[INT15 – CALLBACK]
99	Refused	[THANK AND TERMINATE 91]

Free-Ridership (asked only of Influential Vendors)

C_MULT_SKIP2 [IF MULTCHK=2 AND INF4<>1 SKIP TO THANK AND TERMINATE 86]

COMPANYCHK [ASK IF MULTCHK=02] [INTERVIEWER QUESTION: Is this case's <CUST_COMPANY> variable the same as a previous case's <CUST_COMPANY> variable?]

01	Yes, Duplicate company	[SKIP TO DECISIONCHK]
02	No, New company	[SKIP TO FR2]

DECISIONCHK [ASK IF COMPANYCHK=01] Now thinking about the project at <PREMISE_ADDR> in < PREMISE_CITY>, were the factors that influenced your recommendations to <CUST_COMPANY> the same or different from the previous project we just discussed?

01 Same decision making process [SKIP TO INT99]
02 Different decision making process

FR2 [IF INF4 <> 1 SKIP TO NEXT SECTION, P1] Now on a 1 to 5 scale, where 1 is "not at all influential" and 5 is "extremely influential", how would you rate the influence of the following factors in your recommendations to <**CUST_COMPANY**> for this project? (Select one for each) [RANDOMIZE QUESTIONS]

For FR2A through FR2E:
01 Not at all influential
02
03
04
05 Extremely influential
77 Not applicable
88 Don't know
99 Refused

a. The program incentive provided by Duke Energy?
b. Your interactions with Duke Energy program staff, including technical assistance?
c. Support from your Duke Energy trade ally outreach representative?
d. Program marketing, training, or informational materials?
e. Your firm's past involvement in Duke Energy's programs?
f. [IF PART_Q17=1] The energy design assistance provided by Duke Energy?

FR4 Was the program incentive incorporated into your pricing estimate or proposal to <**CUST_COMPANY**> for the project? (Select one)

01 Yes
02 No
88 Don't know
99 Refused

Program Influence on Sales of Qualifying Equipment (asked for Nonparticipant Spillover)

C_MULT_SKIP1 [SKIP TO INT99 IF MULTCHK=02]

P1 [IF INF4 = 1 SHOW: **"**Next,"] I'd like you to think about ALL of the program-eligible <**MEASURE_TYPE**> projects you sold or installed for Duke Energy's nonresidential customers over the past 12 months. I'd like to focus on projects where you installed the same types of <**MEASURE_TYPE**> equipment that you installed through the Smart Saver Custom program.

Over the past 12 months, approximately how many of these <**MEASURE_TYPE**> projects have you sold or installed within the Duke Energy service territory? (Enter whole number)

___ [ENTER NUMBER OF PROJECTS 0-1000]
0 None [SKIP TO S1]
8888 Don't know
9999 Refused

P2 Thinking about all of these <**MEASURE_TYPE**> sales, approximately what percentage do they make up of your total dollar sales of high-efficiency products in Duke Energy's territory? (Enter whole number)

[Interviewer note: We are referring to projects where you installed the same types of <**MEASURE_TYPE**> equipment that you installed through the Smart Saver Custom program.]

___ [ENTER PERCENTAGE 0-100]
888 Don't know
999 Refused

P3 Now thinking about those sales, approximately what percentage of these <**MEASURE_TYPE**> sales or installations in Duke Energy's service territory involved an incentive through Duke Energy's program? (Enter whole number)

[Interviewer note: We are referring to projects where you installed the same types of <**MEASURE_TYPE**> equipment that you installed through the Smart Saver Custom program.]

___ [ENTER PERCENTAGE 0-100]
888 Don't know
999 Refused

P10 What percentage of these <**MEASURE_TYPE**> sales or installations did you offer or talk about an incentive through Duke Energy's program? (Enter whole number)

___ [ENTER PERCENTAGE 0-100]
888 Don't know
999 Refused

P4 If the incentives or other assistance from Duke Energy's program were NOT available, do you think your company's overall sales of these types of <**MEASURE_TYPE**> equipment would have been about the same, lower, or higher than what you sold in the past 12 months? (Select one)

01 About the same
02 Lower
03 Higher
88 Don't know
99 Refused

P5 [ASK IF P4 = 2] By what percentage do you estimate your company's sales of these types of <**MEASURE_TYPE**> equipment would have been lower if Duke Energy's program was NOT available? (Enter whole number)

[IF NEEDED: Your best estimate is okay]

___ [ENTER PERCENTAGE 1-100]
888 Don't know
999 Refused

Nonparticipant Spillover

NS1 [ASK IF P3 < 100 AND P3 <> 888, 999 ELSE SKIP TO S1] Earlier you indicated that some of your <**MEASURE_TYPE**> sales did not involve an incentive through Duke Energy's program. Some qualifying projects may not receive incentives for one reason or another.

What are the main reasons why your firm or the customer did not pursue or receive an incentive for this program-eligible equipment?

[RECORD RESPONSE VERBATIM]

NS2 On a scale of 1 to 5, where 1 is "not at all influential" and 5 is "extremely influential", how influential was Duke Energy Smart Saver Custom program on your sales of energy saving <**MEASURE_TYPE**> projects that did NOT receive an incentive? (Select one)

01 Not at all influential
02
03
04
05 Extremely influential
88 Don't know
99 Refused

Program Satisfaction

S1 Next, I'd like to ask you just a few questions about your satisfaction with Duke Energy's Smart Saver Custom Incentives program.

Using a scale of 1 to 5, where 1 is "not at all satisfied" and 5 is "very satisfied", how would you rate your satisfaction with Duke Energy's Smart Saver Custom Incentives program overall? (Select one)

01 Not at all satisfied
02
03
04
05 Very satisfied
88 Don't know
99 Refused

S2 [ASK IF S1 = 1 OR 2] Why do you say that?

[RECORD RESPONSE VERBATIM]

S3 On the same scale of 1 to 5, where 1 is "not at all satisfied" and 5 is "very satisfied", how would you rate your satisfaction with… (Select one for each) [RANDOMIZE QUESTIONS]

For S3A through S3E:
01 Not at all satisfied
02
03
04
05 Very satisfied
77 Not applicable
88 Don't know
99 Refused

a. Your interactions with Duke Energy program staff?
b. The technical support provided by the program?
c. The type or variety of projects or equipment eligible for the program?
d. The incentives available through the program?
e. The amount of paperwork required by the program?
f. The time it takes to get an application approved

S5 How easy or difficult is it to understand the differences in equipment eligibility between the custom and prescriptive programs? (Select one)

01 Very easy
02 Somewhat easy
03 Neither easy nor difficult
04 Somewhat difficult
05 Very difficult
88 Don't know
99 Refused

S4 Do you have any recommendations for improvements regarding the program design or operations? (Select one)

01 Yes [RECORD RESPONSE VERBATIM]
02 No
88 Don't know
99 Refused

COVID

CV1 Overall, how has your organization been affected in 2020 by the COVID-19 pandemic? Has it been a…[READ LIST]

01 Large negative effect
02 Moderate negative effect
03 Little or no effect
04 Moderate positive effect
05 Large positive effect
77 Organization is closed/closing
88 [DO NOT READ] Don't know
99 [DO NOT READ] Refused

CV2 Please describe how your business operations changed in 2020 as a result of the pandemic.

[RECORD VERBATIM]

CV3 In your opinion, when do you think your business will return to its usual level of operations?

01 By the end of November 2020
02 By the end of December 2020
03 By the end of March 2021
04 By the end of June 2021
05 By the end of September 2021
06 Longer than September 2021
07 I do not believe this business will return to its previous usual level of operations
08 There has been little or no effect on this business's usual level of operations
88 Don't know
99 Refused

CV4 What impact has COVID-19 had on your recommendations?

01 No effect
02 Effect (specify)

Wrap-Up

E1 Just for classification purposes, approximately how many full time and part time staff does your firm employ at your location?

a. ___ Full-time [0-750]
b. ___ Part-time (includes seasonal employees) [0-750]
888 Don't know
999 Refused

E3 Do you have any additional comments that you would like to share with Duke Energy about their Smart Saver Custom Incentives program?

01 Yes (RECORD RESPONSE VERBATIM)
02 No

INT99 I'd like to thank you for your time with this important study. Have a good day.

Table 15. Preliminary Nonparticipant "Like" Spillover Rate

# of Agreements to VNP5–VNP7	Preliminary Nonparticipant "Like" Spillover Rate
3	100%
2	50%
1 or 0	0%

4.2.2.1 Nonparticipant Spillover Consistency Checks

To improve the reliability of the nonparticipant spillover estimates, two consistency check questions were also asked:

VNP4 In 2019, you mentioned that about <VNP3> of the <MEASURE CATEGORY> you specified and/or installed would have been eligible for an incentive through National Grid but did not receive an incentive.

What are the main reasons why your firm or the customer did not request a customer incentive for this energy saving equipment you specified/installed?

VNP8 Please describe what impact, if any, the National Grid offerings had on your decision to specify or install <MEASURE CATEGORY> outside of the National Grid programs and offerings.

Note that in the preliminary "like" spillover questions, we asked the respondent to refer to program-eligible equipment. Therefore, we ideally would have no cases that respond "did not qualify" to VNP4. However, in the event this response was provided, the preliminary nonparticipant estimate is reduced by 50 percent. We did not completely exclude "did not qualify" measures as nonparticipant spillover since this response only suggested some uncertainty about the eligibility requirements.

The final consistency question was asked to ensure that the responses given to the first set of nonparticipant spillover questions were consistent. The response to this last question was visually examined by two analysts. If the response to the last question contradicted the other responses, the adjusted nonparticipant spillover rate was reduced by one-half or increased by half the distance to 100 percent. For example, if a vendor agreed with all three statements about the impact of their past experience with the program on the installation of program-eligible equipment outside the program, they received a preliminary nonparticipant spillover estimate of 100 percent. If the main reason why they did not have the customer apply for the incentive was something other than "didn't qualify" (e.g., wasn't worth the paperwork hassle), the adjusted nonparticipant spillover rate remained at 100 percent. If, however, in the open-ended question the vendor said, "I would say that, let's see, it really didn't impact the business because our business is driven by more than rebates" or "I don't think it's had much" or "almost no" impact, the final nonparticipant spillover rate was reduced to 50 percent. These responses may indicate that the program influenced a number of installations/sales, but the customer/vendor did not want to prepare the paperwork to get the incentive. If a vendor agreed with two statements, they have a spillover rate of 50 percent. If during the consistency check, the vendor responded such as "I would not have sold nearly as much without the program incentives," then the spillover rate would increase from 50 percent to 75 percent.

Figure 6. Nonparticipant Spillover Scoring