Oklahoma Gas and Electric Company

Oklahoma Comprehensive Demand Program Portfolio

2020 Annual Report

In Accordance with Annual Reporting Requirements

Oklahoma Corporation Commission Utility Rules

165:35-41-7

July 1, 2021

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1.0 Executive Summary

Oklahoma Gas and Electric Company ("OG&E" or "Company") is submitting its Comprehensive Demand Program Portfolio Annual Report for 2020. This report is required to be submitted with the Oklahoma Corporation Commission ("OCC" or "Commission"") by July 1, 2021, pursuant to the Annual Reporting Requirements in OAC 165:35-451-7.

On July 2, 2018, OG&E filed a comprehensive portfolio of energy efficiency programs with the Oklahoma Corporation Commission for Program Years 2019-2021. This portfolio was approved by OCC Order No. 688933 in Cause No. PUD 201800074 on December 27, 2018. The focus of this report will be on the second Program Year ("PY2020"), spanning from January 1, 2020 to December 31, 2020, of the implementation cycle.

Below is a summary of the 2020 Demand Program Portfolio results.

2020 Summary of Results	Projected (Filed)	Actual	% Achieved
Expenses (with Labor)	$37,765,831	$33,964,158	90%
Net Energy Savings (kWh)	158,085,474	168,539,038	107%
Net Demand Savings (kW)	27,801	26,725	96%

Cost Effectiveness - TRC	1.37	1.62
Cost Effectiveness - PACT (UCT)	1.84	3.08
Cost Effectiveness - RIM	0.48	0.65
Cost Effectiveness - PCT	3.69	2.85
Cost Effectiveness - SCT	1.90	2.57

Levelized Cost per kWh	$0.030	$0.027

2.0 Demand Programs

OG&E offered customers four programs. Two of these programs were offered to residential customers, one to commercial/industrial and an educational program to all customers one for residential/commercial/industrial. The programs offered are the:

1. Home Energy Efficiency Program ("HEEP")
2. Weatherization Residential Assistance Program ("WRAP")
3. Commercial Energy Efficiency Program ("CEEP")
4. Education Program ("EP")

2.1 Demand Program Details

Program	Date Program was started or revised	Number of projects*	Actuals		
			Program Expenditure	Verified Net Energy Savings	Verified Net Demand Savings
HEEP	January 2010	155,197	$10,777,777	45,152,966	7,959
WRAP	January 2008	3,741	$5,706,472	13,008,395	3,562
CEEP	January 2013	840	$16,833,729	110,377,677	15,204
Total		159,778	$33,317,978	168,539,038	26,725

**The HEEP Number of projects includes lighting packages, (i.e., 88,500 packages were distributed to the Food Banks).*

Program	Date Program was started or revised	Number of Potential Customers	Customer Category	Number of Projects Completed in 2020
HEEP	January 2010	679,548	Residential Customers	155,197
WRAP	January 2008	211,157	Low Income Residential Customers	3,741
CEEP	January 2013	115,007	Commercial/Industrial Customers	840
Education	January 2010	794,555	All Customers	39

2.2 Summary of Demand Program Costs

Projected

Program	Projected Program Costs (Filed)						
	Administrative	Inducements	Education & Marketing	Program Delivery	EM&V	Allocated Labor	Total
HEEP	$150,000	$7,364,087	$70,000	$3,760,000	$567,250	$371,817	**$12,283,154**
WRAP	$150,000	$4,625,000	$205,000	$165,000	$257,250	$180,983	**$5,583,233**
CEEP	$150,000	$10,199,994	$70,000	$6,025,000	$822,250	$285,172	**$17,552,417**
Education	$0	$0	$0	$800,000	$0	$77,027	**$877,027**
Regulatory	$20,000	$0	$0	$0	$0	$0	**$20,000**
Planning	$100,000	$0	$0	$0	$0	$0	**$100,000**
Research & Development	$1,350,000	$0	$0	$0	$0	$0	**$1,350,000**
Total	**$1,920,000**	**$22,189,081**	**$345,000**	**$10,750,000**	**$1,646,750**	**$915,000**	**$37,765,831**

Actual

Program	Actual Program Costs						
	Administrative	Inducements	Education & Marketing	Program Delivery	EM&V	Allocated Labor	Total
HEEP	$61,609	$6,238,891	$11,226	$3,793,607	$304,418	$368,026	**$10,777,777**
WRAP	$38,463	$5,032,370	$296,928	$70,751	$126,338	$141,622	**$5,706,472**
CEEP	$72,435	$8,974,350	$2,579	$7,172,678	$381,946	$229,740	**$16,833,729**
Education	$0	$0	$0	$380,636	$0	$116,914	**$497,551**
Regulatory	$23	$0	$0	$0	$0	$0	**$23**
Planning	$61,323	$0	$0	$0	$0	$0	**$61,323**
Research & Development	$87,284	$0	$0	$0	$0	$0	**$87,284**
Total	**$321,135**	**$20,245,611**	**$310,733**	**$11,417,673**	**$812,702**	**$856,304**	**$33,964,158**

2.3 Summary of Energy and Demand Savings

Projected

Program	Projected (Filed)	
	Energy Savings (kWh)	Demand Savings (kW)
HEEP	50,478,211	8,969
WRAP	12,183,117	3,110
CEEP	95,424,146	15,722
Total	158,085,474	27,801

Actuals

Program	Actuals			
	Gross Energy Savings (kWh)	Gross Demand Savings (kW)	Verified Net Energy Savings (kWh)	Verified Net Demand Savings (kW)
HEEP	58,539,000	9,366	45,152,966	7,959
WRAP	12,984,274	3,427	13,008,395	3,562
CEEP	112,775,323	15,457	110,377,677	15,204
Total	184,298,597	28,250	168,539,038	26,725

2.4 Summary of Cost Effectiveness and Incentives

Projected

Cost Effectiveness Tests - Projected (Filed)					
Program	**TRC**	**UCT/PACT**	**RIM**	**PCT**	**SCT**
HEEP	1.93	2.18	0.50	5.43	2.81
WRAP	1.19	1.48	0.51	2.55	1.77
CEEP	1.25	1.96	0.47	3.25	1.63
Total	**1.37**	**1.84**	**0.48**	**3.69**	**1.90**

Projected Incentive	$5,444,375

Actuals

Cost Effectiveness Tests - Actuals					
Program	**TRC**	**UCT/PACT**	**RIM**	**PCT**	**SCT**
HEEP	1.90	2.52	0.63	3.60	3.13
WRAP	2.31	2.38	0.76	3.37	3.98
CEEP	1.45	3.81	0.64	2.55	2.22
Total	**1.62**	**3.08**	**0.65**	**2.85**	**2.57**

Actual Incentive	$5,072,329

3.0 Summary of Demand Portfolio Impacts

3.1 Summary of the Cumulative Portfolio Impacts

Program Year	Actual Costs	Filed Savings (kWh)	Verified Net Actual Savings (kWh)
2011	$18,201,000	45,492,000	60,743,000
2012	$14,515,000	45,492,000	65,902,000
2013	$40,939,000	90,315,000	82,315,000
2014	$47,352,000	137,112,000	103,076,000
2015	$42,336,000	143,917,000	100,412,000
2016	$33,342,000	95,524,000	133,011,000
2017	$37,587,000	96,994,000	147,479,000
2018	$37,225,000	92,349,000	173,918,000
2019	$35,111,399	158,009,167	155,696,390
2020	$33,964,158	158,085,474	168,539,038

3.2 Summary of the Portfolio Levelized Costs

Program	Levelized cost/kWh
Demand Portfolio	0.027
HEEP	0.033
WRAP	0.049
CEEP	0.021
Residential Sector	0.038
Commercial Sector	0.021
*Demand Portfolio includes Planning, Regulatory, and R&D Costs	

3.3 Summary of Demand Portfolio Funding and Energy Savings

Demand Portfolio Funding (DPF)	Total Annual Electric Revenue (TAER)	% DPF/TAER
$33,964,158	1,732,577,647	2.0%

Demand Portfolio Energy Savings (DPES) MWh	Total Annual Energy Sales (TAES) MWh	% DPES/TAES
168,539	24,590,220	0.685%

3.4 Summary of the Portfolio Lost Revenues

The PY2020 projected Lost Net Revenues (Filed) was $6,343,477. Actual Lost Net Revenues amounted to $12,220,372.

3.5 Utilities Annual Growth

Year	Annual Metered Growth Rate		Average Growth Rate		
	Energy	Demand	Residential	Commercial	Industrial
2018	25,398,037	6936	8,969,307	7,302,129	6,172,762
2019	25,797,421	6873	8,983,599	6,419,556	7,500,803
2020	24,590,220	6344	8,742,115	5,704,487	7,442,630
Average Growth Rate (2018-2020)	1.3%	-0.8%	2.5%	-5.4%	8.9%

3.6 Reduced Emissions and Water Consumption at Generation

2020	SO_2		NO_X		CO_2e		Fresh Water	
Portfolio	36	Tons	86	Tons	112,370	Tons	46.6	million gallons
Factors	0.4	lb/MWh	0.9	lb/MWh	1,230	lb/MWh	255.2	gallons/MWh

Customer Avoided Water purchase

In PY2020 residential water savings measures reduced residential customers' water consumption by 35,657,570 gallons. The water bill savings associated with the reduction in water consumption are applied as Non-Energy Benefits ("NEBs") in the ADM cost benefit analysis.

4.0 Details of Demand Programs

4.1 Weatherization Residential Assistance Program

The OG&E Weatherization Residential Assistance Program is a program designed for low income residential customers. Customers can enroll in the program by calling the OG&E call center or by logging on to OG&E's website (www.OGE.com/weatherization). This program allows the customer to participate in measures to assist in managing energy consumptions and therefore cost. OG&E residential customers are eligible to apply for WRAP if they own, rent, or lease their single-family home, duplex, or mobile home; have incomes at or below $60,000; or are owners of multifamily units whose rental units are 66% occupied by hard-to-reach customers pursuant to OAC 165:35-41-3 definition of "Hard-to-reach customers." WRAP is designed to improve the thermal envelope of the dwelling, thereby decreasing the amount of energy consumed and improving the comfort and safety of the home.

OG&E partnered with Central Oklahoma Habitat for Humanity and Rebuilding Together OKC, to enable these non-profit agencies to provide weatherization services to qualified OG&E customers. Additional homes were weatherized through a joint program made possible with funding from OG&E and Oklahoma Natural Gas ("ONG").

In 2020, OG&E weatherized 3,741 homes at an average cost of $1,345 per home. OG&E and ONG jointly weatherized 495 homes. One challenge and possible opportunity is that while the customers may be eligible for WRAP, the home may not qualify due to program restrictions for health and safety reasons. For health and safety reasons, OG&E will not weatherize a home that has unvented combustion space heaters or open flame heaters as its main source of heat. The challenge is to determine how to fix or modify these homes so that they can be weatherized safely, and still be cost effective.

4.2 Home Energy Efficiency Program

The Home Energy Efficiency Program consists of four program channels to access the residential customer market. The Residential Solutions channel addresses single-family and multi-family homes with efficient lighting, envelope, and other mechanical system measures. The heating, ventilation and air conditioning ("HVAC") Tune-up channel addresses HVAC units across all segments of the residential market. The Consumer Products channel offers rebates on lighting and other household equipment at point-of-purchase for residential customers. The School Outreach, a.k.a. LivingWise™, channel offers educational materials and kits with energy saving measures for students to take home and install. The Positive Energy New Home Construction channel addresses new residential homes constructed with comprehensive energy efficient standards. In PY2020, there were 1,395 in home assessments completed, 251 attic insulation submissions, 397 window submissions, 1,271 HVAC tune-ups completed, with 45 trade allies participating. Two trade allies performed 756 duct sealing projects in multi-family units, 407 rebates for new A/C units, and 354,000 bulbs distributed to Food Banks. In Consumer Products there were 6 measures available; 1,241,609 LED bulbs, 14,966 power strips, 566 bathroom ventilation fans, 848 A/C window units, 138 room air purifiers, and 342 water dispensers discounted through 6 different companies with 246 locations represented. The LivingWise™ Schools Outreach channel distributed 16,425 kits. There were 1,603 multi-family units completed, and 1,322 Positive Energy Homes were constructed with 38 builders participating. One of the challenges OG&E faced in PY2020 was the COVID-19 safety protocol. "Safety First" is the motto at OG&E, and customers along with trade allies, are top priority. OG&E stopped in home assessments, along with A/C tune up and multi-family installs, for almost 3 months. Once programs re-engaged, safety guidelines were provided by OG&E's legal team following CDC guidelines. Another challenge was in the Positive Energy New Home Construction channel. With the revocation of the federal incentive for energy efficient new home construction, maintaining builder interest was difficult.

Positive Energy New Home Construction

Program	Homes	Program Savings	
	Number of Homes	Energy Savings (kWh)	Demand Savings (kW)
Positive Energy New Home Construction	1,322	2,143,345	753

Program	Actual Program Costs						
	Administrative	Inducements	Education & Marketing	Program Delivery	EM&V	Allocated Labor	Total
Positive Energy New Home Construction	$76,760	$1,114,673	$2,006	$677,777	$54,388	$65,753	**$1,991,357**

Program	Cost Effectiveness Tests - Actuals				
	TRC	PACT	RIM	PCT	SCT
Positive Energy New Home Construction	.58	1.87	.83	.69	1.22

4.3 Commercial Energy Efficiency Program

The Commercial Energy Efficiency Program consists of six channels of customer participation opportunities. The Commercial & Industrial Solutions ("C&I Solutions") channel targets prescriptive and custom measures for commercial customers. The Commercial HVAC channel offers tune-ups for HVAC systems. The Schools and Government Efficiency ("SAGE") channel is designed to overcome the barriers that are unique to that market segment. Small Business Midstream discounts efficient lighting at point-of-purchase. Small Business Direct Install ("SBDI") targets small businesses for turn-key efficiency solutions. Continuous Energy Improvement ("CEI") targets large customers and provides operational, behavioral and other low/no-cost energy-saving opportunities. In PY2020, 108 different customers participated with 2,070 HVAC units tuned up; 8 trade allies completed the work. OG&E provided incentives to 24 school districts, and 8 city, state, and municipal customers, using 9 trade allies. 1,181 customers participated with 2,010 projects using 20 distributors accounting for 69 locations in the Midstream channel and completed 228 projects for Small Business with 29 trade allies. Large C&I had 150 customers participate with 39 trade allies completing 230 projects. Opportunities include more complex projects, more comprehensive measures, and new custom measures.

4.4 Education Program

The Education Program goal is to help customers make informed decisions about long-term energy efficiency and encourage participation in programs that will assist them in managing their energy costs. The Education Program provides presentations to all customer classes, helping them to make informed decisions about energy use. This program was able to actively engage with residential customers and communities across the OG&E service territory. Similarly, the C&I sector received educational services tailored to their needs. Despite the Pandemic, a total of 32 community events and 6 school projects were held in 2020 at various locations across the service territory.

The Education Program with the assistance of CLEAResult, was able to host a virtual, but hands-on National Energy Education Development (NEED) workshop for 60 teachers across the Oklahoma OG&E territory. Each teacher was shipped an activity box to participate in the activities with other teachers during the event. The Program also assisted with the delivery of over 20,000 Energy Education coloring books, activity books, and crayons, to the children receiving free lunches from drop off locations. Included with the books were OG&E program flyers. This effort combined energy education and OG&E program offerings with children needing activities during the beginning of the 2020 Pandemic. Five thousand adult energy saving activity books were delivered to homebound seniors during the pandemic as well.

#	Name of Group	Group Size
1	Home and Garden Show Bennett Center SF	
2	MLK Work days	
3	Widow and Widowers Norman	40
4	OCCC	32
5	Kids Keep Ridge Crest ELEM	58
6	KIDS KEEP CROMWELL ELEM	47
7	ENID HONOR STUDENTS	216
8	United Way of Durant	150
9	Hands of Hope Durant	120
10	Crest Baptist Church Mid-Del	21
11	Gentle Dental Mid Del	8
12	Credit Auto Mid-Del	6
13	Del City Chamber	14
14	Discount tires Del City	22
15	STEED ELEM / coloring books and WX flyers	150
16	Barnes ELEM	88
17	Del City Recreation employees	36
18	Ricks tax service	7
19	Integris Del City	40
20	Best doughnuts	5

#	Name of Group	Group Size
21	Hudiburg	12
22	Burger King	9
23	Padgham Auto Del City	18
24	2 K nails	12
25	NAPA AUTO	8
26	ENID / FRANCHISE BAGS DROP OFF/FIREHOUSE	45
27	CONT. POLICE STATION	100
28	BOARD OF EDUCATION	154
29	PRAIRIE QUEEN-GEO SCHOOL	650
30	CROOKED OAKELEM	550
31	SHIDLER ELEM	420
32	Northern Ok College employees/Enid	84
33	Northwestern OSU	52
34	Small businesses'/Enid	40
35	Muskogee Teacher pop-up	
36	Thunder School event	roughly 1250
37	NEED Virtual Conference	60
38	Turkey Giveaway Perry Media	300+
39	Magic 104.1 toy/Red Andrews Christmas	

4.5 Research and Development

The R&D program approved by the Oklahoma Corporation Commission in Case No. PUD 201800074 as part of the current 2019-2021 demand portfolio includes two projects:

1. Utility-scale battery pilot ("Battery Pilot")
2. Geotargeted neighborhood behavior/EE program advancement pilot ("Geotargeting Pilot")

Both projects remained underway in 2020 despite the significant impact of the COVID-19 pandemic, with the following summary status:

Research and Development Program	Status
Battery Pilot	• Phase 1 laboratory emulation completed • Phase 2 field demonstration preparation underway
Geotargeting Pilot	• Ongoing execution, data collection and modeling • Initial development of data visualization and reporting facility

Impact of COVID-19

The safety protocols implemented by OG&E to address the COVID-19 situation had a significant impact on R&D execution. Field delivery of energy efficiency ("EE") programs emphasized in the Geotargeting Pilot was largely suspended for the period March 16 through June 8, with in-person outreach likewise curtailed from March 16 through year-end. More broadly, OG&E staff shifted to an offsite, remote work environment and access to OG&E facilities, including the laboratory at which execution of the Battery Pilot is based, by contractors and other non-OG&E personnel was prohibited. Nonetheless, progress continued to be made through a combination of innovative approaches to offline and remote work and pivoting to project activities not dependent on in-field or onsite presence.

Project #1 – Battery Pilot

The Battery Pilot seeks to provide a deeper understanding of the potential dispatch and impact of batteries in real-world applications as an EE measure, battery safety and how to manage it, and how batteries can be integrated into OG&E's distribution system. There are three pilot hypotheses:

1. Battery systems can be a cost-effective EEDR measure as determined by the Oklahoma Total Resource Cost Test ("TRC").
2. Battery systems can be safely and effectively deployed and operated on the OG&E distribution system.

3. Battery systems can improve load factor on those parts of the OG&E grid to which they are connected (e.g., substations, circuits) by offsetting demand (i.e., kW) required to be served by the grid.

OG&E continues to conduct the Battery Pilot by exploring deployment and dispatch of batteries for demand response and attendant energy cost savings associated with electric vehicle ("EV") charging.

2020 results include:

Phase 1 – Laboratory emulation

- Hypothesis #1: Determined that batteries must drop below the installed cost of the laboratory demonstration system ($1000/kWh). Depending on the specific project; this cost threshold is anticipated to be achieved within the next 2-3 years
- Hypothesis #2: Safely and effectively completed emulation of three battery dispatch scenarios to support Level 3 (high voltage direct current) electric vehicle supply equipment ("EVSE").
- Hypothesis #2: Initiated examination of electrical dynamics of the distribution system with respect to the two-way power flows batteries would create.
- Hypotheses #3: Confirmed an optimum discharge scenario that minimizes battery discharge while ensuring no additional load is placed on the grid from Level 3 EVSE charging.

Phase 2 – Field demonstration

- Initiated preparation for physical EVSE demonstration.

Project #2 – Geotargeting Pilot

The Geotargeting Pilot seeks to explore leveraging existing EE programs without substantial alteration to target a defined area of the distribution system in order to assess the ability of such targeting to increase participation in EE programs, particularly by hard to reach ("HTR") populations, and for that to reduce distribution system loading as measured by peak capacity (i.e., kW) and secondarily seasonal and annual energy (i.e., kWh). The pilot asks the question, "Can DPR programs 'move the needle' with respect to distribution system loading?" by considering four pilot hypotheses:

1. Geotargeting of DPR programs in an area with high concentrations of HTR customers will generate a deeper understanding of the barriers to EE program participation among HTR customers and how to overcome such barriers.
2. The Pilot will result in a demonstrable increase in EE program participation within the test neighborhood year-over-year and relative to the control neighborhood.
3. The adoption of EE program measures in the test area will reduce distribution transformer (over)loading at peak year-over-year within the test neighborhood and relative to the control neighborhood.

4. The adoption of EE program measures in the test area will reduce summer seasonal energy delivered through distribution transformers year-over-year within the test neighborhood and relative to the control neighborhood.

OG&E continues to conduct the Geotargeting Pilot by geotargeting marketing and outreach to a test neighborhood with a high concentration of HTR customers and significant distribution transformers in South Oklahoma City, and comparing it to a similar control neighborhood east of Lake Overholser that receives EE programs and services on a business as usual basis as well as to itself over time.

2020 results include:

- Hypothesis #1: Completed market characterization and barriers research into the South Oklahoma City test neighborhood in order to tailor marketing and outreach to the specific needs and barriers present.
- Hypothesis #2: Continued to collect and manage EE program and load data despite modest levels of EE program participation due to COVID-19.
- Hypothesis #2: Enhanced EE production reporting to quantify disqualifications of Weatherization Residential Assistance Program ("WRAP") enrollees and participation.
- Hypotheses #3-4: Updated work and data modeling plans to reflect 2020 COVID-19 interruption.

Created conceptual mock-ups of new data visualization and reporting facility under development.

5.0 Implementers

Below is a table that identifies all implementers involved in the Demand Programs.

Company	Name	Business Address	Business Email Address	Business Phone Number
Skyline Energy Solutions	Jamie O'Bryant	PO Box 718, Pauls Valley, OK	skylineenergy@yahoo.com	(405) 238-7800
Frontier Associates LLC	Jean Krausse	1515 S. Capital of Texas Hwy Suite 110, Austin, TX	admin@frontierassoc.com	(512) 372-8778
CLEAResult	Jeremy Sims	210 Park Ave. Suite 1000, Oklahoma City, OK	jeremy.sims@clearesult.com	(405) 507-3017
AM Conservation	Lee Moran	6650 Echo Ave Suite A Reno, NV 89506	LMoran@amconservationgroup.com	(775) 685-6134

6.0 High Volume Electricity User Opt-Out

High Volume Electricity User Opt-Out - Energy Efficiency - All Customers

Metric	Total Electric Sales	Eligible to Opt-Out	% of Eligible Opt-Out	Opted Out	% of Opted Out
Electric Sales (GWh)	24,543	9,165	37%	6,107	25%
Number of Customers		10,309		2,619	

High Volume Electricity User Opt-Out - Energy Efficiency - Municipal & State

Metric	2020		
	Opt-Out Eligible	Chose to Opt-Out of EE Programs	% Opt-Out
2020 Electric Sales (GWh)	2,654	375	14%
Number of Accounts	15,599	798	5%

7.0 Attachments

7.1 ADM Evaluation Measurement and Verification with Cost-Effectiveness Report

ADM

ENERGY RESEARCH AND EVALUATION

Oklahoma Gas & Electric (OG&E) Oklahoma Demand Program Evaluation for PY2020

Final Report

Prepared for:

Oklahoma Gas & Electric (OG&E) in Oklahoma

In accordance with annual reporting requirements:

Title 165: Oklahoma Corporation Commission
Chapter 35. Electric Utility Rules
Subchapter 41. Demand Programs
165:35-41-7. Reporting

May 20, 2021

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1 Executive Summary

This report presents an evaluation of the performance of the Demand Portfolio of energy efficiency programs offered by Oklahoma Gas and Electric (OG&E) in 2020. OG&E is submitting this report to fulfill the requirements outlined in Title 165: Oklahoma Corporation Commission Chapter 35. Electric Utility Rules Subchapter 41. Demand Programs 165:35-41-6.

On July 02, 2018, OG&E submitted a comprehensive portfolio of demand Programs to the Oklahoma Corporation Commission (OCC) for Program Years 2019-2021. This portfolio was approved by the OCC in Cause No. PUD 201800074 by Order No. 688933 on December 27, 2018. The focus of this report is participation in the demand programs during program year 2020 (PY2020) of the implementation cycle, spanning from January 1, 2020 to December 31, 2020.

1.1 Demand Program Offerings

OG&E offered three programs, two residential programs and one commercial and industrial (C&I) program. ADM evaluated the results for the entire portfolio of demand programs. These programs and program channels are listed below. Detailed descriptions for the residential and commercial programs can be found in Section 2.1.

- **Home Energy Efficiency Program (HEEP)**
  - Residential Solutions (RSOL)
  - LivingWise® Schools Outreach
  - Residential HVAC Replacement & Tune-up
  - Consumer Products
  - Positive Energy – New Home Construction (PE-NHC)
- **Weatherization Residential Assistance Program (WRAP)**
- **Commercial Energy Efficiency Program (CEEP)**
  - Commercial and Industrial Solutions (CIS)
  - Schools and Government Efficiency (SAGE)
  - Small Business Direct Install (SBDI)
  - Small Business Midstream
  - HVAC Replacement and Tune-Up
  - Continuous Energy Improvement (CEI)
  - Retro-commissioning (RCx)
  - Networked Lighting Controls (NLC)

Program impacts, including reported and verified annual energy savings and peak demand reduction during PY2020, are summarized in the following sections. These will be expressed as *ex ante*, *ex post,* and net savings.

All impacts presented in this report represent energy (kWh) savings or peak demand (kW) reduction at-the-meter.

1.2 Evaluation Objectives

The goals of the PY2020 Evaluation Measurement & Verification (EM&V) effort are as follows:

- For prescriptive measures, verify that savings are being calculated according to appropriate Technical Reference Manual guidelines. For most measures, this constitutes applying Arkansas TRM version 8.1[1] (AR TRM) methodologies.
- For custom measures, this effort comprises the calculation of savings according to accepted protocols (e.g., International Performance Measurement and Verification Protocol (IPMVP). This is to ensure that custom measures are cost-effective and providing reliable savings.
- Perform process evaluation for all programs and the portfolio overall. This provides a comprehensive review of program operations, marketing and outreach, quality control procedures, and program successes relative to goals. From this, we provide program and portfolio-level recommendations for OG&E. Process evaluation activities include interviews of key program actors, surveys of participants and non-participants, literature reviews and best-practices assessments, and documentation of program activities, successes, and shortcomings.
- Conduct net-to-gross assessments. We developed net-to-gross ratios specific to each program.

[1] The Arkansas Technical Reference Manual version 8.1 can be found here: http://www.apscservices.info/EEInfo/TRMv8.1.pdf. Please note that, throughout this document, the abbreviation “AR TRM” refers to V 8.1. Other references to any other versions will be specifically noted.

1.3 Evaluation Findings

OG&E's portfolio was successful. Table 1-1 shows the savings goals, reported gross impacts, evaluated *ex post* gross kWh savings and *ex post* gross kW reductions, gross realization rates, net impacts, net-to-gross (NTG) ratios, and lifetime impacts.[2]

Table 1-1: OG&E Portfolio Evaluation Impacts

Impact	Metric	HEEP	WRAP	CEEP	Total
Energy Savings (kWh)	Goals (Net)	50,478,211	12,183,117	95,424,146	158,085,474
	Reported (Gross)	58,539,000	12,984,274	112,775,323	184,298,597
	Evaluated (Gross)	64,112,114	13,008,395	112,812,861	189,933,370
	Realization Rate	110%	100%	100%	103%
	Evaluated (Net)	45,152,966	13,008,395	110,377,677	168,539,038
	NTG Ratio	70%	100%	98%	89%
	% of Goal (Net)	89%	107%	116%	107%
	Lifetime (Net)	487,705,861	201,370,344	1,198,931,653	1,888,007,858
Annual Demand Reduction (kW)	Goals (Net)	8,969	3,110	15,722	27,801
	Reported (Gross)	9,366	3,427	15,457	28,250
	Evaluated (Gross)	11,138	3,562	15,599	30,300
	Realization Rate	119%	104%	101%	107%
	Evaluated (Net)	7,959	3,562	15,204	26,725
	NTG Ratio	71%	100%	97%	88%
	% of Goal (Net)	89%	115%	97%	96%

The contribution to portfolio savings by program is summarized in Figure 1-1.

[2] Lifetime impacts are the sum of energy savings over the course of the measure's effective useful life (EUL) and the weighted average demand reduction across the lifetime of the measure divided by the EUL (in years).

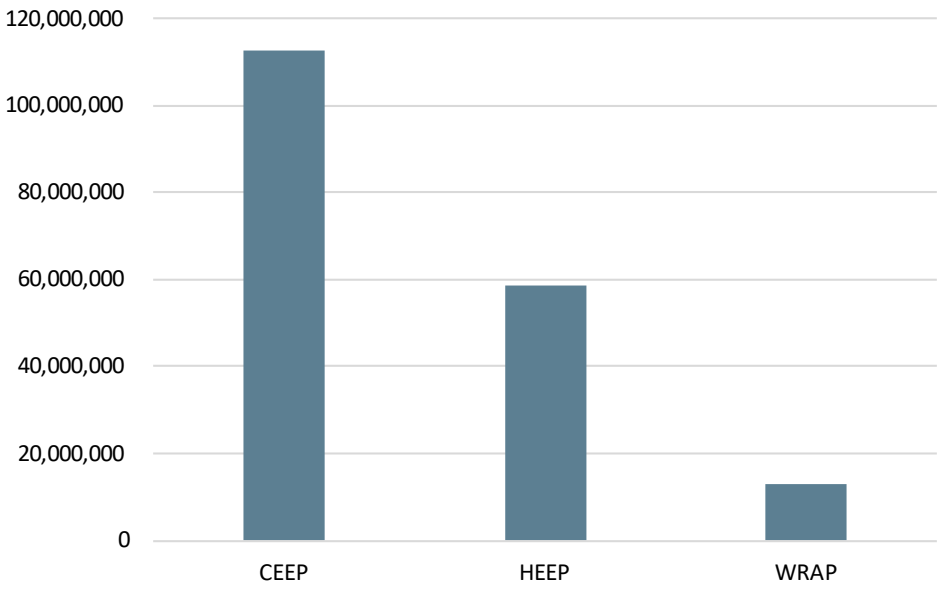

Figure 1-1: Contribution to Portfolio kWh Savings by Program

The *ex ante* energy savings grouped by measure categories for the residential programs can be seen in Figure 1-2.

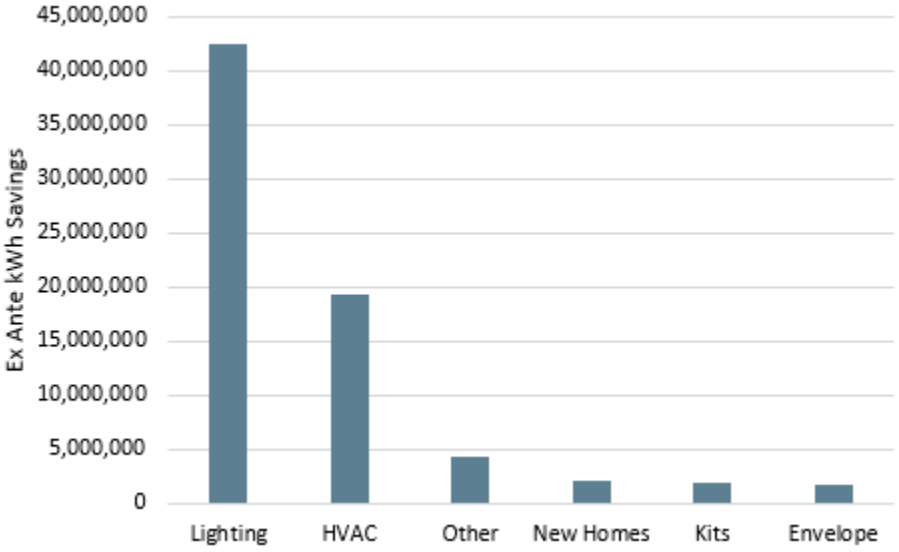

Figure 1-2: Contribution to Residential Savings by End-use

The savings share by end-use was different in the C&I program, shown in Figure 1-3. The majority of *ex ante* savings is attributed to Lighting (e.g., new construction, retrofit, and lighting controls). The Continuous Energy Improvement (CEI) Channel was the second largest contributor to savings.

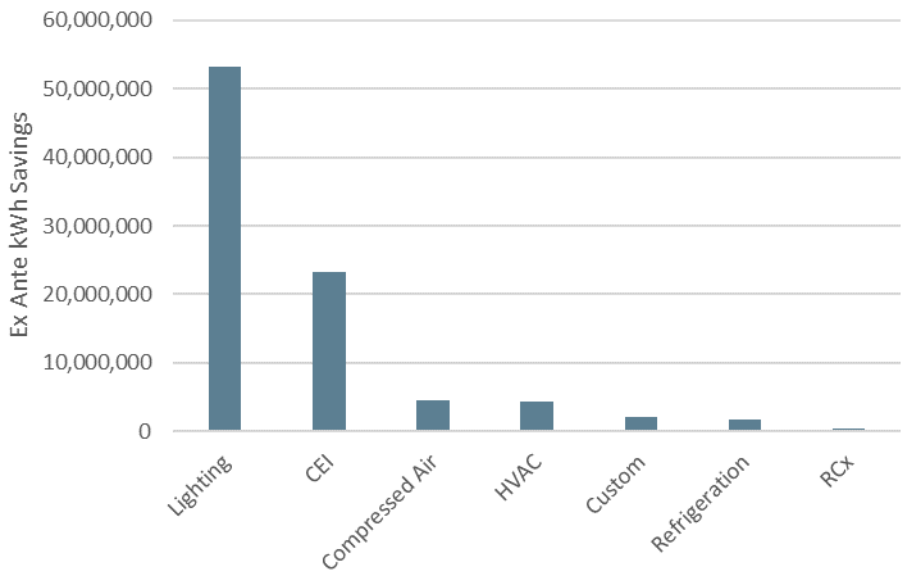

Figure 1-3: Ex Ante Energy Savings by Measure CEEP

Further, we put the net savings into the context of OG&E's PY2020 filed targets. Table 1-2 summarizes the performance against those targets of programs evaluated in this report.

Table 1-2: Program Performance against Energy Savings Targets (kWh)

Program	Verified Net Savings	2020 Net Savings Goal	% of Goal Attained
HEEP	45,152,966	50,478,211	89%
WRAP	13,008,395	12,183,117	107%
CEEP	110,377,677	95,424,146	116%
Total	**168,539,038**	**158,085,474**	**107%**

The program year budgets and actual spending, including OG&E labor expenses, are summarized in Table 1-3.

Table 1-3: Summary of Budgets and Actual Spend

Program	Budgeted Spend	Actual Spend	% Attained
HEEP	$12,283,155	$10,777,777	88%
WRAP	$5,583,233	$5,706,472	102%
CEEP	$17,552,416	$16,833,729	96%
Energy Education Res	$394,662	$223,898	57%
Energy Education C&I	$482,365	$273,653	57%
Planning	$100,000	$61,323	61%
Regulatory	$20,000	$23	0%
R&D	$1,350,000	$87,284	6%
Total	**$37,765,831**	**$33,964,158**	**90%**

1.4 Summary of Portfolio Benefit-Cost Ratios

We calculated the cost-effectiveness of OG&E's programs based on reported total spending, verified net energy savings, and verified net demand reduction for each of the Demand Programs. Additional inputs to the cost-effectiveness testing include estimates of line-loss adjustments, equipment measure life, discount rates, participant costs, and avoided costs. OG&E provided all program spending and economic inputs. The California Standard Practice Manual informs the methods used to calculate cost-effectiveness.[3]

The cost-effectiveness testing also includes Non-Energy Benefit (NEB) savings associated with water savings, when applicable. Several of the residential programs' measures result in reduced water usage and energy efficiency savings. For these measures, we calculated annual water reductions and used average costs of water ($/gallon) in the OG&E service territory to determine NEB impacts. The cost-effectiveness scores shown in Table 1-4 include these NEBs.

The specific tests used to evaluate cost-effectiveness are The Utility Cost Test (UCT), Total Resource Cost (TRC) Test, Ratepayer Impact Measure (RIM), Societal Cost Test (SCT), and Participant Cost Test (PCT). OG&E's 2020 portfolio of programs passes all these tests except the ratepayer impact measure. Few programs pass the ratepayer impact measure, so the latter finding is not unusual. The benefit-cost ratios developed through the cost-effectiveness analysis are presented in Table 1-4.

[3] California Standard Practice Manual: Economic Analysis of Demand Side Management Programs, October 2001. Available at: https://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=7741

Table 1-4: Cost-Effectiveness Estimates and Net Benefits Summary

Program	TRC	UCT	RIM	PCT	SCT	TRC Net Benefits
HEEP	1.90	2.52	0.63	3.60	3.13	$13,274,075
WRAP	2.31	2.38	0.76	3.37	3.98	$7,467,022
CEEP	1.45	3.81	0.64	2.55	2.22	$18,739,189
Energy Education Res	0.00	0.00	0.00	0.00	0.00	($223,898)
Energy Education C&I	0.00	0.00	0.00	0.00	0.00	($273,653)
Planning & Regulatory	0.00	0.00	0.00	0.00	0.00	($61,323)
Regulatory	0.00	0.00	0.00	0.00	0.00	($23)
R&D	0.00	0.00	0.00	0.00	0.00	($87,284)
Total	**1.62**	**3.08**	**0.65**	**2.85**	**2.57**	**$38,834,106**

1.5 Summary of Process Evaluation Conclusions

This section presents the high-level conclusions developed through process evaluation activities for the PY2020 portfolio. Additional details regarding these and other process evaluation conclusions and recommendations can be found in Section 4.7, Section 5.8, and Section 6.9.

Key Process Conclusions for HEEP

- HEEP participants were very satisfied with OG&E overall and individual HEEP Channels, despite some customers noting areas for potential improvement.
- The RSOL Channel's direct install/assessment track may reach a more diverse group of customers than its "major measure" track.
- Survey responses indicate that customers hear about OG&E's HEEP from various sources and that customers hear about different Channels or tracks in various manners. For example, the RSOL Channel's direct install/assessment track participants primarily heard about the Channel through bill inserts, whereas major measure track survey respondents indicated they learned about the opportunity from contractors and the OG&E website.
- Findings from ADM's interviews with participating builders generally indicate the PE-NHC Channel was an important factor in builders' decisions to build energy efficient homes. However, the extent of its influence is unclear.
- Interviews with Residential HVAC Replacement & Tune-up trade allies indicated that more communication and up-to-date customer contact information from HEEP staff would improve Channel implementation.

- There is an opportunity to streamline OG&E HEEP's multifamily energy efficiency improvement efforts. Survey responses from the Multifamily RSOL and Residential HVAC Replacement & Tune-up Channel suggest creating a marketing plan or outreach effort that includes all OG&E's offerings available for multifamily properties which could potentially streamline the sign-up and scheduling process and enable more property managers/owners to make more comprehensive improvements.

Key Process Conclusions for WRAP

- The program met its energy savings goals. When interviewed in Winter 2020, OG&E and Skyline contacts said WRAP would achieve its kWh savings and kW peak demand reduction goals for PY2020. ADM's review of final program data confirmed that the program attained its savings goals.
- Staff interviews and survey results indicate there is an opportunity to increase program participation with millennial OG&E customers.
- Overall program satisfaction was high, though a significant portion of respondents offered recommendations for program improvement. About one-third of respondents noted areas in which the program could improve, ranging from providing more communication to providing additional services.
- A larger portion of the program's participants were multifamily properties in PY2020 than PY2019, indicating an opportunity to expand or shift the program's focus to enroll multifamily properties. Similar to past program years, most participants were single family home residents. However, about 13% of participating homes were classified as either multifamily or duplexes in PY2020 compared to 6% in PY2019. ADM's conversation with the manager of a participating multifamily property in August 2020 suggested that OG&E's WRAP is a unique, impactful opportunity for multifamily properties to reduce energy usage and improve residents' comfort.

Key Process Conclusions for CEEP

- Program staff contacts indicated that OG&E's CEEP achieved its overall ex ante savings goal. Staff said the SAGE, SBDI, and CIS Channels were affected by the pandemic. However, they were able to strategize, adapt, and achieve considerable savings through these Channels.
- Survey responses and interviews indicate that trade allies are a strong source of Program awareness for the SBDI, SAGE, and CIS Channels. However, a more significant portion of CIS and SBDI survey respondents indicated learning about the Program from trade allies than SAGE respondents.

- According to the staff interview conducted with OG&E and CLEAResult, a major challenge in marketing to CIS customers was contacting the right person.
- Over half of Small Business Midstream Channel survey respondents reported their business had applied for and completed an OG&E induced lighting project in the past, indicating the CEEP may engender OG&E customers with interest in continuing to improve their facilities' energy efficiency.
- Survey results showed continued interest in more communication from OG&E regarding their available inducements and programs for business customers.
- Most survey respondents observed that the COVID-19 pandemic had a significant impact on their business, though a smaller portion noted that it had impacted their ability to take advantage of OG&E inducements. A significant portion (about one-third) said that it had not impacted their business or did not note any significant challenges caused by the pandemic.

2 Introduction

This report presents an evaluation of the performance of Oklahoma Gas and Electric's energy efficiency programs in 2020. OG&E is submitting this report to fulfill the requirements outlined in Title 165: Oklahoma Corporation Commission, Chapter 35., Electric Utility Rules Subchapter 41., Demand Programs 165:35-41-7.

2.1 Program Descriptions

Descriptions of each program and program Channel are below. Please note that these descriptions come from the 2019 – 2021 demand program plan.

2.1.1 Residential Portfolio Programs

- **Home Energy Efficiency Program:** This multipronged program helps OG&E's residential customers to reduce energy consumption by implementing energy efficient upgrades in their homes. Multiple Channel offerings provide homeowners with targeted choices to participate aimed at improving customer engagement, measure adoption (e.g., LED lighting), and program savings. The program consists of the following program Channels:
  - **Residential Solutions:** This market-driven HEEP Channel promotes EE by providing homeowners with low-cost home assessments, direct-install measures, community and educational outreach, and inducements for home retrofits. The inducements encourage participation by decreasing the upfront costs of energy efficient upgrades.
  - **Residential HVAC Replacement and Tune-up**: This HEEP Channel improves HVAC system efficiency within residences by providing inducements to improve operating efficiency of the existing unit or replace it with a higher efficiency unit.
  - **Consumer Products:** This HEEP Channel offers rebates for the purchase of efficient products, including lighting, power strips, and home appliances. To help customers offset a portion of the incremental cost associated with higher efficiency appliances and products, the program utilizes upstream, midstream, and downstream inducements.
  - **Positive Energy – New Home Construction:** The HEEP PE-NHC Channel is designed to work with builders and contractors and induce them to include energy efficient practices and measures when constructing new homes within the OG&E service area.

- **LivingWise® Schools Outreach:** This HEEP Channel consists of direct outreach through partnerships with local schools. Energy saving kits and educational materials are provided to 5th-grade students explaining how they can improve energy efficiency at their home. Teachers work directly with the program team to use the teaching aids and distribute the direct-install kits to their students. Students take the kits home and install the measures with the assistance of their parents.

- **Weatherization Residential Assistance Program:** The WRAP program has been designed to achieve energy savings by helping to improve the comfort and reduce energy costs for OG&E's residential customers. Residential customers are eligible to apply for WRAP if they own, rent, or lease their single family home, duplex, or mobile home and have incomes at or below $60,000. Property owners of multifamily units, whose rental units are 66 percent occupied by hard-to-reach customers pursuant to OAC 165:35-41-3 definition of "hard-to-reach customers," are also eligible to apply.

2.1.2 Commercial & Industrial Programs

- **Commercial Energy Efficiency Program:** The CEEP is designed to address the needs of OG&E's commercial and industrial customer base. Specifically, the program provides an umbrella of participation channels for all Commercial and Industrial customers to participate through a number of targeted paths that address a variety of unique participation barriers.
  - **Commercial and Industrial Solutions:** This CEEP channel offers inducements on both a performance and custom path for customers to perform energy upgrades. Technical support is also provided to assist in project identification and development.
    - Performance: The Performance Path provides inducements based on the estimated energy savings achieved with the measures installed.
    - Custom: The Custom Path gives participants an opportunity to achieve their energy efficiency goals by proposing measures that may be outside of the deemed measure list. Proposed measures are evaluated for savings and costs, and an appropriate inducement amount is approved if the project is deemed cost-effective.
  - **Networked Lighting Controls**– A new offering for this planning cycle. The CEEP NLC channel will take a graduated rollout approach given anticipated changes in product and system lines as well as the

development of deemed values for advanced lighting control systems. Furthermore, the program will take a graduated approach to trade ally outreach and education to align delivery with market maturity.

- **Continuous Energy Improvement (CEI)**: The CEEP CEI channel engages large C&I customers and institutional customers, like school districts, with a goal of leveraging cost savings from no and low-cost measures to drive more capital-intensive projects through the prescriptive and custom tracks.
- **Schools and Government Efficiency (SAGE):** The CEEP SAGE channel offers assistance to the institutional and public sectors to overcome barriers to energy improvement that are unique to their market segment, such as conflicting organizational goals, outdated specifications, limited technical knowledge, and rigid energy budgeting. The channel also encourages the prioritization of energy planning in the general management of facilities.
- **Small Business Midstream:** The CEEP channel offers point of sale inducements for qualified products to OG&E commercial customers through participating local and national distributors. This program channel offers an opportunity to participate in EE programs for those contractors and end-users who otherwise would have a hard time participating and/or applying through another CEEP channel.
- **Small Business Direct Install (SBDI):** The CEEP SBDI channel is targeted to OG&E small business customers that have an annual peak demand of 150 kW or less, or that have multiple locations with a combined peak demand of 250 kW or less. The channel drives participation through an extensive contractor network. Contractors provide direct installation of low-cost energy efficiency measures, facility walk-throughs, and inducements for a suite of prescriptive energy efficiency measures. SBDI participants are also eligible to participate in the Commercial and Industrial Solutions program if the customer's needs are beyond the scope of services outlined within this channel.
- **Retro-commissioning**: The CEEP RCx channel is a new offering with three major components for this planning cycle. RCx is available to facilities with an annual peak demand over 150 kW. This channel provides comprehensive system energy optimization studies allowing participants to identify low and no-cost, long-term improvement strategies. Inducements are also offered on a $/kWh basis to address recommendations. Additionally, RCx participants will receive recommendations for higher cost system improvements, and can

address those through the CIS channel. Another component of the RCx channel is the Express Building Tune-Ups ("EBTU") offering for this planning cycle. The EBTU offers an option to smaller commercial customers, or to those who lack the necessary capital outlays to participate in RCx. The third component is C&I Assessments ("CIA") which offers a streamlined energy survey with simplified "find and fix" opportunities for participants.

2.2 Program Implementation & Strategic Alliances

OG&E has several full-time employees dedicated to the implementation of demand programs. Additionally, OG&E entered contracts with several energy services companies and contractors to aid in program implementation.

CLEAResult (CR) was contracted to implement most Channels of HEEP and the entirety of the CEEP. The WRAP is managed in-house by OG&E, with Skyline Energy Solutions conducting audits and measure installation. Frontier Associates is responsible for hosting the program database and calculating *ex ante* savings for program measures. OG&E contracted with AM Conservation to provide energy efficiency kits distributed to students through the LivingWise® Schools Outreach Channel in HEEP.

2.3 Evaluation Measurement and Verification

OG&E engaged ADM Associates, Inc. to conduct evaluation, measurement, and verification (EM&V) of its Demand Program portfolio. The ADM staff evaluated each program within the OG&E portfolio for PY2020.

2.4 High Impact Measures (HIM)

This section outlines the High Impact Measures for each program and sector in the OG&E portfolio of Demand Programs. A HIM is a measure responsible for more than 5% of the sector's total savings.

2.4.1 Residential Programs

Two measures, LED lighting and duct sealing, represent HIMs. Those measures, along with the percentage of savings and total energy savings, are shown in the figure below.

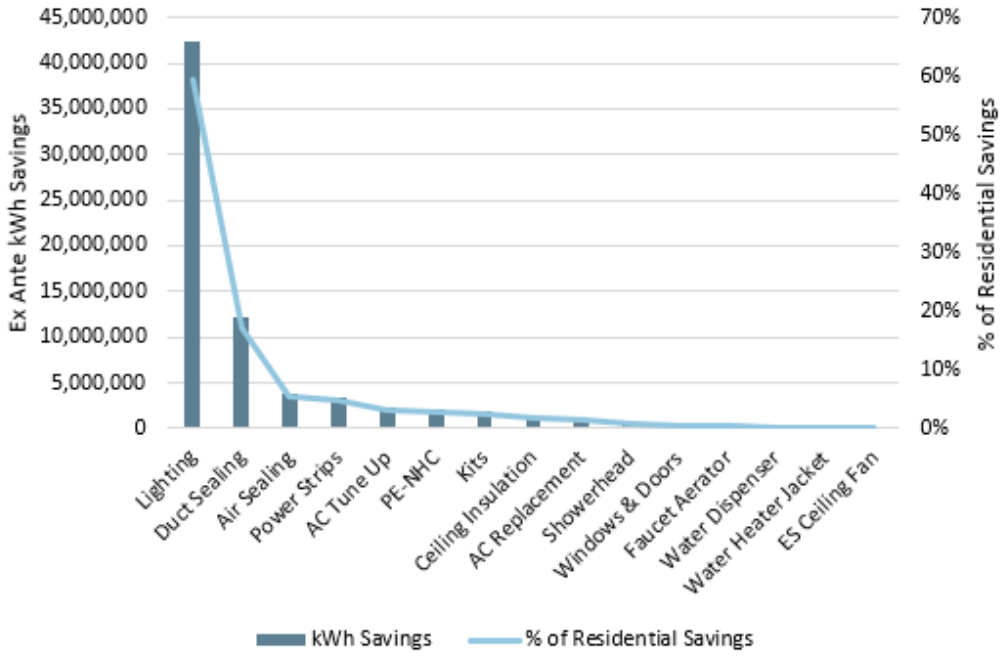

Figure 2-1: Residential High Impact Measures

2.4.2 C&I Programs

Figure 2-2 shows the energy savings of measures installed through OG&E's C&I program. The overwhelming majority of program-level *ex ante* savings were due to lighting measures. High efficiency lighting and lighting controls accounted for the majority of program-level savings. Within the high efficiency lighting measures, projects were categorized within three measure categories, depending on the project type: new construction, retrofit, and Small Business Midstream lighting. The contributions to the *ex ante* savings of each of these are shown in Figure 2-2 below.

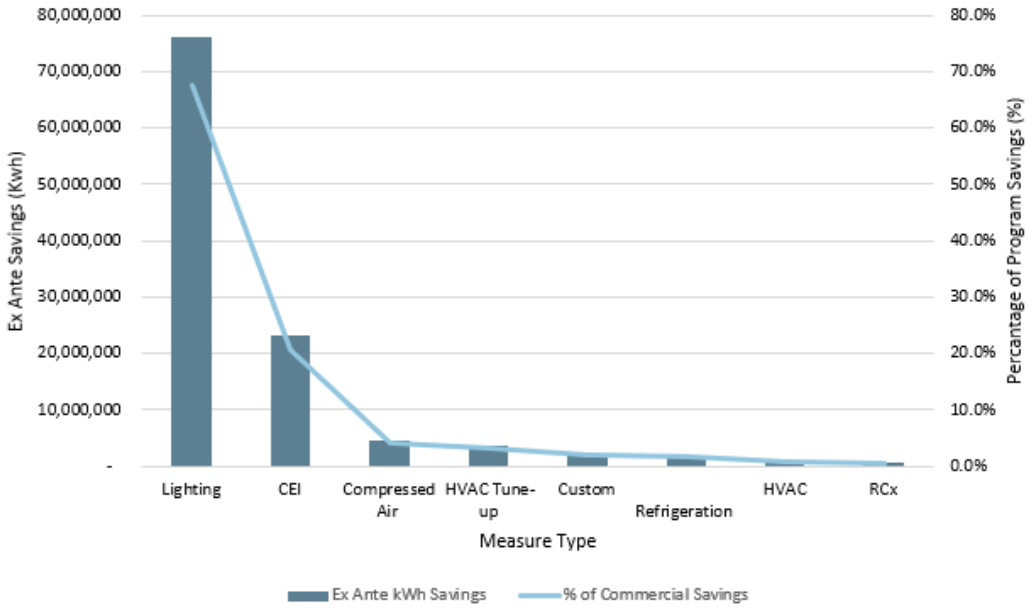

Figure 2-2: C&I Measures by End-Use

3 Methodology

3.1 Introduction

This section details general impact evaluation methodologies by program-type as well as data collection methods applied. This section will present full descriptions of:

- Gross Savings Estimation;
- Sampling Methodologies;
- Free Ridership Determination;
- Process Evaluation Methodologies; and
- Data Collection Procedures.

3.2 Glossary of Terminology

As a first step to detailing the evaluation methodologies, we provide a glossary of terms used throughout this report:

Deemed Savings – An estimate of an energy savings or energy demand savings outcome (gross savings) for a single unit of an installed energy efficiency measure. This estimate (a) has been developed from data sources and analytical methods widely accepted for the measure and purpose and (b) applies to the situation being evaluated.

Ex ante Savings Estimate – (i.e., *Ex ante* Savings, Reported Savings, *Ex ante* Gross Savings, Reported Gross Savings) Forecasted savings used for program and portfolio planning purposes (from the Latin for “beforehand”).

Ex post Evaluation Estimated Savings – (i.e., *Ex post* Savings, *Ex post* Gross Savings, Evaluated Gross Savings) Savings estimates reported by an evaluator after the energy impact evaluation has been completed (from the Latin for “from something done afterward”).

Ex Post Net Savings – (i.e., Net Savings, Evaluated Net Savings, Verified Net Savings) When *Ex Post Evaluation Estimated Savings* are multiplied by the *Net-to-Gross Ratio*.

Free rider – A program participant who would have implemented the program measure or practice in the absence of the program.

Gross Realization Rate – The ratio of *Ex Post* Gross Savings and *Ex Ante* Savings.

Participant – A consumer who received a service offered through the subject efficiency program in a given program year.

Net-to-Gross (NTG) – A factor representing Net program savings divided by the *Ex post* Gross program savings that is applied to *Ex ante* gross program impacts, converting them into net program load impacts after adjustments for free ridership and spillover. (1 – Free ridership % + Spillover %).

Spillover – Reductions in energy consumption and/or demand caused by the program that exceed those directly related to program participation. This occurs when customers adopt energy efficiency measures or take other types of efficiency actions independently (i.e., without an inducement being offered).

Stipulated Values – See "deemed savings."

This glossary is drawn from several evaluation-related reference documents, such as the 2016 IPMVP, US DOE NREL Uniform Methods Project, 2004 California Evaluation Framework, 2006 DOE EERE Guide for Managing General Program Evaluation Studies, and the AR TRM.

3.3 Overview of Methodology

The proposed methodology for the evaluation of the OG&E portfolio is intended to provide:

- Net impact results per program at the 90% confidence and +/-10% precision level; and
- Program feedback and recommendations via process evaluation.

This evaluation provides the verified net savings results, provides the recommendations for program improvement, and ensures cost-effective use of ratepayer funds. The evaluation is also streamlined to focus on areas in need of research and improvement.

3.3.1 Sampling

Sampling is necessary to evaluate savings for the OG&E portfolio insomuch as verification of a census of program participants is typically cost-prohibitive. As per evaluation best practices, samples are drawn to ensure 90% confidence at the +/- 10% precision level. Programs are evaluated on one of three bases:

- Census of all participants;
- Simple random sample; or
- Stratified random sample.

3.3.2 Census

A census of participant data was used for select Programs or Program Channels where such review is feasible. In these cases, all Program measures were evaluated.

3.3.3 Simple Random Sampling

For programs with relatively homogenous measures, we conducted a simple random sample of participants. The sample size for verification surveys is calculated to meet 90% confidence and 10% precision (90/10). The sample size to meet 90/10 requirements is calculated based on the coefficient of variation of program participants' savings. The coefficient of Variation (CV) is defined as:

$$CV = \frac{Standard\ Deviation_x}{Mean_x}$$

Where x is the average kWh savings per participant, without data to use as a basis for x, it is typical to apply a CV of 0.5.

The resulting sample size is estimated with the following:

$$n_0 = \left(\frac{1.645 * CV}{RP}\right)^2$$

Where:

1.645 = Z score for a two-sided 90% confidence interval in a normal distribution

CV = Coefficient of Variation

RP = Required Precision, 10% in this evaluation

3.3.4 Stratified Random Sampling

For the OG&E C&I programs, Simple Random Sampling is not an effective sampling methodology. The CV values observed in business programs are typically very high because the distributions of savings are generally positively skewed. Often, a relatively small number of projects account for a high percentage of the program's estimated savings.

To address this situation, ADM used a sample design that considers such skewness. With this approach, ADM selects several sites with large savings for the sample with certainty and take a random sample of the remaining sites. Non-certainty sites are selected for the sample through systematic random sampling to improve the precision. Non-certainty sites are a random sample of sites remaining after the certainty sites have been selected by ordering them per the magnitude of their savings and using systematic random sampling. Sampling systematically from a list that is ordered according to the magnitude of savings ensures that any sample selected will have some units with high savings, some with moderate savings, and some with low savings. Systematically chosen sampled sites should not result in a concentration of sites with atypically high savings or low savings.

3.3.5 Free Ridership

In determining *ex post* net savings for the OG&E portfolio, we provide estimates of free ridership for individual programs. Free riders are program participants that would have implemented the same energy efficiency measures at nearly the same time absent the program.

3.3.6 Impact Evaluation Activities by Program

We used established, industry-standard approaches to estimate energy savings and demand reductions at the measure, program, and portfolio levels. We followed all applicable measure- and program-level guidelines and protocols from the AR TRM.

We adjusted program-reported gross savings using our research results to evaluate program impacts, relying primarily on engineering desk reviews, AR TRM deemed savings calculations, and on-site or virtual verification and metering for applicable programs. To calculate deemed savings, we verified the appropriateness of savings algorithms and values in program tracking data compared to the AR TRM guidelines. Where sampling was used (for surveys and site visits), we designed a sampling plan to achieve a minimum precision of ±10% of the gross realized savings estimate with 90% confidence.

We estimated energy savings and demand reduction for each program and measure category by applying a verified gross savings adjustment to program-reported savings.

3.3.7 Net-to-Gross Approach by Program

We estimated NTG for each program in the portfolio. Table 3-1 shows the NTG approach followed for each program based on our assessment of specific program needs and the availability of accurate, existing information. These data collection and analysis activities comply with one of the five accepted approaches listed in the AR TRM.

Table 3-1: NTG Approach by Program

Program and Channel Component	Approach
HEEP Residential Solutions: Home Assessment	Self-report survey
HEEP LivingWise® Schools Outreach	Deemed net-to-gross ratio
HEEP Residential HVAC Replacement & Tune-up	Self-report survey
HEEP Consumer Products	Email Survey of random OG&E customers / In-store survey of participating customers / Deemed for food bank distribution participants and non-lighting measures
HEEP PE-NHC (New Home Construction)	Self-report survey
WRAP	Deemed net-to-gross ratio
CEEP CIS	Self-report survey
CEEP SAGE	Self-report survey
CEEP SBDI	Self-report survey
CEEP Small Business Midstream	Self-report survey
CEEP CEI	Deemed net-to-gross ratio

3.4 Overview of Process Evaluation

We took the following steps to determine the scope of the process evaluation for the PY2020 programs.

3.4.1 General Approach

The general approach to process evaluation begins reviewing the tests for timing and appropriateness of process evaluation as defined in Protocol C of the AR TRM. In this review, we determine what aspects of the program warrant a process evaluation (due to issues identified in past evaluations).

The data collection procedures for the residential and commercial process evaluations included:

- *Participant Surveying*. We surveyed statistically significant samples of participants in each program to provide feedback for the program and assess participant satisfaction.
- *In-Depth Interviews*. We conducted in-depth interviews with high-level program actors, including OG&E program staff, third-party implementation staff, and program trade allies. These interviews are semi-structured, in having general topics to be covered, without fully prescribed question and answer frameworks.
- *Review of Tracking Data.* We reviewed program tracking data for each program to prepare for survey and interview outreach efforts, compare program activity in 2020 to past years, identify trends, validate the data's consistency, and

investigate the geographic distribution of projects throughout OG&E's utility service territory.

4 Home Energy Efficiency Program (HEEP)

4.1 Evaluation Findings

Table 4-1 and Table 4-2 present the *ex ante* energy and demand savings, *ex post* energy and demand savings, energy and demand realization rates, energy and demand net savings, and net-to-gross (NTG) for the HEEP.

Table 4-1: Energy Savings Summary for HEEP in PY2020

Channel	*Ex Ante* Energy Savings (kWh)	*Ex Post* Energy Savings (kWh)	Realization Rate	Net-to-Gross	Net Energy Savings (kWh)	Net Lifetime Energy Savings (kWh)
RSOL	3,157,482	3,001,466	95%	83%	2,476,891	28,256,664
LivingWise® Schools Outreach	1,849,948	1,752,591	95%	100%	1,752,591	16,468,333
Residential HVAC Replacement and Tune-up	8,831,040	8,768,374	99%	85%	7,442,339	107,889,881
Consumer Products	42,645,856	48,446,337	114%	65%	31,713,886	290,909,512
PE-NHC	2,054,673	2,143,345	104%	82%	1,767,259	44,181,471
HEEP Total	**58,539,000**	**64,112,114**	**110%**	**70%**	**45,152,966**	**487,705,861**

Table 4-2: Demand Reduction Summary for HEEP in PY2020

Channel	*Ex Ante* Demand Reductions (kW)	*Ex Post* Demand Reductions (kW)	Realization Rate	Net-to-Gross	Net Demand Reductions (kW)
RSOL	776	726	94%	73%	529
LivingWise® Schools Outreach	171	201	117%	100%	201
Residential HVAC Replacement and Tune-up	1,890	1,835	97%	85%	1,559
Consumer Products	5,800	7,623	131%	66%	5,027
PE-NHC	728	753	104%	85%	642
HEEP Total	**9,366**	**11,138**	**119%**	**71%**	**7,959**

4.2 Program Overview

The design of the HEEP offering in PY2020 was a multipronged approach to encourage residential customers to reduce the energy consumption of their homes. It provides the customer multiple avenues for participation, including home assessments, the Residential HVAC Replacement and Tune-up Channel, energy efficient new homes, energy saving kits, and consumer product offerings. OG&E contracted with implementation contractors

AM Conservation for the LivingWise® Schools Outreach Channel and CLEAResult (CR) for all other HEEP Channels.

Table 4-3: PY2020 HEEP Participation Summary by Channel

Channel	Total Quantity of Measures	Ex Ante Energy Savings (kWh)	Ex Ante Demand Reductions (kW)
RSOL	46,267	3,157,482	776
LivingWise® Schools Outreach	16,425	1,849,948	171
Residential HVAC Replacement and Tune-up	2,495	8,831,040	1,890
Consumer Products	1,258,469	42,645,856	5,800
PE-NHC	1,322	2,054,673	728
HEEP Total	**1,324,978**	**58,539,000**	**9,366**

4.2.1 Residential Solutions Channel

The Residential Solutions (RSOL) Channel of HEEP offers home energy assessments and discounted measure installations based on customer assessment recommendations. Additionally, direct install energy saving measures are offered to single family and multifamily residential customers in OG&E's Oklahoma service territory.

4.2.2 LivingWise® Schools Outreach Channel

The OG&E LivingWise® Schools Outreach Channel, known by teachers, students, and parents as LivingWise® Schools Outreach, provides teachers, parents, and students with educational materials and energy efficient products for use in their home. The teacher has the responsibility of choosing to participate and enroll their class in the Channel. Teachers enrolled in the Channel educate their fifth-grade students about electricity and the benefits of saving energy in their homes.

The Third-Party Implementer or TPI (AM Conservation) developed a curriculum for the Channel that spans five days and helps teachers meet the Oklahoma Academic State Standards. This curriculum allows teachers to easily integrate the Channel into their existing curriculum at no cost to the school district, teacher, or students. The ready-made curriculum reduces the teachers' burden of developing an additional week of lesson plans. It includes documentation explicitly outlining each Oklahoma Academic Standard supported through the Channel in each of three areas (language arts, mathematics, and science). The Channel materials and website are geared towards teachers, with design features such as a FAQ page to help teachers with their most common questions. Teachers have the option of accessing many additional resources via the LivingWise® Schools Outreach website that can enrich the students' experience (including optional activities).

The LivingWise® Schools Outreach[4] webpage includes resources for teachers, students, and parents that offer a range of information from energy efficiency information to installation instructions for the measures provided in the kits. Teachers send the kits home with the students with instruction to seek out their parents' help with the installation of the included measures. The kit materials help students to learn about energy-saving habits and ways to be more energy-efficient at home. Students eager to learn more can find "Cool Links" on the LivingWise® Schools Outreach website that includes resources and games marketed towards children, such as the Department of Energy Kids and Energy Information Administration (EIA) Kids.

A quiz assesses the students' knowledge about electricity before and after participating in the Channel. Surveys accompany the quizzes. The Home Check-Up Survey collects information about the home; impact calculations utilize this information, including the type of heating fuel and air conditioning used at home. The Home Activities Survey collects information about measure installation; impact calculations utilize this information known as in-service rates (ISR). Teachers are eligible for a $50 gift card when 80% of their student surveys are completed and returned.

Some bilingual literature is included in the LivingWise® School Outreach kit, including a "Quick Start Guide" to help parents with product installation and other energy saving tips. Parents can also visit the LivingWise® School Outreach website for installation instructions and other energy-saving information in Spanish.

4.2.3 Residential HVAC Replacement and Tune-up Channel

The HEEP Residential HVAC Replacement and Tune-up Channel was designed to offer inducements for HVAC replacements, HVAC tune-ups, duct sealing, and air sealing. The objectives of the HVAC replacement and tune-up measures generate energy and demand savings from residential HVAC systems. Newly installed HVAC units replace old inefficient equipment. HVAC tune-ups optimize an HVAC unit's operation and efficiency. Duct sealing and air sealing measures improve a home's infiltration by reducing air leakage.

OG&E customers' requests for participation are completed through a network of participating independent HVAC trade allies. When customers contact the Channel, the project team refers the customer to available trade allies or schedules an appointment. Trade allies install the measure, collect data on system performance, and then submit the required paperwork. Once the application has passed the Channel's review, the application is processed, and the rebate is paid.

[4] https://www.getwise.org/

This Channel targets all residential customers living within the OG&E Oklahoma service territory. Inducements offered by the Channel include $87.50-$200 for HVAC Tune-ups, $300-$6,000 for HVAC Replacement, $34-$400 for duct-sealing, and $1-$620 for air-sealing.

4.2.4 Consumer Products Channel

The Consumer Products Channel provides instant inducements on select energy-saving products within two paths: Upstream and Food Bank Lighting Giveaway. The goal of the Channel is to encourage the purchase of energy-saving products by OG&E customers. Table 4-4 below outlines the measures offered through the Consumer Products Channel. Table 4-4 also details the participating retailers and the rebate amounts for all Channel qualifying measures. A brief description of these two paths is below.

Table 4-4: Upstream Component Measures, Locations, and Inducements

Measure	Participating Retailers/Organizations	Instant Inducement
LED Omni-directional Lamps	10+[5]	$1.00 - $2.25
LED Specialty Lamps	10+[5]	$1.00 - $4.25
Advanced Power Strips	Dollar Tree	$10
Window Air Conditioner	Home Depot	$25
Room Air Purifier	Home Depot	$25
Bathroom Exhaust Fan	Home Depot	$25 - $35
Water Cooler	Home Depot	$25

Lighting measures account for the majority of savings and induced measures in the Consumer Products Channel. The number of participants in this Channel is unknown due to the nature of the upstream design. However, the total number of induced non-lighting measures equals 16,860, and the total number of induced lighting measures equals 1,241,609. Table 4-3 above details the total quantity of measures induced, the energy savings, and demand reduction. The total amount of inducements paid by OG&E for the Consumer Products Channel in PY2020 equals $2,224,878. The TPI reported no data for the Consumer Products Channel before 2/21/2020. However, the TPI reported data on a nearly weekly basis after that and experienced consistent participation. The Channel experienced one significant spike in participation on August 19th, as illustrated in Figure 4-1 below.

[5] Franchised locations operated under “Doing Business As” names, which resulted in 50 unique retailer names in the data set. When consolidated under the franchise name there were 10 participating retailers in the Consumer Products Channel.

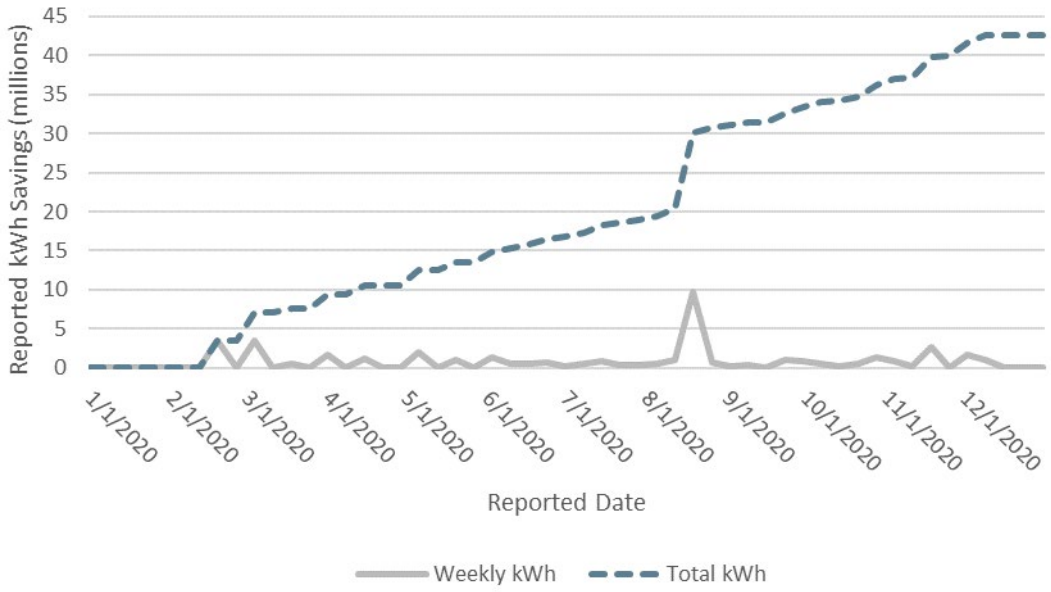

Figure 4-1: Accumulation of Ex Ante kWh Savings

4.2.4.1 Upstream

OG&E works with retailers and manufacturers through the TPI to offer instant, in-store inducements on qualifying energy efficient products to OG&E customers. In PY2020, the Upstream path offered seven measures to its customers: ENERGY STAR® Omni-directional and ENERGY STAR® Specialty LEDs (hereafter referred to as LEDs when described jointly), advanced power strips, window air conditioners, room air purifiers, bathroom exhaust fans, and water coolers. OG&E provided instant rebates that generally ranged between $1.00 and $4.25 on a variety of LEDs. OG&E worked with many of the big box retailers they had partnered with in previous years, such as Home Depot and Wal-Mart. The participating retailers advertise that OG&E is responsible for the discounted pricing of the energy-saving products using signage or stickers on the product package. The retailers track the sale of the energy-saving products and report the sales to the TPI, who reimburses the retailer or manufacturer for the difference between the discounted and regular retail price.

4.2.4.2 Food Bank Lighting Giveaways

Food Bank Lighting Giveaways has operated as a path in the Consumer Products Channel since 2015. OG&E offered each household who visited local food banks within their service territory an OG&E branded box that contained ENERGY STAR® Omni-Directional LEDs and a flyer educating the customer about the importance of energy efficient lighting. Since its inception, the path has donated millions of ENERGY STAR® Omni-Directional LEDs to families who do not have the privilege of food security. The ENERGY STAR® Omni-Directional LEDs help reduce the cost of electricity for families.

Four organizations participated in PY2020: Regional Food Bank of Oklahoma, Community Food Bank of Eastern Oklahoma, Restore OKC, and Skyline Urban Ministry. The food banks operate within three major cities in Oklahoma: Oklahoma City, Tulsa, and McAlester. The Food Bank Lighting Giveaways path represents 25% of the Consumer Products Channel reported savings and 28% of the induced measures.

4.2.5 Positive Energy – New Home Construction (PE-NHC)

The PE-NHC Channel's objective is to induce homebuilders to include energy efficient measures in the construction of new homes built within OG&E's Oklahoma service territory. The Channel also educates participants about the benefits of energy efficient homes.

The Channel utilizes home builders as the lead source of marketing and outreach. OG&E provides home builders with a significant amount of support in the marketing and outreach process. The Channel works with the builders throughout the design and construction process to ensure that participating homes meet or exceed the PE-NHC Channel's minimum requirements.

The implementer has a third-party Home Energy Rating System (HERS) rater model, which analyses all participating homes using certified energy modeling software to determine ex ante savings. OG&E, the implementer, and HERS raters perform inspections during a home's construction process to support the energy models.

4.3 Impact Evaluation Approach

The impact evaluation effort of the HEEP included the following:

- **Desk Review of Residential Calculations**. We utilized the AR TRM values in assessing savings from residential measures.
- **Participant Survey Photo Submissions**. Respondents to ADM's RSOL and Residential HVAC Replacement and Tune-up Single Family surveys were allowed to upload photos to verify program participation. Sixty-six Residential HVAC Replacement & Tune-up and 113 RSOL Channel survey respondents uploaded verification photos (see Section 4.3.6 for more detail).
- **Free Ridership Estimation**. We determine free ridership through primary research, including stakeholder interviews and customer surveys.

In addition to the AR TRM, we also examined the ex ante data sets provided by the implementation contractor to assess savings by measure. The workbook utilizes AR TRM savings algorithms with trade ally inputs to calculate savings based on the measure and input parameters. We verified the factor tables for each measure to ensure the values were appropriate.

4.3.1 Residential Solutions

The following sections outline the impact evaluation approach for the RSOL Channel.

For equipment and retrofits rebated through the PY2020 HEEP, calculation methodologies were performed as described in the AR TRM. Table 4-5 identifies the sections in the AR TRM that were used for verification of measure-level savings.

Table 4-5: AR TRM Sections by Measure Type

Measure	Section in AR TRM
ENERGY STAR® Omni-Directional	2.5.1.4
Ceiling Insulation	2.2.2
ENERGY STAR® Windows	2.2.7
Faucet Aerators	2.3.4
ENERGY STAR® Doors	2.2.7
Low Flow Showerhead	2.3.5
ENERGY STAR® Pool Pumps	2.4.5
Advanced Power Strips	2.4.4

4.3.1.1 ENERGY STAR® Omni-Directional LEDs

Energy savings for Omni-directional LEDs was calculated using the following savings algorithms from the AR TRM:

Equation 4-1: ENERGY STAR® Omni-Directional LED Energy Savings

$$kWh_{savings} = \left((W_{base} - W_{post})/1000 \right) \times Hours \times ISR \times IEF_E$$

Where:

W_{base} = Based on the wattage equivalent of the lumen output of the purchased LED Omni-directional lamp and the Program year purchased/installed.

W_{post} = Wattage of Omni-directional LED purchased/installed

ISR = In-Service Rate or percentage of rebate units that get installed to account for units purchased but not immediately installed. The ISR was obtained from the 2020 customer survey data.

Hours = Average hours of use per year = 365 days in a year * Daily usage (hours/day) for residential lamps. ADM has reviewed appropriate metering studies and calculated an unweighted average Hours of Use (HOU) per lamp across all studies to reduce the possibility of bias. ADM applied a value of 2.63 hours * 365.25 days/year = 960.61 hours.

IEF_E = Interactive Effects Factor to account for cooling energy savings and heating energy penalties; this factor also applies to outdoor and unconditioned

spaces as specified in Arkansas TRM. The IEF_E values by heating/Cooling type are shown in the table below:

Table 4-6: Interactive Effects Factor for Cooling Energy Savings and Heating Energy Penalties

Heating Type	Interactive Effects Factor (IEF_E)
Gas Heat with AC	1.10
Gas Heat with no AC	1.00
Electric Resistance Heat with AC	0.83
Electric Resistance Heat with no AC	0.73
Heat Pump	0.96
Heating/Cooling Unknown	0.97

Peak demand impacts were calculated via the following formula, adjusting peak demand impacts for the percentage of indoor and outdoor bulbs based on the survey results:

Equation 4-2: ENERGY STAR® Omni-Directional LED Demand Reduction

$$kW_{savings} = \left((W_{base} - W_{post})/1000\right) \times CF \times ISR \times IEF_D$$

Where:

W_{base} = Based on the wattage equivalent of the lumen output of the purchased Omni-directional LED and the Program year purchased/installed

W_{post} = Wattage of Omni-directional LED purchased/installed

CF = Summer Peak Coincidence Factor for measure (Indoor = 10%, Outdoor = 0%)

ISR = In-Service Rate or percentage of rebated units installed to account for units purchased but not immediately installed. The ISR was obtained from the 2020 customer survey data.

IEF_D = Interactive Effects Factor to account for cooling demand savings; this factor also applies to outdoor and unconditioned spaces, as specified in section 2.5.1.3 in Arkansas TRM. The IEF_D values by heating/Cooling type are shown in the table below:

Table 4-7: Interactive Effects Factor for Cooling Demand Savings

Heating Type	Interactive Effects Factor (IEF_D)
Gas Heat with AC	1.29
Gas Heat with no AC	1.00
Electric Resistance Heat with AC	1.29
Electric Resistance Heat with no AC	1.00
Heat Pump	1.29
Heating/Cooling Unknown	1.25

When the Energy Independence and Security Act (EISA) 2007 standard goes into effect for an LED, the reduced wattage savings should be claimed for the rest of the measure's life. For example, up until 2022, a 20W LED with 1200 lumens may claim a 53W baseline. After 2022, the baseline becomes 27W for the remainder of the measure's life.

4.3.1.2 Ceiling Insulation

This measure requires adding ceiling insulation above a conditioned area in a residential dwelling of existing construction to a minimum ceiling insulation value of R-38. It pertains to ceiling insulation only (attic floor).

Deemed savings values will be used to calculate the energy and demand savings. They are dependent on the climate zone. Section 2.2.2 of the Arkansas TRM will be used to look up these values. The deemed savings are based on the R-value of the ceiling insulation pre-retrofit and combined post-retrofit R-value of at least R-38. They are the savings per square foot that are a factor to be multiplied by the ceiling area's square footage over a conditioned space that is being insulated. Table 4-8 shows the values from Zone 8 Northeast/North Central Region in Arkansas.

Table 4-8: Ceiling Insulation (R-38) – Deemed Savings Values - Zone 8

Ceiling Insulation Base R-value	AC/Gas Heat kWh	Gas Heat (no AC) kWh	Gas Heat Therms	AC/Electric Resistance kWh	Heat Pump kWh	AC Peak Savings (kW)	Peak Gas Savings (therms)
0 to 1	1.8642	0.2203	0.3060	8.734	4.572	0.00107	0.00539
2 to 4	1.0497	0.1215	0.1687	4.846	2.495	0.00061	0.00284
5 to 8	0.6330	0.0728	0.1011	2.909	1.495	0.00038	0.00165
9 to 14	0.3909	0.0446	0.0618	1.784	0.917	0.00025	0.00099
15 to 22	0.1847	0.0216	0.0299	0.858	0.439	0.00011	0.00048

4.3.1.3 ENERGY STAR® Windows

This measure involves replacing windows with ENERGY STAR® window(s) in an existing home. Deemed savings per square foot of the window, inclusive of frame and sash, are used to calculate the energy and demand savings for ENERGY STAR® windows replacing single-paned or double-paned, clear glass. They are dependent on the climate

zone. Table 4-9 and Table 4-10 show the Zone 8 Northeast/North Central Region's values in Arkansas.

Table 4-9: ENERGY STAR® Replacement for Single-Pane Window - Zone 8

Equipment Type	kWh Savings / sq. ft.	kW Savings / sq. ft.	Therms Savings / sq. ft.	Peak Therms Savings / sq. ft.
Electric AC with Gas Heat	5.800	0.0036	0.253	0.011
Gas Heat Only (no AC)	0.187	n/a	0.256	0.011
Elec. AC with Resistance Heat	11.485	0.0036	n/a	n/a
Heat Pump	7.768	0.0036	n/a	n/a

Table 4-10: ENERGY STAR® Replacement for Double-Pane Window - Zone 8

Equipment Type	kWh Savings / sq. ft.	kW Savings / sq. ft.	Therms Savings / sq. ft.	Peak Therms Savings / sq. ft.
Electric AC with Gas Heat	3.730	0.0037	0.210	0.0077
Gas Heat Only (no AC)	0.156	n/a	0.214	0.0077
Elec. AC with Resistance Heat	8.476	0.0037	n/a	n/a
Heat Pump	5.484	0.0031	n/a	n/a

4.3.1.4 ENERGY STAR® Doors

This measure involves replacing doors with ENERGY STAR® door(s) in an existing home. Deemed savings per square foot of window, inclusive of frame and sash from section 4.3.1.3, are used to calculate the energy and demand savings for ENERGY STAR® doors replacing single-paned or double-paned, clear glass doors.

4.3.1.5 ENERGY STAR® Variable-Speed Pool Pumps

This measure involves replacing a single-speed pool pump with an ENERGY STAR® certified variable-speed or multi-speed pool pump. This measure applies to all residential applications; however, pools that serve multiple tenants in a common area are not eligible for this measure. Deemed savings are per installed unit based on the pump horsepower. The tables below show the deemed savings of both variable speed and multi-speed pool pumps by horsepower.

Table 4-11: ENERGY STAR® Variable Speed Pool Pumps – Deemed Savings Values

Pump HP	kW Reductions	kWh Savings
0.5	0.24	1,713
0.75	0.28	1,860
1	0.36	2,063
1.5	0.47	2,465
2	0.52	2,718
2.5	0.57	2,838
3	0.72	3,364

4.3.1.6 Faucet Aerators

This measure involves retrofitting aerators on kitchen and bathroom water faucets. The methodology in Equation 4-3 represents savings per faucet aerator installed. The following formulas are used to calculate the energy and demand savings.

Equation 4-3: Faucet Aerators Energy Savings

$$kWh_{savings} = \frac{\rho \times C_p \times V \times (T_{Mixed} - T_{Supply}) \times \left(\frac{1}{RE}\right)}{Conversion\ Factor}$$

Where:

ρ = Water density = 8.33 lb/gal
C_p = Specific heat of water = 1 BTU/lb·°F
V = gallons of water saved per year per faucet

- Water gallons save/year/faucet (1.5 gpm) is 359
- Water gallons save/year/faucet (1.0 gpm) is 599

T_{mixed} = Mixed water temperature, 105.3°F
T_{Supply} = Average supply water temperature (climate zone dependent Water Main Temperature).
RE = Recovery Efficiency (or in the case of HPWH, EF); if unknown, use 0.98 as a default for electric resistance water heaters, 2.2 for heat pump water heaters, or 0.79 for natural gas water heaters
Conversion Factor = 3,412 Btu/kWh for electric water heating or 100,000 Btu/Therm for gas water heating

Equation 4-4: Faucet Aerators Demand Reduction

$$kW_{savings} = kWh_{savings} \times Ratio_{Annual\ kWh}^{Peak\ kW}$$

Where:

$Ratio_{\text{Peak kW Annual kWh}}$ = 0.000104

4.3.1.7 Low Flow Showerhead

This measure consists of removing existing showerheads and installing low-flow showerheads in residences. The formulas below are used to calculate the energy and demand savings.

Equation 4-5: Low Flow Showerhead Annual Energy Savings

$$kWh_{savings} = \frac{\rho \times C_P \times V \times (T_{Mixed} - T_{Supply}) \times \left(\frac{1}{RE}\right)}{Conversion\ Factor}$$

Where:

ρ =Water density = 8.33 lb/gallon
C_p = Specific heat of water = 1 BTU/lb·°F
V = 2.0, 1.75, or 1.5 gallons per minute (GPM) showerhead water gallons saved per year
T_{mixed} = Mixed water temperature, 107.1°F, from Table 156 (average for Arkansas)
T_{supply} = Average supply water temperature (Water main temperature)
RE = Recovery Efficiency (or in the case of HPWH, EF); if unknown, use 0.98 as a default for electric resistance water heaters, 2.2 for heat pump water heaters, or 0.79 for natural gas water heaters
Conversion Factor = 3,412 Btu/kWh for electric water heating or 100,000 Btu/therm for gas water heating

Equation 4-6: Low Flow Showerhead Demand Reduction

$$kW_{savings} = kWh_{savings} \times Ratio_{Annual\ kWh}^{Peak\ kW}$$

Where:

$Ratio_{Peak\ kW\ Annual\ kWh}$ = 0.000104

4.3.1.8 Advanced Power Strips

In the AR TRM, energy savings for advanced power strips are determined based on the strips' end-use – either in a home office setting, a home entertainment setting, or some other use. The determining factor of the end-use in residence is what kind of appliance is plugged into the 'master' outlet of the advanced power strip; the AR TRM provides deemed savings values for televisions, personal computers, or 'other' appliances plugged into the 'master' outlet.

Savings were calculated based on the percentage of survey respondents that indicated their advanced power strip's master outlet was occupied by either a television, PC, or 'other' category of appliance. These percentages were applied as an in-service rate to the population of advanced power strips installed through the Program to calculate *ex post* savings for this measure. Savings were scaled according to the number of controlled outlets on the advanced power strips. The table below outlines AR TRM deemed savings assumptions for power strips.

Table 4-12: Deemed Savings for Tier 1 Residential Advanced Power Strip

System Type	Peripheral Device	kW Savings	kWh Savings
Home Entertainment	Audio Equipment: AV Receiver	0.002	20
Home Entertainment	Audio Equipment: Speakers	0.000	0
Home Entertainment	Audio Equipment: Subwoofer	0.000	4
Home Entertainment	Media Player: Blu-Ray	0.001	7
Home Entertainment	Media Player: DVD	0.002	20
Home Entertainment	Media Player: DVD-R	0.003	29
Home Entertainment	Media Player: DVD/VCR	0.004	37
Home Entertainment	Media Player: VCR	0.003	28
Home Entertainment	Set-Top Box: Cable	0.013	96
Home Entertainment	Set-Top Box: Cable with DVR	0.034	259
Home Entertainment	Set-Top Box: Satellite	0.012	83
Home Entertainment	Set-Top Box: Satellite with DVR	0.022	154
Home Entertainment	Set-Top Box: Stand Alone DVR	0.022	180
Home Entertainment	Television: CRT	0.001	11
Home Entertainment	Television: LCD	0.000	3
Home Entertainment	Television: Plasma	0.000	4
Home Entertainment	Television: Projection	0.006	48
Home Entertainment	Video Game Console: Nintendo Wii	0.002	21
Home Entertainment	Video Game Console: PlayStation 2	0.001	11
Home Entertainment	Video Game Console: PlayStation 3	0.009	92
Home Entertainment	Video Game Console: XBOX	0.005	53
Home Entertainment	Video Game Console: XBOX 360	0.008	89
Home Office	Computer: Desktop	0.004	38
Home Office	Computer: Laptop	0.004	38
Home Office	Computer Monitor: CRT	0.002	16
Home Office	Computer Monitor: LCD	0.001	8
Home Office	Computer Speakers	0.002	16
Home Office	Copier	0.001	13
Home Office	Fax Machine: Inkjet	0.004	46
Home Office	Fax Machine: Laser	0.002	20
Home Office	Printer: Inkjet	0.001	13
Home Office	Printer: Laser	0.003	38
Home Office	Scanner	0.002	18
Home Entertainment	Whole System Average	0.030	252
Home Office	Whole System Average	0.008	83
Average APS	Whole System Average	0.019	167

4.3.2 LivingWise® Schools Outreach

At the outset of each Program year, the TPI calculates average per-kit savings based on the savings algorithms and assumptions about installation found in the last Program year. The TPI sends electronic reports to OG&E throughout the year with the number of kits delivered to classrooms and their associated impacts. The TPI provides OG&E with a final report after the Program year is complete that specifies the number of kits delivered, and their final estimates of annual kWh and kW impacts for the Program year.

OG&E maintains a tracking system that shows the number of participants in the Program each year and recorded impacts. OG&E uses the participation information and impact estimates provided by the TPI as the reported amounts for the Program year.

ADM performed the calculation methodologies described in the AR TRM for the measures rebated through the PY2020 LivingWise® Schools Outreach Channel. Table 4-13 identifies the locations of savings calculations used for verification of measure-level savings in the AR TRM.

Table 4-13: AR TRM Sections by Measure Type

Measure	Section in TRM
ENERGY STAR® Omni-Directional LEDs	2.5.1.4
Faucet Aerators	2.3.4
Low-Flow Showerhead	2.3.5

The LivingWise® Schools Outreach Channel's impact evaluation effort included a desk review of residential calculations and values from the AR TRM for residential measures found within each kit. ADM applied an NTG ratio of 100% for this Channel.

In addition to the AR TRM, we also examined the Excel workbook utilized by the TPI to assess each project's savings. The TPI's workbook reported the net number of kits. The TPI workbook utilized the Arkansas TRM v.7.0 savings algorithms to estimate per kit savings based on input parameters. ADM modified the AR TRM algorithms to utilize the calculated ISR using student surveys provided by the TPI. ADM determined the mix of water heater fuel types (standard electric, heat pump, or gas) from the student survey for domestic hot water measures. For omnidirectional lamps, ADM calculated a weighted average heating type for the inputs: IEF_E, IEF_D, and IEF_G. ADM verified that the savings values were appropriate for each kit. ADM applied those savings values to the number of kits distributed in PY2020.

4.3.2.1 ENERGY STAR® Omni-Directional LEDs

See Section 4.3.1.1 for details on how the AR TRM outlines the savings algorithms.

4.3.2.2 Faucet Aerators

See Section 4.3.1.4 for details on how the AR TRM outlines the savings algorithms.

4.3.2.3 Low Flow Showerheads

See Section 4.3.1.7 for details on how the AR TRM outlines the savings algorithms.

4.3.3 Residential HVAC Replacement and Tune-up Channel

The impact evaluation effort of the HEEP Residential HVAC Replacement and Tune-up Channel included the following:

- **Desk Review of Residential Calculations**. We utilized CLEAResult's CoolSaver™ M&V plan and database and the AR TRM to review all projects.
- **Confirmation of HVAC unit model numbers**: We verified HVAC model numbers using an AHRI model number or participant survey HVAC unit nameplate photo submission.
- **Net-to-Gross Estimation**. We estimated the NTG based on survey responses.

4.3.3.1 Central Air Conditioner Replacement

This measure installs a new AC system in residential applications. All installations were installed in replace-on-burnout (ROB) scenarios per the tracking data provided by CLEAResult. This assumption of ROB scenarios was confirmed to be correct with customer survey responses.

The savings for central air conditioning units were calculated by using the following equations.

Equation 4-7: Central AC Replacement Energy Savings

$$kWh_{savings} = CAP \times (\frac{1kW}{1000W}) \times EFLH \times (\frac{1}{SEER_{base}} - \frac{1}{SEER_{post}})$$

Equation 4-8: Central AC Replacement Demand Reduction

$$kW_{savings} = CAP \times (\frac{1kW}{1000W}) \times (\frac{1}{EER_{base}} - \frac{1}{EER_{post}}) \times CF$$

Where:

CAP = *Rated equipment cooling capacity of the new unit (Btu/hr)*
EFLH = Equivalent full-load cooling hours
SEER$_{base}$ = Seasonal energy efficiency rating of the baseline equipment for cooling
= 14 SEER
SEER$_{post}$ = Seasonal energy efficiency rating of the installed equipment for cooling
EER$_{base}$ = Full-load energy efficiency rating of the baseline equipment for cooling
= 11.8 EER
EER$_{post}$ = Full-load energy efficiency rating of the installed equipment for cooling
CF = Coincidence factor = 0.87 (default)

4.3.3.2 Central Heat Pump Replacement

This measure installs a new residential heat pump. All projects were replace-on-burnout (ROB) per the tracking data provided by CLEAResult.

The savings for central heat pump replacements were calculated by using the following equations.

Equation 4-9: Central Heat Pump Replacement Total Energy Savings

$$kWh_{savings} = kWh_{savings\_C} + kWh_{savings\_H}$$

Equation 4-10: Central Heat Pump Replacement Cooling Energy Savings

$$kWh_{savings\_C} = CAP\_C \times (\frac{1kW}{1000W}) \times EFLH\_C \times) \times (\frac{1}{SEER_{base}} - \frac{1}{SEER_{post}})$$

Equation 4-11: Central Heat Pump Replacement Heating Energy Savings

$$kWh_{savings\_H} = CAP\_H \times (\frac{1kW}{1000W}) \times EFLH\_H \times) \times (\frac{1}{HSPF_{base}} - \frac{1}{HSPF_{post}})$$

Equation 4-12: Central Heat Pump Replacement Demand Reduction

$$kW_{savings} = CAP\_C \times \left(\frac{1kW}{1000W}\right) \times \left(\frac{1}{EER_{base}} - \frac{1}{EER_{post}}\right) \times CF$$

Where:

CAP_C = Rated equipment cooling capacity of the new unit (Btu/hr)
CAP_H = Rated equipment heating capacity of the new unit (Btu/hr)
EFLH_C = Equivalent full-load cooling hours
EFLH_H = Equivalent full-load heating hours
$SEER_{base}$ = Seasonal energy efficiency rating of the baseline equipment for cooling
= 14 SEER
$SEER_{post}$ = Seasonal energy efficiency rating of the installed equipment for cooling
$HSPF_{base}$ = Heating seasonal performance rating of the baseline equipment for heating
= 8.2 HSPF (split) or 8.0 HSPF (packaged)
$HSPF_{post}$ = Heating seasonal performance rating of the installed equipment for heating
EER_{base} = Full-load energy efficiency rating of the baseline equipment for cooling
= 11.8 EER

EER_{post} = Full-load energy efficiency rating of the installed equipment for cooling

CF = Coincidence factor = 0.87 (default)

4.3.3.3 Geothermal Replacement

This measure consists of installations of a residential geothermal heat pump. All installations were designated as replace-on-burnout (ROB) installation scenarios. This assumption of ROB scenarios was confirmed to be correct with customer survey responses.

The savings for central heat pump replacements were calculated by using the following equations.

Equation 4-13: Central Heat Pump Replacement Total Energy Savings

$$kWh_{savings} = kWh_{savings\_C} + kWh_{savings\_H}$$

Equation 4-14: Central Heat Pump Replacement Cooling Energy Savings

$$kWh_{savings\_C} = CAP\_C \times (\frac{1kW}{1000W}) \times EFLH\_C \times) \times (\frac{1}{SEER_{base}} - \frac{1}{SEER_{post}})$$

Equation 4-15: Central Heat Pump Replacement Heating Energy Savings

$$kWh_{savings\_H} = CAP\_H \times (\frac{1kW}{1000W}) \times EFLH\_H \times) \times (\frac{1}{HSPF_{base}} - \frac{1}{HSPF_{post}})$$

Equation 4-16: Central Heat Pump Replacement Demand Reduction

$$kW_{savings} = CAP\_C \times \left(\frac{1kW}{1000W}\right) \times \left(\frac{1}{EER_{base}} - \frac{1}{EER_{post}}\right) \times CF$$

Where:

CAP_C = Rated equipment cooling capacity of the new unit (Btu/hr)

CAP_H = Rated equipment heating capacity of the new unit (Btu/hr)

$EFLH\_C$ = Equivalent full-load cooling hours

$EFLH\_H$ = Equivalent full-load heating hours

$HSPF$ = COP x 3.412 Btu/Watt-hr

COP_{base} = Coefficient of performance, heating
= 3.7, ASHRAE 90.1-2013, Table 6.8.1-2 Heat Pump Minimum Efficiencies – Water to air, water loop (heating mode)

COP_{post} = Heating seasonal performance rating of the installed equipment for heating

EER_{base} = Full-load energy efficiency rating of the baseline equipment for cooling
= 14.1 EER, ASHRAE 90.1-2013, Table 6.8.1-2 Heat Pump Minimum Efficiencies – Water to air, water loop (cooling mode)
EER_{post} = Full-load energy efficiency rating of the installed equipment for cooling
SEER = *EER x 13/11*.3, using SEER to EER conversion
CF = Coincidence factor = 0.87 (default)

4.3.3.4 HVAC Tune-Up

The HVAC Tune-Up measure provides financial inducements to encourage residential customers to improve their HVAC systems' efficiency.

A qualified technician provides tune-ups that involve testing the unit's performance before and after measures are implemented. Typical tune-up measures can include airflow corrections, cleaning of the blowers, fans, evaporator coils, condenser coils, and a refrigerant charge correction.

Evaluation of the Channel is based on the CoolSaver™ 2020 M&V Plan provided by CLEAResult. We examined the data set containing a census of participants to assess savings by measure. The workbook provided contains data exported from the CoolSaver™ tracking tool. We examined the data and recreated the overall savings calculations. Savings from tune-ups were based on the AR TRM stipulated equivalent full-load hours along with unit-specific capacity and deemed efficiency loss recovered due to work performed.

4.3.3.5 Duct Sealing

Duct sealing savings were calculated using the following savings algorithms from the AR TRM.

Equation 4-17: Duct Sealing Electric Cooling Energy Savings

$$kWh_{savings\_C} = ((DL_{pre} - DL_{post}) \times EFLH\_C \times (h_{out} \times \rho_{out} - h_{in} \times \rho_{in}) \times 60)/(1000 \times SEER)$$

Where:

DL_{pre} = Pre-improvement duct leakage at 25 Pa (ft^3/min)
DL_{post} = Post-improvement duct leakage at 25 Pa (ft^3/min)
EFLH_C= Equivalent Full Load Hours
h_{out} = Outdoor design specific enthalpy (Btu/lb), 39 BTU/lb
h_{in} = Indoor design specific enthalpy (Btu/lb), 29 BTU/lb
ρ_{out} = Density of outdoor air at 95°F = 0.0740 (lb/ft^3)

ρ_{in} = Density of conditioned air at 75°F = 0.0756 (lb/ft^3)
60 = Constant to convert from minutes to hours
CAP = Cooling capacity (Btu/hr)
1000 = Constant to convert from W to kW
SEER = Seasonal Energy Efficiency Ratio of the existing system (Btu/W·hr). Default value for SEER = 11.5

Equation 4-18: Duct Sealing Heat Pump Heating Energy Savings

$$kWh_{savings\_H} = ((DL_{pre} - DL_{post}) \times 60 \times HDD \times 24 \times 0.018)/(1000 \times HSPF)$$

Where:

DL_{pre} = Pre-improvement duct leakage at 25 Pa (ft^3/min)
DL_{post} = Post-improvement duct leakage at 25 Pa (ft^3/min)
60 = Constant to convert from minutes to hours
HDD = Heating degree days
24 = Constant to convert from days to hours
0.018 = Volumetric heat capacity of air (Btu/ft^3°F)
CAP = Heating capacity (Btu/hr)
1000 = Constant to convert from W to kW
HSPF = Heating Seasonal Performance Factor of the existing system (Btu/W·hr). Default value for HSPF = 7.30

Equation 4-19: Duct Sealing Electric Resistance Heating Energy Savings

$$kWh_{savings\_H} = ((DL_{pre} - DL_{post}) \times 60 \times HDD \times 24 \times 0.018)/3412$$

Where:

DL_{pre} = Pre-improvement duct leakage at 25 Pa (ft^3/min)
DL_{post} = Post-improvement duct leakage at 25 Pa (ft^3/min)
60 = Constant to convert from minutes to hours
HDD = Heating degree days
24 = Constant to convert from days to hours
0.018 = Volumetric heat capacity of air (Btu/ft^3°F)
$EFLH_H$ = Equivalent full load heating hours
CAP = Heating capacity (Btu/hr)
3,412 = Constant to convert from Btu to kWh

Equation 4-20: Duct Sealing Cooling Demand Reduction

$$kW_{savings\_C} = kWh_{savings\_C}/EFLH_C \times CF$$

Where:

$kW_{savings\_C}$= Calculated kWh savings for cooling
$EFLH_C$= Equivalent full load cooling hours
CF = Coincidence factor = 0.87

4.3.3.6 Air Infiltration

This measure reduces air infiltration into the residence, using pre- and post-treatment blower door air-pressure readings to quantify the air leakage reduction. There is no post-treatment minimum infiltration requirement; however, installations must comply with the prevailing Oklahoma mechanical or ventilation code. This measure applies to all residential applications.

Deemed savings are based on savings per reduced CFM_{50} ($CFM_{50,pre}$ – $CFM_{50,post}$) estimates provided in the AR TRM. Savings estimates are also based on the HVAC types. CFM_{50} post values are measured with a blower door test after the air sealing measures were installed. CFM_{50} pre is measured before the air measure is installed or calculated to find the maximum allowable $CFM_{50,\ pre}$.

Equation 4-21: Maximum Allowable CFM_{50} Pre-Value Algorithm

$$\frac{CFM_{50,pre}}{ft^2} = \frac{ACH_{Nat,pre} \times h \times N}{60}$$

Where:

$CFM_{50,\ pre/ft2}$ = Per square foot pre-installation infiltration rate
$ACH_{Nat,pre}$ = Maximum pre-installation air change rate=3.0
60 = Constant to convert from minutes to hours
H = Ceiling height (ft.) = 8.5 (default)
N = N factor

Table 4-14: Air Infiltration – N Factor

Wind Shielding	Number of Stories		
	Single Story	Two Story	Three + Story
Well Shielded	25.8	20.6	18.1
Normal	21.5	17.2	15.1
Exposed	19.4	15.5	13.5

4.3.4 Consumer Products

The impact evaluation effort of the Consumer Products Channel included the following:

- **Desk Review of Residential Calculations**: We utilized AR TRM values in assessing savings from some measures offered in this Channel. For those measures not included in the AR TRM, we used the Illinois TRM version 7.0 and the 2016 Pennsylvania TRM.

- **Net-to-Gross Estimation**: We determined the NTG through a survey with a random sample of 10,000 OG&E customers.
- **Leakage Estimation**: ADM estimated Leakage for each of the retailers and food banks in this Channel.

4.3.4.1 ENERGY STAR® Omni-Directional LEDs

See Section 4.3.1.1 for details on how the AR TRM outlines the savings algorithms for ENERGY STAR® Omni-directional LEDs. ADM modified the ISR for the food bank distribution from the AR TRM value. ADM determined that the ISR of 90% from the Vermont TRM[6] is more appropriate for this distribution method through a discussion with the implementation and utility staff.

4.3.4.2 ENERGY STAR® Specialty LEDs

The savings algorithms and inputs for specialty LEDs are equal to Omni-directional LEDs in all respects but two. The measure life for directional LEDs is 20 years, whereas Omni-directional and decorative LEDs have a 19-year measure life. Furthermore, the default baseline wattage for reflectors and specialty EISA exempt lamps is dependent upon lamp type and lumen range, as illustrated in Table 4-15 and Table 4-16 below.

[6]See page 155
https://puc.vermont.gov/sites/psbnew/files/doc_library/Vermont%20TRM%20Savings%20Verification%202018%20Version_FINAL.pdf

Table 4-15: ENERGY STAR® Default Baseline Wattage for Reflector Lamps

Lamp Type (a)	Incandescent Equivalent (Pre-EISA) (b)	Wattsbase (EISA Tier 1) (c)	Wattsbase (EISA Tier 2) Effective 01/01/2023 (c)
PAR20	50	35	23
PAR30	50	35	23
R20	50	45	29
PAR38	60	55	35
BR30	65	EXEMPT	38
BR40	65	EXEMPT	38
ER40	65	EXEMPT	38
BR40	75	65	42
BR30	75	65	42
PAR30	75	55	35
PAR38	75	55	35
R30	75	65	42
R40	75	65	42
PAR38	90	70	45
PAR38	120	70	45
R20	≤45	EXEMPT	23
BR30	≤50	EXEMPT	23
BR40	≤50	EXEMPT	23
ER30	≤50	EXEMPT	23
ER40	≤50	EXEMPT	23

Table 4-16: ENERGY STAR® Directional LEDs - Default Baseline Wattage for Specialty EISA Exempt Lamps

Minimum Lumens	Maximum Lumens	Incandescent Equivalent (Wbase)
310	749	40
750	1,049	60
1,050	1,489	75
1,490	2,600	100

4.3.4.3 Advanced Power Strip

See Section 4.3.1.8 for details on how the AR TRM outlines the savings algorithms for advanced power strips.

4.3.4.4 Window Air Conditioners

ADM utilized the AR TRM to evaluate window air conditioner savings. The evaluation team verified Window Air Conditioner (WAC) model numbers listed in the Channel

tracking data system against the ENERGY STAR® database[7] to ensure that each WAC distributed in 2020 was ENERGY STAR® qualified.

WAC kWh and kW savings were calculated via the following formulas:

Equation 4-22: Window AC Energy Savings

$$kWh\ savings = CAP * \frac{kW}{1000W} * RAF * EFLH_C * \left(\frac{1}{\eta_{base}} - \frac{1}{\eta_{post}}\right)$$

Equation 4-23: Window AC Demand Reduction

$$kW\ savings = CAP * \frac{kW}{1000W} * \left(\frac{1}{\eta_{base}} - \frac{1}{\eta_{post}}\right) * CF$$

Where:

CAP = Rated equipment cooling capacity of the new unit (Btu/h).
η_{base} = Energy efficiency rating (EER) of the baseline cooling equipment (Table 4-17).
η_{post} = Energy efficiency rating (EER) of the installed cooling equipment (at least equal to Table 4-17).
CF = Coincidence factor = 0.87 (default).
RAF = Room AC adjustment factor = 0.49 (default)
$EFLH_C$= Equivalent full-load cooling hours Table 4-18

Table 4-17: Window AC Replacement - Baseline Efficiency Standards

Reverse Cycle (Yes/No)	Louvered Sides (Yes/No)	Capacity (Btu/hr)	Baseline Efficiency (CEER)[8]	Efficiency Standard (EER)
No	Yes	<8,000	11.0	12.1
		≥8,000 and <14,000	10.9	12.0
		≥14,000 and <20,000	10.7	11.8
		≥20,000	9.4	10.3
No	No	<8,000	10.0	11.0
		≥8,000	9.6	10.6
Yes	Yes	<20,000	9.8	10.8
		≥20,000	9.3	10.2
Yes	No	<14,000	9.3	10.2
		≥14,000	8.7	9.6

[7] www.energystar.gov
[8] Combined Energy Efficiency Ratio (CEER)

Table 4-18: Window AC Replacement – Equivalent Full-Load Cooling Hours

Weather Zone	Location	EFLHC
9	Rogers	1,305
8	Ft. Smith	1,432
7	Little Rock	1,583
6	El Dorado	1,738

Table 4-19: RAF Derivation

Weather Zone	Location	ES[9] EFLHC	RLW Adj Hours[10]	AHAM Hours[11]	Avg. Hours	RAF
9	Rogers	1,305	431	833	632	0.48
8	Ft. Smith	1,432	473	978	725	0.51
7	Little Rock	1,583	522	1,009	766	0.48
6	El Dorado	1,738	573	1,061	817	0.47
Average:						0.49

4.3.4.5 Room Air Purifiers

The evaluation team verified room air purifier (RAP) model numbers listed in the program tracking system in the ENERGY STAR® databases (www.energystar.gov) to ensure that each RAP distributed in 2020 is ENERGY STAR® qualified.

RAP kWh and kW savings were calculated via the following formulas from the AR TRM:

Equation 4-24: ENERGY STAR® RAP Annual Energy Savings

$$Annual\ Energy\ Savings = kWh_{base} - kWh_{ee}$$

Equation 4-25: RAP kWh Algorithm

$$kWh = \left[\frac{CADR}{CADR\ per\ watt} * \frac{(AOH)}{1000}\right] + \left[Standby\ Hours * \frac{Standby\ Power}{1000}\right]$$

Where:

CADR = Clean Air Delivery Rate = Actual, if unknown, assume CADR in each range as provided in Table 4-20 below.
Standby Power, conventional unit = 1.0 Watt
CADR/watt, conventional unit = 1.0 CADR/Watt
CADR/watt, efficient unit = Actual, if unknown use 3.0 CADR/Watt
Standby Power, efficient unit = Actual, if unknown use 1.0

[9] ENERGY STAR® Equivalent Full Load Cooling Hours (ES EFLHC)
[10] RLW Analytics Adjusted Full Load Cooling Hours (RLW Adj Hours). See footnote 85 in AR TRM.
[11] Association of Home Manufacturers (AHAM). See footnote 86 in AR TRM.

AOH = Annual Operating Hours = run hours per year, 16 hours/day, 365 days a year = 5,840 hours
Standby Hours = 8760 – 5840 = 2920 hours

Equation 4-26: ENERGY STAR® RAP Demand Savings

$$kW_{savings} = \left(\frac{kWh_{savings}}{AOH}\right) * CF$$

Where:

Hours = Annual operating hours = 5,840 hours
CF = Coincidence Factor for the measure, assumes equal use throughout the year, 5840 hours divided by 8760 = 0.67

Annual energy consumption and savings for each capacity class are shown in Table 4-20.

Table 4-20: Annual Energy Savings by Capacity Range

Clean Air Delivery Rate (CADR) Range	CADR	Baseline Unit Energy (kWh/yr.)	ENERGY STAR® Unit Energy (kWh/yr.)	kWh Savings	kW Savings
51-100	75	441	149	292	0.0335
101-150	125	733	246	487	0.0558
151-200	175	1025	344	681	0.0782
201-250	225	1317	441	876	0.1005
Over 250	300	1755	587	1168	0.134

4.3.4.6 Bathroom Exhaust Fan

The evaluation team used the Illinois TRM version 7.0 to inform the energy savings and demand reduction algorithms for ENERGY STAR® bathroom exhaust fans. The evaluation team checked the model numbers of bathroom exhaust fans listed in the program tracking system against ENERGY STAR® databases (www.energystar.gov) to verify that each bathroom exhaust fan distributed in 2020 is ENERGY STAR® qualified.

Bathroom exhaust fan kWh and kW savings were calculated via the following formulas:

Equation 4-27: ENERGY STAR® Bathroom Exhaust Fan Annual Energy Savings

$$\Delta kWh = \left(CFM * \frac{\left(\frac{1}{\eta_{baseline}} - \frac{1}{\eta_{efficient}}\right)}{1000}\right) * Hours$$

Where:

CFM = Nominal Capacity of the exhaust fan
= Actual or use defaults provided below

= Assume 50CFM for continuous ventilation

$\eta_{baseline}$ = Average efficacy for baseline fan (CFM/watts)

= See table below

$\eta_{efficient}$ = Average efficacy for efficient fan (CFM/watts)

= Actual or use defaults provided below

Hours = assumed annual run hours,

= 1089 for standard usage

= 8766 for continuous ventilation.

Table 4-21: ENERGY STAR® Bathroom Exhaust Fan Default Inputs

					ENERGY STAR®		ENERGY STAR® Most Efficient	
Application	Min CFM	Max CFM	Average CFM	Base CFM /Watts	CFM /Watts	ΔkWh Savings	CFM /Watts	ΔkWh Savings
Standard Usage	10	89	70.6	1.7	4.9	28.9	12.0	38.2
	90	200	116.1	2.6	5.6	25.3	13.9	38.7
	Unknown		92.4	2.2	5.3	27.4	12.9	38.6
Continuous Usage	N/A		50	1.7	5.1	170.7	11.2	216.9

Equation 4-28: ENERGY STAR® Bathroom Exhaust Fan Demand Savings

$$\Delta kW = \left(CFM * \frac{\left(\frac{1}{\eta_{baseline}} - \frac{1}{\eta_{baseline}}\right)}{1000} \right) * CF$$

Where:

CF = Summer Peak Coincidence Factor

= 0.135 for standard usage

= 1.0 for continuous operation

Other variables as defined above

Table 4-22: ENERGY STAR® Bathroom Exhaust Fan Default kW Savings

Application	Min CFM	Max CFM	Average CFM	ENERGY STAR® ΔkW Savings	ENERGY STAR® Most Efficient ΔkW Savings
Standard Usage	10	89	70.6	0.0036	0.0047
	90	200	116.1	0.0031	0.0048
	Unknown		92.4	0.0034	0.0048
Continuous Usage	N/A		50	0.0195	0.0247

4.3.4.7 Water Cooler

The evaluation team used the 2016 Pennsylvania TRM to calculate the energy savings and demand reduction for ENERGY STAR® Water Coolers. The evaluation team checked

the water cooler model numbers listed in the program tracking data against the ENERGY STAR® database (www.energystar.gov) to verify that each water cooler distributed in 2020 was ENERGY STAR® qualified.

Water cooler kWh and kW savings were calculated via the following formulas:

Equation 4-29: ENERGY STAR® Water Cooler Annual Energy Savings

$$\Delta kWh = (kWh_{base} - kWh_{ee}) * 365_{year}^{Days}$$

Equation 4-30: ENERGY STAR® Water Cooler Demand Savings

$$\Delta kW_{peak} = \Delta kWh * ETDF$$

Table 4-23: ENERGY STAR® Water Cooler - References

Component	Unit	Value
kWh_{base} , Energy use of baseline water cooler	kWh/day	Cold Only: 0.29 Hot & Cold: 2.19
kWh_{ee}, Energy use of ENERGY STAR® water cooler	kWh/day	Cold Only: 0.16 Hot & Cold Storage: 0.87 Hot & Cold On-Demand: 0.18 Or EDC Data Gathering
HOU, Annual hours of use	Hours/year	8760
ETDF, Energy to Demand Factor	kW/kWh/yr.	0.0001119

Table 4-24: Default Savings for ENERGY STAR® Water Coolers

Cooler Type	ΔkWh	ΔkWpeak
Cold Only	47.5 kWh	0.00532 kW
Hold & Cold Storage	481.8 kWh	0.0539 kW
Hot & Cold On-Demand	733.7 kWh	0.0821 kW

4.3.4.8 Leakage

The AR TRM defines leakage: “when program-incented efficient products are installed outside of the funding utility’s service territory.” When Channel discounted bulbs are installed outside of OG&E’s service territory, the discounted bulbs’ energy and demand impacts are not being realized within the territory that paid for and claimed the savings. ADM calculated leakage for the Consumer Products Channel in PY2019. Given that there were no significant changes to program offerings in PY2020, the leakage calculated in the PY2019 evaluation was applied to PY2020. ADM estimated leakage using an approach that combined survey responses with Geo-mapping. The leakage analysis utilized the following approach:

- First, we developed a map of concentric circles surrounding the participating retailers. The initial modeling assumed the “reach” of a retailer is a 60-minute drive,

which is then modified by the presence of an alternative sponsoring retailer (i.e., if a customer is within a 60-minute drive of two sponsoring retailers, it is assumed they purchased from the closest one). Then an initial leakage score is applied to each participating retail location based upon the percent of customers within the concentric circle served by the sponsoring utility.

- Second, ADM used the survey to assess customers' shopping habits within the radius of participating retailers. ADM assessed the survey responses to discover the total and maximum drive times that Oklahoma consumers find acceptable when shopping for products induced by the Channel. ADM modified the initial 60-minute drive assumption established in Step 1, with the assessed total and maximum drive times.
- Lastly, ADM calculated the percentage of LEDs leaked out of the OG&E territory (but still within Oklahoma) and the percent leaked out-of-state.

ADM applied out-of-state leakage to the lighting measures only. Table 4-25 shows the estimated leakage for each participation path in the Consumer Products Channel for PY2020.

Table 4-25: PY2020 Leakage Estimates

Participation Path	Estimated Leakage for Energy Savings (kWh)	Estimated Leakage for Demand Reductions (kW)
Upstream	61,963	9.61
Food Bank	129,663	20.11
Total	**191,626**	**29.72**
Sums may differ due to rounding.		

Table 4-26: Retailer/Organization Leakage Categorization[12]

Participating Retailer/Organization	Leakage Category
Ace Hardware	Do-It-Yourself
Batteries Plus	Do-It-Yourself
Community Food Bank of Eastern Oklahoma	Food Bank
Crest Fresh Market	Mass Merchant
Dollar General	Discount
Dollar Tree	Discount
Regional Food Bank of Oklahoma	Food Bank
Target	Mass Merchant
The Home Depot	Do-It-Yourself
Walmart	Mass Merchant

Retailers/Organizations were classified into one of four categories, as illustrated in Table 4-26 above. The Channel-level leakage rate was 0.19%, the leakage rate for mass merchant stores was 0.70%, do-it-yourself stores was 0.00%, discount stores was 0.05%, and food banks was 0.27%.

4.3.4.9 Cross-Sector Sales Adjustments

The AR TRM stipulates:

"For retail (time of sale) programs, increased savings may be claimed based on sales to nonresidential customers. […] 6.7 percent of installed lamps may be allocated to the commercial program. […] Since no building type will have been identified, apply the weighted average annual operating hours and coincidence factor based on a review of the building types that participate in commercial lighting programs during the current program year."

Therefore, ADM evaluated the weighted average annual operating hours (AOH) and CF based on building types in the CEEP Small Business Midstream Channel. The AOH was determined to be 3,505, and the CF equal to 0.64. We applied the commercial AOH and CF to the 6.7% of LEDs that the AR TRM stipulates were installed in nonresidential settings, which increased annual energy savings and peak demand reduction for those LEDs.

The period in which the savings occur affects the applicable baseline wattage and discount factor for cost-effectiveness savings. All savings that occur after 2022 are subject to the second tier EISA standard baseline. Lifetime energy savings for these bulbs

[12] The retailers listed in Table 4-26 were used in the PY2019 leakage analysis. Crest Fresh Market and Ace Hardware didn't participate in PY2020. Restore OKC and Skyline Urban Ministry are new participants in PY2020.

also increases to the extent that the savings occur sooner before EISA tier 2 baselines become effective.

4.3.4.10 Net-to-Gross Estimation Methodology

For the Consumer Products Channel, ADM separated LEDs into two NTG categories:

- The assumed net-to-gross ratio for bulbs distributed through the Food Bank Lighting Giveaway path was 100%. The 100% net-to-gross ratio was assumed because customers do not shop for the LEDs but rather have them simply offered them without prompting. Individuals who received LEDs through the food banks are also more likely to represent low-income customers, potentially limiting their ability or willingness to purchase high-efficiency lighting products.
- ADM estimated a free ridership score for bulbs discounted at participating retail stores. To determine the net effects of the in-store retail discounts required estimating the percentage of energy savings from efficient lighting purchases that would have occurred without Program intervention. Ideally, participating retailers could provide LED sales data for non-program periods or from similar non-program retail locations. These data would provide adequate information to calculate the lift in LED sales attributable to the Channel price markdowns. However, retailers are reluctant to release sales data for this purpose, and non-program sales data were not made available to us.

Therefore, ADM conducted surveys with randomly selected OG&E customers and with volunteers. Additional details are provided in Section 4.5.4 below.

4.3.5 Positive Energy – New Home Construction (PE-NHC)

The impact evaluation effort of the PE-NHC Channel includes the following:

- **Checking of Program databases**. We received and checked Channel databases from OG&E.
- **Performing engineering reviews.** We reviewed supporting documentation and performed virtual site visits to verify energy models.
- **Free ridership estimation.** We used interviews with builders and Program managers to calculate free ridership rates.

4.3.5.1 Energy Savings Calculations

The *ex ante* energy savings are found by subtracting the as-built home energy consumption from its baseline home's energy consumption. The baseline home represents a home built to meet Oklahoma Uniform Building Code minimum energy efficiency requirements. The as built and baseline homes share the same skeletal

properties; the only difference is their energy efficiency values in various parts of the home.

A similar process is used to find the peak demand reduction.

4.3.5.2 Baseline Home

The baseline represents a home built to meet Oklahoma Uniform Building Code minimum energy efficiency requirements. The Oklahoma Uniform Building Code uses the 2015 international residential code (IRC) with amendments. Key assumptions used in the baseline home are shown in Table 4-27.

Table 4-27: Baseline Home Key Assumptions

Input	Assumption	Source
Attic Insulation	R-28.6	2015 IRC with amendments
Wall Insulation	R-12.20	2015 IRC with amendments
Window U	0.5	2015 IRC with amendments
Window SHGC	0.35	2015 IRC with amendments
Infiltration	7 ACH at 50 Pa	2015 IRC with amendments
Cooling Efficiency (SEER)	14	NAECA minimum values.
Heat pump efficiency heating (HSPF)	8.2	NAECA minimum values for both GSPH and ASHP

4.3.6 Photo Verification Procedures and Findings

ADM asked HEEP RSOL and Residential HVAC Replacement and Tune-up single family survey respondents to upload photos to verify their participation in OG&E's HEEP. We received participant survey photo submissions for the Residential HVAC Replacement and Tune-up and RSOL Channels.

Residential HVAC Replacement and Tune-up

Residential HVAC Replacement and Tune-up survey participants were instructed to provide pictures of their HVAC unit's model numbers. Sixty-six survey respondents uploaded photos of their HVAC unit's nameplate. ADM was able to verify 54 of these participants' unit model numbers. The submitted photos were compared against model documents in the tracking data. It was found that the tracking data model did not match the model number found in the photos for twelve respondents.

Residential Solutions

ADM received photo uploads from 113 respondents to the RSOL single family survey. Respondents verified direct install as well as "major measure" installations through the photo upload section. After being downloaded, ADM staff randomly sampled and verified the quality of uploaded photos; the majority of them were clear and sufficient to support the verification.

- **ENERGY STAR® Windows:** 50 customers with claimed installations reported within Program tracking data replied to the survey. 49 respondents confirmed the installation of the program-induced windows, which resulted in a 98% verification rate. One stated they did not recall the installation of Channel induced windows. 26 respondents also uploaded photos to verify the installation of their ENERGY STAR® Windows further.
- **LEDs:** 202 customers with claimed installations replied to the survey, 189 confirmed the installation and verified the quantities, resulting in a 92% verification rate. 83 respondents uploaded photos to verify the installation of their LEDs further.
- **Advanced Power Strips:** 148 customers with claimed installations replied to the survey, and 147 confirmed the installation and verified the quantities, resulting in a 99% verification rate. The majority, 72% of power strips, were installed with entertainment devices plugged into them. 63 respondents uploaded photos to verify the installation and end-use of their advanced power strips further.
- **Ceiling Insulation:** 26 customers with claimed installations replied to the survey, all confirmed the installation, resulting in a 100% verification rate. Due to the safety concern, ADM did not ask for photo verification for this measure.
- **ENERGY STAR® Variable-Speed Pool Pumps:** Due to the low quantity of installations in PY2020, no participants that received inducements for pool pumps replied to the participant survey. ADM assigned a 100% verification rate for this measure.
- **Faucet Aerator:** Due to the low quantity of installations among single family customers in PY2020, no participants that received faucet aerators replied to the survey. ADM assigned a 100% verification rate for this measure.
- **Low Flow Showerhead:** Due to the low quantity of installations among single family customers in PY2020, no participants that received low flow showerheads replied to the survey. ADM assigned a 100% verification rate for this measure.

4.4 Gross Savings Summary and Findings

4.4.1 Residential Solutions

After reviewing the tracking data and inputs for savings calculations, we provided verified *ex post* savings per TRM protocols. The savings from the measures below were verified and matched to the calculations provided by CLEAResult.

- Single family Measures:
  - ENERGY STAR® Windows

- Faucet Aerators
- Low Flow Showerheads
- LEDs
- Advanced Power Strips
- Ceiling Insulation
- ENERGY STAR® Doors
- ENERGY STAR® Variable-Speed Pool Pumps

- Multifamily Measures:
  - Low Flow Showerheads
  - Aerators
  - LEDs
  - Advanced Power Strips

ADM verified measure-level savings per the AR TRM guidelines and obtained results that differed from CLEAResult's calculations. Table 4-28, Table 4-29, and Table 4-30 present the verified *ex post* savings results of the PY2020 Residential Solutions Channel by measure and market segment. Overall, the realization rate of energy savings and demand reductions was 95% and 98% for single family (SF) customers and 95% and 82% for multifamily (MF) customers.

Table 4-28: SF and MF Combined Savings Summary for PY2020

Measure	*Ex Ante* Energy Savings (kWh)	*Ex Post* Energy Savings (kWh)	Realization Rate (kWh)	*Ex Ante* Demand Reductions (kW)	*Ex Post* Demand Reductions (kW)	Realization Rate (kW)
Aerator	155,627	157,040	101%	16	16	101%
Smart Strips	792,416	669,590	84%	121	79	65%
LEDs	977,005	933,030	95%	138	133	96%
Showerhead	539,572	545,361	101%	56	57	101%
EE Window	245,254	241,364	98%	184	181	98%
Ceiling Insulation	431,037	438,628	102%	255	255	100%
EE Pool Pumps	12,596	12,557	100%	2.62	2.63	100%
EE Doors	3,975	3,896	98%	3.35	3.28	98%
Total	**3,157,482**	**3,001,466**	**95%**	**776**	**726**	**94%**

Table 4-29: Single Family Savings Summary by Measure for PY2020

Measure	*Ex Ante* Energy Savings (kWh)	*Ex Post* Energy Savings (kWh)	Realization Rate (kWh)	*Ex Ante* Demand Reductions (kW)	*Ex Post* Demand Reductions (kW)	Realization Rate (kW)
Smart Strips	301,761	267,079	89%	31	31	99%
Aerator	3,552	3,600	101%	0.37	0.37	100%
Showerhead	19,142	19,322	101%	1.99	2.01	101%
LEDs	530,032	485,750	92%	66	60	92%
EE Window	245,254	241,364	98%	184	181	98%
Ceiling Insulation	431,037	438,628	102%	255	255	100%
EE Pool Pumps	12,596	12,557	100%	2.62	2.63	100%
EE Doors	3,975	3,896	98%	3.35	3.28	98%
Total	**1,547,349**	**1,472,196**	**95%**	**544**	**535**	**98%**

Table 4-30: Multifamily Savings Summary by Measure for PY2020

Measure	*Ex Ante* Energy Savings (kWh)	*Ex Post* Energy Savings (kWh)	Realization Rate (kWh)	*Ex Ante* Demand Reductions (kW)	*Ex Post* Demand Reductions (kW)	Realization Rate (kW)
Aerator	152,075	153,440	101%	16	16	101%
Smart Strips	490,655	402,511	82%	90	48	53%
LEDs	446,973	447,280	100%	72	72	100%
Showerhead	520,430	526,039	101%	54	55	101%
Total	**1,610,133**	**1,529,270**	**95%**	**232**	**191**	**82%**

Table 4-31, Table 4-32, and Table 4-33 outline the verified *ex post* lifetime savings by measure for the Residential Solutions Channel by market segment.

Table 4-31: SF and MF Combined Lifetime Savings Summary for PY2020

Measure	EUL Tier One	EUL Tier Two	*Ex Post* Lifetime Energy Savings (kWh)
Aerator	10		1,570,400
Smart Strips	10		6,695,900
LEDs	3	16	7,859,938
Showerhead	10		5,453,610
EE Window	20		4,827,280
Ceiling Insulation	20		8,772,560
EE Pool Pumps	10		125,570
EE Doors	20		77,920
Total			**35,383,178**

Table 4-32: Single family Lifetime Savings Summary by Measure for PY2020

Measure	EUL Tier One	EUL Tier Two	*Ex Post* Lifetime Energy Savings (kWh)
Smart Strips	10		2,670,790
Aerator	10		36,000
Showerhead	10		193,220
LEDs	3	16	4,202,770
EE Window	20		4,827,280
Ceiling Insulation	20		8,772,560
EE Pool Pumps	10		125,570
EE Doors	20		77,920
Total			**20,906,110**

Table 4-33: Multifamily Gross Lifetime Savings Summary by Measure

Measure	EUL Tier One	EUL Tier Two	*Ex Post* Lifetime Energy Savings (kWh)
Aerator	10		1,534,400
Smart Strips	10		4,025,110
LEDs	3	16	3,657,168
Showerhead	10		5,260,390
Total			**14,477,068**

4.4.2 LivingWise® Schools Outreach

ADM reviewed the tracking data for a census of kits and verified there were no duplicate project data errors. ADM verified inputs for savings calculations and provided verified *ex post* savings per AR TRM. The savings from the measures below were verified and matched to the calculations provided by the TPI.

- Faucet Aerators
- Low-flow showerheads
- Omni-directional LEDs

Table 4-34 presents the verified *ex post* energy-savings results of the PY2020 LivingWise® Schools Outreach Channel. Overall, the realization rate for energy savings and demand reduction was 95% and 117%, respectively. The individual measure sections below list factors that impacted savings. Table 4-35 below outlines the EUL and the verified *ex post* lifetime energy-savings by measure for the LivingWise® Schools Outreach Channel. Table 4-36 shows the per-measure *ex post* savings and in-service rates (ISR) for the LivingWise® Schools Outreach kit components. The ISRs were relatively unchanged from the previous Program year, apart from Omni-directional LED 1. ISRs for PY2020 measures were within ±2% of the PY2019 ISRs.

Table 4-34: LivingWise® Schools Outreach Savings Summary

Ex Ante Energy Savings (kWh)	*Ex Post* Energy Savings (kWh)	Realization Rate (kWh)	*Ex Ante* Demand Reductions (kW)	*Ex Post* Demand Reductions (kW)	Realization Rate (kW)
1,849,948	1,752,591	95%	171	201	117%

Table 4-35: Lifetime Savings Summary by Measure for PY2020

Measure	EUL Tier One	EUL Tier Two	*Ex Post* Lifetime Energy Savings (kWh)
Omni-directional LEDs	3	16	4,742,025
Faucet Aerator	10		2,259,537
Low-Flow Showerhead	10		9,466,771
Total			**16,468,333**

Table 4-36: Ex Post Savings Summary Per Kit

Measure	ISR	*Ex Post* Energy Savings (kWh)	*Ex Post* Demand Reductions (kW)
Omni-directional LED 1	59%	17.65	0.0024
Omni-directional LED 2	59%	17.65	0.0024
Faucet Aerator (kitchen)	38%	5.32	0.0006
Faucet Aerator (bathroom)	36%	8.43	0.0009
Low-Flow Showerhead	46%	57.64	0.0060

4.4.2.1 Omni-directional LEDs

ADM could not recreate the *ex ante* savings estimates for lamps.

4.4.2.2 Faucet Aerators

The *ex ante* kW calculations used the Arkansas TRM v.7.0 to inform its mixed water temperature (102.6°, weather zone seven Little Rock) and average water main temperature (67.8°, weather zone seven Little Rock), but not its annual gallons saved. The annual gallons saved for kitchen aerators equals 145.92 and 229.13 for bathroom aerators. The *ex post* used the AR TRM volume saved (1.5 GPM for kitchen aerators - 359 gallons; 1.0 GPM for bathroom aerators – 599 gallons), and mixed water temperature of 104.8° in zone eight (Fort Smith). Finally, ADM factored the student survey results into the analysis by taking a weighted average of savings based on heat type.

4.4.2.3 Low-Flow Showerheads

The TPI calculated *ex ante* kW and kWh using the Arkansas TRM v.7.0 algorithms, except for gallons of water saved. The ex ante savings used 1,500.69 gallons of water saved. ADM used the savings algorithms from the AR TRM for *ex post* savings in PY2020.

Furthermore, the *ex post* savings calculations used the zone 8 (Fort Smith) mixed temperature of water (106.7°F), whereas the *ex ante* used the Arkansas average mixed temperature of water (104.3°F).

4.4.3 Residential HVAC Replacement and Tune-up Channel

Table 4-37 outlines the verified *ex post* energy savings and demand reductions per measure for the Residential HVAC Replacement and Tune-up Channel. Table 4-38 outlines the *ex post* lifetime savings for the Residential HVAC Replacement and Tune-up Channel.

Table 4-37: Savings Summary for Residential HVAC Replacement and Tune-up Channel

Measure	*Ex Ante* Energy Savings (kWh)	*Ex Post* Energy Savings (kWh)	Realization Rate (kWh)	*Ex Ante* Demand Reductions (kW)	*Ex Post* Demand Reductions (kW)	Realization Rate (kW)
Tune-up	2,254,052	2,243,098	100%	1,205	1,205	100%
Replacement	779,169	654,683	84%	170	113	67%
Air Infiltration	860,704	883,101	103%	60	61	103%
Duct Sealing	4,937,115	4,987,492	101%	455	455	100%
Total	**8,831,040**	**8,768,374**	**99%**	**1,890**	**1,835**	**97%**

Table 4-38: Residential HVAC Replacement and Tune-up Channel Lifetime Savings Summary

Measure	EUL	*Ex Post* Lifetime Energy Savings (kWh)
Tune-Up	7	15,810,515
Replacement	18	11,813,624
Air Infiltration	11	9,714,110
Duct Sealing	18	89,774,857
Total	**14**	**127,113,105**

There are two unique EULs for Tune-up measures. Tune-up measures that include a refrigerant adjustment receive an EUL of 10 years. Whereas a tune-up that does not include refrigerant adjustment receives an EUL of 3 years. For HVAC replacement measures there are three unique EULs. Air Conditioners 19 years, GSHPs 25 years, and ASHPs 16 years. The table above represents the average EUL of all HVAC measures. It is a simple division of the total lifetime measure savings by the total first-year measure savings, and the total EUL of 14 is calculated by dividing channel level lifetime savings by the first-year total annual savings

4.4.4 Consumer Products

ADM performed an invoice review to verify all claimed measures in the Consumer Products Channel had matching invoices. ADM found 99.98% of claimed measures had matching invoices. Table 4-39 outlines the verified *ex post* energy savings and demand reductions for the Consumer Products Channel. The overall realization rate for energy savings and demand reduction was 114% and 131%, respectively. However, ADM found high variability between measures in realization rates. Detailed descriptions of differences in the savings calculations are in the measure level findings below. Table 4-40 outlines the *ex post* lifetime savings for the Consumer Products Channel.

Table 4-39: Gross Savings Summary for Consumer Products

Participation Path	*Ex Ante* Energy Savings (kWh)	*Ex Post* Energy Savings (kWh)	Realization Rate (kWh)	*Ex Ante* Demand Reductions (kW)	*Ex Post* Demand Reductions (kW)	Realization Rate (kW)
Food Bank - Omni-directional LEDs	10,591,122	11,452,741	108%	1,422	1,776	125%
Retail - Directional Lamps	3,392,996	4,108,887	121%	455	637	140%
Retail - Omni-directional and Decorative LEDs	25,656,736	30,180,044	118%	3,444	4,681	136%
Advanced Power Strips	2,505,308	2,229,724	89%	284	253	89%
Window Air Conditioners	266,288	205,315	77%	168	245	145%
Room Air Purifiers	52,708	40,809	77%	6	5	78%
Bathroom Exhaust Fan	15,923	12,766	80%	2	2	80%
Water Cooler	164,776	216,051	131%	18	24	131%
Total	**42,645,856**	**48,446,337**	**114%**	**5,800**	**7,623**	**131%**

Table 4-40: Gross Lifetime Savings Summary for Consumer Products

Bulb Type	EUL Tier One	EUL Tier Two	*Ex Post* Lifetime Energy Savings (kWh)
Food Bank - Omni-directional LEDs	3	16	90,999,995
Retail - Directional Lamps	3	17	54,167,496
Retail - Omni-directional and Decorative LEDs	3	16	283,099,579
Advanced Power Strips	10		22,297,245
Window Air Conditioners	11		2,155,806
Room Air Purifiers	9		367,278
Bathroom Exhaust Fan	19		242,553
Water Cooler	10		2,160,508
Total			**455,490,460**

4.4.4.1 LED Lamps

Three primary factors contributed to the high realization rates for LEDs. The first two factors are the adjustment to Hours and CF inputs explained in Cross-Sector Sales Adjustments. The third factor only affected the upstream path. The *ex ante* calculations assigned a high baseline wattage to some reflector lamps. The affected reflector lamps are BR20, BR30, BR40, and PAR38. The AR TRM assigns default baseline wattages for pre-EISA incandescent equivalent lamps (Table 4-15 above). ADM verified the manufacturer incandescent equivalent wattage of all misclassified lamp models. The BR20 lamps (3 distinct models) incandescent equivalent wattage was 50 watts and was assigned 45 $Watts_{base}$. The BR30 lamps (10 distinct models) incandescent equivalent wattage was determined to be 65 watts and was assigned 40 $Watts_{base}$. The BR40 lamps (5 distinct models) incandescent equivalent wattage were determined to be 80 and 90 watts and were assigned 75 $Watts_{base}$. The PAR38 lamp (1 distinct model) equivalent incandescent wattage was determined to be 90 watts and was assigned 70 $Watts_{base}$.

Additionally, as explained in section 4.3.4.1 of this report, we applied an ISR of 90% to the food bank lamps.

4.4.4.2 Advanced Power Strip

The TPI used AR TRM for energy savings calculations, except an ISR wasn't applied to the energy savings and demand reductions. ADM applied the ISR from Tier 2 APS to the savings calculations.

4.4.4.3 Window Air Conditioners

The TPI's *ex ante* calculations used climate zone 7 $EFLH_C$ (Table 4-18) for all units. ADM used zone 8 $EFLH_C$ for all units, as zone 8 better approximates the weather in Oklahoma. The TPI's *ex ante* calculations used an RAF of 0.49, the average RAF value for all Arkansas climate zones (Table 4-19) of the AR TRM. ADM used the zone 8 RAF value of 0.51 from the same table.

The TPI's *ex ante* calculations for peak kW had a formula error. The formula referenced the Arkansas average RAF (0.49) instead of the coincidence factor of 0.87. This caused a 44% ((0.87-0.49)/0.87 = 0.44) reduction in the *ex ante* kW calculations.

The TPI cooling capacity for one window air conditioner model was different from the ENERGY STAR® database (Toshiba RAC-WK1511ESCRU). Finally, we could not recreate ex-ante savings for one WAC model (LW8017ERSM).

4.4.4.4 Room Air Purifiers

The TPI's *ex ante* energy-savings calculations used CADRs based on the CADR range defined in the AR TRM table 190, whereas ADM used the CADR identified in the ENERGY STAR® database. The demand savings realization rate varies from the energy savings realization rate due to differences in rounding. The *ex ante* data provides demand savings to three decimal places, whereas ADM calculated savings to four decimal places.

4.4.4.5 Bathroom Exhaust Fan

The TPI used one deemed *ex ante* savings value from Table 2-94 in the 2016 PA TRM for all units. ADM utilized the $\eta_{efficient}$ and CFM of the fans listed in the ENERGY STAR® database to calculate energy and demand savings. The difference in realization rate is, therefore, due to more accurate inputs.

4.4.4.6 Water Cooler

The TPI used deemed ex ante savings values from the default table in the Illinois TRM v7.0. ADM utilized the kWh_{ee} of the water coolers listed in the ENERGY STAR® database to calculate energy and demand savings. The difference in realization rate is, therefore, due to more accurate inputs.

4.4.5 Positive Energy – New Home Construction (PE-NHC)

For PY2020, ADM analyzed a sample of participating homes and calculated realization rates, energy savings, and demand savings for each sampling strata. Results for the homes included in the M&V sample are shown in Table 4-41.

Table 4-41: Ex Ante and Ex Post Savings per Strata

Stratum	kWh Threshold	Number of Sampled Homes	*Ex Ante* Energy Savings (kWh)	*Ex Post* Energy Savings (kWh)	*Ex Ante* Demand Savings (kW)	*Ex Post* Demand Savings (kW)
1	2,730	4	246,842	244,280	31	31
2	1,995	66	1,807,832	1,899,065	697	722
Total		**70**	**2,054,673**	**2,143,345**	**728**	**753**

4.4.5.1 Sampling Plan

ADM was able to verify energy model inputs for a sample of homes. The sampling approach was able to achieve sampling criteria requirements. See below for the PE-NHC evaluation sampling strategy.

Table 4-42: Sampling Plan

Stratum	kWh Threshold	*Ex Ante* Energy Savings (kWh)	CV	Measures	Number of Sampled Homes	Relative Precision	Absolute Precision
1	2,730	246,842	0.50	28	4	38.2%	94,367
2	1,995	1,807,832	0.50	1,294	66	9.9%	178,301
Total		**2,054,673**		**1,322**	**70**		

4.4.5.2 Verified Savings

The strata savings totals are found by multiplying the established stratum realization rates by the *ex ante* stratum totals. The Channel savings and reductions per strata are outlined in Table 4-43 and Table 4-44 below. The Channel savings totals were found by summing up the strata savings totals.

Table 4-43: Gross Program Energy Savings

Stratum	kWh Threshold	*Ex Ante* Energy Savings (kWh)	*Ex Post* Energy Savings (kWh)	Realization Rate
1	2,730	246,842	244,280	99%
2	1,995	1,807,832	1,899,065	105%
Total		**2,054,673**	**2,143,345**	**104%**

Table 4-44: Gross Program Demand Reduction

Stratum	kWh Threshold	*Ex Ante* Demand Reductions (kW)	*Ex Post* Demand Reductions (kW)	Realization Rate
1	5,000	31	31	100%
2	0	697	722	104%
Total		**728**	**753**	**104%**

4.5 Net Savings Summary and Findings

The following section summarizes the methodology and results of OG&E's HEEP net savings methodology and findings for PY2020.

4.5.1 Residential Solutions

4.5.1.1 Net Savings Methodology

ADM administered a survey and asked participants a series of questions on their financial ability to implement the measures without inducements, plans to implement the project before learning of the rebate, the likelihood of implementing the measure in the absence of the Channel, and the impact of the Channel on the timing of the project.

Several criteria were used for determining the likelihood that a customer was a free rider. The methodology for determining free ridership differed for direct install measures (advanced power strips, faucet aerators, Omni-directional LEDs, and low-flow showerheads) and "major measures" (ENERGY STAR® windows, ENERGY STAR® doors, ENERGY STAR® pool pumps, and ceiling insulation).

For the "major measures," the first criterion was based on responses to a question regarding a customer's financial ability to pay for efficient measures. It was assessed with the following question:

- FR1: Would you have been able to make the financial investment to complete the [MEASURE] project if the rebate was not available?

Respondents who indicated that they were not able to afford the efficiency measure without the financial support provided by the Channel were deemed not to be free riders. For all others, a free ridership score was assigned based on a combination of their reported prior plans to implement the measure, the reported likelihood they would have installed one without the Channel, and the reported effect of the Channel on the likely timing of the installation.

The presence of plans before involvement with the Channel was assessed through the following questions:

- FR2: Before learning about the rebate, did you have plans to purchase or install the [MEASURE] that you received a rebate for?
- FR3: Did you [INSTALL/COMPLETE] [A MORE EFFICIENT] [MEASURE] than you would have if you had not received a rebate through the [PROGRAM]?

Respondents who answered "Yes" to the first and "No" to the second question were assigned a prior plan score of 1. All other respondents were assigned a prior plan score of 0.

The respondents' stated likelihood of implementing the measure in the absence of the Channel was assessed through the following two questions*:*

- FR4: Using a scale where 1 means not at all likely and 5 means very likely, how likely is it that you would have [INSTALLED/COMPLETED] the same [MEASURE] if the rebate was not available?
- FR5: [IF HAD AN ASSESSMENT AND MEASURE WAS RECOMMENDED DURING IT] Using a scale where 1 means not at all likely and 5 means very likely, how likely is it that you would have [INSTALLED/COMPLETED] the same [MEASURE] if it was not recommended [through the home energy assessment/by your service provider]?

Based on the responses to the likelihood question, the following point values were assigned to each of the responses:

- 1 (Not at all likely) = 0
- 2 = .25
- 3 = .5
- 4 = .75
- 5 (Very likely) = 1

The likelihood score was based on the lowest-rated likelihood provided to the two questions. The Program effect on the timing is assessed with the following two questions:

- FR6: Did you [INSTALL/COMPLETE] the [MEASURE] sooner than you would have if the [PROGRAM] rebate had not been available?
- FR7: When might you have installed/completed the same [MEASURE] if you had not participated in the [PROGRAM]?

The information provided in response to these questions was used in the following manner:

- If the respondent stated that they would have installed the measure in more than one year, the preliminary free ridership score was multiplied by 0, resulting in a final free ridership score of 0. This is consistent with the AR TRM definition of a

free rider as someone who would have implemented a program measure within one year of when it was installed through a program.

- If the respondent stated that they would have installed the measure in 6 months to one year, the preliminary free ridership score was multiplied by .25.
- If the respondent stated that they would have installed the measure within 6 months of when it was installed, the preliminary free ridership score was multiplied by .5.
- If the respondent states that they did not install the measure sooner because of the program, the preliminary free ridership score was not adjusted.

Figure 4-2 summarizes the calculation of the free ridership score for "major measures." Participants who report that they did not have the financial ability to pay for the efficiency improvement were assigned a free ridership score of 0. For all other participants, the free ridership score was based on the average of the plans score and the likelihood of installing the measure without the Program, multiplied by the timing score.

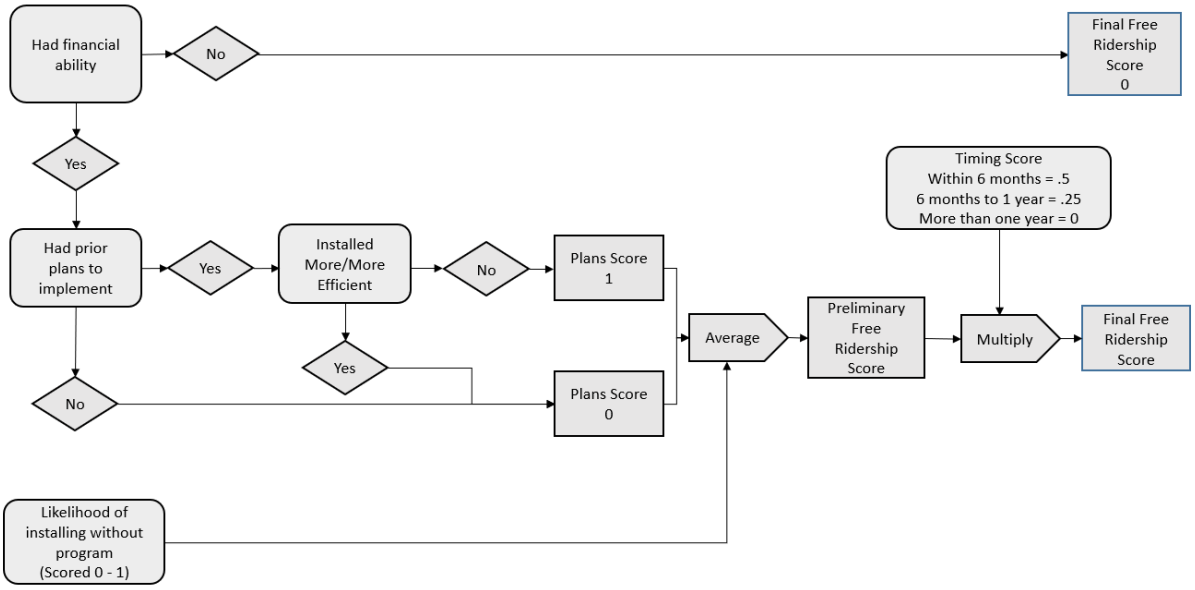

Figure 4-2: Free Ridership Scoring for "Major Measures"

The approach to estimating free ridership for the direct install measures was similar to the approach used for major measures but differed in three regards. First, because direct install items are relatively low-cost items, the financial ability was less likely to be a factor for participants. Second, because of their relatively low cost and the ability to easily self-install the items, it was unlikely that participants would have had plans to install the equipment for an extended period. As such, the free ridership methodology did not factor in financial ability or the Program's impact on the projects' timing. Third, since they receive multiple units from the Program, the respondents' plans may have been to install fewer

than the total number received through the Program. Consequently, the plans score was factored by a quantity adjustment based on the number of units the respondent reports would have been installed without the Program.

The questions for assessing prior plans were as follows.

- DIFR1: Did you have plans to install the [MEASURE] before you learned you could receive them for free through [PROGRAM]?
- DIFR2: [For Advanced Power Strips] Just to be clear, did you have plans to purchase an energy-saving power strip or plans to purchase a standard power strip?
- DIFR3: Had you ever purchased & installed [MEASURE] before you received them for free through the program?

Respondents who say yes to the first and third question and yes to the second question, as applicable, are assigned a prior plan score of 1. All other respondents are assigned a score of 0.

A quantity adjustment score was calculated as a percent of the items the customer would have installed if they were not provided for free through the Program based on responses to the following questions.

- DIFR4: If you had not received them for free through the [PROGRAM], would you have purchased & installed all of the [MEASURE], some of them, or none of them?
- DIFR5: How many of the [MEASURE_QTY] [MEASURE] that you received for free would you have purchased & installed if they had not been provided through the [PROGRAM]?

A likelihood of installing the measure without the Program score was calculated based on the response to this question.

- DIFR6: Using a scale where 1 means not at all likely and 5 means very likely, how likely is it that you would have installed the same [MEASURE] within 12 months of when you received them if you had not received them for free?

Based on the responses to the likelihood question, the following point values were assigned to each of the responses:

- 1 (Not at all likely) = 0
- 2 = .25
- 3 = .5
- 4 = .75
- 5 (Very likely) = 1

Customers that indicate they did not have plans to install the measure were assigned a free ridership score of zero, regardless of their likelihood score. The direct install free ridership score is summarized in Figure 4-3.

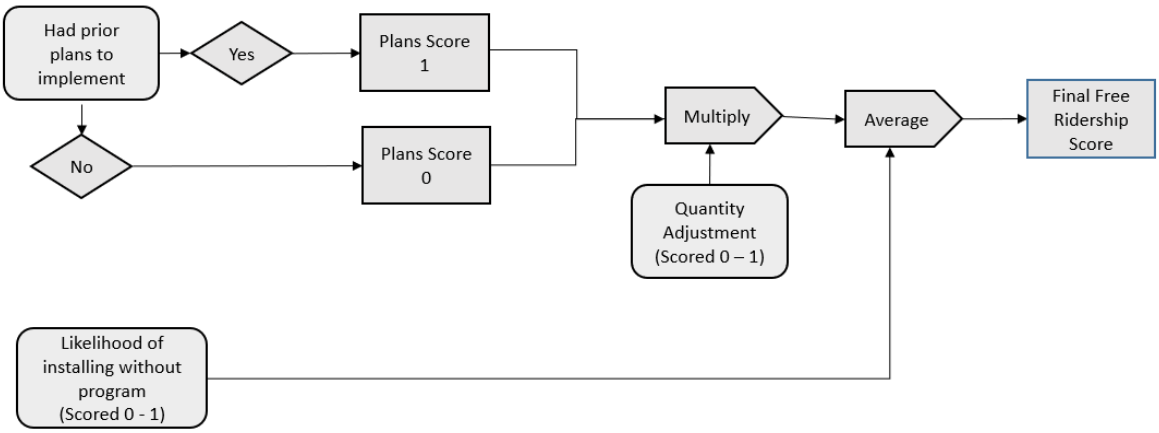

Figure 4-3: Free Ridership Scoring for Direct Install Measures

The participant survey included questions related to additional energy efficiency purchases made due to the customers' experience with the Channel to calculate spillover savings attributable to the Residential Solutions Channel. The survey asked the following questions to identify additional purchases made:

- SO1: Have you purchased and installed any of the following items since completing your HEEP project without getting a rebate or discount?

Participants indicating that they have purchased and installed one or more energy efficiency projects since participating in OG&E's HEEP Residential Solutions Channel were then asked two questions to determine whether the energy savings resulting from those measures may be attributed to the Channel:

- SO3: On a scale of 0 to 10, where 0 represents "not at all important" and 10 represents "very important," how important was your experience with the OG&E Residential Solutions program in your decision to purchase the items you just mentioned?
- SO4: Using a scale where 0 means "definitely would NOT have installed" and 10 means "definitely would have installed," how likely is it that your organization would have installed this additional equipment if you had NOT participated in the OG&E Residential Solutions program?

Participants responding to question SO3 with a rating of 7 or higher, and responding to question SO4 with a rating of 3 or lower, were considered to have been motivated by the

Channel to make these additional purchases. The energy savings from these additional purchases were attributed to the Channel.

4.5.1.2 Net Savings Results

ADM administered surveys to nine multifamily and 297 single family decision-makers who participated in the RSOL Channel.

Table 4-45 summarizes the measure level free ridership results for the single-family path.

Table 4-45: RSOL SF Measure Level Free Ridership

Measure	Free Ridership Score (kWh)	Free Ridership Score (kW)	Free Ridership (kWh)	Free Ridership (kW)
Advanced Power Strips	0.01	0.01	3,238	0.3
Faucet Aerators	0.87	0.87	3,132	0.3
Ceiling Insulation	0.23	0.19	100,885	48.4
ENERGY STAR® Doors	0.52	0.51	2,026	1.7
ENERGY STAR® Pool Pumps	0.90	0.90	11,301	2.4
ENERGY STAR® Windows	0.52	0.51	125,509	92.2
LEDs	0.23	0.23	111,722	13.9
Low Flow Showerheads	0.86	0.86	16,617	1.7

Table 4-46 summarizes the measure level free ridership results for the multifamily path.

Table 4-46: RSOL MF Measure Level Free ridership

Measure	Free Ridership Score (kWh)	Free Ridership Score (kW)	Free Ridership (kWh)	Free Ridership (kW)
Advanced Power Strips	0.00	0.00		0.00
LEDs	0.31	0.48	138,657	34.74
Faucet Aerators	0.01	0.01	1,534	0.16
Showerheads	0.02	0.02	10,521	1.09

None of the multifamily participants reported spillover (i.e., none of the survey respondents reported being influenced by the Channel to implement similar energy efficient measures after their participation). Two single family participants reported spillover, and ADM calculated its impact on net savings.

Table 4-47 and Table 4-48 summarize the results of the net savings analysis.

Table 4-47: Net Energy Savings for HEEP RSOL

Component	Ex Ante kWh Savings	Ex Post Gross kWh Savings	Free Ridership	Spillover	Ex Post Net kWh Savings	Overall NTG Ratio
Multifamily	1,610,133	1,529,270	150,712	0	1,378,558	90%
Single Family	1,547,349	1,472,196	374,430	566	1,098,333	75%
Total	**3,157,482**	**3,001,466**	**525,142**	**566**	**2,476,891**	**83%**

Table 4-48: Peak Demand Reductions for HEEP RSOL

Component	Ex Ante Peak kW Reductions	Ex Post Gross kW Reductions	Free Ridership	Spillover	Ex Post Net kW Reductions	Overall NTG Ratio
Multifamily	232	191	*35.99*	0	155	81%
Single family	544	535	160.94	0	374	70%
Total	**776**	**726**	**197**	**0**	**529**	**73%**

Table 4-49, Table 4-50, and Table 4-51 show the net lifetime energy savings for the Residential Solutions Channel by measure and market segment.

Table 4-49: SF and MF RSOL Combined Net Lifetime Savings Summary

Measure	EUL Tier One	EUL Tier Two	Net Lifetime Energy Savings (kWh)
Aerator	10		1,523,736
Advanced Power Strips	10		6,669,192
LEDs	3	16	5,759,579
Showerhead	10		5,182,233
ENERGY STAR Windows	20		2,317,094
Ceiling Insulation	20		6,754,871
EE Pool Pumps	10		12,557
EE Doors	20		37,402
Total			**28,256,664**

Table 4-50: SF RSOL Net Lifetime Savings Summary

Measure	EUL Tier One	EUL Tier Two	Net Lifetime Energy Savings (kWh)
Advanced Power Strips	10		2,644,082
Aerator	10		4,680
Showerhead	10		27,051
LEDs	3	16	3,236,133
ENERGY STAR Windows	20		2,317,094
Ceiling Insulation	20		6,754,871
EE Pool Pumps	10		12,557
EE Doors	20		37,402
Total			**15,033,870**

Table 4-51: MF RSOL Net Lifetime Savings Summary

Measure	EUL Tier One	EUL Tier Two	Net Lifetime Energy Savings (kWh)
Aerator	10		1,519,056
Advanced Power Strips	10		4,025,110
LEDs	3	16	2,523,446
Showerhead	10		5,155,182
Total			**13,222,794**

4.5.2 LivingWise® Schools Outreach

The net-to-gross ratio was 100% for LivingWise® Schools Outreach. Students are not involved in the decision to participate in the Channel. The teachers have complete control over participation. Furthermore, it is unlikely that students would be purchasing the measures included in the kits. Thus, we assign a net-to-gross ratio of 100% to the LivingWise® Schools Outreach Channel. Table 4-52 and Table 4-53 outlines the net energy savings and net demand reduction results for LivingWise® Schools Outreach. Table 4-54 shows the net lifetime energy savings for the LivingWise® Schools Outreach Channel by measure.

Table 4-52: Net Energy Savings for HEEP LivingWise® Schools Outreach

Ex Ante Energy Savings (kWh)	*Ex Post* Energy Savings (kWh)	Free Ridership	Spillover	Net Energy Savings (kWh)	Net-to-Gross (NTG)
1,849,948	1,752,591	0.00	0.00	1,752,591	100%

Table 4-53: Peak Demand Reductions for HEEP LivingWise® Schools Outreach

Ex Ante Demand Reductions (kW)	*Ex Post* Demand Reductions (kW)	Free Ridership	Spillover	Net Demand (kW) Reductions	Net-to-Gross (NTG)
171	201	0.00	0.00	201	100%

Table 4-54: LivingWise® Schools Outreach Net Lifetime Savings Summary

Measure	EUL Tier One	EUL Tier Two	Net Lifetime Energy Savings (kWh)
ENERGY STAR® Omni-Directional LEDs	3	16	4,742,025
Faucet Aerators	10		2,259,537
Low-Flow Showerhead	10		9,466,771
Total			**16,468,333**

4.5.3 Residential HVAC Replacement and Tune-up Channel

4.5.3.1 Net Savings Methodology

ADM administered a survey to ask decision-makers that participated in the OG&E Residential HVAC Replacement and Tune-up Channel a series of questions on their financial ability to implement the measure without Channel inducements, plans to complete the project before learning of the Channel rebate, the likelihood of completing the project in the absence of the Channel, and the impact of the Channel on the timing of the project.

Several criteria were used for determining the likelihood that a customer was a free rider. The first criterion was based on a customer's financial ability to pay for efficient measures. It was assessed with the following question:

- FR1: Would you have been able to make the financial investment to complete the [MEASURE] project if the rebate was not available?

Respondents who indicated that they were not able to afford the efficiency measure without the financial support provided by the Channel were deemed not to be free riders. For all others, a free ridership score was assigned based on a combination of their reported prior plans to implement the measure, the reported likelihood they would have installed one without the Channel, and the reported effect of the Channel on the likely timing of the installation.

The presence of plans before involvement with the Channel was assessed through the following questions:

- FR2: Before learning about OG&E's HVAC program, did you have plans to complete the HVAC improvements that you received a discount or rebate for through this program?
- FR3: Did you [INSTALL/COMPLETE] [A MORE EFFICIENT/MORE] [MEASURE] than you would have if you had not received a rebate through the [PROGRAM]?

Respondents who answered "Yes" to the first and "No" to the second question were assigned a plan score of 1. All other respondents were assigned a prior plan score of 0.

The respondents' stated likelihood of implementing the measure in the absence of the Channel was assessed through the following question:

- FR4: Using a scale where 1 means not at all likely and 5 means very likely, how likely is it that you would have [INSTALLED/COMPLETED] the same [MEASURE] if the rebate was not available?

Based on the responses to the likelihood question, the following point values were assigned:

- 1 (Not at all likely) = 0
- 2 = .25
- 3 = .5
- 4 = .75
- 5 (Very likely) = 1

The Channel effect on the timing was assessed with the following two questions:

- FR6: Did you [INSTALL/COMPLETE] the [MEASURE] sooner than you would have if the [PROGRAM] rebate had not been available?
- FR7: When might you have installed/completed the same [MEASURE] if you had not participated in the [PROGRAM]? Would you say …

The information provided in response to these questions was used in the following manner:

- If the respondent stated that they would have installed the measure in more than one year, the preliminary free ridership score was multiplied by 0, resulting in a final free ridership score of 0. This is consistent with the AR TRM definition of a free rider as someone who would have implemented a program measure within one year of when it was installed through a program.
- If the respondent stated that they would have installed the measure in 6 months to one year, the preliminary free ridership score was multiplied by .25.
- If the respondent stated that they would have installed the measure within 6 months of when it was installed, the preliminary free ridership score was multiplied by .5.
- If the respondent states that they did not install the measure sooner because of the program, the preliminary free ridership score was not adjusted.

A service provider free ridership score was developed for customers who completed HVAC projects based on the participant and service provider survey responses.

Program education and outreach efforts may influence service providers selling of efficient equipment in ways that are not apparent to customers. To account for this, the assessment of free ridership for HVAC equipment included a service provider influence component. Specifically, participants were asked:

- FR8: Did the service provider that you worked with provide you with information, marketing material, or a recommendation to [INSTALL/COMPLETE] the energy efficient [MEASURE]?
- FR9: On a scale where 1 means “not at all influential and 5 means “very influential,” how influential was the information, marketing material, or recommendation

provided by this service provider in your decision to [INSTALL/COMPLETE] the [MEASURE]?

For respondents who answered “Yes” to the first question and rated the second question as greater than 4, a service provider influence score was developed from service provider responses to a survey of service providers that complete projects through the Channel.

Specifically, for participants who rated the contractors' marketing material or recommendation as greater than 4, the participants' free ridership score was equal to the minimum of the free ridership score developed based on the participant responses or the contractor responses. The contractor free ridership score used for this was either the free ridership score for the contractor that completed the participants' project or the average contractor free ridership score if the participants' contractor did not respond to the survey.

To determine the influence of the Channel on the trade ally’s approach to and level of marketing energy efficient equipment, the evaluation team asked the following question:

- FR1: On a scale of 0 to 10 where 0 is “not at all important” and 10 is “extremely important,” how important was this Channel, including the rebates and information provided through the Channel, in influencing your level of marketing to OG&E customers during 2019?

If the trade ally’s answer to FR1 was greater than 2, then the survey administrator asked the following question:

- FR2: Please briefly describe the most significant ways in which this Channel influenced your level of marketing and selling of energy efficient items to customers during 2019.

The survey asked the following question to determine the effect on the types of equipment and services offered:

- FR3: Thinking about the projects that you completed as part of this Channel in 2019, did the availability of inducements from the Channel influence the type, quantity, or efficiency level of the items that you recommended to customers? In other words, would you have made different recommendations if the Channel were not available?

If the trade ally answers “Yes” to FR3, then the respondent was prompted with the following question:

- FR4: Please briefly describe the most significant ways in which this Channel influenced your decision to recommend energy efficient items to customers during 2019.

- To calculate the trade ally's free ridership score the evaluation team will subtract 1 from the answer of C1 in percentage form. If the trade ally answered "Yes" to question C3, the percentage from C1 was reduced by 50%.

To calculate the trade ally's free ridership score, the evaluation team subtracted 1 from the answer of C1 in percentage form. If the trade ally answered "Yes" to question FR3, the percentage from FR1 would be reduced by 50%.

The following table presents examples of how the free ridership score was determined. Figure 4-4 summarizes the free ridership scoring of Residential HVAC Replacement and Tune-up projects.

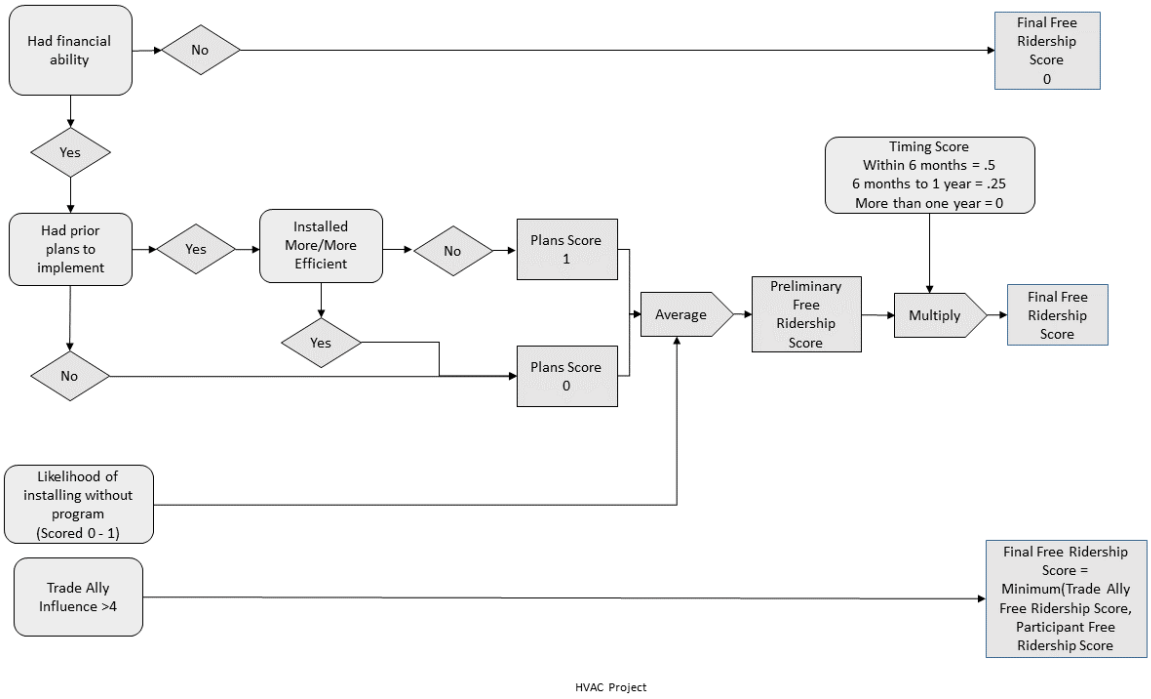

Figure 4-4: Non-Audit Free Ridership Scoring

The participant survey included questions related to any additional energy efficiency purchases that have been made due to the customers' experience with the Channel to calculate spillover savings. The survey asked the following questions to identify additional purchases made:

- SO1: Have you completed any of the following [ENERGY EFFICIENT PROJECT NAME] since completing your HEEP project without getting a rebate or discount?

Participants that indicated having completed one or more energy efficiency projects since participating in OG&E's HEEP Residential HVAC Replacement and Tune-up Channel were asked two questions to determine whether the energy savings resulting from that measure may be attributed to the Channel:

- SO3: On a scale of 0 to 10, where 0 represents "not at all important" and 10 represents "very important," how important was your experience with the OG&E Residential HVAC program in your decision to purchase the items you just mentioned?
- SO4: Using a scale where 0 means "definitely would NOT have installed" and 10 means "definitely would have installed," how likely is it that your organization would have installed this additional equipment if you had NOT participated in the OG&E Residential HVAC program?

Participants that responded to question SO3 with a rating of 7 or higher, and responded to question SO4 with a rating of 3 or lower, were considered to have been motivated by the Channel to make these additional purchases. The energy savings from these additional purchases were attributed to the Channel.

4.5.3.2 Net Savings Results

We administered surveys to decision-makers who participated in the HEEP Residential HVAC Replacement and Tune-up Channel. In total, 206 single family and 6 multifamily participants responded to the survey.

Table 4-55 summarizes the measure-level free ridership results for the Residential HVAC Replacement and Tune-up Channel. ADM did not find any spillover savings attributable to the Channel.

Table 4-55: Residential HVAC Replacement and Tune-up Channel Free Ridership Summary

Measure	Free Ridership Score (kWh)	Free Ridership Score (kW)
HVAC Tune-Up	0.11	0.12
HVAC Install	0.20	0.22
Duct Sealing	0.16	0.16
Air Sealing	0.20	0.20

The tables below summarize the net savings analysis results for the Residential HVAC Replacement and Tune-up Channel. Table 4-58 outlines the net lifetime energy savings for the Channel.

Table 4-56: Net Energy Savings for Residential HVAC Replacement and Tune-up Channel

Measure	*Ex Ante* Energy Savings (kWh)	*Ex Post* Energy Savings (kWh)	Free Ridership (kWh)	Channel Level Spillover (kWh)	Net Energy Savings (kWh)	Net-to-Gross Ratio
HVAC Tune-Up	2,254,052	2,243,098	245,722	0.00	7,442,339	85%
HVAC Install	779,169	654,683	128,394			
Air Sealing	860,704	883,101	775,702			
Duct Sealing	4,937,115	4,987,492	176,217			
Total	**8,831,040**	**8,768,374**	**1,326,035**			

Table 4-57: Net Demand Reductions for Residential HVAC Replacement and Tune-up Channel

Measure	Expected Peak kW Reductions	*Ex Post* Gross kW Reductions (kW)	Free Ridership (kW)	Channel Level Spillover (kW)	Net Energy Reductions (kW)	Net-to-Gross Ratio
HVAC Tune-Up	1,205	1,205	132	0.00	1,559	85%
HVAC Install	170	113	22			
Air Sealing	60	61	71			
Duct Sealing	455	455	12			
Total	**1,890**	**1,835**	**238**			

Table 4-58: Net Lifetime Energy Savings for Residential HVAC Replacement and Tune-up Channel

Measure	Estimated Useful Life (EUL)	Net Lifetime Energy Savings (kWh)
HVAC Tune-Up	7	13,419,502
HVAC Install	18	10,027,058
Air Sealing	11	8,245,052
Duct Sealing	18	76,198,269
Total		**107,889,881**

4.5.4 Consumer Products

The following section summarizes the methodology and results of estimating the net savings of the Consumers Products Channel of the HEEP.

4.5.4.1 Net Savings Methodology

Determining the net effects of the in-store retail discounts requires estimating the percentage of energy savings from efficient product purchases that would have occurred

without program intervention. Ideally, participating retailers could provide sales data for non-program periods and from similar non-participating retail locations. This data would provide adequate information to calculate the lift in LED sales attributable to the Channel's price markdowns. However, retailers in other evaluations have been reluctant to release sales data for this purpose, and non-participating retailer sales data may not be made available to the evaluation team.

As a result, evaluating the price discounts' net effect requires estimating free ridership without sales data. Various methodologies have been used in similar evaluations across the country, all of which have certain advantages and disadvantages. In past program years, the evaluators surveyed a random sample of OG&E customers via email to estimate the net-to-gross ratio.

This year the evaluators used an email recruitment method and a targeted approach of placing "tear-off" sheet pads with a short message, survey link, and QR code in stores near the discounted measures.

ADM asked survey respondents a series of questions to calculate free ridership for LED lamps. The questions elicited feedback regarding influences on their purchasing decisions. Each respondent was assigned a free ridership score based on a scoring algorithm. Three factors related to the likelihood of purchasing LED lamps without a Program sponsored discount were used in the algorithm to determine a free ridership score for each respondent.

The first factor, the "behavior without discount" factor, was the primary determinate of respondents' free ridership scores. ADM developed the score for this factor from responses to questions on the likelihood of purchasing the energy efficient measure if they had cost the regular retail price. Specifically, ADM asked respondents how likely they would have been to purchase the LED lamps if they had cost more (i.e., it was not discounted). The likelihood score developed from this response was adjusted based on the percent of the total number of LED lamps that the respondent would have purchased if they had cost more. For example, if the respondent reported they would have purchased one-half of the LED lamps if they cost more, the likelihood score was reduced by 50%.

The second factor was the respondents' previous experience with purchasing LED lamps. For example, respondents who reported that the LED lamps they purchased in the last six months replaced other LED lamps or had previously purchased LED lamps were assigned higher free ridership levels than respondents without previous experience with LED lamps.

The third factor was a mitigating factor based on the influence of Channel discounts on LED lamp purchases. ADM reduced the prior experience free ridership score for participants that reported that they had purchased LED lamps and that the discount was influential to the purchase.

Figure 4-5 summarizes the algorithm used for calculating free ridership for discounted LED light bulbs purchased through the Consumer Products Channel. The figure and above description highlight LEDs, but the methodology used for advanced power strips and window air conditioners would be similar.

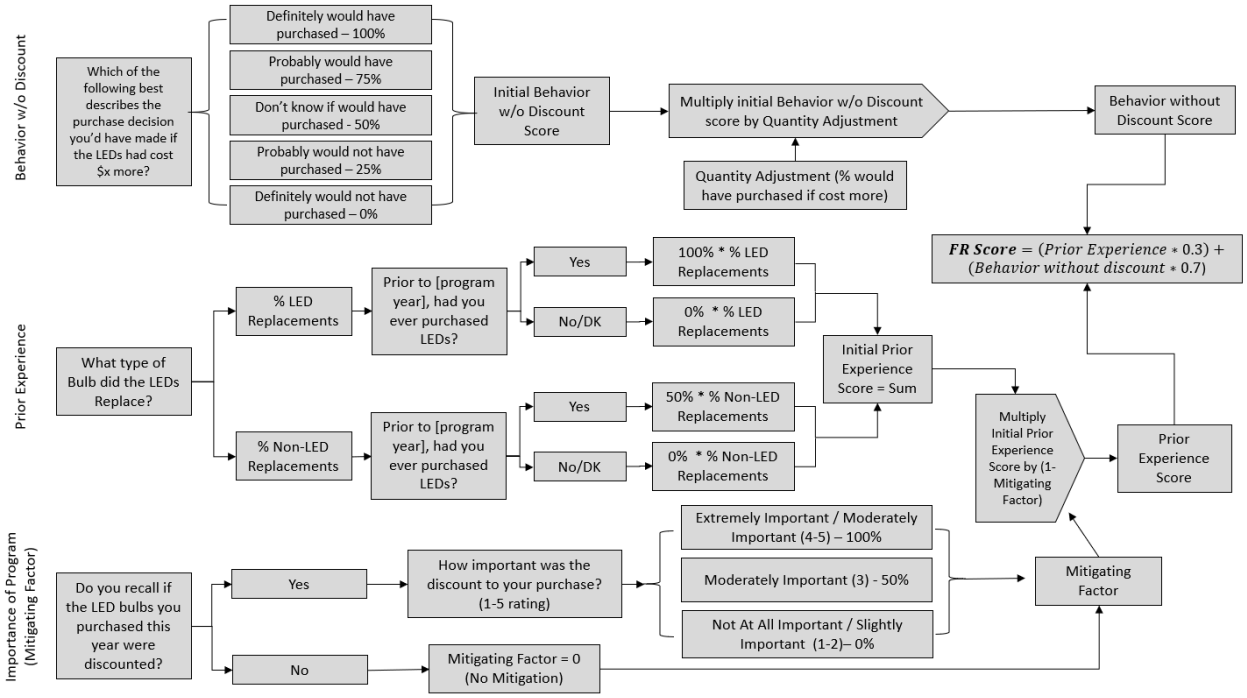

Figure 4-5: Consumer Products Channel Free Ridership Scoring

4.5.4.2 Net Savings Results

The tables below summarize the results of the net savings analysis. A total of 404 respondents to the Consumer Products Channel survey reported that they had purchased LED lightbulbs at a participating retailer in 2020. Deemed NTG ratios were used for non-lighting measures because insufficient customers reported purchasing the induced items at participating retailers to calculate NTG ratios and achieve a minimum 10% precision and 90 confidence level (90/10). Table 4-61 outlines the net lifetime energy savings for the Consumer Products Channel in the HEEP.

Table 4-59: Net kWh Savings for HEEP Consumer Products

Measure Category	*Ex Ante* Energy Savings (kWh)	*Ex Post* Energy Savings (kWh)	Net Energy Savings (kWh)	Net-to-Gross (NTG)
Food Bank - Omni-directional LEDs	10,591,122	11,452,741	11,452,741	100%
Retail - Directional Lamps	3,392,996	4,108,887	2,103,816	51%
Retail - Omni-directional and Decorative LEDs	25,656,736	30,180,044	15,452,664	51%
Advanced Power Strips	2,505,308	2,229,724	2,229,724	100%
Window Air Conditioners	266,288	205,315	205,315	100%
Room Air Purifiers	52,708	40,809	40,809	100%
Bathroom Exhaust Fan	15,923	12,766	12,766	100%
Water Cooler	164,776	216,051	216,051	100%
Total	**42,645,856**	**48,446,337**	**31,713,886**	**65%**

Table 4-60: Net kW Peak Demand Reductions for HEEP Consumer Products

Measure Category	*Ex Ante* Demand Reductions (kW)	*Ex Post* Demand Reductions (kW)	Net Demand Reduction Savings (kW)	Net-to-Gross (NTG)
Food Bank - Omni-directional LEDs	1,422	1,776	1,776	100%
Retail - Directional Lamps	455	637	326	51%
Retail - Omni-directional and Decorative LEDs	3,444	4,681	2,397	51%
Advanced Power Strips	284	253	253	100%
Window Air Conditioners	168	245	245	100%
Room Air Purifiers	5.97	4.68	4.68	100%
Bathroom Exhaust Fan	1.98	1.58	1.58	100%
Water Cooler	18.43	24.18	24.18	100%
Total	**5,800**	**7,623**	**5,027**	**66%**

Table 4-61: Net Lifetime Savings Summary for Consumer Products Channel

Measure Category	Estimated Useful Lifetime (EUL) Tier One	Estimated Useful Lifetime (EUL) Tier two	Net Lifetime Energy Savings (kWh)
Food Bank - Omni-directional LEDs	3	16	90,999,995
Retail - Directional Lamps	3	17	27,734,623
Retail - Omni-directional and Decorative LEDs	3	16	144,951,504
Advanced Power Strips	10		22,297,245
Window Air Conditioners	10.5		2,155,806
Room Air Purifiers	9		367,278
Bathroom Exhaust Fan	19		242,553
Water Cooler	10		2,160,508
Total			**290,909,512**

4.5.5 Positive Energy – New Home Construction (PE-NHC)

ADM interviewed seven builders that participated in the PE-NHC Channel in 2020. We used these results as well as eight builder interviews from 2019 to assign free ridership scores. Builder's NTG responses were weighted by total Channel kWh savings and kW reduction to develop Channel level kW, and kWh NTG estimates.

We estimated a free ridership probability for each builder based on the average of the three scores described below. Free ridership scores were developed for the impacts resulting from the construction standards and geothermal heat pumps.

4.5.5.1 Program Components Score

A Program components score was calculated based on how influential various Program factors were in the builders' decisions to construct efficient homes. Specifically, interview respondents were asked to rate the influence of the following factors on their decisions to build efficient homes on a scale ranging from 1 to 5, where 1 means "not at all influential" and 5 means "extremely influential."

- Component 1: Technical assistance or information from Program staff
- Component 2: Technical assistance or information from HERS raters
- Component 3: The rebates provided by the Program
- Component 4: Program informational materials.

A score was assigned to each of the ratings in the following manner:

- 1 (Not at all influential) = 0
- 2 = .25
- 3 = .5

- 4 = .75
- 5 (Extremely influential) = 1

The Program components score was calculated as equal to the highest-rated component:

MAX(Component1-4)

4.5.5.2 Program Influence Score

The Program influence score was based on respondents' ratings of how likely they would have been to build any efficient homes if the Channel did not provide the rebate and information. Specifically, builders were asked:

- Using a scale where 1 means "not at all likely and 5 means "very likely," how likely is it that you would have built any homes in OGE's service territory that met the program's efficiency standards if the program was not available?

The Program Influence Score was assigned as follows:

- 1 (Not at all likely) = 1
- 2 = .75
- 3 = .5
- 4 = .25
- 5 (Very likely) = 0

4.5.5.3 No Program Score

Builders were asked a series of questions about the number of homes that their firm would have likely built that met construction standards without the Channel:

- Now, thinking about your history of working with the program, if the program had never been available, would you have built fewer or the same number of homes in [YEAR] to the OG&E efficiency standards?
- [IF FEWER] You said that you would have built fewer homes that met the efficiency standards of the program if the program had never been available.
- What percent of those homes would you have built to those same standards if the program had never been available?

These questions were intended to capture the influence that the Channel has had on the builder's efficient construction practices. The goal was to separate the available rebates' effects and the Channel's prior educational efforts on builder's current construction practices. A critical component of the Channel is increasing builders' skill in and knowledge of efficient construction. Using efficient construction techniques may lead to long term changes in building practices.

A score was developed based on the percent of homes that the builder reports would have been built if the Channel had never been available. Specifically, the no Program score was calculated as:

1 – % Homes Built in the absence of the Channel

4.5.5.4 Free Ridership Score

The free ridership score was calculated as follows:

1 – Average (Program Components Score, Program Influence Score, No Program Score)

4.5.5.5 Participant Spillover Methodology

Builders were asked if they completed any efficient homes inside the service territory that did not receive a Channel inducement and the Channel's influence on the decision to complete those additional homes to estimate participant spillover impacts.

4.5.5.6 Net Savings Results

Table 4-62 summarizes the net-to-gross results for the interviewed builders from PY2019 and PY2020.

Table 4-62: Summary of Builder Net Savings Results

Year of Interview	Builder	Program Components Score	Program Influence Score	No Program Score	Spillover	Net-to-Gross Ratio
2019	Builder 1	1.0	1.00	1.00	0.00	100%
2019	Builder 2	1.0	1.00	1.00	0.00	100%
2019	Builder 3	1.0	0.25	0.00	0.00	42%
2019	Builder 4	1.0	1.00	0.90	0.00	97%
2019	Builder 5	1.0	1.00	0.50	0.00	83%
2019	Builder 6	1.0	0.75	1.00	0.00	92%
2019	Builder 7	1.0	0.75	0.70	0.00	82%
2019	Builder 8	1.0	0.75	0.25	0.00	67%
2020	Builder 9	1.0	0.75	0.90	0.00	88%
2020	Builder 10	1.0	0.00	1.00	0.00	67%
2020	Builder 11	1.0	1.00	0.00	0.00	67%
2020	Builder 12	1.0	1.00	1.00	0.00	100%
2020	Builder 13	1.0	0.00	0.00	0.00	33%
2020	Builder 14	1.0	0.00	0.80	0.00	60%
2020	Builder 15	1.0	0.50	0.50	0.00	67%

Table 4-63 and Table 4-64 summarize the net kWh savings and peak kW demand reductions of the PE-NHC Channel.

Table 4-63: Summary of Net kWh Savings for PE-NHC

Channel	*Ex Ante* Energy Savings (kWh)	*Ex Post* Energy Savings (kWh)	Realization Rate	Net-to-Gross	Net Energy Savings (kWh)	Net Lifetime Energy Savings (kWh)
PE - NHC	2,054,673	2,143,345	104%	82%	1,767,259	44,181,471

Table 4-64: Summary of Net kW Peak Demand Reductions of PE-NHC

Channel	*Ex Ante* Demand Reductions (kW)	*Ex Post* Demand Reductions (kW)	Realization Rate	Net-to-Gross	Net Demand Reductions (kW)
PE - NHC	728	753	104%	85%	642

4.6 Process Evaluation Summary and Findings

This section provides a summary of ADM's process evaluation of the OG&E HEEP. Section 4.6.1 presents a summary of feedback from in-depth interviews with the Program and implementer staff. Section 4.6.2 through Section 4.6.6 have Channel specific interview summaries as well as participant survey findings.

4.6.1 HEEP Staff Feedback

ADM staff interviewed OG&E and implementer (CLEAResult) staff in April and December of 2020. The interviews in April were to inquire about OG&E's plans for operating the programs during the COVID-19 pandemic. The December interviews addressed program progress, including the impacts of COVID-19, program design and implementation, communication, and marketing.

For OG&E, we interviewed the HEEP and PE-NHC program managers. For CLEAResult, we interviewed the overall manager for HEEP as well as the managers of the Consumer Products, Residential Solutions (RSOL), Residential HVAC Replacement & Tune-up (HVAC), and Positive Energy – New Home Construction (PE-NHC) Channels. For AM Conservation, we interviewed the LivingWise® Schools Outreach manager. All interviewed individuals have continued in their current roles for at least two years.

This section summarizes feedback that is relevant to the HEEP program as a whole across the various Channels.

Roles and Responsibilities

The HEEP Program Manager (HEEP PM) has overall responsibility for HEEP. The HEEP PM interacts with several OG&E and CLEAResult staff in managing HEEP. The HEEP PM works with other OG&E program managers, notably for WRAP, to cross-promote and cross-refer the programs.

The only reported change in OG&E staffing is the departure of a former EM&V Specialist. The HEEP PM reported that the workload was picked up by another continuing Senior EM&V Analyst and a new EM&V Analyst hired from CLEAResult. The PM reported that the transition was "seamless," and the workload did not suffer from the changes.

For CLEAResult, in 2020 the RSOL Channel manager also took on responsibility for managing Residential HVAC Replacement & Tune-up and PE-NHC.

Program Goals and Progress

Contacts reported that the HEEP program is on track to meet or exceed overall savings goals. Not all Channels performed equally, however, as they were differentially affected by the COVID-19 pandemic. Additional details on the progress of each Channel can be found in the channel-specific sections below.

Program Design and Implementation

Contacts identified some changes to program measures and, in the case of PE-NHC, a change to the modeling software used. Otherwise, they identified no changes to participation processes or requirements other than those needed to adapt to the COVID-19 pandemic. However, CLEAResult contacts reported that HEEP is planning to begin providing inducements in the form of pay cards in 2021. This decision was made so that customers who do not have a checking account do not have to use a check-cashing service and pay a fee. Customers had the option of receiving a check instead of the pay card.

This is the first year that ADM interviewed contacts for the LivingWise® Schools Outreach Channel. Details of design and implementation for that Channel are provided below.

Inducement Levels

The OG&E and CLEAResult contacts agreed that inducement levels are appropriate and motivate measure uptake. No major changes are foreseen in the immediate future.

Marketing and Outreach

The HEEP PM noted that the program used social media (Facebook and Instagram) to promote HEEP more in 2020 than previously. OG&E also promotes the program through bill inserts but tries to avoid sending inserts "too often." The COVID-19 pandemic prevented OG&E and CLEAResult staff from doing on-site presentations, such as at the state fair and home & garden shows, which the program has relied upon in the past to market itself to customers, including those living in remote areas of the service territory. Additional details on marketing and outreach for each Channel can be found in the Channel-specific sections below.

Communication

All interviewees noted good communication between OG&E and CLEAResult. The HEEP PM said that she "never had one bit of problem" communicating with CLEAResult – she does not ask "a lot" from them but when she does, they respond in a very timely manner. The PM reported that the primary challenge in 2020 was the lack of face-to-face communication, but everyone learned to use online video calls. A CLEAResult contact echoed OG&E's sentiments, saying that OG&E staff "were always there to talk about things."

The OG&E contact for LivingWise® Schools Outreach reported that she has weekly meetings with the implementer, AM Conservation, whom she described as "great" – "they are the kind of people that you want to have on your side." She was happy with their communication, stating they "stay on top of things" and work with her to develop a plan if it looks like they are getting behind or may not recruit as many schools as planned.

Barriers and Challenges

Contacts reported that the greatest challenges for HEEP resulted from the COVID-19 pandemic, specifically: 1) the pandemic caused all Channels except Consumer Products to shut down for three months; 2) the economic impacts reduced consumer purchases; 3) after the shut-down, some customers were hesitant to participate because of concerns about transmission, and 4) some trade allies did not participate either because of concerns about transmission or because they did not want to comply with OG&E's safety protocol. OG&E and CLEAResult responded to these challenges by 1) shifting funding to Consumer Products, which was not affected by the shut-down; 2) implementing virtual inspections for the RSOL single family Channel; 3) changing RSOL multifamily participation requirements to allow multifamily properties to participate without treating all units; 4) maintaining contact with trade allies during the shut-down period to let them know they "were still a partner"; and 5) implementing safety protocols after the shut-down to protect against transmission of the virus.

Channel-specific details are provided below.

4.6.2 Residential Solutions Channel

The process-related data collection activities for the OK HEEP RSOL evaluation included program staff interviews and a survey of participating single family (SF) and multifamily (MF) participants.

4.6.2.1 RSOL Staff Interviews

This section provides RSOL Channel specific information gathered through ADM's interviews with HEEP staff. Additional background and information gathered during the interviews can be found in Section 4.6.1.

Goals and Progress

RSOL got hit hardest by the pandemic because it involves going into customers' homes to do the in-home assessment or do the multifamily installs. That created a "big step backward." The program Channel was largely shut down from mid-March until mid-June; the only exceptions during that time were window replacements and attic insulation installation, which could be done with minimal interaction with residents. After starting back up with safety protocols in place, some customers remained hesitant to have other people come into their homes.

In May, CLEAResult had suggested the idea of having "virtual assessments" for single family homes, but OG&E had decided at the time not to go forward with that. As the pandemic lasted into the fall, OG&E and CLEAResult decided to begin doing the virtual assessments. OG&E had established safety protocols to reduce the risk of infection when performing assessments or installations. Some contractors decided not to participate in the multifamily portion of RSOL this year either because of safety concerns (from entering multiple units for each job) or because they did not want to adhere to the safety protocols. The OG&E contact reported that RSOL did not get a lot of "traction" this year but had gotten "quite a few" signups in the past month (November), and so had a good pipeline of projects for 2021.

Design and Implementation

Interviewees reported adding two measures to the single-family component of the RSOL Channel: ENERGY STAR® doors and ENERGY STAR® pool pumps. The OG&E contact reported that there had been little uptake of those measures. A CLEAResult contact reported that the biggest change to the Channel's implementation was the addition, in October, of a virtual assessment option for the single-family component, using a streaming app. The assessment uses the same mobile tool used in an in-person assessment, but the streaming app allows the CLEAResult employee to "walk through the house" with the customer and capture data. This approach does not allow the direct install of measures that are done in an in-person visit; instead, CLEAResult has changed to a "custom" option in which the assessor identifies any needed measures (e.g., power strips, LEDs, water measures) and CLEAResult has them shipped to the customer. CLEAResult had re-worded marketing material to describe the virtual assessment option. The contact noted that they had completed "a handful" of virtual assessments from October through December and that the customers who had participated that way

seemed to be satisfied with it. The CLEAResult contact also noted that they had changed requirements for participation in the multifamily component. Previously, a multifamily property could participate only if all units were treated. To respect tenants' concerns about COVID-19, the program changed the rule to allow individual tenants to opt-out or to receive the measures while they were away from their unit, or in some other way, able to avoid contact with installers. A challenge in implementing this change was that it was difficult to predict which tenants would allow entry.

Marketing and Outreach

In addition to the general HEEP marketing described above, another means of driving participation in the RSOL Channel is by promoting it via outbound calling to customers who had participated in other Channels, such as the Residential HVAC Replacement and Tune-up Channel. CLEAResult also promoted the Channel via direct mail to new homeowners and was working on developing a mailing campaign to customers who had been disqualified for participation in WRAP to promote the single-family component of RSOL. A CLEAResult contact noted that they had worked in coordination with the CEEP CEI Channel in previous years to promote the single family component of the RSOL Channel to employees of CEI participants during employee engagement events but that the pandemic had prevented them from doing that in 2020. The contact noted that the pandemic also interrupted plans for three other market and outreach activities, which CLEAResult intends to institute in the 2021 program year: 1) conducting outreach during the summer to pool supply retailers to promote the new inducements for ENERGY STAR® pool pumps; 2) promoting the RSOL Channel to renters, who may not realize they are eligible to participate; and 3) following up with previous RSOL participants whom the E-Score home report shows would benefit from additional measures.

Barriers and Challenges

As noted above, the COVID-19 pandemic caused RSOL to shut down for three months, reduced consumer spending, made customers hesitant to participate because of concerns about transmission, and reduced trade ally participation because of concerns about transmission or refusal to comply with OG&E's safety protocol. OG&E and CLEAResult responded to these challenges as they pertained to RSOL by implementing virtual inspections for single family projects, changing multifamily participation requirements to allow multifamily properties to participate without treating all units, and implementing safety protocols after the shut-down to protect against transmission of the virus.

In addition, an OG&E contact identified a challenge that affected the RSOL Channel (as well as the Residential HVAC Replacement and Tune-up Channel). This contact noted that among some cultural groups, there is a preference not to allow unknown individuals

into the home when the “man of the house” is not home. To address this, OG&E staff have attended community functions to explain their programs and reduce concerns about allowing program staff and contractors to enter their homes. The contact also noted that word of mouth within such communities has been effective in reducing such resistance.

4.6.2.2 Single family Customer Survey

ADM conducted a mixed-mode (phone/email) survey of 296 RSOL Channel participants in August-September and November-December 2020. ADM invited all Channel participants through Q3 to provide feedback. Participants without email addresses were contacted by phone. Table 4-65 displays additional detail regarding the response rates for the RSOL SF participant survey. The survey aimed to gather information regarding program awareness, decision-making, satisfaction, and measure installation verification. Unless otherwise stated, the calculations, graphs, and tables in this process evaluation use the complete sample of respondents (n=296).

Table 4-65: Single Family RSOL Survey Response Rate Information

Survey Delivery	Total
Initial email contact list	1145
Invalid email addresses	2
Bounced email	44
Undeliverable email	44
Invalid email (%)	8%
Email invitations sent (unique valid)	1055
Email completions	223
Email completions w/photo upload	98
Email completions w/photo upload (%)	44%
Email response rate (%)	21%
Initial phone list	397
Disconnected/wrong number	101
Invalid phone (%)	25%
Phone calls (unique valid)	296
Phone completions	73
Phone completions w/photo upload	15
Phone completions w/photo upload (%)	21%
Phone response rate (%)	25%
Total invites (unique)	1351
Total completions	296
Total completions w/photo upload	113
Total completions w/photo upload (%)	38%
Response rate (%)	22%

ADM surveyed customers that participated in the home assessment and direct install track of the RSOL Channel (n = 220) as well as customers that received an inducement for a "major measure," such as ENERGY STAR® windows or ceiling insulation (n = 76; Table 4-66).

Table 4-66: What measures did RSOL SF respondents receive?

Measure	n	Percentage of Respondents (n=296)
Direct Install/Home Assessment	220	74%
LED Lightbulbs	189	64%
Smart Strips	147	50%
Assessment	182	61%
Major Measure	76	26%
ENERGY STAR® Windows	49	17%
Ceiling insulation	26	9%

Ninety-five percent of survey respondents indicated that they lived in a single-family home. The remaining respondents said they lived in a mobile home, manufactured home, condominium, duplex, or rowhouse. A similar portion of respondents (95%) stated that they owned their home (5% said they were renters, and 2% preferred not to say). ADM also inquired with survey-takers regarding the number of people living in their home, the square footage of their home, main heating fuel, and water heating fuel. Table 4-67 summarizes these respondent characteristics.

Table 4-67: Single Family RSOL Respondent Home Characteristics[13]

Question	Response	Percent (n=296)
What is the main fuel used to heat your home?	Electricity	30%
	Natural gas	67%
	Propane	<1%
	Don't Know/Prefer not to say	4%
What is the main fuel used to heat your water?	Electricity	25%
	Natural gas	71%
	Propane	1%
	Don't Know/Prefer not to say	4%
Including yourself, how many people currently live in your household?	1	23%
	2	35%
	3	16%
	4	8%
	5	5%
	6 or more	3%
	Prefer not to say	9%
About how many square feet is your home?	Less than 1,000 square feet	6%
	1,000-1,999 square feet	54%
	2,000-2,999 square feet	29%
	3,000-3,999 square feet	5%
	4,000 or more square feet	2%
	Don't know	4%

ADM also asked respondents to provide demographic information regarding income, race, educational background, gender, and age. Fifty-three percent of respondents said they had completed a four-year degree (29%) or graduate/professional degree (24%). Half of the respondents said they were employed working either up to 30 hours per week (10%) or more than 30 hours per week (40%).

Of respondents that shared household income information, more than half indicated their income was $75,000 or less. Table 4-68 displays respondents' household income information. A significant portion of respondents did not share household income information as they could not recall (5%) or preferred not to share (27%) and are not included in Table 4-68.

[13] Percentages may sum to more than 100% because of rounding. Also, two respondents wrote in more than one main heating type.

Table 4-68: Respondent Household Income

Response	Percentage of Respondents (n=205)
Less than $10,000	1%
$10,000 to less than $20,000	5%
$20,000 to less than $30,000	5%
$30,000 to less than $40,000	15%
$40,000 to less than $50,000	10%
$50,000 to less than $75,000	23%
$75,000 to less than $100,000	16%
$100,000 or more	25%

About half of survey respondents identified as male (48%), and the remaining respondents identified as female (44%) or preferred not to answer (7%). Regarding age, 49% of survey respondents reported being 55 years of age or older. The majority of survey-takers (74%) identified as Caucasian or white. Table 4-69 provides additional self-reported survey-taker demographic information.

ADM also investigated differences between the demographics of direct install/assessment and major measure RSOL track survey respondents. We found that each tracks' respondents had similar characteristics. The one exception was that the RSOL direct install/assessment track survey had a larger portion of respondents identify as nonwhite. Twenty-six percent of RSOL direct install/assessment track respondents identified as nonwhite compared to 5% of major measure track respondents.[14] This indicates that the RSOL direct install/assessment track may reach a more diverse customer group than the major measure track.

[14] ADM compared the proportions with two proportion z-tests. This difference is significant with an alpha of 0.05.

Table 4-69: Additional Single Family RSOL Survey Respondent Characteristics[15]

Question	Response	Percent (n=296)
What is your age?	18-24 years old	1%
	25-34 years old	13%
	35-44 years old	18%
	45-54 years old	12%
	55-64 years old	14%
	65-74 years old	20%
	75-85 years old	14%
	86 years old or older	2%
	Prefer not to say	8%
How would you identify your race or identify?	Asian	4%
	Black/African American	7%
	Caucasian/White	74%
	Hispanic or Latino	3%
	Native American or Alaska Native	7%
	Prefer not to say	10%
Which of the following categories best describes your employment status?	Employed, working up to 30 hours per week	10%
	Employed, working 30 or more hours per week	40%
	Not employed, looking for work	2%
	Not employed, Not retired or disabled	2%
	Retired	35%
	Disabled, not able to work	1%
	Prefer not to answer	8%
What's the highest level of education you've completed?	High School Graduate/GED	11%
	Associates Degree, Vocation/Technical School, Or some college	27%
	Four-year college degree	29%
	Graduate or professional degree	24%
	I prefer not to answer	9%

Program Awareness & Decision to Participate

ADM inquired with respondents regarding how they first learned about OG&E's HEEP.

Figure 4-6 shows major measure respondents' source of Channel awareness. Figure 4-7 displays assessment/direct installation respondents' source of Channel awareness. Respondents that received inducements for a major measure primarily learned about the Channel from contractors (26%), the OG&E or HEEP website (22%), or retailers/stores

[15] Sums to more than 100% because respondents could select more than one race or ethnicity.

(20%) whereas half of home assessment/direct measure installation participants learned about the RSOL Channel from bill inserts or messages on their bills (see Figure 4-7).

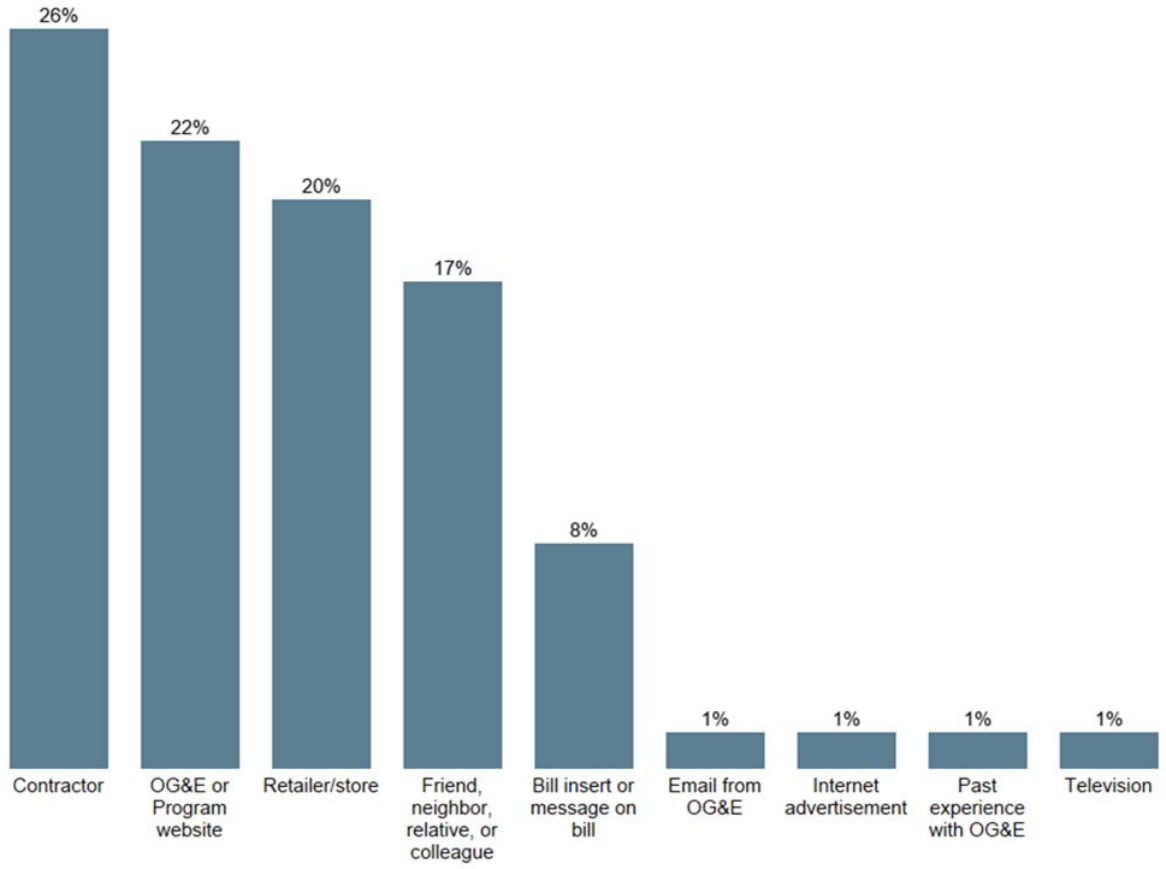

Figure 4-6: HEEP RSOL Major Measure Respondents' Sources of Program Awareness

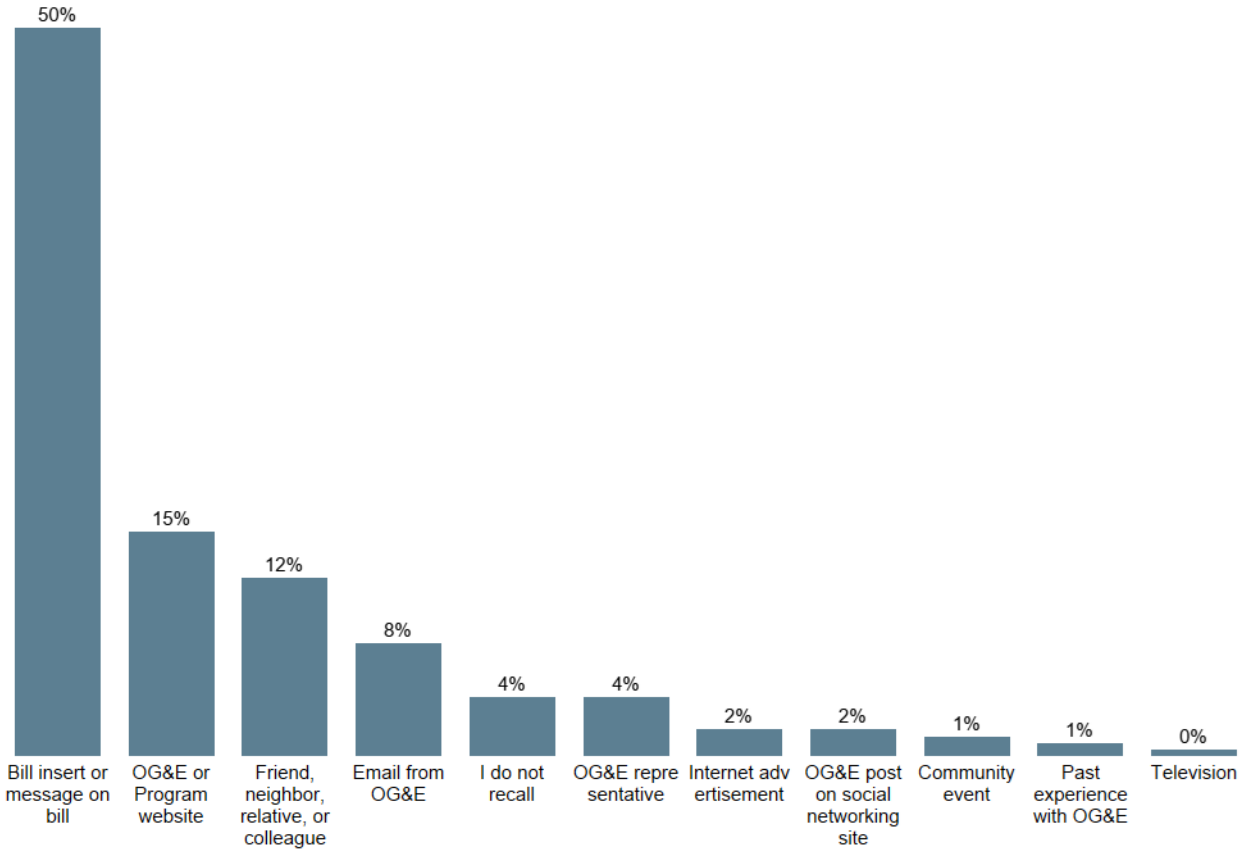

Figure 4-7: RSOL Direct Install/Assessment Respondents' Sources of Program Awareness

In addition to asking about how participants had heard about the Channel, ADM also asked whether anyone had recommended it to them. One-third of respondents (n=257) said that someone had recommended participating in OG&E's RSOL Channel. Forty-two percent of these respondents said a contractor recommended the Channel. Thirty-three percent said OG&E staff or a representative recommended it, while the remaining respondents said they had been recommended the Channel through word-of-mouth (24%) or could not recall who recommended participating (1%).

ADM asked respondents to rank and rate the importance of different reasons for signing up to participate in the RSOL Channel. Seventy percent of respondents rated reducing their monthly utility bill as either the most important (49%) or second most important reason (21%) for participating in OG&E's RSOL Channel. Sixty-five percent of respondents said that improving home comfort was either the most or second most important reason for their participation. Figure 4-8 displays how customers ranked the importance of different factors in their decision to participate in the RSOL Channel.

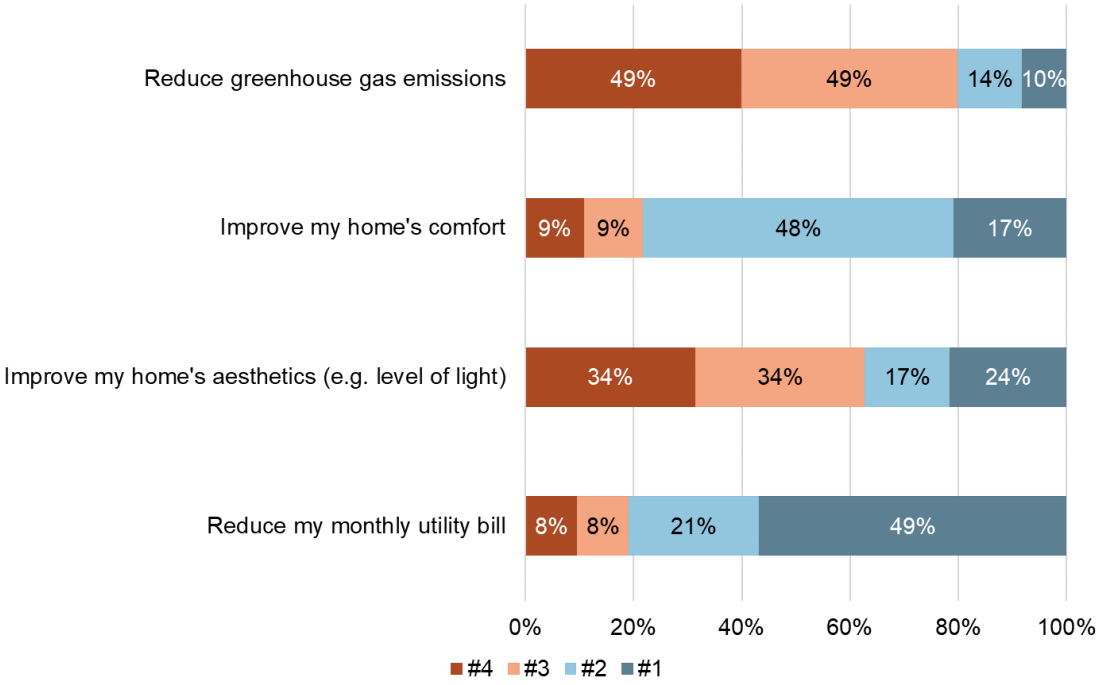

Figure 4-8: RSOL Survey Respondents Reasons for Participation

When ADM asked respondents to rate the reasons they signed up on a scale from 0 (not at all important) to 10 (very important), 91% of respondents said reducing their monthly bill was an important reason for signing up. A smaller portion of respondents said improving home comfort (78%), improving home aesthetics (53%), or reducing greenhouse gas emissions was important (44%) in motivating them to sign up for the Channel.[16]

Energy assessment experience

One hundred and eighty-two survey takers that participated in the RSOL Channel's in-home energy assessment provided feedback regarding the sign-up process, assessment, and direct installation of measures (if applicable).

The vast majority of these respondents said they requested their home energy assessment in two ways: by calling the customer service center (51%) or by visiting the website (41%). The remaining respondents were unable to recall how they requested their assessment (6%) or said they signed up in some other way (3%). Other methods of signing up included sending OG&E an email, receiving a call from OG&E, and attending a community event. Like ADM's 2019 survey results, most respondents who recalled

[16] Rated the importance a 7 or higher on a scale from 0 (not at all important) to 10 (very important).

using the website[17] or calling the customer service center[18] to sign-up rated the ease of signing up highly.

Of the 182 in-home assessment survey respondents, three-quarters (73%) noted that their assessor provided them an energy assessment report with energy efficiency recommendations. Of those 133 respondents, the vast majority (89%) said that the report was helpful.[19]

Just over half (56%) of the in-home assessment respondents noted that their assessor had provided them with information regarding other OG&E energy efficiency programs during their appointment.

Three-quarters (75%) of these respondents said their assessor discussed the potential energy savings they could achieve by implementing their recommendations. Eighty-nine percent of the respondents that recalled their home energy assessor providing recommendations found them helpful.[20]

Of the 136 respondents who recalled their assessor gave them recommendations, just under half (47%) said they had completed some of the recommendations. Those 64 respondents noted completing an assortment of energy efficiency improvements. Half (51%) of these respondents said they had installed LED lightbulbs. A quarter (26%) said they had either completed weatherstripping or air sealing improvements (23%) or had participated in the OG&E Weatherization program (3%). Respondents also noted other improvements that included adding insulation (12%), replacing doors or windows (8%), or replacing an appliance like a water heater, AC unit, or refrigerator (6%). A smaller portion of these respondents noted making other improvements, including changing furnace filters (3%), changing heating/water heating setpoints (3%), having an AC tune-up (3%), or installing solar panels (2%).

Of the fifty-one respondents who stated that they had not completed the recommendations that their assessor provided, 45% said they were still planning on making the improvements in the future.

Figure 4-9 illustrates the outcome of in-home assessments in terms of recommendations made and implemented. The percentages in each circle represent the proportion of the 182 in-home assessment respondents who provided the information indicated.

[17] Rated it a 4 or 5 out of 5 on a scale from 1 (very difficult) to 5 (very easy)

[18] 91% of survey respondents that recalled calling the customer service center rated it a 4 or 5 out of 5 on a scale from 1 (very difficult) to 5 (very easy)

[19] Rated the helpfulness of the report a 4 (27%) or 5 (62%) on a scale from 1 (not at all helpful) to 5 (very helpful)

[20] Rated their helpfulness a 4 (27%) or 5 (62%) out of 5 on a scale from 1 (not at all helpful) to 5 (very helpful)

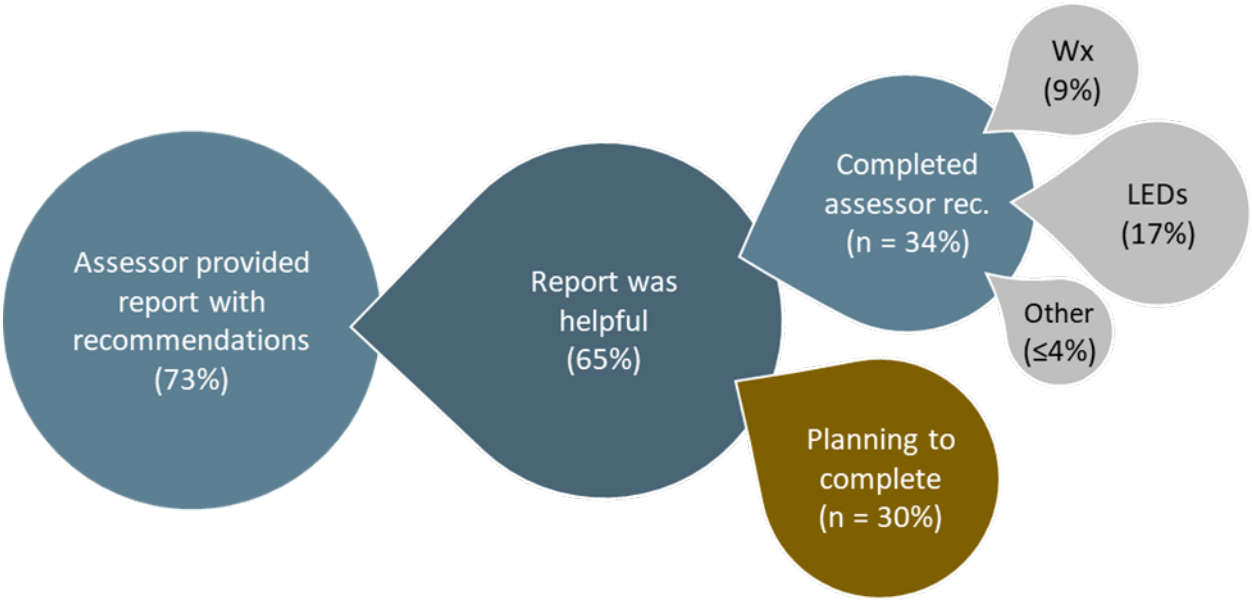

Figure 4-9: Outcome of In-Home Assessment: Recommendations and Installations

Table 4-70 displays the reasons customers noted for not making the improvements that the OG&E RSOL assessor recommended.

Table 4-70: Single Family RSOL Respondents' Reasons for Not Implementing Recommended Improvements

Response	Percent (n = 51)
Still planning to implement in the future	47%
Cost	37%
Do not have time	12%
Waiting for equipment to fail	10%
Thought OG&E was sending someone	6%
No need	6%
Do not think they need to be done/will save energy	4%
Need more information	4%
COVID-19	4%
Do not own the property	2%
Moving soon	2%
I do not know	2%

Channel satisfaction

Most respondents were satisfied with their overall experience and individual aspects of their experience with the OG&E RSOL Channel.[21] Figure 4-10 displays RSOL single family survey-takers' satisfaction with various aspects of the Channel and the Channel overall. Additionally, 77% of respondents reported recommending this OG&E Channel to others (n=296).

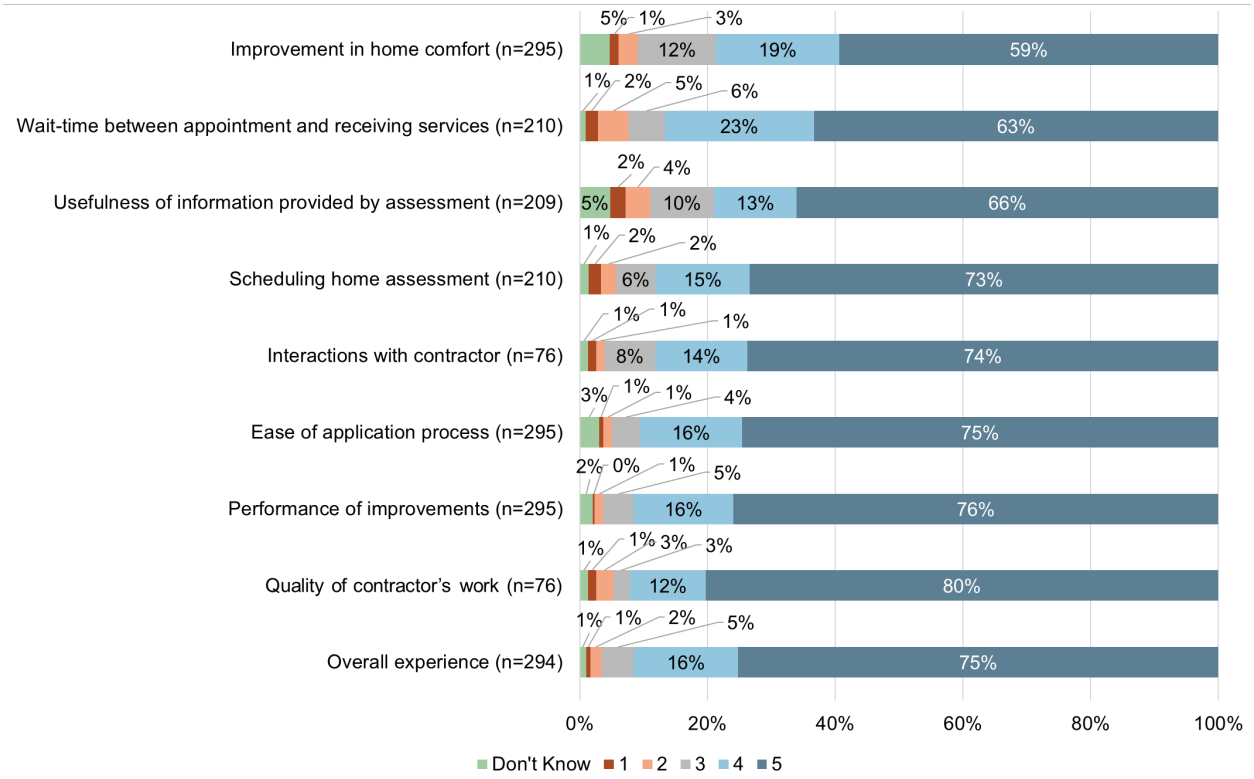

Figure 4-10: Single Family RSOL Respondent Satisfaction

Thirty-nine of the survey respondents (13%) noted dissatisfaction with some aspect of the Channel and were allowed to elaborate. Thirty-four of these respondents had participated in the RSOL assessment/direct install track. These respondents noted a variety of issues:

- 17 (44%) mentioned issues with communications. These issues ranged from customers having difficulties scheduling their assessment and coordinating with the Channel staff to customers misunderstanding the Channel's offerings or the process to sign up for other OG&E Home Energy Efficiency Program Channels.

[21] 92% of respondents rated their overall experience with the Channel a 4 or 5 on a scale from 1 (very dissatisfied) to 5 (very satisfied) and over 75% rated their experience a 4 or 5 with all other aspects of the Channel.

- 13 (33%) shared dissatisfaction with their assessment. Of those, six said they did not receive an assessment report, and seven said the RSOL Channel assessor/assessment did not meet their expectations by providing useful or sufficient information.
- 12 (31%) noted a long wait time to receive services.
- Six (15%) were dissatisfied with the Channel's offerings or communications in general and noted opportunities for improving Channel design, communication, or implementation.
- Three respondents expressed dissatisfaction with their contractor, two were unhappy with the advanced power strips, and one indicated dissatisfaction with the provided LED lightbulbs and the ease of getting their rebate.

A large majority (89%) of respondents indicated that they were satisfied with OG&E as their electric service provider overall.[22]

Direct installation decision making

ADM asked RSOL participants to confirm the items installed in their homes as a part of their participation in the Channel. One hundred and forty-seven respondents confirmed the installation of advanced power strips. One hundred and eighty-nine respondents confirmed that their assessor installed LED light bulbs. None of the survey-takers reported receiving faucet aerators or energy saving showerheads through the RSOL Channel.

Of the 189 customers that confirmed receiving LED light bulbs through the Channel, 90% stated that they had purchased them in the past, and 55% said that they had plans to install them before learning about the OG&E RSOL Channel.

By contrast, of the 147 respondents who said they had purchased advanced power strip(s), 22% reported having done so before participating in the RSOL Channel, and 11% that they had plans to install them before learning about the OG&E RSOL Channel.

These findings indicate a relatively small portion of the discounted LED light bulbs might not have been sold without the OG&E RSOL Channel, but it seems that a much larger portion of the power strips would not have been sold without the OG&E RSOL Channel.

Major measure decision-making

Of the 76 survey-takers who reported installing a major measure, 26 confirmed that they had received a rebate for ceiling insulation, and 49 confirmed that they received a rebate

[22] Rated their satisfaction with OG&E a 4 (23%) or 5 (65%) on a scale from 1 (very dissatisfied) to 5 (very satisfied). n=295.

for ENERGY STAR® windows. One respondent could not recall whether they had ENERGY STAR® windows installed through the RSOL Channel.

Consistent with ADM's 2019 customer survey, most respondents noted having plans to install these measures before learning of the OG&E rebate. Forty-five of ENERGY STAR® window respondents and 22 of the ceiling insulation survey respondents said they had plans to install these measures before learning of the OG&E rebate.

Similarly, about four-fifths of ENERGY STAR® window and half of ceiling insulation respondents noted that they would have been able to make the financial investment to make the improvements without the OG&E RSOL Channel inducement.

One-fifth of the ENERGY STAR® window and about one-third of the ceiling insulation respondents said they made the improvements sooner than they would have if the OG&E rebate had not been available.

These survey findings indicate that a sizeable portion of respondents still would install ENERGY STAR® windows or ceiling insulation if the OG&E RSOL Channel did not offer an inducement.

4.6.2.3 Multifamily Customer Survey

ADM conducted phone surveys with nine property owners or managers that participated in the OG&E RSOL Channel in 2020. Five respondents said that electricity was the primary fuel type used for space heating the tenant units, and one noted that natural gas was used. The remaining three respondents said that some units or buildings use natural gas, while others used electricity for space heating. Similarly, four respondents said tenants' water was heated using electricity, while the other five respondents noted water heating used electricity and natural gas. All respondents said that tenants paid their electric bills. Four noted that some units at the RSOL Channel participating property were receiving some sort of federal, state, or other housing assistance.

Program Awareness

Five respondents noted that they had heard about the Channel from a contractor. One of these respondents also said that they had contacted OG&E regarding the Channel and knew about the opportunity through their previous employer. Two property owners/managers said that their corporate office had decided to participate, and they were unaware of how they became aware of the opportunity. The remaining respondent only commented they had learned about the Channel through word-of-mouth.

Six of the respondents reported directly completing the application to participate in the RSOL Channel, three of these respondents also noted that a contractor had worked on their application, and one said they had worked with someone else at their company on

the application. Two respondents stated that someone else at their company had been responsible for completing their application.

All respondents confirmed receiving advanced power strips, faucet aerators, LED bulbs, and energy saving showerheads at their properties and said that a Channel contractor or vendor implemented the HEEP RSOL project at their property or properties.

Past Experience and Decision-making

Regarding their motivation to participate, all the respondents stated that they participated to reduce tenant utility bills, and five said they were seeking to reduce the property's bills.

Three respondents noted that they had plans to purchase faucet aerators and LED lightbulbs before learning that they could receive them for free through the RSOL Channel. One of the respondents had plans to purchase and install the low flow showerheads, while no respondent mentioned any previous plans for purchasing and installing advanced power strip(s) in tenant units.

ADM asked RSOL multifamily respondents about the likelihood they would have installed the same energy efficient products within 12 months of when they received them if they had not received them for free. Figure 4-11 displays the result.

Survey findings indicate most properties would not have installed the energy efficient products without the OG&E RSOL Channel.

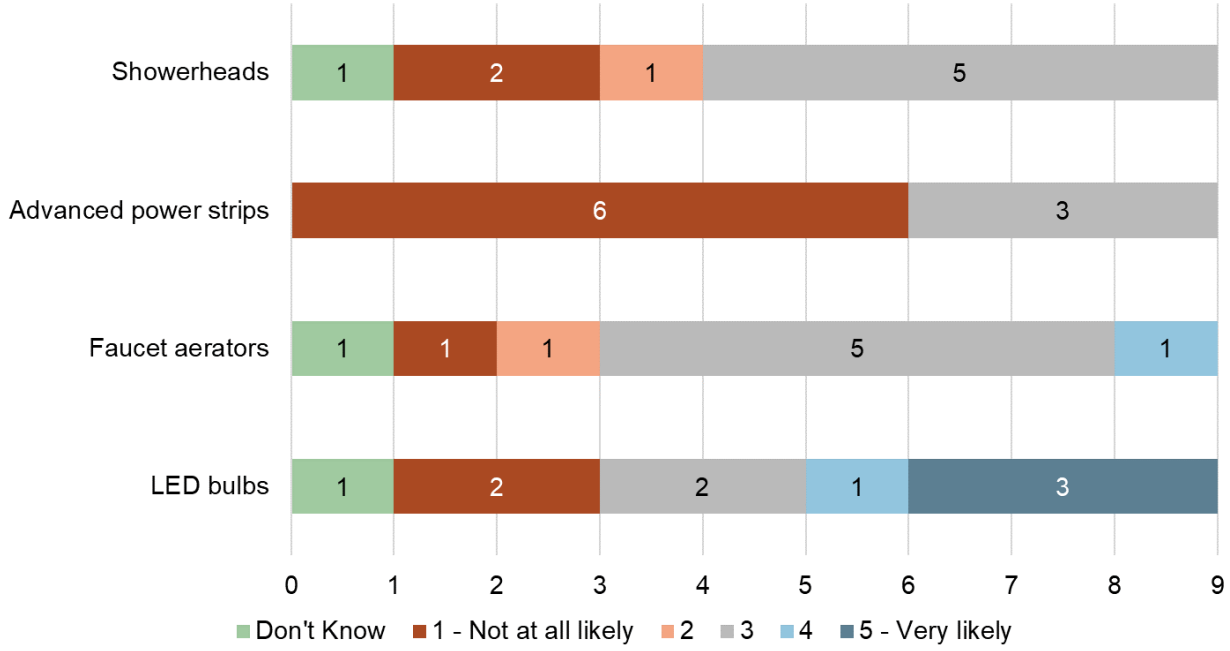

Figure 4-11: How likely is it that you/your property would have installed the same products within 12 months of when they received them?

Three respondents noted having installed additional energy efficient equipment that OG&E had not induced after participating in this Channel. Two said they had installed LED light bulbs, and one mentioned ENERGY STAR appliances such as refrigerators and dishwashers. These respondents did not know the quantity of LED light bulbs or appliances purchased since participating. Two were unsure whether their participation in the RSOL Channel had influenced their decision to purchase the LED light bulbs. One respondent said they always seek to purchase energy efficient appliances and observed that they would have installed these items regardless of their participation in the RSOL Channel as they replaced items as tenants moved out or old equipment failed.

One respondent noted that their property had also participated in the OG&E HEEP Residential HVAC Replacement and Tune-up Channel and had duct and air sealing improvements completed at their properties.

Channel satisfaction

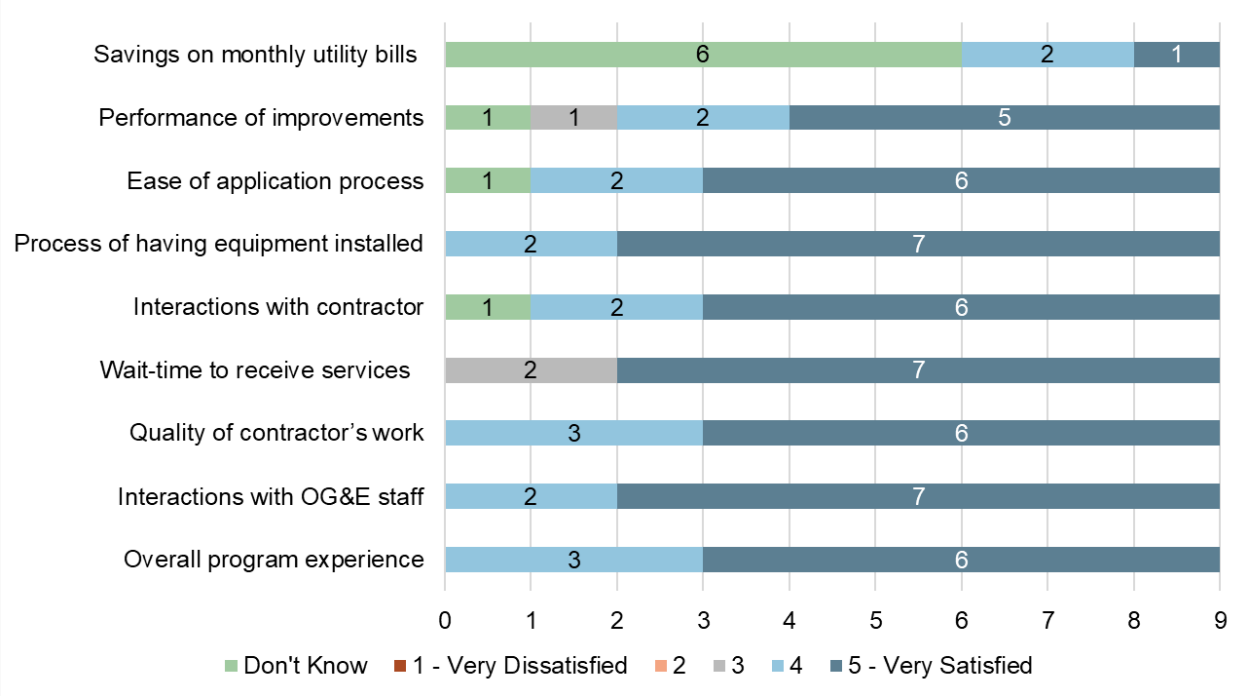

Figure 4-12: RSOL Multifamily Respondent Satisfaction

All the respondents were satisfied with their overall experience. Figure 4-12 displays RSOL multifamily survey respondents' satisfaction with the Channel overall and individual aspects of the Channel.

Three respondents provided additional feedback and suggestions to improve the Channel. Two respondents noted that they had been interested in common area lighting and were disappointed that their property had not received more holistic energy efficiency upgrades through the Channel. Two respondents noted that some tenants had been

unhappy with the low flow showerheads provided through the Channel. One specifically mentioned that the contractor had installed some showerheads in units in which the residents had requested to keep their old equipment installed. One respondent stated that an OG&E representative or contractor had offered to check their AC units but had not.

In addition to being satisfied with the Channel, eight of the nine respondents also noted being satisfied with OG&E as their electric service provider. The remaining respondent commented that OG&E could improve its service by increasing their support and communication when they turn off units' power for non-payment. They noted that sometimes they are unaware if a unit has been turned off or is non-functional.

4.6.3 LivingWise® Schools Outreach Channel

The 2020 process evaluation activities included a review of updated Channel materials and a review of the student survey and quiz materials. The survey results were supplied to ADM by AM Conservation.

4.6.3.1 LivingWise® Schools Outreach Staff Interviews

This section provides LivingWise® Schools Outreach Channel specific information gathered through ADM's interviews with HEEP staff. Additional background and information gathered during the interviews can be found in Section 4.6.1.

Goals and Progress

The OG&E contact for LivingWise® Schools Outreach reported that the Channel is "flowing just fine" and looks like it will meet the goal.

Design and Implementation

This is the first year that ADM's evaluation interviewed contacts for the LivingWise® Schools Outreach Channel. Contacts explained that participation in LivingWise® Schools Outreach has two components: 1) a workbook that participating fifth-grade teachers may use to help teach children energy-related science to their students, and 2) energy saving measure kits for the teachers to distribute to the students.

The OG&E contact noted that the workbook helps them teach children about the kits' measures and includes math and problem-solving components. The AM Conservation contact echoed this sentiment and said the program "fills a science void that teachers always seem to be looking for" to meet certain state standards; that it is a good "filler" for the science curricula, providing a hands-on program. That contact went further to say that LivingWise® Schools Outreach has been "institutionalized" in OG&E's service territory, meaning that teachers now expect the program. The OG&E contact suggested, however,

that the materials do not replace existing curricula – that teachers often use them after the students complete state testing to provide "fun facts" related to the existing curricula. Contacts for both OG&E and AM Conservation reported that teachers typically spend one to two weeks on the teaching materials.

The Channel is restricted to 16,000 kits per year, which is fewer than the number of fifth graders in the OG&E service territory. The OG&E contact reported that they try to spread participation out over multiple school districts so that the kits are not going to one area; this year's internal goal was to get at least 50 school districts, and they had gotten more than 100.

After 500 to 600 kits are distributed the implementer sends the OG&E contact a spreadsheet showing the number of kits that were distributed, together with a bill. OG&E EM&V staff upload the spreadsheet into OG&E's project tracking system and review the savings calculations. The OG&E contact reported that OG&E had not identified any problems with the tracking data this year.

The OG&E contact noted that no changes had been made to the contents of the energy saving kits. The contact noted, however, that the COVID-19 pandemic caused OG&E to change the implementation somewhat. Typically, they try to implement LivingWise® Schools Outreach completely in the spring. This year, they began in the spring but were able to distribute only about 40% of the kits before the pandemic caused schools to shut down. They started up again in the fall, but school buildings remained closed and education was being carried out virtually. LivingWise® Schools Outreach staff were able to get teachers to mail the kits to their students and use the workbooks during online instruction. Another change is that, while the implementer typically delivers the kits to teachers inside the school, in 2020, they met teachers outside the schools to deliver the kits.

The OG&E contact reported receiving feedback from parents about how much fun they had installing the kit measures. She regarded this – the fact that the kits allow families to save money while having fun with their kids – as a great program strength, especially as some families do not have incomes (because of the economic impacts of the pandemic).

Marketing and Outreach

OG&E and AM Conservation coordinate recruiting schools for the LivingWise® Schools Outreach Channel. OG&E sends letters to schools once or twice a year that mentions LivingWise® Schools Outreach, teacher scholarships, and grants for energy efficient equipment in the classroom. At the beginning of the year, AM Conservation sends an email blast to schools about the Channel. Then nine OG&E community coordinators and community affairs representatives conduct outreach in the community. The community outreach may include outreach to corporations that support local schools, chambers of

commerce, and school boards. The community coordinators also conduct direct outreach to schools, which includes delivering a flyer about the program. The OG&E PM also typically visits 60 to 70 schools a year, although this year, the number of schools she was about to visit was reduced to 30. Teachers may then contact AM Conservation to ask to participate. The OG&E contact noted that she did not expect the marketing activities to change much because they already work so well. Her main focus is getting new schools to participate and to get the kits to new families.

Barriers and Challenges

The need to continue distributing kits in the fall 2020 term created a challenge for the LivingWise® Schools Outreach. OG&E typically finds the spring term to be a better time to work with the students. However, to offer the program in the spring 2021 term, LivingWise® Schools Outreach will need to recruit new schools, since the spring 2021 fifth graders in the currently recruited schools will already have been reached by LivingWise® Schools Outreach in fall 2020.

4.6.3.2 Geographic Distribution of School Outreach Kits

The geographic distribution of LivingWise® School Outreach kits by zip code is displayed below in Figure 4-13. The kits were distributed throughout the state and include most major population centers, including Oklahoma City, Tulsa, Muskogee, Ardmore, and Caddo.

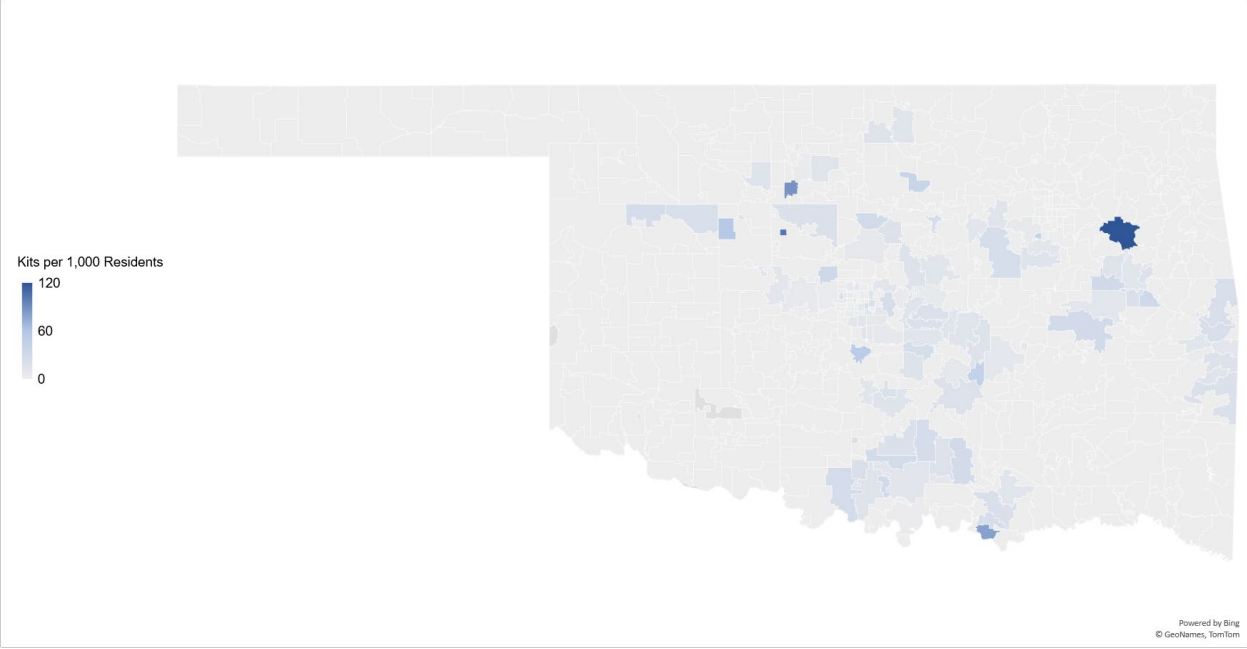

Figure 4-13: Distribution of LivingWise® Schools Outreach Kits

4.6.3.3 Responses to Kit Surveys/Quizzes

As previously stated, AM Conservation did not significantly change the program design in PY2020. It continued to include four surveys/quizzes within the course materials to help Channel administrators understand more about the Channel's efficacy. The surveys/quizzes are the Pre-Program Quiz, the Home Check-Up Survey, the Post-Program Quiz, and the Home Activities survey. The surveys were a mix of demographic and engagement questions. The Pre-Program Quiz and Post-Program quizzes each contained the same ten questions that assess students' energy knowledge. The quizzes were a mix of multiple-choice and true or false questions. They were administered in the classroom by teachers before and after teachers completed the curriculum with their students.

Consistent with previous program years' findings, students performed better on the Post-Program quiz than on the Pre-Program quiz on average. The score for each quiz response ranged from 0% to 100%. Based on the number of questions answered correctly, the pre-Program quiz's average score was 55% compared to 75% for post-Program quizzes. Therefore, on average, post scores were 20 points higher than pre scores.[23] The mean difference between the average pre- and post-scores for teachers' classes varied greatly. The scores ranged from an increase of 52% to a decrease of 13%.

Figure 4-14 shows the percent of students that answered individual questions correctly in the Pre-Program and Post-Program quizzes.

[23] ADM conducted a one-sample *t*-test on the 1,177 students who took both the Pre-Program Quiz and Post-Program Quiz. A total of 1,208 students took the Pre-Program Quiz and 1,187 responses took the Post-Program Quiz, with 1,220 taking at least one of them; therefore, scores from 96% of the students were included in the *t*-test. The number of students who completed quizzes varied widely among teachers. Teachers with more students, therefore, have disproportionately larger influence on the overall results. To equalize the contribution that each teacher made to the overall results, we also computed a weighted mean difference score, where the weight for each student was equal to the mean number of students per teacher divided by the number of students that student's teacher had. The findings were dissimilar to the initial findings, with a weighted mean Pre-Post difference of 28 percentage points.

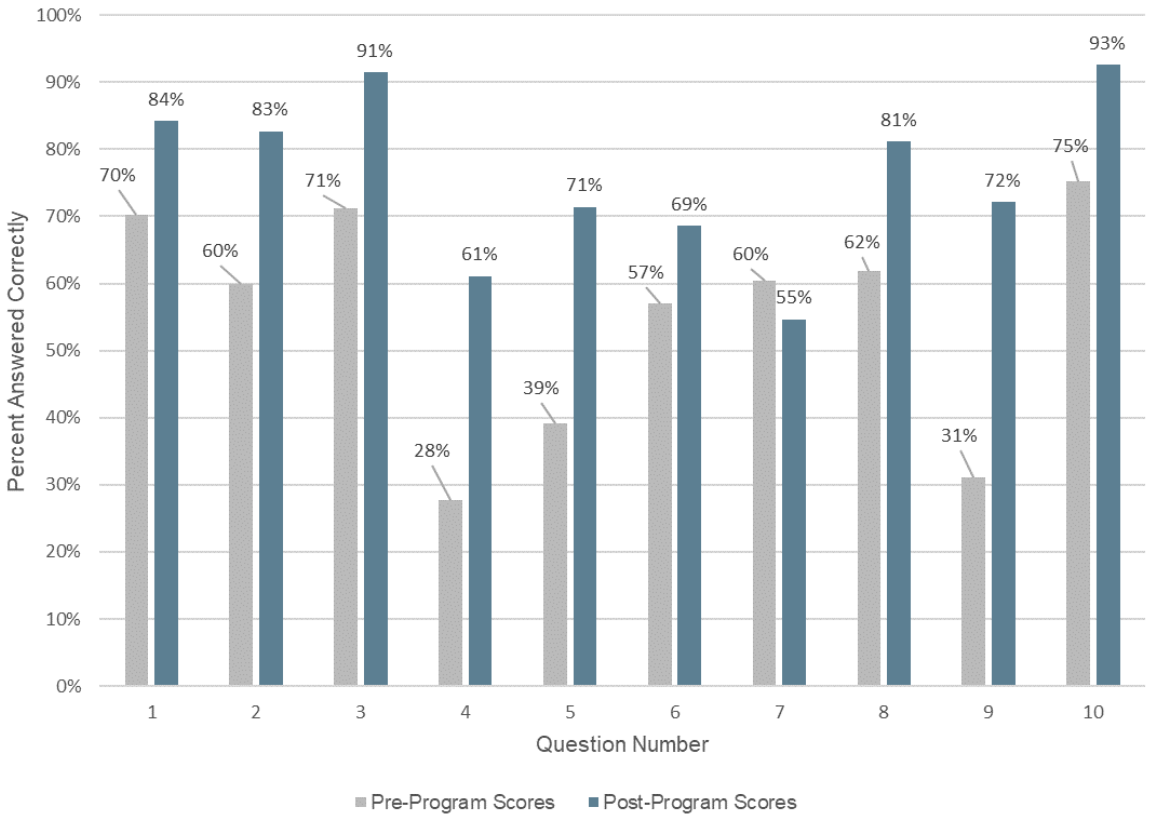

Figure 4-14: What percent of quiz questions did students answer correctly?

Note that the only question that did not show improvement between Pre-Program and Post-Program was Question 7, which asks which appliance uses the most energy.[24] In ADM's 2019 evaluation, it was suggested that Question 7 be altered to be less ambiguous. As written, the answer to this question depends on whether the respondent considers the question to be asking which appliance uses the most energy when running (i.e., which one requires the highest wattage) or which appliance uses the most energy over time (i.e., which one uses the most kWh). A clothes dryer uses 400 to 1300W compared to about 100 to 400W for a refrigerator, so the clothes dryer uses more energy by the wattage criterion. However, a refrigerator is in continuous use, and so it uses more kWh than a clothes dryer over an extended period.

The Home Check-Up Survey contained questions regarding students' home characteristics. Teachers gave this survey to students to take home and fill it out with parental assistance if needed. That survey had 1,159 respondents. The responses from the survey were very consistent with previous program years. Nearly 57% of survey

[24] Question seven has not shown improvement for two consecutive years. In PY2019, question seven received 1% fewer correct responses in the post-program quiz. In PY2020, question seven received 5% fewer correct responses in the post-program quiz.

respondents reported that their home used electricity for heating. The remaining respondents said their home used natural gas (26%) or some other fuel source (17%).

An equal number of survey respondents (41%) indicated that electricity and natural gas was the primary fuel type for their water heater, and fewer (18%) reported propane. Most respondents reported having either one (29%) or two bathrooms (55%) in their homes. About 68% of respondents reported having at least one-half bathroom in their homes. Table 4-71 displays a summary of selected home characteristics.

Table 4-71: Home Characteristics

Home Characteristics	Percentage of Respondents
Home Type (n=1,195)	
Single family	89%
Multifamily	11%
Own or Rent (n=1,177)	
Own	74%
Rent	26%
Home Heating Type (n=1,174)	
Natural Gas	26%
Electricity	57%
Propane	11%
Other	6%
Water Heating Type (n=1,159)	
Natural Gas	41%
Electricity	41%
Propane	18%
Air Conditioning Type (n=1,176)	
Central Air Conditioner	75%
Evaporative Cooler	3%
Room Unit	17%
Do Not Have One	4%
Number of People Living in Household (n=1,196)	
One	1%
Two	3%
Three	17%
Four	27%
Five	26%
Six	14%
Seven+	12%

The Home Activities survey was the final survey administered to the students. It asked about their home energy use and installing the measures they received in the LivingWise® Schools Outreach kits. The Home Activities Survey had 1,156 respondents. Sixty-two percent of students stated that they worked with their family on the Channel's activities.

Most survey respondents rated the LivingWise® Schools Outreach favorably. Table 4-72 illustrates the ratings that students assigned to the Channel.

Table 4-72: How would you rate LivingWise® Schools Outreach?

Response	Home Activities Survey Respondents (n = 1,156)
Great	45%
Pretty Good	33%
Okay	19%
Not So Good	3%

Over half of the survey respondents reported installing the LED nightlights and both 9W Omni-directional LEDs. Fewer than half of respondents stated they had installed the high-efficiency showerhead, kitchen faucet aerator, or bathroom faucet aerator. Table 4-73 displays installation rates for the School Outreach Kit measures.

Table 4-73: Installation rates for LivingWise® Schools Outreach Kits

Measure	High-efficiency Showerhead (n=1,181)	Bathroom Faucet Aerator (n=1,176)	Kitchen Faucet Aerator (n=1,173)	1st 9W LED (n=1,178)	2nd 9W LED (n=1,176)	LED Night Light (n=1,181)
Installation rate	46%	36%	38%	64%	55%	75%

Fifty-eight percent of survey respondents reported that their family changed their energy use behavior following their participation in the Channel (Figure 4-15). However, over three-quarters of survey respondents reported that their families did not lower their water heater settings, raise the temperature on their refrigerator (71%), or adjust the thermostat in winter for heating (56%) or summer for cooling (56%).

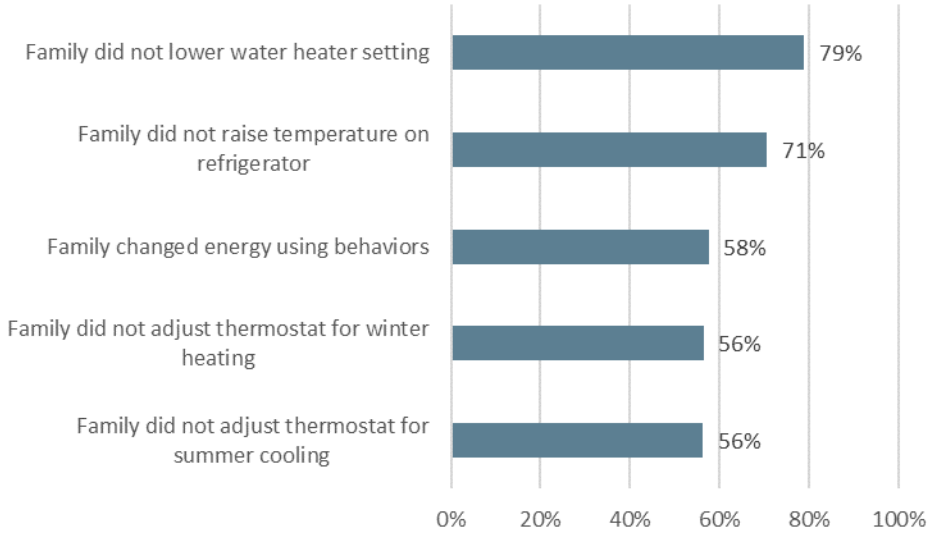

Figure 4-15: Did students report changing home energy behaviors?

4.6.4 Residential HVAC Replacement and Tune-up Channel

The Residential HVAC Replacement and Tune-up Channel's process-related data collection activities included program staff interviews, surveys of participating single-family home customers and multifamily property owners/managers, and in-depth interviews with participating trade allies and contractors.

4.6.4.1 Residential HVAC Replacement and Tune-up Channel Staff Interviews

This section summarizes information gathered through interviews with OG&E and CLEAResult staff regarding the OG&E HEEP Residential HVAC Replacement and Tune-up Channel. Additional information regarding staff interviews can be found in Section 4.6.1.

Goals and Progress

The HEEP Residential HVAC Replacement and Tune-up Channel was shut down from mid-March until mid-June, but in fact field work was not able to begin until the beginning of July after safety training with trade allies had been completed. It was affected by COVID-19 to some degree because customers did not want other people to come into their homes. However, it was not affected as adversely as RSOL since heating and air contractors do a lot of their work outside the home. Before the program opened back up in mid-June, OG&E had put safety protocols in place to reduce the risk of infection when treating homes. However, some contractors nevertheless decided not to participate this year either because of safety concerns or because they did not want to adhere to the safety protocols. Despite these challenges, this Channel came "really close" to its goal.

Design and Implementation

Interviewees indicated the only change to the Residential HVAC Replacement and Tune-up Channel was adjusting the minimum SEER requirement for replacements, with a minimum of SEER 18 now required. Early in the year, CLEAResult had looked into the possibility that the minimum outdoor temperature for conducting HVAC tune-ups could be lowered. ADM was consulted as the evaluator and approved doing so, but in the end, the shutdown prevented CLEAResult from performing any tune-ups at lower outdoor temperatures.

Marketing and Outreach

In addition to the general HEEP marketing described above, a CLEAResult contact reported that CLEAResult was developing a mailing campaign to customers who had been disqualified for participation in WRAP to promote the Residential HVAC Replacement and Tune-up Channel.

Barriers and Challenges

As noted above, the COVID-19 pandemic caused Residential HVAC Replacement & Tune-up to shut down for three months, reduced consumer spending, made customers hesitant to participate because of concerns about transmission, and reduced trade ally participation because of concerns about transmission or refusal to comply with OG&E's safety protocol. OG&E and CLEAResult responded to these challenges as they pertained to Residential HVAC Replacement & Tune-up by maintaining contact with trade allies during the shut-down period to let them know they "were still a partner" and implementing safety protocols after the shut-down to protect against transmission of the virus.

In addition to the COVID-19 specific challenges that affected most of the programs identified above, an OG&E contact identified a challenge that affected the Residential HVAC Replacement & Tune-up Channel (as well as the RSOL Channel). This contact noted that among some cultural groups, there is a preference not to allow unknown individuals into the home when the "man of the house" is not home. To address this, OG&E staff have attended community functions to explain their programs and reduce concerns about allowing program staff and contractors to enter their homes. The contact also noted that word of mouth within such communities has been effective in reducing such resistance.

A CLEAResult contact noted that a challenge for the Residential HVAC Replacement & Tune-up Channel was that their current trade allies do not work in some remote parts of the service territory. The contact noted that, when dealing with customers in those areas, they ask them if there is an HVAC provider they have used in the past that the program can contact to recruit. Such results produced "very little" success in 2020, at least partly because of the shortened period of program activity – CLEAResult made contact with "a

handful" of trade allies in remote areas but did not sign anyone up through that effort. CLEAResult will renew those efforts in 2021.

4.6.4.2 Single Family Residential HVAC Replacement & Tune-up Channel Customer Survey

ADM conducted a survey of 206 single family HEEP Residential HVAC Replacement & Tune-up Channel participants in August, November, and December 2020. We surveyed customers that participated in both the tune-up and installation tracks of the Channel. Table 4-74 displays additional detail regarding the response rates for the RSOL SF participant survey. Fifty-three replacement and 153 tune-up track customers responded to the survey. See Table 4-74 for more information.

Table 4-74: Single Family Residential HVAC Replacement & Tune-up Survey Response Rate Information

Survey Delivery	Tune-Up	Install	Total
Initial email contact list	401	280	681
Invalid email addresses	14	13	27
Bounced email	34	27	61
Undeliverable email	15	14	29
Invalid email (%)	*16%*	*19%*	*17%*
Email invitations sent (unique valid)	338	226	564
Email completions	85	29	114
Email completions w/photo upload	41	14	55
Email completions w/photo upload (%)	48%	48%	48%
Email response rate (%)	25%	13%	20%
Initial phone list	410	105	515
Disconnected/wrong number	43	14	57
Invalid phone (%)	*10%*	*13%*	*11%*
Phone calls (unique valid)	367	91	458
Phone completions	68	24	92
Phone completions w/photo upload	10	1	11
Phone completions w/photo upload (%)	*15%*	*4%*	*12%*
Phone response rate (%)	17%	23%	18%
Total invites (unique)	705	317	1022
Total completions	**153**	**53**	**206**
Total completions w/photo upload	51	15	66
Total completions w/photo upload (%)	33%	28%	32%
Response rate (%)	**22%**	**17%**	**20%**

Most respondents reported owning a single family, single-story home that uses natural gas as the main fuel for home and water heating. Table 4-75 summarizes respondent home characteristics.

Table 4-75: Single Family Residential HVAC Replacement & Tune-up Survey Respondent Home Characteristics

Question	Response	Percent (n=206)
Do you rent or your home?	Own	93%
	Rent	3%
	Own and Rent to Someone Else	4%
Which of the following best describe your home?	Single family home	94%
	Duplex, condo, townhouse, or apartment	2%
	Don't know/prefer not to say	4%
What is the main fuel used to heat your home?	Electricity	24%
	Natural Gas	71%
	Propane/Wood Stove	1%
	Don't know/Prefer not to say	3%
What is the main fuel used to heat your water?	Electricity	26%
	Natural Gas	67%
	Propane	1%
	Don't know/Prefer not to say	5%
How many stories does your house have?	1	78%
	2	17%
	3 or more	1%
	Don't know/Prefer not to say	3%
About how many square feet is your home?	Less than 1,000 square feet	4%
	1,000-1,999 square feet	49%
	2,000-2,999 square feet	26%
	3,000-3,999 square feet	7%
	4,000 or more square feet	5%
	Don't know	9%
When was your home built?	Before 1960	17%
	1960 to 1969	13%
	1970 to 1979	12%
	1980 to 1989	13%
	1990 to 1999	8%
	2000 to 2009	19%
	2010 to 2018	16%
	Don't know/Prefer not to say	8%
Including yourself, how many people currently live in your household?	0	<1%
	1	18%
	2	36%
	3	12%
	4	12%
	5	6%
	6 or more	2%
	Prefer not to say	14%

Table 4-76: Residential HVAC Replacement & Tune-up Respondent Household Income[25]

Response	Percentage of Respondents (n=136)
$10,000 to less than $20,000	7%
$20,000 to less than $30,000	5%
$30,000 to less than $40,000	9%
$40,000 to less than $50,000	7%
$50,000 to less than $75,000	20%
$75,000 to less than $100,000	21%
$100,000 or more	32%

About half of survey respondents identified as male (47%). and the remaining respondents identified as female (46%) or preferred not to identify their gender (8%). Regarding age, survey respondents identified themselves evenly between being 54 years old or younger and 55 years of age or older. The majority of survey-takers (72%) identified as Caucasian or white.

ADM also asked respondents to provide demographic information regarding income, race, educational background, gender, and age (Table 4-77). Fifty-one percent of respondents said they had completed a four-year degree (24%) or graduate/professional degree (27%). Fifty-three percent said they were employed working either up to 30 hours per week (9%) or more than 30 hours per week (44%).

[25] Does not total 100% due to rounding.

Table 4-77: Additional Single Family Residential HVAC Replacement & Tune-up Survey Respondent Characteristics

Question	Response	Percent (n=206)
What is your age?	18-24 years old	<1%
	25-34 years old	12%
	35-44 years old	18%
	45-54 years old	14%
	55-64 years old	17%
	65-74 years old	19%
	75-85 years old	10%
	86 years old or older	<1%
	Prefer not to say	9%
How would you identify your race or identify? [2]	Asian	3%
	Black/African American	7%
	Caucasian/White	72%
	Hispanic or Latino	4%
	Native American or Alaska Native	5%
	Prefer not to say	11%
Which of the following categories best describes your employment status?	Employed, working up to 30 hours per week	9%
	Employed, working 30 or more hours per week	44%
	Not employed, looking for work	2%
	Not employed, Not retired or disabled	1%
	Retired	33%
	Disabled, not able to work	1%
	Prefer not to answer	10%
What's the highest level of education you've completed?	High School Graduate/GED	16%
	Associates Degree, Vocation/Technical School, Or some college	22%
	Four-year college degree	24%
	Graduate or professional degree	27%
	I prefer not to answer	11%

ADM also investigated differences between the demographics of HVAC tune-up and installation survey respondents. The respondents had similar characteristics, with a few notable differences.[26] A larger portion of installation respondents than tune-up respondents identified as male (57% versus 43%). Also, 34% of HVAC installation

[26] ADM compared the proportions with two proportion z-tests. These differences are significant with an alpha of 0.05.

customers said they use electricity to heat their home compared to 21% of tune-up respondents.

4.6.4.3 Single Family HVAC Tune-Up and Installation Customer Survey

ADM asked the 153 HEEP Residential HVAC Replacement and Tune-up participants questions about their experience with HVAC tune-ups, Channel awareness, the decision to participate in the OG&E HEEP, and satisfaction with the Channel.

Past Experience

Fifty-nine percent said that before they participated in the Channel they did not have (51%) or did not recall having (8%) regular HVAC system tune-ups.

Of the 62 respondents that said they had previously had tune-ups, nearly half (47%) reported having had a contractor perform a tune-up of their equipment twice or more. About three-quarters (74%) of those respondents with prior tune-up experience said that their equipment had been functioning properly before they participated in the Channel as far as they knew. The other respondents said that the equipment was not functioning properly (26%) or not functioning at all (2%), or they were unsure or did not provide detail about its operational status (4%).[27]

One-fifth (20%) of the 153 tune-up respondents said their contractor explained the difference between an OG&E tune-up and any other tune-up they might have received if they had not gone through the OG&E HEEP Residential HVAC Replacement and Tune-up Channel. This is about half the portion of survey respondents that noted their contractor explained the difference in ADM's 2019 customer survey.[28]

Decision-making

Survey findings indicate that most tune-up track participants would not have had a tune-up if OG&E did not offer the service at no cost to customers through the Channel.

Two-thirds of respondents said they did not have plans (57%) or could not recall if they had plans (10%) to tune-up their HVAC system before learning about the Channel. Forty-nine percent of respondents noted that the service provider they worked with provided information, marketing material, or a recommendation to complete their HVAC tune-up project. Seventy-two percent of these respondents reported that the information, marketing material, or recommendation they provided was influential in their decision to

[27] These percentages do not sum to 100% because some respondents had more than one unit tuned up or selected more than one operational status for their equipment.

[28] The difference between the two proportions was significant by a two-proportion t-test, with an alpha of 0.05.

complete their tune-up.[29] Over half of respondents (61%) noted that the OG&E Residential HVAC Replacement and Tune-up Channel offering influenced them to conduct the tune-up project sooner.

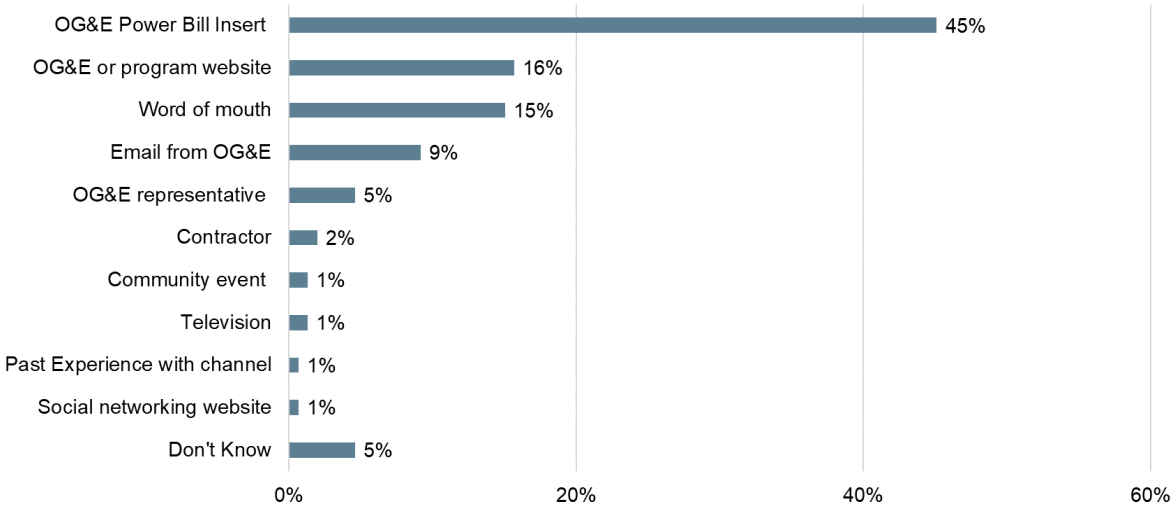

Figure 4-16: How did HVAC tune up participants learn about the Channel?

ADM asked customers to both rank and rate the reasons they participated in the program. ADM asked for both rankings and ratings to assess the relative importance (ranking) of each reason and the absolute importance (rating).

Figure 4-17 shows the value in obtaining both types of feedback. In terms of importance ratings, bill reduction and home comfort improvement were the two most important reasons for signing up: 93% of respondents rated reducing their monthly bill as important, while 91% rated home comfort as important.[30] These ratings are nearly identical, and both are much higher than the percentage of respondents who gave an “important” rating to reducing greenhouse gas (59%) or improving home aesthetics (46%). Rankings show a more nuanced view, however. When the percentage of respondents giving the highest or second highest to each item is considered, the difference between reducing bills and home comfort increases, while the difference between the greenhouse gas and home aesthetics decreases somewhat.

[29] Rated the level of influence a 4 (25%) or 5 (47%) on a scale from 1 (not at all influential) to 5 (very influential)

[30] Rated the importance a 7 or higher on a scale from 0 (not at all important) to 10 (very important).

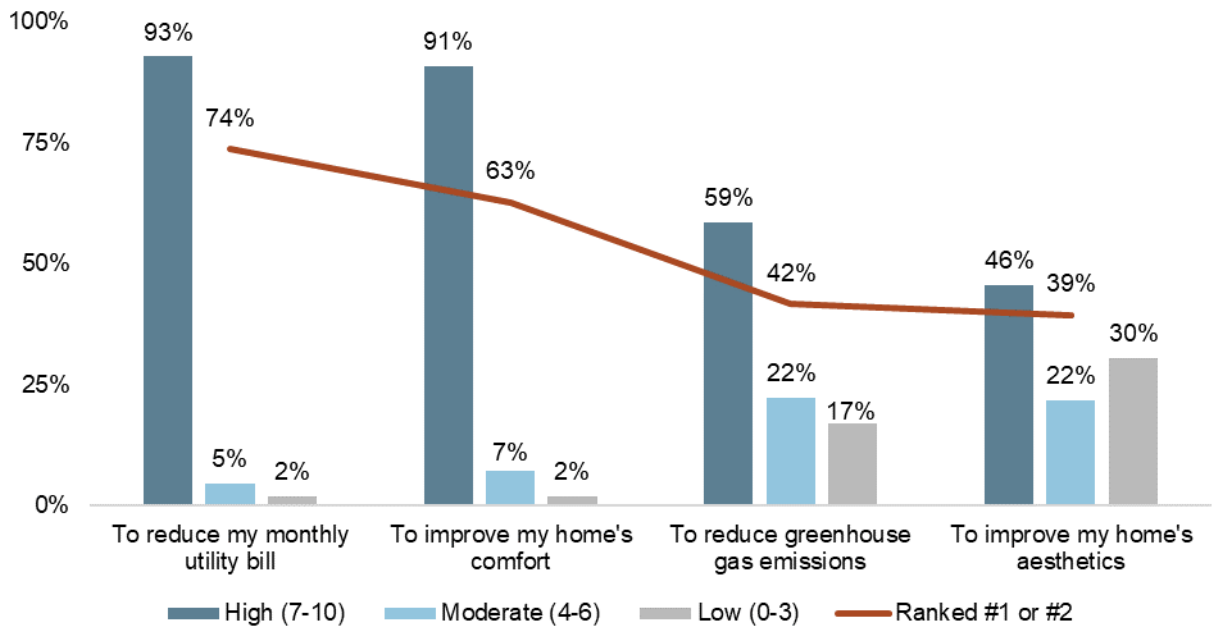

Figure 4-17: Rankings and Importance Ratings of Reasons for Participation

Reducing bills and improving comfort have nearly identical importance ratings. However, Figure 4-18 shows that the former was ranked #1 in importance much more frequently than the latter. Thus, the difference in influence between the two may be somewhat greater than the rating data suggest. Note also that a sizable minority of respondents rated home aesthetics as most important. In the case of HVAC tune-up, improved aesthetics may reflect reduced noise.

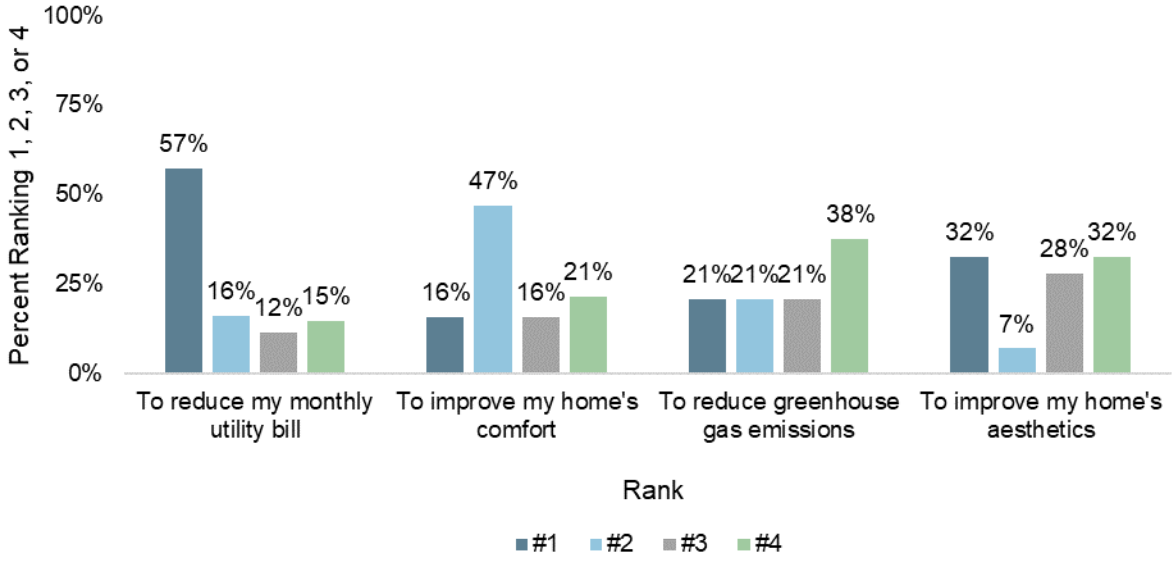

Figure 4-18: All Rankings for Reasons for Participation

Respondents were also allowed to note any other more important reason for participation. Seven percent of respondents alluded to increasing the longevity and performance of their HVAC equipment. One percent of respondents noted they signed up because they misunderstood what was provided through OG&E's tune-up (e.g., thought the OG&E HEEP tune-up provided free refrigerant/freon, lightbulbs, or advanced power strips).

Twenty-four percent of respondents (n=37) noted that the OG&E tune-up had been recommended to them. Most of these respondents said it was either recommended by an OG&E representative (49%) or a friend, relative, neighbor, or landlord (43%). The remaining respondents (8%) noted that a contractor had recommended the tune-up.

Satisfaction

Most HVAC tune-up respondents reported being satisfied with various aspects of participation and their overall experience. Additionally, 69% of respondents indicated that they had recommended the OG&E HVAC tune-up track to someone else after participating. This finding indicates the HEEP HVAC tune up track's implementation was consistent with PY2019, and its design and participation procedures are well established and well-functioning.

Figure 4-19 displays HVAC tune-up survey respondents' satisfaction with various aspects of their participation and their experience with the HEEP overall.

Twenty-nine percent of respondents noted dissatisfaction with their experience with the HVAC tune-up track or an opportunity for OG&E to improve its services. These respondents noted opportunities to improve scheduling (12%), Channel offerings or communication about OG&E services (12%), the quality of the contractor's work (8%), and the amount of savings on their monthly bill (2%). Customers that noted dissatisfaction or made suggestions for improvement worked with various HVAC trade allies, indicating no sole or clear trade ally responsible for Channel dissatisfaction.

Eighty-six percent of HVAC tune-up track respondents were satisfied with OG&E as their electric utility.[31]

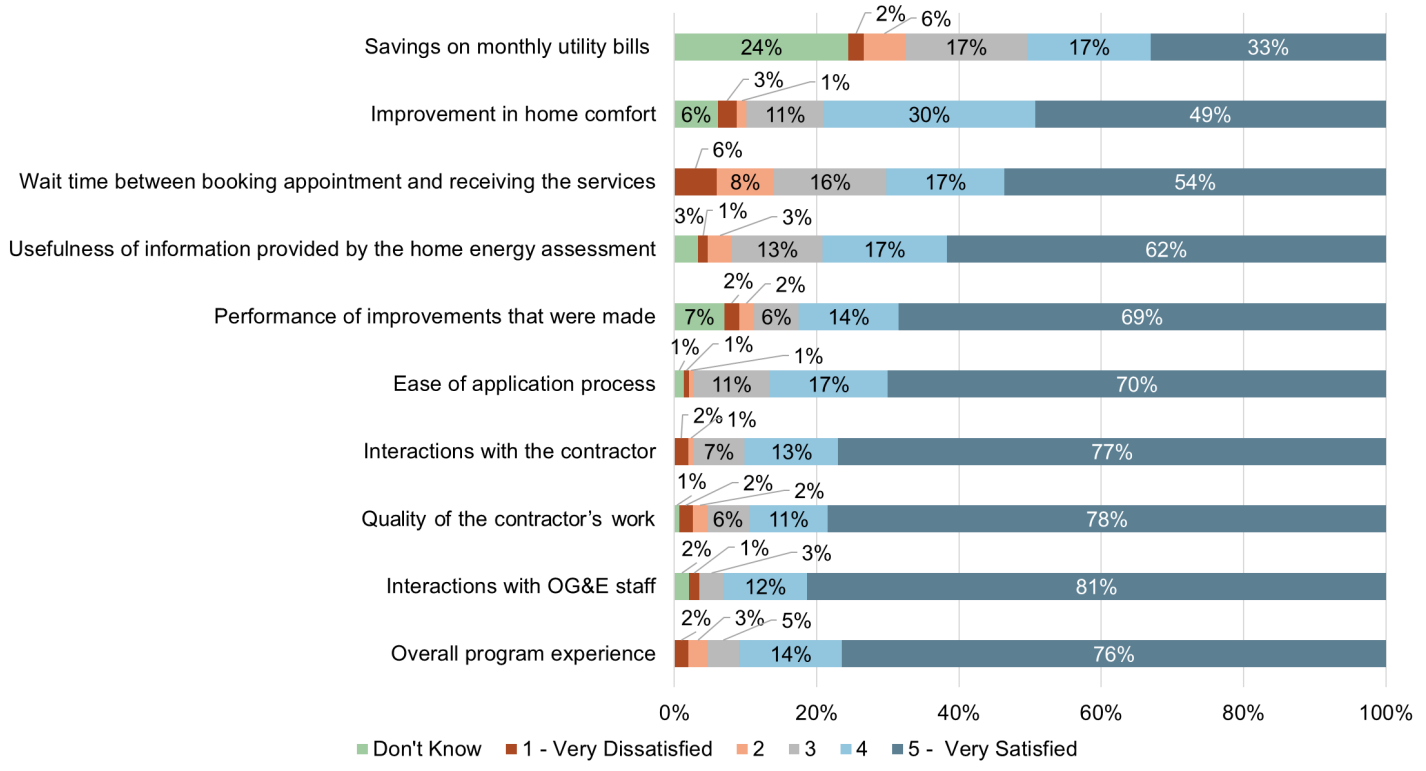

Figure 4-19: Residential HVAC Replacement & Tune-up Track Satisfaction

4.6.4.4 Single Family HVAC Installation Customer Survey

Fifty-three HVAC installation participants provided ADM feedback in August, November, and December of 2020. ADM conducted phone surveys with 24 customers, and 29 customers responded to an email invitation and completed the survey online.

Installation Experience

Eighty-seven percent of survey-takers said their HVAC installation was not part of a new construction or major renovation project, indicating most OG&E HEEP HVAC installation participants are replacing older, less efficient units.

Of the respondents that replaced an HVAC unit (n=46), 74% said the replacement was planned rather than an emergency replacement, and 63% noted that their old unit was still functional.

[31] Rated their satisfaction a 4 or 5 on a scale from 1 (very dissatisfied) to 5 (very satisfied).

Decision-making

Survey findings indicate that a considerable portion of OG&E HVAC installation participants would still have installed a new unit if OG&E did not offer an inducement. However, the inducement is often important in influencing customers to buy more efficient units, and the Channel's trade allies are influential in customer decision-making.

Forty-nine percent of respondents said they planned on installing a new unit before learning about the OG&E inducement and 62% of respondents said they would have been financially able to complete the project without the OG&E inducement. Eighty-seven percent of respondents said they installed a more efficient unit than they otherwise would have if they had not received an inducement through the Channel.

Eighty-one percent of respondents recalled their service provider offering them information, marketing materials, or a recommendation to complete their HVAC installation project; 86% of these respondents (n=43) said that this information or recommendation had been influential in their decision to complete their HVAC installation project.[32]

Forty-two percent of respondents said they completed their HVAC installation project sooner than if the Channel had not been available. Half of these respondents said they would have completed the project over a year later (31%) or never (19%).

The two most common ways respondents said they learned about the inducement were through a retailer (36%) or a HVAC contractor (25%). Figure 4-20 displays how respondents reported learning about the OG&E HVAC installation inducement.

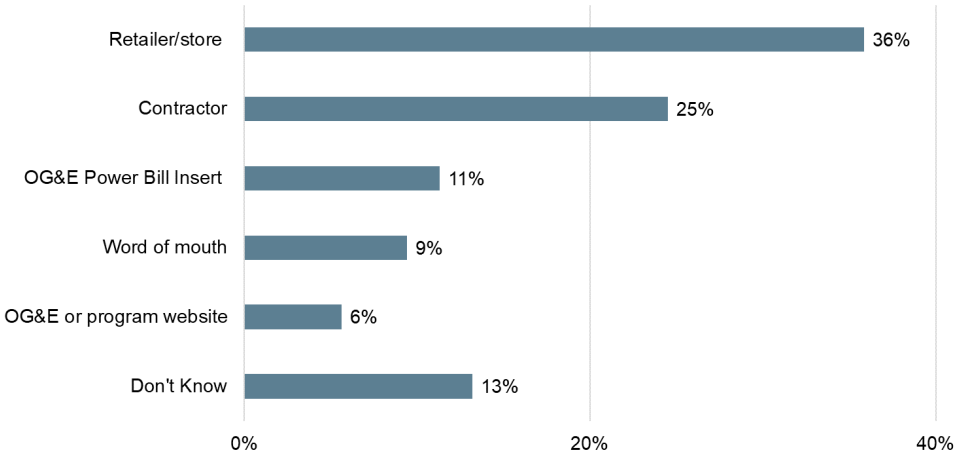

Figure 4-20: How did HVAC installation participants learn about the Channel?

[32] Rated the contractor's influence on their decision a 4 or 5 on a scale from 1 (not at all influential) to 5 (very influential)

Sixty-seven percent of respondents noted that the OG&E Residential HVAC Replacement and Tune-up Channel was recommended. Eighty-eight percent of these respondents (n=32) said it was either recommended by a HVAC contractor. The other respondents noted learning about the inducement through OG&E staff (6%) or word-of-mouth (6%).

Satisfaction

All but one of the HVAC installation survey respondents was satisfied with their overall channel participation experience. Figure 4-19 displays the HVAC installation survey respondents' satisfaction with various aspects of their participation and their experience with HEEP overall. Three respondents (6%) wrote in comments and provided additional detail regarding their dissatisfaction. One mentioned difficulty communicating with the trade ally, and another said their electric bill had not decreased, and the third respondent said their unit was currently not functioning. ADM found that 92% of the HVAC installation survey respondents were satisfied with OG&E as their electric utility.[33]

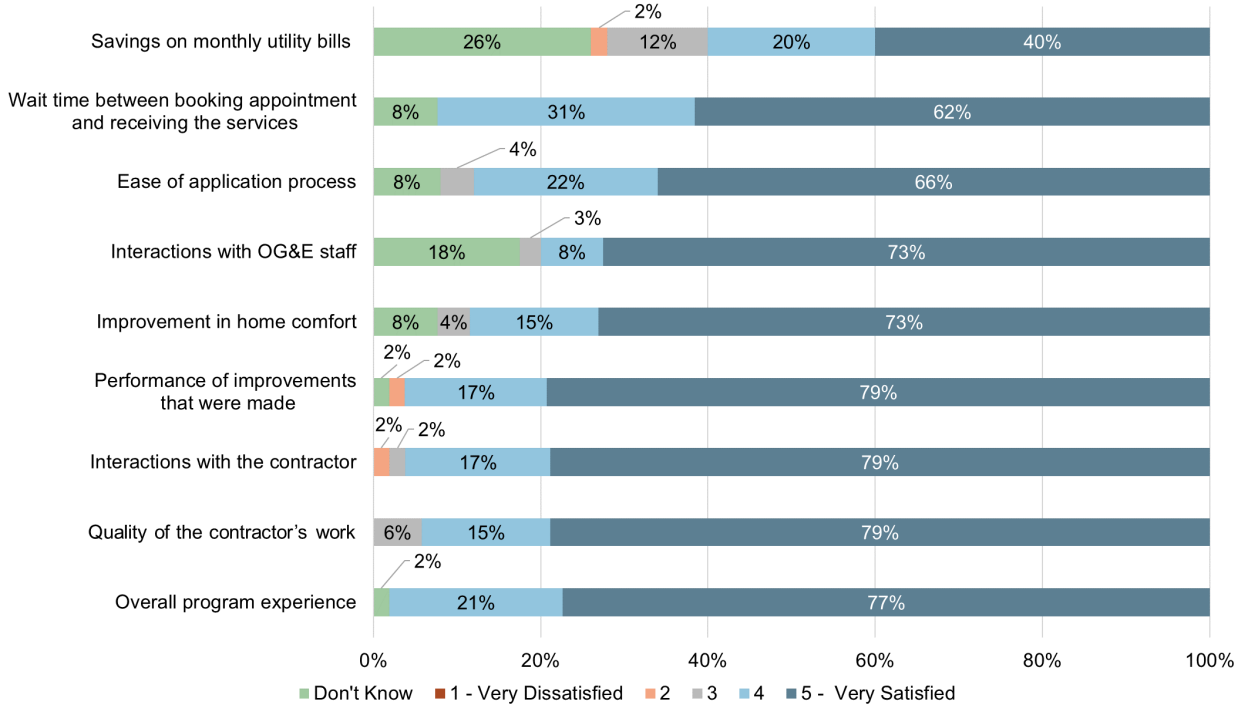

Figure 4-21: HVAC Installation Track Satisfaction

[33] Rated their satisfaction a 4 or 5 on a scale from 1 (very dissatisfied) to 5 (very satisfied). Six percent of respondents provided a rating of 3. The remaining respondent (2%) noted that they live in an area that has experienced power surges for years and his refrigerator had been damaged by a power surge; this customer rated OG&E a 1 out of 5.

4.6.4.5 Multifamily Owner/Manager Survey

In August 2020 and January 2021, ADM completed surveys with six representatives from the properties that participated in the OG&E HEEP HVAC Replacement and Tune Up Channel. All survey respondents represented properties that received duct sealing, and five respondents' properties also received air sealing.

Property Description

Four respondents said that electricity was their property's main heating and water heating fuel. The other two respondents said their property relied on a mix of natural gas and electricity. All respondents said that air conditioning was centrally supplied to tenant units and tenants were responsible for paying their electric bill.

Two owners/managers said that the property that participated in the OG&E HVAC Replacement and Tune-up Channel had tenants that received some federal, state, or other housing assistance. However, neither was able to estimate the percent of the units receiving housing assistance. Four respondents mentioned that their company-owned or managed other properties in OG&E service territories that had not yet participated in any OG&E energy efficiency programs.

Program Awareness

Three owners/managers noted that they or someone at their company had requested the service from OG&E after learning about it from experience (two respondents) or an internet search (one respondent). Two respondents said they first learned about the OG&E HVAC Replacement and Tune-up Channel from OG&E or a Channel representative. The sixth respondent said they had learned about the Channel from a nearby apartment complex.

Respondents' Prior Upgrade Plans and Program Influence

Respondents reported on their prior awareness of the needs for and prior plans to make the program's improvements. Of the six respondents, all but one was unaware that the duct systems at their properties were leaky, and three were unaware that their tenant units were drafty.

Three survey respondents noted that their property did not plan to make the air sealing or duct sealing improvements before they had learned about OG&E's Residential HVAC Replacement & Tune-Up and Replacement Channel. One respondent said they had had plans to make the improvements but that the OG&E Channel sped up their timeline considerably. One respondent said their property had had plans and that the OG&E Channel did not affect those plans' timing. One did not know if their property had plans.

The correspondence between the reported awareness of draft issues and the reported plans to carry out the air or duct sealing is modestly consistent with the idea that creating awareness of draft issues is instrumental in getting property managers to carry out the sealing:

- Two respondents did not know about the issues and did not have prior plans to do the sealing (completely consistent);
- One did not know about the issues and reported non-immediate plans to address them that were accelerated by the Channel (somewhat consistent);
- One knew about the issues and had non-immediate plans to address them that were accelerated by the Channel (somewhat consistent);
- One knew about the issues and had no plans to address them (inconsistent);

The above may suggest bringing the draftiness issue to property managers' attention is an important element of the Channel's activities.

Three respondents stated that they would not have been able to pay for the improvements they received through the Channel if the rebate had not been available. One said they did not know if their company would have been able to afford the improvements.

Five respondents said they completed this project sooner than they would have if this OG&E Channel had not been available. Of those five respondents, two did not know when they would have completed the project, three would have completed the same project in two or more years.

Program Satisfaction

ADM asked the multifamily participants about their satisfaction with different aspects of the Channel and the Channel overall (see Figure 4-22). Four respondents reported high levels of satisfaction overall.[34]

Two respondents that did not rate the Channel highly noted issues with the quality of the contractor's work. After they participated in the Channel, these two respondents noted that tenant units needed spray foam, sheet rock, and paint repairs or cleaned up. One respondent noted needing to replace multiple AC units because the contractor sealed incorrect areas. They also stated that after the contractor completed their work, the ducts made whistling noises. Though both respondents noted dissatisfaction with the quality of the contractor's work, one rated the overall quality of the contractor's work as satisfactory, indicating the issue(s) they experienced did not significantly affect their overall satisfaction with the Channel.

[34] Rated their satisfaction a 4 or 5 on a scale from 1 (very dissatisfied) to 5 (very satisfied)

ADM also received a follow-up call from a property manager one week after survey administration. This respondent informed ADM of a similar contractor-related issue; multiple residents had informed them that residents were unable to change air filters now as Channel contractors had "plastered over" the access area. These three survey respondents' experiences may indicate an opportunity to improve the quality of the contractor's work.

One of the six respondents said they had recommended the Channel to someone else. Five of the respondents were satisfied with OG&E as their electric service provider.[35]

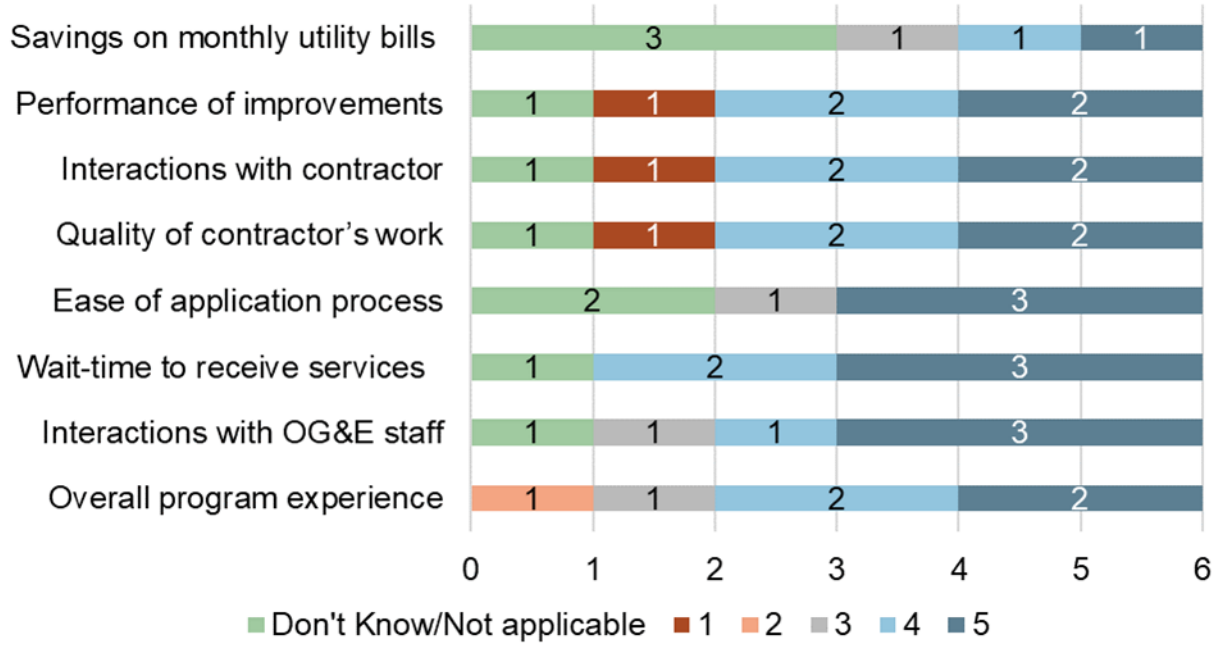

Figure 4-22: Multifamily Participant Satisfaction

4.6.4.6 Residential HVAC Replacement & Tune-up Trade Ally In-Depth Interviews

ADM interviewed six Residential HVAC Replacement & Tune-up contractors that participated in the OG&E Home Energy Efficiency Program's Residential HVAC Replacement & Tune-up Channel in 2020. Five trade allies primarily offered HVAC tune-up and replacement services to single family customers through the Channel. The sixth trade ally provided duct sealing and air sealing to multifamily properties through the Channel. Three of the trade allies noted that they owned and operated their company and were the only staff. Another trade ally said they had the help of one other technician most

[35] Rated their satisfaction a 4 or 5 on a scale from 1 (very dissatisfied) to 5 (very satisfied). The sixth respondent did not know or could not recall their level of satisfaction with OG&E.

of the year in addition to himself. The three remaining interviewees noted that their companies ranged in size from under 10 to over 300 employees.

Awareness and Participation

The trade allies recalled learning about the Channel several different ways. Three trade allies mentioned learning about the Channel from other HVAC contractors. One trade ally also mentioned receiving information in the mail, while another related that he was previously employed at a company that had participated in the Channel. The multifamily trade ally said that he had learned of OG&E's energy efficiency programs through his experience with utility-sponsored energy efficiency programs and had become involved after emailing the OG&E program manager in the Summer of 2019. One trade ally said they had been contacted by OG&E staff directly. The remaining trade ally could not recall how they first learned of the Channel and said they had participated for almost 10 years.

All the interviewees mentioned that they decided to participate to grow their customer base or to expand their business. One trade ally noted that associating with OG&E benefitted them as they had a good brand. Another trade ally said that participating in the Channel helped differentiate them from other businesses.

Communication and Training

Five of the trade allies noted that they had received training from Channel staff in PY2020. Training ranged from limited instruction on submitting paperwork to more in-depth discussion and explanation of the data collection software required for the Channel. All five trade allies that had training said it had been helpful.[36]

Channel Influence

All the trade allies noted that the inducements and information provided through the Channel had been important in influencing their marketing level and selling of the incentivized energy efficient measures to OG&E customers in 2020. [37] Moreover, two Residential HVAC Replacement & Tune-up trade allies said they would not have made the same recommendations to customers if the Channel was not available. The multifamily trade ally said that without the Channel, they would not be promoting the induced measures.

[36] Rated the helpfulness of the training a 5 on a scale from 1 (not at all helpful) to 5 (very helpful).
[37] Rated the level of importance of the Channel in influencing them a 7 or higher on a scale from 0 (not at all important) to 10 (very important).

Five of the trade allies said that all of the projects they complete qualify for the Channel apply for the inducement. Another trade ally reported applying for an inducement for about 70% of their projects because of a lack of funds.

All the interviewees expected that their volume of OG&E Residential HVAC Replacement & Tune-up Channel projects would increase in 2021. Three trade allies noted that COVID-19 had impacted their project volume in 2020 and were hopeful that it would have less impact in 2021. Two trade allies said their companies had plans to expand, while another noted that they had become more proficient with Channel operations. One trade ally said that they expected federal incentives for energy efficiency to increase, enabling them to take advantage of OG&E inducements to conduct projects.

The multifamily trade ally and two Residential HVAC Replacement & Tune-up trade allies observed that the COVID-19 pandemic had caused a significant decreased in their project volume in 2020. Two trade allies noted that their companies had made significant efforts to adapt and overcome the challenges that the COVID-19 pandemic presented, and their overall number of projects had increased in 2020. The remaining trade ally said that COVID-19 had a limited impact on their business, noting only that a limited number of customers had canceled their appointments.

Satisfaction

The trade allies were satisfied with the Channel overall, and most voiced satisfaction with specific aspects of its design and implementation (see Figure 4-23). Two trade allies voiced dissatisfaction with a particular aspect of the Channel. One trade ally said that his company typically only performs tune-ups through the Channel and voiced dissatisfaction with the Channel's measures because funds are typically not available for his company to utilize for HVAC installations. Another trade ally was dissatisfied with the inducement amount and observed that Channel funding ran out quickly for high efficiency HVAC units.

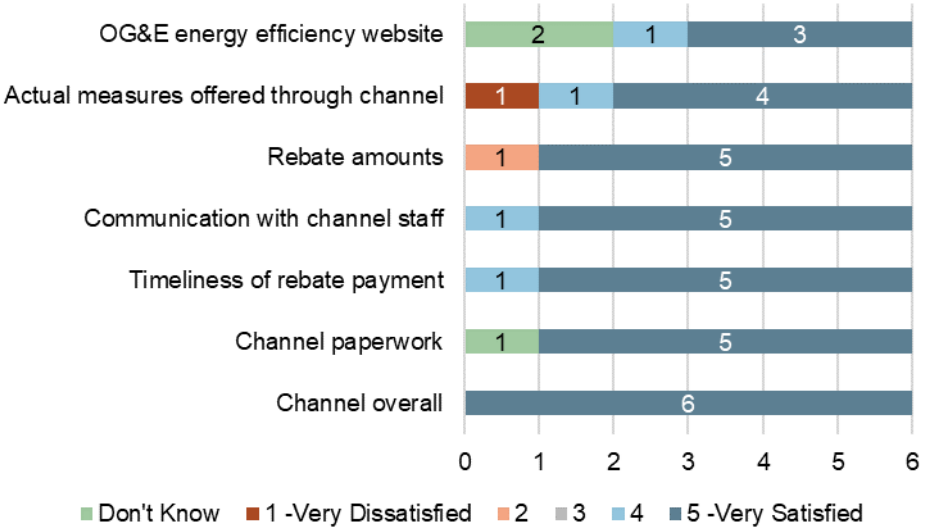

Figure 4-23: Trade Ally Satisfaction

ADM also inquired with trade allies regarding opportunities for Channel design or implementation improvements. Two trade allies noted that the Channel could improve the customer contact and sign-up information. They noted that the Channel provided old customer information, and on occasion, customers did not recall signing up or thought the trade allies were not legitimate. Furthermore, because of this, one noted that scheduling was "three times more work this year." Another trade ally said that the implementation contractor had made staff changes, which may have led to a lack of communication and confusion about the amount of funding left in the Channel in late summer 2020.

The multifamily trade ally offered specific recommendations to improve the Channel and OG&E's offerings for multifamily buildings. He observed opportunities to decrease barriers to participation and better integrate OG&E's energy efficiency inducements to improve the energy efficiency of multifamily properties more holistically in OG&E's service territory.

To move the Channel towards a more holistic approach to multifamily properties, he suggested expanding OG&E's range of induced measures for multifamily properties to include attic insulation, windows, common area lighting, or custom efficiency projects. He noted that his company participates in OG&E's HEEP RSOL Channel, but their participation in these two Channels is treated separately; he stated that their business could market the offerings together, but the work has to occur at different times. He noted that he might have been unaware of available inducements but noted that regardless, creating a marketing/budget plan specific to multifamily buildings would strengthen the Channel's operations. He noted that multifamily property management often plans improvement projects a year or more in advance and has annual budgets which may be fully allocated halfway through the year. He noted that sometimes multifamily properties

decline to participate in the Channel because their HVAC systems have designs that make air sealing and duct sealing improvements prohibitively expensive.

He advised that a marketing/budget plan that explained and addressed the OG&E energy efficiency programs' offerings and constraints would be beneficial and enable multifamily properties to plan and implement holistic energy efficiency improvement projects.

4.6.5 Consumer Products Channel

The following section provides an overview of the methods used and detailed findings from the process evaluation for the Consumer Products Channel of OG&E's HEEP. The process-related data collection activities for the HEEP Consumer Products Channel included program staff interviews and a survey of OG&E customers.

4.6.5.1 Consumer Products Staff Interviews

This section provides Consumer Products specific information gathered by ADM through interviews with HEEP staff. Additional background and context regarding the interviews can be found in Section 4.6.1.

Goals and Progress

Consumer Products did well and was "carrying" the other Channels. A primary reason for this Channel's success was that retail stores, where the savings were acquired, continued in business from March to June when other Channels shut down. Early in the year, recognizing that this would be the case, OG&E and CLEAResult re-allocated portfolio funding to put more funding into the food bank donation. Further, although CLEAResult had to stop sending field representatives to the stores, they continued doing "warm calling" to the stores to keep them engaged and up to speed on what was happening with the program. OG&E was able to "ramp it up" by doing more promotions and increasing the number of enrolled food banks. The addition of measures to the program (water dispensers, room air purifiers, bathroom ventilation exhaust fans) also helped.

Design and Implementation

Interviewees indicated the only changes to the Consumer Products Channel were the addition of several models of Energy Star® water dispensers, room air purifiers, bathroom ventilation exhaust fans, and an advanced power strip. The program targets different measure types at different store chains, based on their understanding of the types of measures that sell well at various outlet types. Small appliance measures are offered at Home Depot. In contrast, advanced power strips are offered at Dollar General and Dollar Tree, which, according to the interviewees, serve lower-income, harder-to-reach customers. A CLEAResult contact commented that the efforts to pull in smaller-footprint stores, like Dollar General or Dollar Tree stores, are partly aimed at reaching rural areas.

Marketing and Outreach

The Consumer Products Channel continues to rely primarily on in-store posters and signage to draw attention to discounted items. However, the Channel also is occasionally highlighted in email blasts and bill inserts. A CLEAResult contact noted that they had been able to do some in-store product demonstrations in February but had not been able to do in-store demonstrations from early March until the middle of June. The contact noted that identifying certain retailers with certain products can be a “no-no” on social media, given retail chains’ competitive nature. So, mentions of the Consumer Products Channel on social media must be kept general. The contact said that the Channel’s efforts through food banks had continued as before, providing OG&E-branded educational flyers in light bulb cases.

Barriers and Challenges

Contacts reported that the greatest challenges for HEEP resulted from the COVID-19 pandemic. However, as noted above, this affected other Channels more than Consumer Products. The primary challenge to Consumer Products was that the economic impacts reduced consumer purchases.

4.6.5.2 OG&E Customer Survey

Methods & Description of Survey

ADM gathered survey responses from 455 customers using two methods: an email invitation and an in-store “tear-off” sheet pad. To recruit customers for the email survey, ADM requested a random sample of 10,000 customers from OG&E and contacted customers with one invitation and three reminders. ADM administered the email survey from September to December 2020 and received 450 responses, for a 4.5% response rate. ADM worked with CLEAResult to place "tear-off" sheet pads for in-store survey recruitment. The pads include a short message about the survey, a survey link, and a QR code and are placed in stores close to discounted measures (a QR code is a barcode that can be scanned by a smartphone to automatically direct individuals to a web page). ADM added an in-store "tear-off" sheet survey approach to attempt to capture non-lighting program participants. CLEAResult staff reported placing the in-store recruitment “tear-off” sheet pad by non-lighting measures (room air conditioners, water dispensers, air purifiers, and bathroom ventilation fans) in 10 Home Depot stores in late October 2020. ADM received five responses from the in-store “tear-off” sheet recruitment method from October to December 2020.

The survey asked respondents whether they had bought measures induced through the OG&E HEEP Consumer Products Channel at a participating retailer in 2020. It also asked about their energy efficiency awareness, behaviors, attitudes, and decision-making

process that went into buying energy efficiency products. The survey also investigated household characteristics and demographic information.

ADM investigated respondent demographics through the survey as well as through customer data provided by OG&E. The typical respondent owned a single family home, relied on natural gas for home and water heating, and lived with one or two other people (see Table 4-78). Nearly all respondents (99%) confirmed that OG&E was their electric utility, and the remaining respondents (1%) noted PSO, AEP, OEC, PEC, ECOC, or Canadian Valley provided their home's electricity.

Table 4-78: Consumer Products Survey Respondent Home Characteristics

Question	Response	Percent (n=454)
Do you rent or your home?	Rent	23%
	Own	76%
	Prefer not to say	1%
Which of the following best describe your home?	Single family home	85%
	Duplex, condo, townhouse, or apartment	12%
	Mobile home	3%
	Don't know/prefer not to say	<1%
What is the main fuel used to heat your home?	Electricity	42%
	Natural Gas	53%
	Propane/Wood Stove	3%
	Don’t know/Prefer not to say	2%
What is the main fuel used to heat your water?	Electricity	33%
	Natural Gas	61%
	Propane	2%
	Don’t know/Prefer not to say	3%
About how many square feet is your home?	Less than 1,000 square feet	9%
	1,000-1,999 square feet	50%
	2,000-2,999 square feet	24%
	3,000-3,999 square feet	6%
	4,000 or more square feet	4%
	Don’t know	6%
When was your home built?	Before 1960	15%
	1960 to 1969	10%
	1970 to 1979	14%
	1980 to 1989	11%
	1990 to 1999	8%
	2000 to 2009	16%
	2010 to 2018	16%
	Don’t know/Prefer not to say	11%
Including yourself, how many people currently live in your household?	0	<1%
	1	17%
	2	35%
	3	16%
	4	11%
	5	7%
	6 or more	4%
	Prefer not to say	10%

ADM also asked respondents to provide information regarding income, race, educational background, gender, and age (Table 4-79. Most respondents identified as Caucasian or white and reported being employed and having completed some education beyond high school. Of the respondents who identified their gender (n=433), fifty-one percent said they

were female, while the remaining respondents identified as male (49%) or described themselves as non-binary (<1%). Four percent of respondents declined to identify their gender.

Of respondents that shared household income information, 57% indicated their household income was less than $75,000 (Table 4-80). A significant portion of respondents did not share household income information as they could not recall (1%) or preferred not to share (21%) and are not included in Table 4-80. Refusing to provide income information was somewhat higher among retired and disabled respondents than those in the workforce and those with a lower education level. Since retired, disabled, and lower education level respondents typically earn less, this may indicate the reported income information is biased toward higher income.

Table 4-79: Additional Consumer Products Survey Respondent Characteristics

Question	Response	Percent (n=454)
What is your age?	18-24 years old	2%
	25-34 years old	13%
	35-44 years old	19%
	45-54 years old	20%
	55-64 years old	19%
	65-74 years old	18%
	75-85 years old	5%
	86 years old or older	1%
	Prefer not to say	2%
How would you identify your race or identify? [38]	Asian	3%
	Black/African American	5%
	Caucasian/White	74%
	Hispanic or Latino	5%
	Native American or Alaska Native	7%
	Pacific Islander or Native Hawaiian	>1%
	Middle Eastern or North African	>1%
	Prefer not to say	10%
Which of the following categories best describes your employment status?	Employed, working up to 30 hours per week	13%
	Employed, working 30 or more hours per week	52%
	Not employed, looking for work	4%
	Not employed, Not retired or disabled	2%
	Retired	21%
	Disabled, not able to work	4%
	Prefer not to answer	4%
What's the highest level of education you've completed?	Less than high school	1%
	High School Graduate/GED	17%
	Associates Degree, Vocation/Technical School, Or some college	28%
	Four-year college degree	26%
	Graduate or professional degree	22%
	I prefer not to answer	6%

[38] Sums to more than 100% because respondents could select more than one race or ethnicity.

Table 4-80: Consumer Products Survey Respondent Household Income

Response	Percentage of Respondents (n=354)
Less than $10,000	3%
$10,000 to less than $20,000	8%
$20,000 to less than $30,000	10%
$30,000 to less than $40,000	6%
$40,000 to less than $50,000	10%
$50,000 to less than $75,000	21%
$75,000 to less than $100,000	15%
$100,000 or more	28%

Energy Efficient Product Purchases at Participating Retailers

Eighty-nine percent of survey-takers (404 respondents) reported buying LED light bulbs from a retail store chain that participated in the OG&E Consumer Products Channel. A much smaller portion of respondents noted buying non-lighting measures at participating retailers (see Table 4-81).

Table 4-81: Consumer Products Survey Induced Measure Purchases

Measure	Percent of Respondents (n=455)
LED light bulbs	89%
ENERGY STAR® bathroom ventilation fans	2%
ENERGY STAR® room air conditioners	1%
ENERGY STAR® room air purifiers	<1%
Energy Saving Advanced Power Strips	<1%
ENERGY STAR® Water dispensers	<1%

ADM investigated the experience and decision-making of OG&E customers that bought LED lightbulbs and other induced measures in 2020. Fewer than 10 respondents reported program-induced purchases of each non-lighting measure; investigation of non-lighting measures was omitted from this report.

LED Lightbulb Purchases at Participating Retailers

ADM asked survey-takers what kind of lightbulb(s) they replace with the LED bulb(s) they bought in 2020. While two-thirds of respondents reported that they replaced incandescent or halogen bulbs, nearly half said they replaced at least one other LED lightbulb with the discounted lightbulb(s) they bought (see Table 4-82).

Table 4-82: What types of bulbs did respondents replace with discounted LEDs?[39]

Response	Percent of Respondents (n=404)
Traditional Incandescent/Halogen	67%
LED	47%
CFLs	42%
Installed bulbs in fixture or socket where there was none before	22%
I do not recall	8%

The reasons respondents gave for buying LED lightbulb(s) were similar to the reasons provided in ADM's 2019 survey of OG&E customers. Seventy-nine percent of respondents said that they replaced burnt-out bulbs. A smaller portion noted they bought LED lightbulb(s) to replace working lightbulbs (29%), stock up (23%), or install new fixtures or lamps (15%).

There was a fair amount of overlap in reasons given for buying LED bulbs – in particular, between replacing burnt-out bulbs and stocking up. Of respondents who said they bought LEDs to replace burnt-out bulbs, 26% also said they were stocking up. Stocking up was reported much less frequently (8%) by respondents who *did not* report buying on burn-out but instead replaced working bulbs or installing new fixtures or lamps.

ADM asked survey-takers what they considered to be the most important characteristic they considered when buying light bulbs. Table 4-83 displays the results. The most common responses were energy efficiency and how long the bulb lasted, followed somewhat closely by its brightness. Less common responses included the lighting color, price, ENERGY STAR® certification, and dimmability.

[39] Sums to more than 100% because respondents could select more than replacement response.

Table 4-83: Which is the most important characteristic when buying light bulbs?

Response	Percent of Respondents (n=455)
Energy efficiency	27%
How long the bulb lasts	24%
Brightness of the bulb	20%
Color of the light	13%
Price	10%
ENERGY STAR® Certification	3%
Ability to dim the bulb	1%
Don't know	2%
Other	1%

Survey findings indicate that a significant portion of customers were unaware that the LED light bulbs they bought were discounted, possibly indicating an opportunity to increase awareness. Eighty-five percent of respondents could not recall whether the LED lightbulb(s) they bought were discounted. This portion of respondents is larger than in 2018 or 2019, indicating fewer customers were aware their purchase was discounted through the Channel in 2020 than in past years.[40]

Of the customers that *did* recall that their LED purchase was discounted (n=62), 25% recalled that OG&E was responsible for the discount. All respondents but one who noted being aware of OG&E's discounts cited an "in-store display" as their source of awareness of OG&E's discount on LED bulbs; the other respondent said they had learned about the discount through a bill insert message. Seventy-six percent of these respondents said that the discount was at least moderately important in their decision-making process (see Figure 4-24).

About half of respondents who bought LED bulbs at a participating retail store said they would have probably or definitely still bought them if the bulbs had cost $2 more per bulb (see Figure 4-25).

[40] In 2018 and 2019, 29% and 26% of respondents recalled that the LED lightbulb(s) they bought were discounted, respectively. ADM compared the proportions with two proportion z-tests. These differences are significant with an alpha of 0.05.

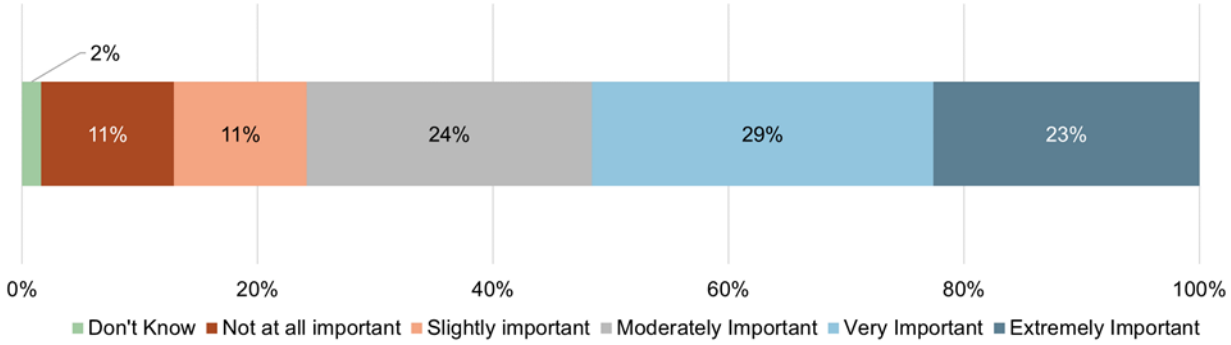

Figure 4-24: How important was the discount on the decision to purchase LEDs?

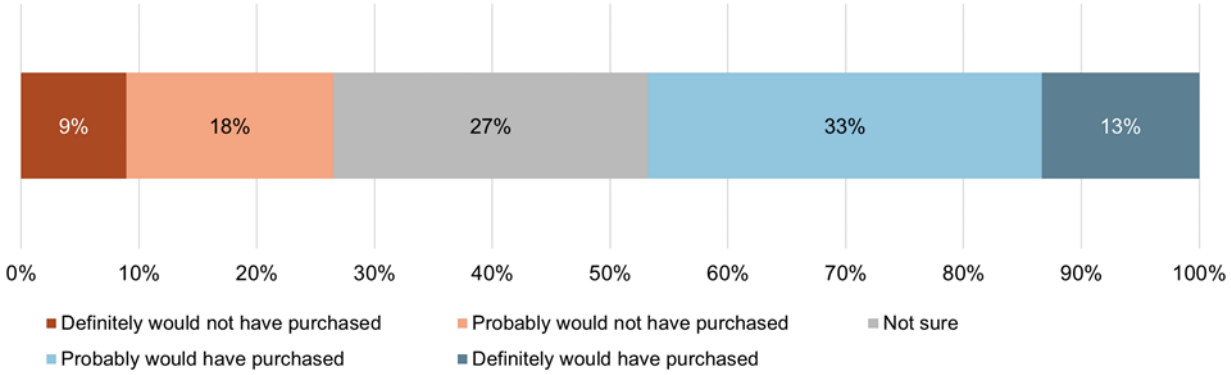

Figure 4-25: Which of the following best describes the purchase decision you would have made if the LEDs you bought in 2020 had cost $2 more?[41]

Eighty-two percent of respondents who bought LEDs at participating retail stores reported that they had bought LED bulbs before 2020. This is a larger proportion of survey respondents than in 2018 (68%) and 2019 (71%), indicating increasing LED lightbulb purchase experience among OG&E customers in Oklahoma. Consistent with ADM's 2018 and 2019 customer surveys, most respondents (92%) said the LED lightbulb(s) that they had bought in the past were not discounted by OG&E or did not recall if they had been.

Energy Efficiency Behaviors & Attitudes

ADM asked survey-takers questions to investigate energy efficiency knowledge, attitudes, and behavior.

Survey results indicate most OG&E customers are aware of various available lighting technologies. Most respondents matched lighting technologies with descriptions: eighty-six percent matched LED lightbulb(s) to its definition, 85% matched incandescent/halogen to its definition, and 77% matched CFL to its definition.

[41] n=404

ADM asked survey-takers how different factors motivated their interest in improving their homes. Consistent with ADM's 2019 customer survey, responses indicate that respondents are most interested in improving their homes' energy efficiency and health and safety (see Figure 4-26).

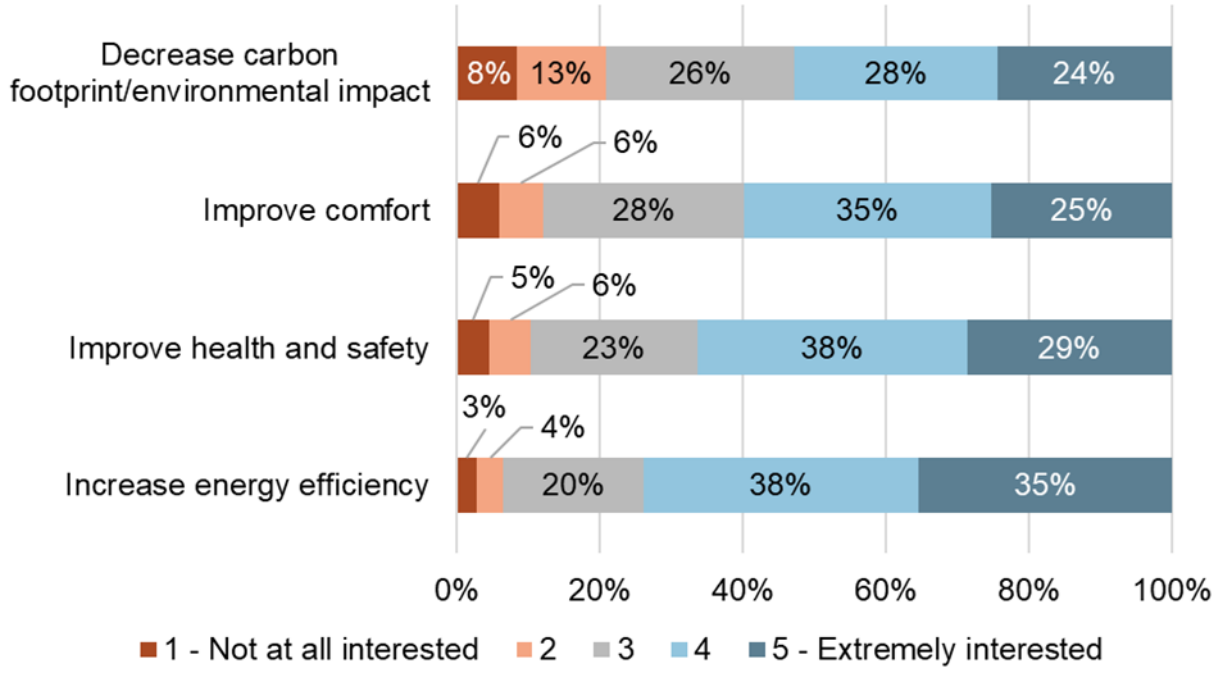

Figure 4-26: What motivates respondents to improve their homes?

Figure 4-27 shows respondents' level of agreement with various statements regarding energy efficiency. The attitudes of respondents were consistent in ADM's 2019 and 2020 Consumer Products Channel surveys. Respondents most strongly indicated agreement that "energy efficiency saves money," and they also tended to indicate agreement that "it is possible to save energy without sacrificing comfort by being energy efficient."

The figure does not display the portion of respondents that did not know how to rate their level of agreement with the statements (see footnote 42 for additional detail). Twenty-eight percent of respondents either did not know how to rate their attitude (10%) or disagreed (18%) with the statement that "scarce energy supplies will be a problem in the future." This may indicate an opportunity for OG&E to partner with schools, nonprofits, or other organizations to help educate customers' regarding the earth's finite resources.

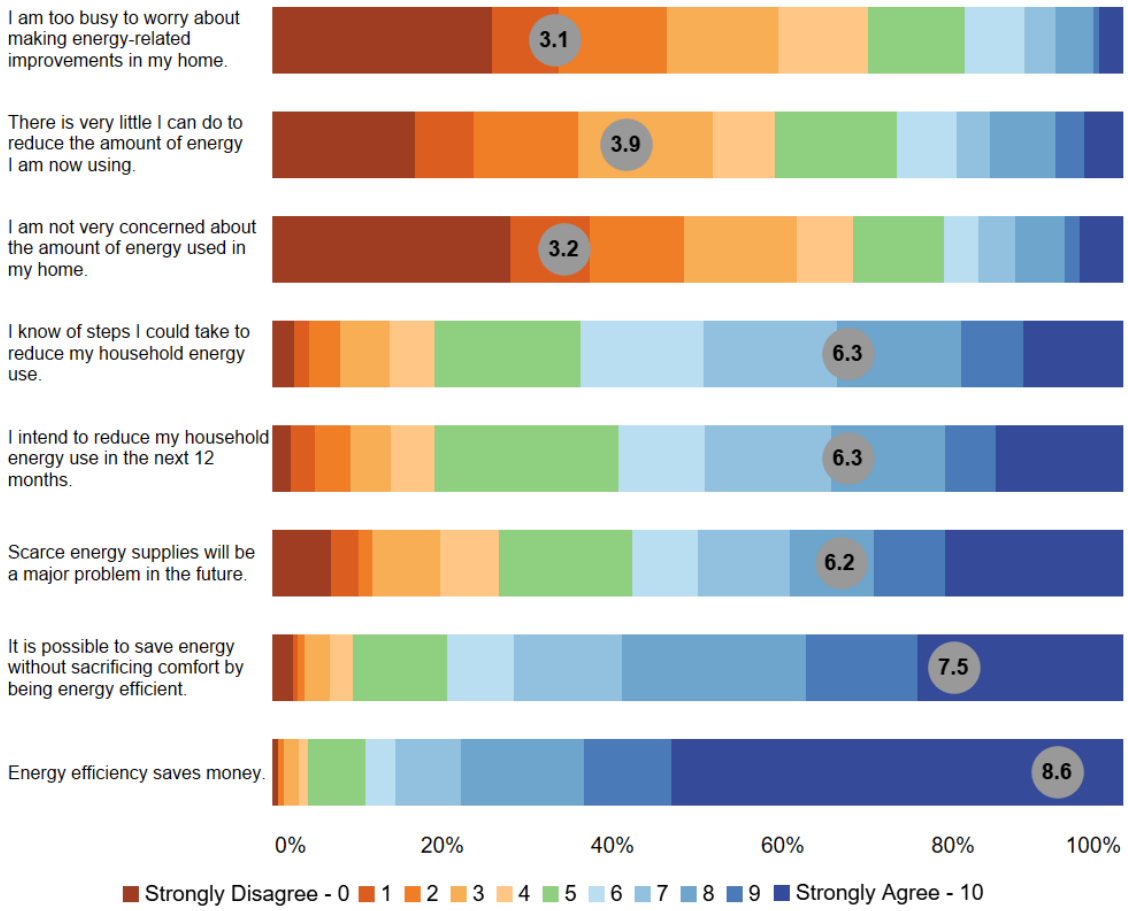

Figure 4-27: Respondent agreement with statements regarding energy efficiency[42]

As would be expected, responses on the various attitude items were interrelated. Those who agreed with any pro-conservation statements (the fourth through eighth statements on the above graphic) tended to agree with the others. Those who agreed with any other three items (the first through third statements) tended to agree with the others.

Further, the stated intent to reduce household energy usage was related to reported energy efficiency purchases or program participation. Of respondents who reported a strong intention to reduce energy usage (a 7 or higher on the 0-10 scale), 45% reported

[42] n=455. Average ratings are displayed in grey circles. Don't Know responses are not displayed. The percentage "don't know" from top to bottom of

Figure 4-27, beginning with "I am too busy to worry about making energy-related improvements to my home" were 1%, 3%, 0%, 4%, 6%, 10%, 2%, 1%. Ten percent of respondents not knowing their attitude about the statement regarding "scarce energy supplies" may indicate an opportunity to improve OG&E customers' education concerning the Earth's finite resources.

they had bought energy efficient equipment other than LEDs[43] or had participated in one of OG&E's downstream programs. Compared to 32% of respondents who reported less intention to reduce energy usage. Thus, intention, in this case, appears related to behavior.

In addition to the attitude items described above, we assessed respondent agreement with the statement, "People's efforts produce better results when they work together than when they go it alone." The purpose was to assess the potential value of appealing to collective efforts in messaging about energy efficiency. A substantial majority (81%) of respondents reported agreement, with a rating of 7 or higher on the 0-10 scale. This information may be valuable in shaping messaging to appeal to the sense that collective efforts produce better results than isolated ones. Such messaging could potentially offset self-defeating thoughts (e.g., "what difference can my actions make?") that could undermine actions.

Seventy-nine percent of respondents said they would be interested in additional information on energy saving tips and rebate programs offered by OG&E.[44]

Most respondents were satisfied with OG&E overall; however, nearly half of respondents were unaware or dissatisfied with OG&E's marketing efforts and levels of inducements for energy efficient products (see Figure 4-28). Ninety-four percent of survey respondents perceived OG&E to be at least somewhat trustworthy.[45]

[43] A very high percentage of survey respondents reported buying LEDs. Therefore, we omitted this from the list of energy efficient purchases we considered.

[44] These respondents rated their level of interest a 3 or higher on a scale from 1 (not at all interested) to 5 (extremely interested).

[45] Provided a rating of 4 or 5 on a scale from 1 (not at all trustworthy) to 5 (extremely trustworthy).

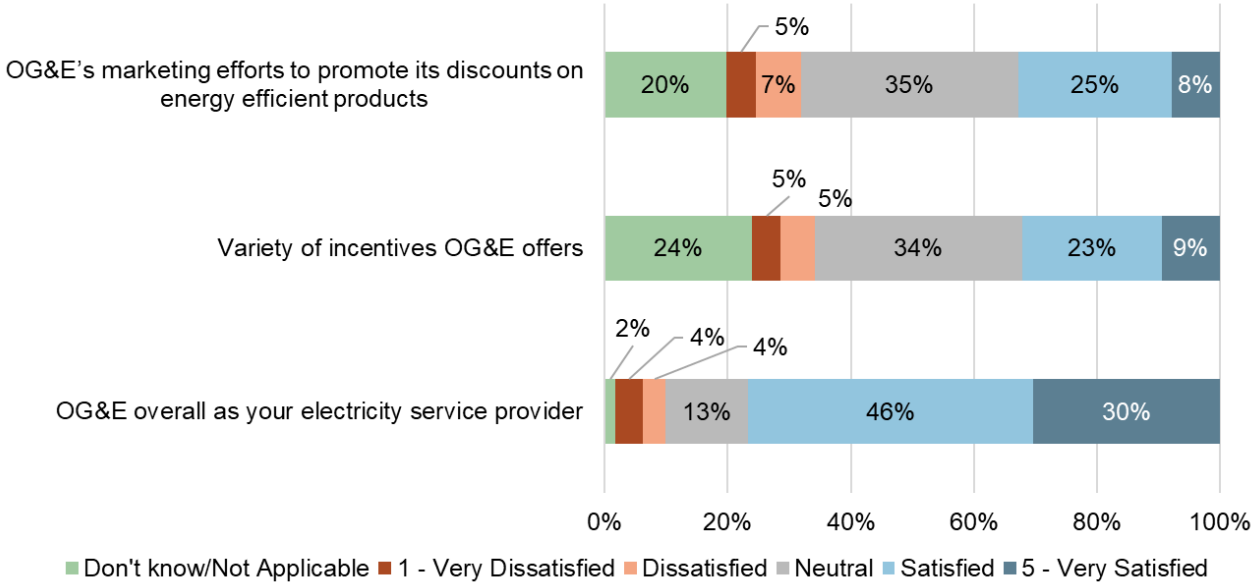

Figure 4-28: Respondent Satisfaction Inducements, Marketing & OG&E Overall

4.6.6 Positive Energy - New Home Construction (PE-NHC) Channel

ADM conducted interviews with OG&E staff and PE-NHC Channel participating builders to investigate participant satisfaction, any significant changes to Channel design, as well as key barriers and drivers of Channel success. Participating builders also provided insight into their decision-making processes to help support the estimation of Channel net savings.

4.6.6.1 Program Staff Interviews

In addition to interviewing the individuals specified in Section 4.6.1, we interviewed the OG&E Program Manager for the PE-NHC Channel and CLEAResult's PE-NHC Channel manager.

Goals and Progress

In the April interview, the OG&E contact for PE-NHC noted that construction was slowing down. April and May are usually among the biggest times for buying houses, but people were not buying because of the pandemic's economic impacts. In the December interview, however, the OG&E contact reported that new home construction had increased and that there were probably about 500 more new homes built in OG&E territory than the previous year. The contact suggested that the increase in demand for new homes was a combination of two things: 1) low interest rates; and 2) a desire to get out of multifamily housing because of COVID fears. The evidence for the latter supposition was that "starter" homes (i.e., smaller, less expensive homes) had increased

in particular. As a result, the PE-NHC Channel passed its goals both in energy savings and the number of homes built; the Channel incented 1,388 new homes compared to a target of 1,100. PE-NHC was allowed to exceed the overall goal because the pandemic had caused other HEEP Channels to experience shortfalls.

Design and Implementation

Interviewees indicated no changes to the PE-NHC Channel's design or implementation, other than changing from using REMRATE to Ekotrope software to model home savings.

Marketing and Outreach

The OG&E staff for the PE-NHC Channel indicated that builders market energy efficiency – including the fact that the home has received third-party verification as an energy efficient home – as an advantage of their program-incented new homes. They advertise their program involvement through yard signs and literature that the program provides. The contact also works with builders' sales staff to train them to talk about energy efficiency. OG&E dropped two builders from the program because they were not willing to adhere to PE-NHC's building requirements (specifically, requirements relating to the type of slab being poured); however, the Channel has as much participation as it can handle – there is "no room at the inn." Nevertheless, program staff typically participate in the spring and fall "parade of homes" events; they could not participate in the 2020 spring event, but they were able to participate in the fall event.

Communication

The OG&E PE-NHC contact reported that interactions with CLEAResult had significantly improved since removing the previous CLEAResult manager for that Channel.

Barriers and Challenges

The change from REMRATE to Ekotrope software was the primary challenge for PE-NHC. This had a "major impact" on the raters, as they were required to buy a license for, and learn to use, the new software rather than REMRATE, which they had been using for 10 years. Ekotrope provided training on the software, but there was a "learning curve." The contact noted that the new software was not well received by several of the raters, but they all conformed. Otherwise, they would not have been able to rate for OG&E.

4.6.6.2 Builder Interviews

ADM conducted interviews with OG&E staff and PE-NHC Channel participating builders to investigate Channel design, marketing and outreach, participation, processes, satisfaction, any significant changes to the Channel, and key barriers and drivers to Channel success. Participating builders also provided insight into their decision-making processes to support the estimation of Channel net savings.

In November 2020, ADM conducted phone interviews with builders that participated in OG&E's PE-NHC Channel. ADM verified contact and program participation information with the Program Manager for the PE-NHC Channel and attempted to speak with 10 participating builders that had built homes to the program's standards in 2020. ADM spoke with seven participating builders. All the builders reported that all of the new homes they had built within OG&E territory in 2020 received OG&E PE-NHC inducements.

- **All the builders noted that they had participated in the PE-NHC Channel for multiple years.** Three said they had learned about the program from OG&E staff and their membership in the builder's association. Two builders mentioned that they had heard about the program from OG&E staff and said they had heard about the program from a colleague and past work experience at another construction firm. One mentioned learning about it from a HERS rater. The remaining builder could not recall how they learned about the program.
- **Builders use the PE-NHC as a marketing tool for their homes, though they generally perceive awareness of the Channel to be low.** Three builders said that 10% of customers or fewer knew about the Channel before working with them, while the other two builders were unsure. All of the builders noted that they inform customers of the Channel and use promotional materials provided by OG&E to inform customers of the benefits of homes that meet the Channel's building standards.
- **Interviews indicated builders are largely satisfied with the program, though some offered recommendations for improvement.** All the builders said they were satisfied with the communication and support from OG&E staff and the Channel overall. Four builders suggested increasing the program inducement amount, three of whom noted that the inducement had not kept pace with rising material costs. Two noted a lack of satisfaction with rebate check processing time and the amount of communication regarding the payment status. One builder also noted that HERS raters were doing a "pretty good job." However, on occasion, it takes multiple requests to get paperwork back and mentioned that they are occasionally "unorganized."

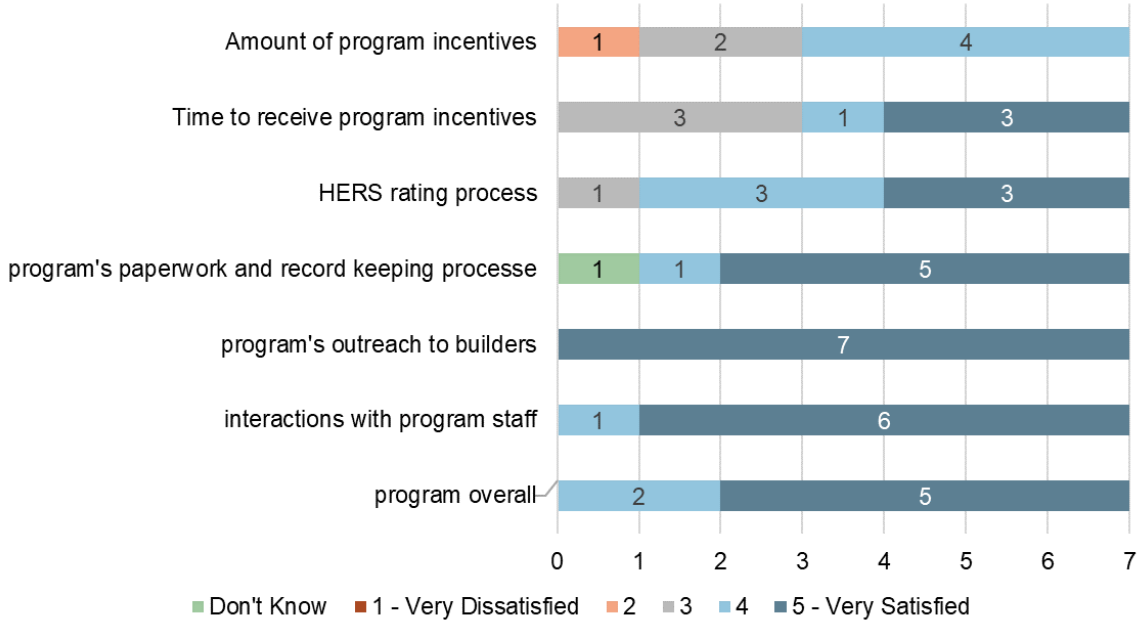

Figure 4-29: Builders' satisfaction

- **The PE-NHC Channel appeared to be a generally important factor in builders' decisions to build energy efficient homes. However, the extent of its influence was challenging to gauge because of some inconsistent builder responses.** All the builders said the Channel's inducement was a very important factor in their decision to build qualifying homes. Four said technical assistance from staff and HERS raters was also important.[46] However, one builder stated it was very likely[47] they would have built the same number of PE-NHC qualifying homes in OG&E territory in 2020 if the Channel had never existed. Four others indicated it was likely they would have built some efficient homes. Three builders indicated that some (10% - 50%) of their homes would have been built to PE-NHC standard; the fourth builder said they would have been very likely to have built efficient homes but that the homes would not have been built to exactly the PE-NHC standard and would not have built any homes to that standard. A fifth builder gave inconsistent responses, saying *both* it was not at all likely they would have built any qualifying homes *and* that they would have built the same number of PE-NHC qualifying homes if the Channel had never existed.

[46] Rated the importance of the inducement a 4 or 5 on a scale from 1 (not at all important) to 5 (very important).

[47] Rated their likelihood a 5 on a scale from 1 (not at all likely) to 5 (very likely)

- **Builders' motivation to participate was similar in 2019 and 2020.** All builders indicated that financial inducement is an important factor motivating them to participate in OG&E PE-NHC Channel.[48] Five builders also indicated that the ability to differentiate themselves from other builders and other program assistance played important roles in motivating them to participate in the Channel.[49] ADM observed similar motivations among builders in 2019, leading to the finding that PE-NHC inducements help builders position themselves as leaders in the market, driving energy efficiency in new home construction.
- **Builders rated home size, appearance, location, and interior features as the most important factors in customers' homebuying decision-making process.** Figure 4-30 displays builders' perceptions regarding the importance of various factors in the homebuyers' decision-making process. The relative perceived importance of home price was lower in 2020 than in 2019. It is consistent with builders' perception that interest rates enable homebuyers to purchase homes and view price as less of a limiting factor.[50]

[48] Rated the importance of the factor a 7 or higher on a scale from 0 (not at all important) to 10 (very important)

[49] Rated the importance of the factor a 7 or higher on a scale from 0 (not at all important) to 10 (very important)

[50] In general, builders gave higher ratings in 2020 than in 2019 for all factors. The average perceived importance of home price was similar in 2019 and 2020 (8.4 in 2019 and 8.3 in 2020), but builders only perceived one other factor to be more important than price in 2019 (general appearance).

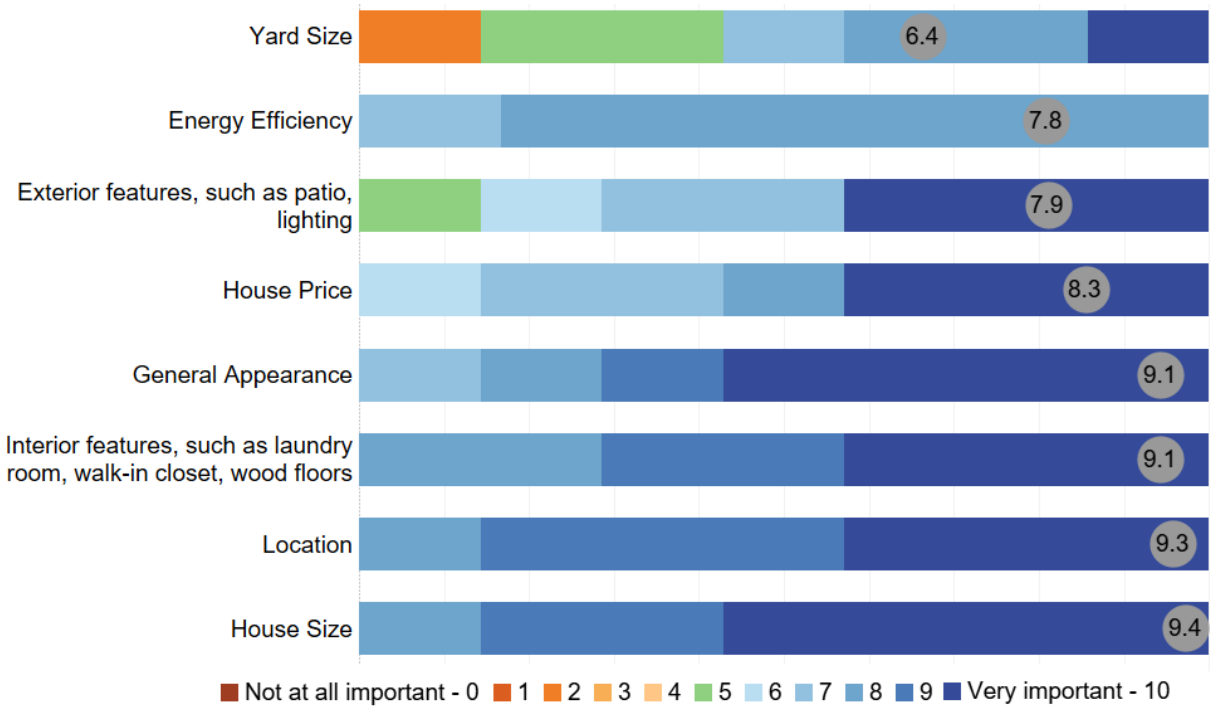

Figure 4-30: How important do builders perceive various factors to be in homebuyers' decision-making process?[51]

- **Builders suggested that COVID-19 created challenges for homebuilding in Oklahoma.** Builders noted several COVID-19 related challenges. Two noted that it interrupted home sales due to a pause in home viewings. One specified that it had caused them to pause construction. Another builder stated that getting subcontractors had been difficult in 2020 as some have quit or become sick.
- **Market and government response to the pandemic may have strengthened Oklahoma's new homes market in 2020.** Four builders noted low interest rates had strengthened the new homes market by enabling customers to buy and builders to construct new homes. One builder noted that he had been building homes for 31 years, and this "could be one of our best years." Another builder noted that a significant number of existing homes had been taken off the market because of COVID-19 and health concerns about in-home viewings. He said that this caused an increased demand for new construction. One builder said that COVID-19 had not affected the new home market in Oklahoma in any way.
- **Some builders noted changes to customer priorities related to COVID-19.** Three builders noted that COVID-19 had possibly affected customer preferences.

[51] n=8. One builder initially objected to the question, saying that everything was important. That builder eventually gave a rating of 10 to all factors. Average ratings are displayed in grey circles.

One builder said that they had sold out of “shop homes” or mixed-use buildings with commercial space on the ground floor and residential space on the second floor. Another builder observed that home buyers are looking for more space and amenities. The third builder said that “larger, expensive homes seem to be selling” but was hesitant to relate this to the COVID-19 pandemic directly.

- **Builders provided perspectives on current trends and the outlook for the next 12 months of home building in OG&E territory.**
  - Four builders said that supply costs had increased in 2020. One of these four builders suggested this may inhibit their ability to continue building energy efficient homes, while another said that he was observing the price of lumber plateau.
  - Three builders noted the possibility of an oversaturated new home market in Oklahoma within the next 12 months. They observed that the current level of production could create a supply of new homes that exceeds demand.
  - One builder predicted that in 2021 they would have a 50% increase in new home production.
  - Three builders were unsure or did not know what to expect in the next 12 months in terms of trends or industry developments that may affect the number of new homes they build to Positive Energy standards.

4.7 Conclusions & Recommendations

4.7.1 Conclusions

The key conclusions from the PY2020 evaluation of the HEEP are as follows:

HEEP Awareness (Cross-Channel)

- Customers were very satisfied with OG&E overall and individual HEEP Channels, although some customers noted areas for potential improvement.
- Survey responses indicate that customers hear about OG&E’s HEEP from various sources and hear about the different Channels in various manners. For example, the RSOL Channel’s direct install/assessment participants primarily heard about the Channel through bill inserts, whereas major measure survey learned about the opportunity from contractors and the OG&E website.

RSOL Channel

- The RSOL Channel’s direct install/assessment offering may reach a more diverse group of customers than its “major measure” one.

School Outreach Channel

- The program operated as usual and reached its goals despite the challenges posed during the COVID-19 pandemic. Over three-quarters of survey respondents rated the program as “pretty good” or better, and parent feedback received by the OG&E contact indicates that the program is fun to participate in.

Residential HVAC Replacement & Tune-up Single family

- Responses from the single family HEEP Residential HVAC Replacement & Tune-up survey indicate the Channel is an important resource for customers and an influential tool for promoting energy efficient equipment. The participant survey indicated that the Channel succeeds in getting customers to get tune-ups that they otherwise would not have gotten and to install a more efficient unit than they otherwise would have installed.
- Residential HVAC Replacement & Tune-up Contractors are not consistently explaining the differences between a standard tune-up and the OG&E tune-up or explain the difference in a way that customers do not understand or recollect. Survey responses indicate that this issue persisted from 2019 to 2020. About half of the participants did not receive an explanation of the differences between a standard tune-up and the OG&E tune-up in 2019, whereas 20% recalled their contractor explaining the difference in 2020.
- Interviews with Residential HVAC Replacement trade allies indicated that more communication and up-to-date customer contact information from HEEP staff would improve Channel implementation by reducing customer concerns of contractor legitimacy and contractors’ work to contact customers successfully.

RSOL and Residential HVAC Replacement & Tune-up Multifamily

- There is an opportunity to streamline OG&E HEEP’s multifamily energy efficiency improvement efforts. Survey responses from the Multifamily RSOL and Residential HVAC Replacement and Tune-up Channel suggest creating a marketing plan or outreach effort that includes all OG&E’s offerings available for multifamily properties could streamline the sign-up and scheduling process and enable more property managers/owners to make more comprehensive improvements.
- Residential HVAC Replacement & Tune-up Multifamily survey responses indicate there is an opportunity to improve the quality of the contractor’s work as half of the respondents noted issues or maintenance needs arising after participating in the Channel.

Consumer Products Channel

- Findings from the Consumer Products Channel survey indicate that most customers were unaware that the LED light bulbs they bought were discounted. This portion of respondents is larger than in 2018 or 2019, indicating a smaller portion of customers were aware that their purchase was discounted through the Channel in 2020 than in past years.

PE-NHC Channel

- Findings from ADM's interviews with participating builders generally indicate the PE-NHC Channel was an important factor in builders' decisions to build energy efficient homes, though the extent of its influence is unclear.

4.7.2 Recommendations

ADM offers the following recommendations for the OG&E HEEP:

- Use multifamily property manager feedback to tailor additional training or guidance for the Residential HVAC Replacement & Tune-up Multifamily trade allies. Additionally, consider including some random M&V or follow-ups with participants fairly soon after the Channel participation to ask any specific issues or concerns that arise after participation.
- OG&E and CLEAResult should consider an integrated approach for marketing and enrolling Multifamily properties in the RSOL and Residential HVAC Replacement and Tune-up Channels. Ensuring participating properties are aware of all available inducements at the time of their enrollment can enable them to engage in more comprehensive energy efficiency improvement projects.
- Considerations to improve the energy savings realization rate for the School Outreach Channel include using the AR TRM stipulated value for annual gallons of water saved for both faucet aerators and low-flow showerheads. Additionally, using the mixed water temperature from zone 8 (Ft. Smith) for low-flow showerheads and faucet aerators would improve the realization rates. ADM analysis found that weather from zone 8 (Ft. Smith) more closely approximates the weather found in the OG&E distribution territory.
- For the Residential HVAC Replacement and Tune-up Channel, CLEAResult, and OG&E should consider working more closely with contractors to ensure they have up-to-date customer contact information and adequate communication regarding the Channel's schedule.
- While we recognize that window air conditioners make up less than 1% of the Consumer Products Channel kWh savings, we know there is a possibility of the measure's composing a larger percentage of Channel savings in the future.

Therefore, improving the realization rate of this measure could be of greater benefit in the future. Actions that could improve the realization rate include using the AR TRM's coincidence factor when calculating demand savings. Additionally, using the EFLH and RAF from zone 8 (Ft. Smith) in Table 4-17 and Table 4-18 would improve the energy savings realization rates.

5 Weatherization Residential Assistance Program (WRAP)

5.1 Evaluation Findings

Table 5-1 outlines the *ex ante* and verified *ex post* energy savings by measure for the PY2020 Weatherization Residential Assistance Program (WRAP).

Table 5-1: Gross Electric Savings Summary, by Measure, for PY2020

Measure	*Ex Ante* Annual Energy Savings (kWh)	*Ex Post* Gross Annual Savings (kWh)	Realization Rate (kWh)	*Ex Ante* Peak Demand Reduction (kW)	*Ex Post* Gross Peak Demand Savings (kW)	Realization Rate (kW)
Air Infiltration	2,957,052	2,957,052	100%	640	640	100%
Ceiling Insulation	910,150	910,150	100%	333	333	100%
Duct Sealing	7,199,900	7,221,721	100%	2,349	2,355	100%
LEDs	1,833,269	1,837,002	100%	96	225	236%
Water Heater Jackets	69,497	69,497	100%	7	7	100%
Water Heater Pipe Wraps	13,585	12,152	89%	1	1	90%
ES Windows	821	821	100%	1	1	100%
Total	**12,984,274**	**13,008,395**	**100%**	**3,427**	**3,562**	**104%**

Table 5-2 outlines the *ex post* lifetime energy savings, by measure, for the PY2020 WRAP.

Table 5-2: Gross Lifetime Savings Summary by Measure for PY2020

Measure	EUL Tier One	EUL Tier Two	*Ex Post* Gross Lifetime Energy Savings (kWh)
Air Infiltration	11		32,527,570
Ceiling Insulation	25		22,753,741
Duct Sealing	18		129,990,984
LEDs	3	16	15,020,194
Water Heater Jackets	13		903,466
Water Heater Pipe Wraps	13		157,974
ES Windows	20		16,416
Total			**201,370,344**

Additional details, including approaches, are found in the following sections.

5.2 Program Overview

OG&E's WRAP seeks to generate energy and demand savings for limited-income residential customers by installing a range of cost-effective weatherization and other measures in eligible dwellings. The program's purpose is to provide OG&E's limited-income residential customers the assistance they need to make their homes more energy efficient, increase comfort levels, and reduce their utility bills.

The program focuses on residential customers who own or rent homes within OG&E's service territory and earn less than $60,000 a year or are enrolled in OG&E's Low-Income Assistance Program (LIAP).

The program is designed to facilitate the installation of a wide range of cost-effective weatherization measures, including:

- Ceiling Insulation
- Air Infiltration
- Duct Sealing
- LEDs
- Water Heater Pipe Wrap
- Water Heater Jacket

The following measures may be installed by participating non-profit organizations:

- Floor Insulation
- Wall Insulation
- ENERGY STAR® Windows
- ENERGY STAR® Ceiling Fan with Light Kit

Measures are selected for individual homes through a contractor assessment which identifies a list of cost-effective improvements. OG&E works with Skyline Energy Solutions and non-profit organizations such as the Central Oklahoma Habitat for Humanity to implement the program.

Table 5-3 presents the number of participating customers per residence type for PY2020. Eighty-six percent of participating residences lived in single-family homes.

Table 5-3: Participation by Residence Type

Residence Type	Number of Participating Residences	Percentage of Participating Residences
Single family	3,216	86%
Duplex	102	3%
Mobile Home	24	1%
Multifamily	399	11%
Total	**3,741**	**100%**

Figure 5-1 displays the number of projects invoiced each month of PY2020. April and May 2020 are omitted from the figure as there were no homes invoiced during these months.[52] October and July had the highest number of homes invoiced.

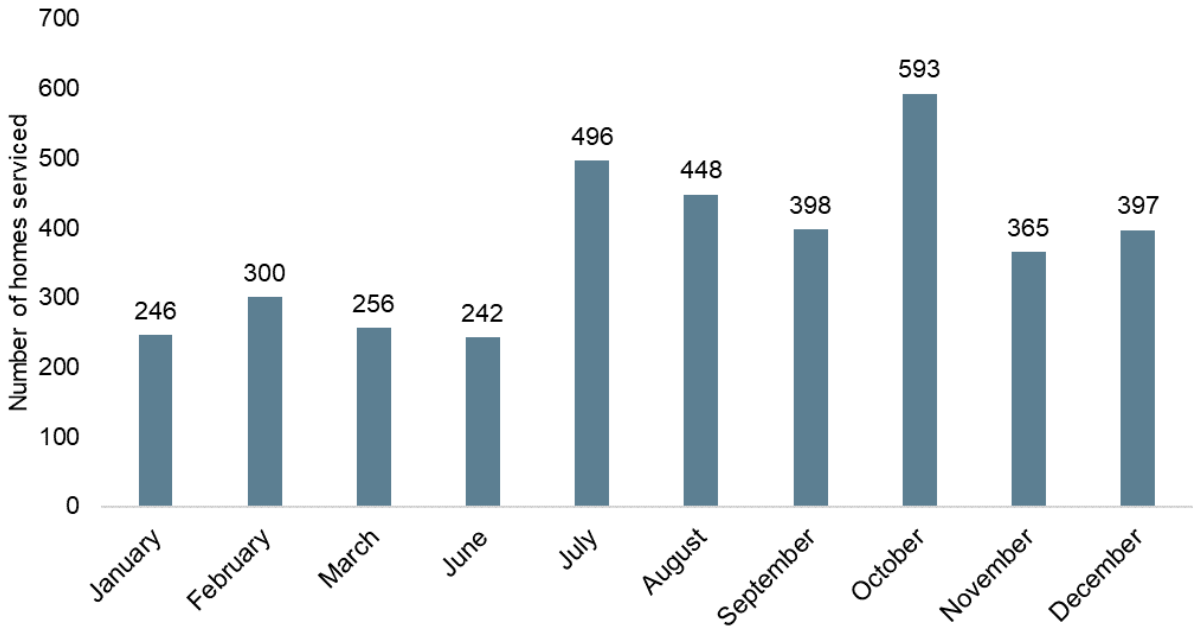

Figure 5-1: WRAP Participation by Month

Table 5-4 displays the number of households receiving each of the measure types offered in PY2020.[53] Similar to PY2019, air infiltration reduction was the most common improvement made.

[52] WRAP was paused due to the COVID-19 pandemic for 9 weeks. See the WRAP staff interviews in Section 5.7.1 for additional detail.

[53]The values represent the number of homes receiving the measure, rather than the total number of measures installed at all homes. Thus, the values for LEDs do not present the total number of bulbs installed, but the total number of participants receiving at least one of that measure type.

Table 5-4: Number of Households Receiving Measure Types

Measure	Number of Households Receiving Measure
Ceiling Insulation	1,169
Air Infiltration	3,702
Duct Sealing	3,520
Water Heater Jackets	241
Water Heater Pipe Wraps	215
LEDs	3,432
ES Windows	2

5.3 Gross Impact Evaluation Approach

This section presents gross impact methodologies and key findings for WRAP's PY2020 evaluation. For measures implemented through the PY2020 program, savings verification was performed per methodology described in the 2017 Update to the Oklahoma Deemed Savings (OKDS).

The calculation methodologies for Program measures are detailed in the following sections. In these examples, energy units are expressed in kWh.

5.3.1 Air Infiltration Reduction Savings Calculations

The deemed savings algorithms in the OKDS for air infiltration reduction were developed through simulation modeling using BEopt 2.6, running EnergyPlus 8.4 as the underlying simulation engine. Multiple equipment configurations were simulated in each of the five Oklahoma weather zones in developing savings values denominated in deemed savings per CFM_{50} of air leakage rate reduction. The following table summarizes the infiltration reduction deemed savings values for all Oklahoma weather zones.

Table 5-5: Deemed Savings Values for Air Infiltration Reduction

Zone	AC/Gas Heat kWh	Gas Heat (no AC) kWh	AC/Electric Resistance kWh	Heat Pump kWh	Summer Peak kW Savings
9	0.15	0.06	1.99	0.72	0.000091
8A	0.22	0.07	2.39	0.96	0.000128
8B	0.25	0.07	2.34	0.97	0.000146
7	0.22	0.05	1.79	0.75	0.000152
6	0.18	0.03	1.18	0.51	0.000119

Baseline assumptions used in developing of these deemed savings are based on a 2013 ASHRAE Handbook of Fundamentals, Chapter 16, which provides typical infiltration rates for residential structures. In a study of low-income homes reported in ASHRAE,

approximately 95% of home infiltration rates were below 3.0 Air Changes per Hour (ACH) ACH_{Nat}[54]. Therefore, savings should only be applied to homes with infiltration rates at or below ACH_{Nat} of 3.0 to avoid inducing homes with envelope problems that are not easily remedied through typical weatherization procedures or improperly conducted blower door tests. With this baseline in effect, the pre-installation ACH value is calculated as follows:

Equation 5-1: Pre-Installation ACH Value

$$ACH_{Nat,pre} = \frac{CFM_{50,pre} \times 60}{Vol \times N}$$

Where:

$CFM_{50,pre}$ = Pre-installation infiltration rate (CFM50)
60 = Constant to convert from minutes to hours
Vol = Square footage of treated space multiplied by the weighted average ceiling height of treated space (8.5 by default)[55]
N = N factor (deemed value based on the type of wind shielding and number of stories in the home)

Pre-retrofit leakage rates are limited to the maximum per square foot values specified in OKDS, as this generally indicates severe structural damage not repairable by typical infiltration reduction techniques. The maximum allowable pre-infiltration rate allowance may be waived for residences implementing the measure through low-income programs at the utility's discretion [56].

The deemed savings are expressed as linear functions of the leakage reduction achieved (in CFM_{50})[57]. The following formula must be used to calculate deemed savings for infiltration efficiency improvements. The formula applies to single family and multifamily dwellings and all building heights and shielding factors. Only structures with electric refrigerated air conditioning systems are eligible.

[54] 2013 ASHRAE Handbook of Fundamentals, Chapter 16, p. 15.18, Figure 12.

[55] Typical ceiling height of 8 feet adjusted to account for greater ceiling heights in some areas of a typical residence.

[56] Low-income customers are income-eligible customers served through a low-income or hard-to-reach program.

[57] Model testing indicates that a straight-line relationship between demand and energy savings achieved and CFM_{50} reductions is appropriate with beginning and ending leakage rates within the ranges permitted by the measure.

Equation 5-2: Air Infiltration Deemed Savings

$$Deemed\ Savings = \Delta CFM_{50} \times V$$

Where:

ΔCFM_{50} = Air infiltration reduction in Cubic Feet per Minute at 50 Pascal

V = Constant to convert from minutes to hours

The following example calculated energy savings for a residence in Weather Zone 7 with electric AC and electric resistance heat (Table 5-5). If the residence had a leakage rate of 3,670 CFM_{50} before air infiltration reduction and a leakage rate of 2,718 CFM_{50} after, then the residence would have an annual gross savings of 1,704.08 kWh.

$$Air\ Infiltration\ Savings = 1.79 \times (3{,}670 - 2{,}718) = 1{,}704.08\ kWh$$

5.3.2 Ceiling Insulation Savings Calculations

The deemed savings algorithms in the OKDS for ceiling insulation were developed through simulation modeling in BEopt 2.6, running EnergyPlus 8.4 as the underlying simulation engine. Multiple equipment configurations were simulated in each of the five Oklahoma weather zones using R-38 insulation in developing savings values denominated in deemed savings per square footage of ceiling area. The deemed savings provided in Table 5-6 are normalized to the square footage of affected conditioned space, calculated as the floor area projected vertically downward from the bounds of the attic space receiving upgraded ceiling insulation or encapsulation for Weather Zone 8A.[58]

[58] If the R-38 ceiling insulation option is implemented and an adjoining knee wall(s) is simultaneously insulated as well, savings from the knee wall insulation measure should also be claimed. If attic encapsulation is chosen, any knee wall(s) adjoining the encapsulated attic need not be insulated and knee wall deemed savings may not be claimed.

Table 5-6: Deemed Savings Values for R-38 Ceiling Insulation, Zone 8A

R-Value of Preexisting Ceiling Insulation	AC/Gas Heat kWh	Gas Heat (no AC) kWh	AC/Electric Resistance kWh	Heat Pump kWh	Summer Peak kW Savings
	per sq. ft.	per sq. ft.	per sq. ft.	per sq. ft.	per sq. ft.
R-0	1.06	0.17	6.03	3.25	0.000718
R-1 to R-4	0.89	0.14	5.10	2.74	0.00065
R-5 to R-8	0.43	0.07	2.49	1.37	0.000319
R-9 to R-14	0.24	0.04	1.44	0.79	0.000168
R-15 to R-22	0.12	0.02	0.74	0.40	0.0000849

The following example considers a residence in Weather Zone 8A with a heat pump and a pre-retrofit ceiling insulation R-value ranging from 9 to 14. If the residence has a ceiling area of 800 sq. ft., then the residence would have an annual gross savings of 632 kWh.

$$Ceiling\ Insulation\ Savings = 0.79 \times (800) = 632\ kWh$$

The OKDS specifies an efficiency standard of R-38, meaning that to qualify for deemed savings, the combined R-value of existing and added insulation should be at least R-38.

Additionally, pre-insulation R-value must not exceed R-22. If this eligibility criterion is not met, deemed savings default to 0 kWh.

5.3.3 Duct Sealing Savings Calculations

All residential customers with refrigerated air cooling are eligible to claim cooling savings for this measure. Customers must have central heating with either a furnace (gas or electric resistance) or a heat pump to claim heating savings. The annual savings for the installation of duct sealing in residence, which primarily depends on the home's cooling and heating type, can be calculated using the following equations:

Equation 5-3: Duct Sealing Electric Cooling Energy Savings

$$kWh_{savings,C} = \frac{\left(DL_{pre} - DL_{post}\right) \times EFLH_C \left(h_{out}\rho_{out} - h_{in}\rho_{in}\right) \times 60}{1{,}000 \times SEER}$$

Where:

DL_{pre} = Pre-improvement duct leakage at 25 Pa (ft^3/min)
DL_{post} = Post-improvement duct leakage at 25 Pa (ft^3/min)
$EFLH_c$ = Equivalent full load cooling hours
h_{out} = Outdoor seasonal specific enthalpy (Btu/lb)
h_{in} = Indoor seasonal specific enthalpy (Btu/lb)
ρ_{out} = Density of outdoor air (lb/ft^3)

ρ_{in} = Density of conditioned air at 75˚F=0.0756 (lb/ft^3)[59]
60 = Constant to convert from minutes to hours
1,000 = Constant to convert from W to kW
SEER = Seasonal Energy Efficiency Ratio of the existing system (Btu/W○hr) =11.5[60]

Equation 5-4: Duct Sealing Heat Pump Heating Energy Savings

$$kWh_{savings,H} = \frac{\left(DL_{pre} - DL_{post}\right) \times 60 \times HDD \times 24 \times 0.018}{1{,}000 \times HSPF}$$

Where:

DL_{pre} = Pre-improvement duct leakage at 25 Pa (ft^3/min)
DL_{post} = Post-improvement duct leakage at 25 Pa (ft^3/min)
60 = Constant to convert from minutes to hours
HDD = Heating degree days
24 = Constant to convert from days to hours
0.018 = Volumetric heat capacity of air (Btu/ft^3 ˚F)
HSPF = Heating Seasonal Performance Factor of the existing system (Btu/W○hr) =7.3[61]

Equation 5-5: Duct Sealing Electric Resistance Heating Energy Savings

$$kWh_{savings,H} = \frac{\left(DL_{pre} - DL_{post}\right) \times 60 \times 0.77\, HDD \times 24 \times 0.018}{3{,}412}$$

Where:

DL_{pre} = Pre-improvement duct leakage at 25 Pa (ft3/min)
DL_{post} = Post-improvement duct leakage at 25 Pa (ft3/min)
60 = Constant to convert from minutes to hours
0.77 = Factor to correlate design load hours to EFLH under actual working conditions (to account for the fact that people do not always operate their heating system when the outside temperature is less than 65°F)[62]
HDD = Heating degree days
24 = Constant to convert from days to hours

[59] ASHRAE Fundamentals 2009, Chapter 1: Psychometrics, Equation 11, Equation 41, Table 2

[60] Average of US U.S. DOE minimum allowed SEER for new air conditioners from 1992-2006 (10 SEER) and from 2006-2015 (13 SEER).

[61] Average of DOE minimum allowed HSPF for new heat pumps from 1992-2006 (6.8 HSPF) and from 2006-2015 (7.7 HSPF).

[62] Manual J, Volume 7: Appendix A-4

0.018 = Volumetric heat capacity of air (Btu/ft^3°F)
3,412 = Constant to convert from Btu to kWh

Equation 5-6: Duct Sealing Gas Furnace Heating Energy Savings

$$kWh_{savings,H} = \frac{(DL_{pre} - DL_{post}) \times 60 \times HDD \times 24 \times 0.018}{100{,}000 \times AFUE}$$

Where:

DL_{pre} = Pre-improvement duct leakage at 25 Pa (ft^3/min)
DL_{post} = Post-improvement duct leakage at 25 Pa (ft^3/min)
60 = Constant to convert from minutes to hours
HDD = Heating degree days
24 = Constant to convert from days to hours
0.018 = Volumetric heat capacity of air (Btu/ft^3°F)
100,000 = Constant to convert from Btu to therms
AFUE = Annual Fuel Utilization Efficiency of existing system = 0.78 (default)[63]

The required site-specific inputs, as stated in OKDS for duct sealing, are as follows:

- The pre-and post-improvement duct leakage
- The weather zone of the residence
- The cooling and heating type of residence

For example, if an air-conditioned home in weather zone 7 had a pre-improvement leakage of 450.8 CFM and post-improvement leakage of 241.7 CFM, the annual gross cooling savings from the installation of duct sealing would be approximately 1,251 kWh, using the SEER Value 11.5.

$$kWh_{savings,C} = \frac{(450.8 - 241.7) \times 1{,}681 \times (39 \times 0.074 - 29 \times 0.076) \times 60}{1{,}000 \times 11.5}$$
$$= 1{,}251\ kWh$$

OKDS for duct sealing also includes specifications for demand (kW cooling) savings, calculated as follows:

Equation 5-7: Duct Sealing Cooling Demand Reduction

$$kW_{savings,C} = \frac{kWh_{savings,C}}{EFLH_C} \times 1.163 \times CF$$

Where:

[63] Department of Energy minimum allowed AFUE for new furnaces manufactured before May 1, 2013: 0.78 AFUE

$kWh_{savings.C}$ = Calculated kWh savings for cooling
$EFLH_C$ = Equivalent full load cooling hours
1.163 = Constant to convert efficiency from SEER to EER
CF = Coincidence factor = 0.87[64]

5.3.4 Light-emitting Diodes (LEDs) Savings Calculations

The deemed savings for LEDs can be calculated by using the following equation.

Equation 5-8: LED Energy Savings

$$kWh_{savings} = ((Watts_{base} - Watts_{post})/1{,}000) \times Hours \times ISR \times IEF_E$$

Where:

W_{base} = Based on wattage equivalent of the lumen output of the purchased Omni-directional LEDs and the program year purchased/installed; for Omni-directional LEDs, use the following base and post case wattages

Table 5-7: ENERGY STAR® Omni-Directional LEDs – EISA Baselines

Minimum Lumens	Maximum Lumens	Incandescent Equivalent 1st Tier EISA 2007 (W_{base})	Incand. Equiv. 2nd Tier EISA 2007 (W_{base})[65]	Effective dates for 2nd Tier EISA 2007 Baselines
310	749	29	12	1/1/2020
750	1,049	43	20	1/1/2020
1,050	1,489	53	28	1/1/2020
1,490	2,600	72	45	1/1/2020

W_{post} = Wattage of Omni-directional LED purchased/installed.
$Hours$ = Average hours of use per year = 961 hours/year (assuming 2.63 hours/day and 365.25 days/year operation)[66]
ISR = In-Service Rate, or the percentage of rebate units that get installed, to account for units purchased but not immediately installed

[64] Air Conditioning Contractors of America (ACCA) Manual S recommends that residential air conditioners be sized at 115% of the maximum cooling requirement of the house. Assuming that the house's maximum cooling occurs during the hours 4 to 5 PM, the guideline leads to a coincidence factor for residential HVAC measures of 1.0/1.15 = 0.87.

[65] Wattages developed using the 45 lumens per Watt (lpw) standard that goes into effect in 2020.

[66] ADM Associates, Inc., "Residential Lighting Hours of Use (HOU) for the Oklahoma Demand Programs in 2016". Prepared for Oklahoma Gas & Electric. September 2016.

IEF_E = Interactive Effects Factor to account for cooling energy savings and heating energy penalties.

The required site-specific inputs as stated in the OKDS are as follows:

- The quantity and lumen output of post fixtures
- Whether or not the retrofits were a time-of-sale or direct install (this defines the in-service rate)
- Whether or not the bulbs were installed indoors or outdoors
- The heating type of the residence

For example, if 7 LEDs, each with a light output of 1,049 lumens, were directly installed to replace 7 incandescent lamps in a residence with gas heating, the annual gross savings would be approximately 246.6 kWh.

$$kWh_{savings} = ((7 \times 43 - 7 \times 9)/1{,}000 \times 961 \times 0.98 \times 1.10 = 246.6\, kWh$$

The OKDS also accounts for future changes in lighting baselines as per EISA 2007 guidelines. Specifically, it specifies that the 1st Tier EISA 2007 baselines came into effect in January 2014 and that the 2nd Tier EISA 2007 baselines came into effect in January 2020. To allow for market turnover resulting from the EISA baseline change in 2020, we used January 1, 2023, as the threshold date for the next tier of EISA baseline changes to come into effect.

5.3.5 Water Heater Jackets Savings Calculations

The energy savings for the water heater jackets can be calculated by using the following equation:

Equation 5-9: Water Heater Jacket Annual Energy Savings

$$kWh_{savings} = \left(U_{pre} - U_{post}\right) \times A \times (T_{tank} - T_{ambient}) \times \frac{1}{RE} \times \frac{Hours_{Total}}{Conversion\ Factor}$$

Where:

U_{pre} = 1 ÷ 5 = 0.2 BTU/h °F ft^2

U_{post} = 1 ÷ (5 + $R_{Insulation}$)

$R_{Insulation}$ = R-Value of installed insulation; if unknown, assume a default R-value of 6.7

A = Insulated tank surface area in square feet (πDL) with L (length) and D (tank diameter) in feet; if unknown, use the default assumptions from OKDS

T_{tank} = Water heater temperature setpoint (°F); if unknown, assume the default value of 120°F

$T_{ambient}$ = Average ambient temperature (°F); if installed in an unconditioned space, use value from OKDS's Table 38, and if installed in a conditioned space, assume the default value of 78°F

RE = Recovery Efficiency (or in the case of HPWH, EF); if unknown, use 0.98 as a default for electric resistance water heaters, 0.79 for natural gas water heaters, or 2.2 for heat pump water heaters[67]

$Hours_{Total}$ = 8,760 hours per year

Conversion Factor = 3,412 BTU/kWh for electric water heating of 100,000 BTU/Therm for gas water heating

The required site-specific inputs, as stated in the OKDS for Water Heater Jackets, are as follows:

- The length and the nominal diameter of the water tank
- The R-value of installed insulation
- The water heater space type (condition or unconditioned)
- The weather zone of the residence
- The water heating type of residence

For example, if a home located in weather zone 8A had water heater jackets with an R-value of 6.7 installed in an unconditioned space on an electric resistance water heater tank with size of 40 gallons, the residence would have deemed annual gross savings of approximately 392.6 kWh.

$$Annual\ kWh_{savings} = (0.2 - 1/(5 + 6.7)) \times 21.81 \times (120 - 60) \times \left(\frac{1}{0.98}\right) \times \frac{8760}{3412}$$
$$= 392.6\ kWh$$

The peak demand savings for water heater jackets can be calculated using the following formula.

Equation 5-10: Water Heater Jackets Peak Demand Savings

$$kW_{savings} = \left(U_{pre} - U_{post}\right) \times A \times \left(T_{tank} - T_{ambient,MAX}\right) \times \frac{1}{RE} \times \frac{1}{3{,}412}$$

Where:

$T_{ambientMAX}$ = Average maximum ambient temperature (°F); the average ambient temperature of 78°F was used for water heaters inside the thermal

[67] Default values based on median recovery efficiency of residential water heaters by fuel type in the AHRI database, at https://www.ahridirectory.org

envelope; the weather zone-dependent annual maximum ambient temperature from OKDS table 39 was used for unconditioned spaces. Note that all other variables are the same as the previous equation.

5.3.6 Water Heater Pipe Insulation Savings Calculations

The deemed savings for the installation of water heater pipe insulation can be calculated by using the following equation:

Equation 5-11 Water Heater Pipe Insulation Annual Energy Savings

$$kWh_{savings} = \left(U_{pre} - U_{post}\right) \times A \times \left(T_{Pipe} - T_{ambient}\right) \times \left(\frac{1}{RE}\right) \times \frac{Hours_{Total}}{Converison\ Factor}$$

Where:

U_{pre} = 1 ÷ 2.03 = 0.49 BTU/h °F ft^2

U_{post} = 1 ÷ (2.03 +$R_{Insulation}$)

$R_{Insulation}$ = R-Value of installed insulation

A = Insulated pipe surface area in square feet (πDL) with L (length) and D (pipe diameter) in feet; if unknown, use the default assumptions from OKDS.

T_{pipe} = Average temperature of the pipe (°F); assume a default value of 120°F (assumed water heater setpoint)

$T_{ambient}$ = Average ambient temperature (°F); if installed in an unconditioned space, use value from Table 41 of the OKDKD, and if installed in a conditioned space, assume the default value of 78°F

RE = Recovery Efficiency (or in the case of HPWH, EF); if unknown, use 0.98 as a default for electric resistance water heaters, 0.79 for natural gas water heaters, or 2.2 for heat pump water heaters[68]

$Hours_{Total}$ = 8,760 hours per year

$Conversion\ Factor$= 3,412 BTU/kWh for electric water heating or 100,000 BTU/Therm for gas water heating

The required site-specific inputs, as stated in the OKDS for Water Heater Pipe Insulation, are as follows:

- The length and the nominal diameter of the water heater pipe;
- The R-value of installed insulation;
- The water heater space type (condition or unconditioned);

[68] Default values based on median recovery efficiency of residential water heaters by fuel type in the AHRI database, at https://www.ahridirectory.org/ahridirectory/pages/rwh/defaultSearch.aspx

- The weather zone of the residence; and
- The water heating type of the residence.

For example, if a home located in weather zone 8A installed pipe wrap with an R-value of 6.7 on an electric-resistance water heater pipe with a surface area of 1.571 (diameter of 1 inch and length of 6 feet) the annual gross savings would be approximately 80.0 kWh.

Annual Energy Savings

$$kWh_{savings} = (0.49 - 1/(2.03 + 4)) \times 1.5708 \times (120 - 60) \times \left(\frac{1}{0.98}\right) \times \frac{8760}{3412} = 80.0\ kWh$$

OKDS for Water Heater Pipe Insulation includes specifications for demand savings from water heater pipe insulation, calculated as follows:

Equation 5-12 Water Heater Pipe Insulation Demand Reduction

$$kW_{savings} = \left(U_{pre} - U_{post}\right) \times A \times \left(T_{Pipe} - T_{ambientMAX}\right) \times \left(\frac{1}{RE}\right) \times \frac{1}{3{,}412\ Btu/kWh}$$

Where:

$T_{ambientMAX}$ = Average maximum ambient temperature (°F); the average ambient temperature of 78°F was used for water heaters inside the thermal envelope; the weather zone-dependent annual ambient temperature from OKDS was used for unconditioned spaces.

5.3.7 Windows Savings Calculations

The deemed savings algorithms in the OKDS for ENERGY STAR® (ES) Windows were developed through simulation modeling developed in BEopt 2.6, running EnergyPlus 8.4 as the underlying simulation engine. For this measure, there are two different baseline assumptions and two sets of deemed savings values:

- One set of deemed savings values is applicable where single-pane windows, without storm windows, are replaced. The baseline assumptions are single-pane clear glass with an aluminum frame without a thermal break, having a U-factor of 1.16, and a solar heat gain coefficient (SHGC) of 0.76.
- The other set of deemed savings values is applicable when an ENERGY STAR® window is replacing a double-glazed (i.e., double-pane), clear window with an aluminum frame, a U-factor of 0.76, and a solar heat gain coefficient (SHGC) of 0.67. These deemed savings would also be applicable when the window being replaced is a single pane with a storm window.

For a window to qualify for these deemed savings, it must meet the most recent ENERGY STAR® criteria for the EPA's South-Central climate zone. The criteria include a U-factor

less than or equal to 0.30 and an SHGC of less than or equal to 0.2569. Multiple equipment configurations were simulated in each of the five Oklahoma weather zones using the ENERGY STAR® Requirement. Deemed savings are calculated per square foot of window installed, inclusive of frame and sash. Table 5-8 summarizes the deemed savings values for Weather Zone 8A. The deemed savings provided in Table 5-8 are normalized to the square footage of affected conditioned space, calculated as the floor area projected vertically downward from the bounds of the attic space receiving upgraded ceiling insulation or encapsulation for Weather Zone 8A.

Table 5-8: Deemed Savings Values for ENERGY STAR® Windows, Zone 8A

Existing Windowpane Type	AC/Gas Heat kWh	Gas Heat (no AC) kWh	AC/Electric Resistance kWh	Heat Pump kWh	Summer Peak kW Savings
	per sq. ft.	per sq. ft.	per sq. ft.	per sq. ft.	per sq. ft.
Single Pane	5.13	5.13	9.88	7.78	0.00323
Double Pane	3.76	3.76	6.09	5.33	0.00234

The following example considers a residence in Weather Zone 8A with gas heating and central air conditioning. If the residence replaced existing standard single pane windows with 54 sq. ft. of ENERGY STAR® Windows, then the home would have an annual gross savings of 277.0 kWh.

$$ES\ Windows\ Savings = 5.13 \times (54) = 277.0\ kWh$$

5.4 Net Savings Approach

WRAP is an income-qualified program and has a stipulated net-to-gross ratio of 1.0. ADM did not conduct a free ridership analysis or spillover savings analysis for WRAP, and net savings are equal to gross savings.

5.5 Survey Sampling, Verification Procedures, and Findings

5.5.1 Survey Sampling Plan

ADM conducted a phone survey in PY2020 and designed the survey's sample to be statistically representative of the program population and ensure accurate program

[69] These requirements reflect the ENERGY STAR® specifications for windows in the South-Central region as of January 1, 2015. These values are subject to updates in ENERGY STAR® specifications and are subject to change at any time.

insights. Our sample approach was designed to achieve a minimum 10% precision and 90 confidence level (90/10) for this effort.

For the calculation of sample size for survey completes, a coefficient of variation of 0.5 was assumed.[70] With this assumption, a minimum sample size of 68 participants was required, as shown in the following formula:

Equation 5-13: Minimum Sample Size Formula for 90 Percent Confidence Level

$$n_0 = \left(\frac{Z * CV}{RP}\right)^2 = \left(\frac{1.645 * 0.5}{0.10}\right)^2 = 68$$

Where:

η_0 = minimum sample size

Z= Z-statistic value (1.645 for a two-sided 90% confidence level)

CV = Coefficient of Variation (assumed to be 0.5)

RP = Required Precision (0.10)

Although 68 was the minimum sample size, ADM conducted phone surveys with 200 participants across the OG&E service territory. The additional survey completes were obtained to support more robust findings and gather additional feedback from program participants as ADM did not conduct in-person field visits in 2020. ADM's in-house survey team called 801 participants and completed 200 surveys (response rate of 25%). Survey respondents represented 6 counties and 55 zip codes across OG&E's service territory.

5.5.2 Survey Verification Procedure

The survey informed the gross impact analysis by verifying the presence of reported tracking data measures. ADM asked customers to confirm the measures they received through the program. Fourteen of the respondents indicated that they did not recall receiving an improvement or measure or there was an error in the program records. However, ADM verified receipt of these measures through program records. See Table 5-9 for the measures that were confirmed through ADM's customer survey.

[70] The coefficient of variation, cv(y), is a measure of variation for the variable to be estimated. Its value depends on the mean and standard deviation of the distribution of values for the variable (i.e., cv(y) = sd(y)/mean(y)). Where y is the average savings per participants. Without data to use as a basis for a higher value, it is typical to apply a CV of 0.5 in residential program evaluations.

Table 5-9: Survey Confirmation of WRAP Measures

Measure	Confirmed	Not Confirmed
Air Infiltration	197	3
LED	189	6
Duct Sealing	179	5
Attic Insulation	55	0
Water Heater Pipe Wrap	2	0
Water Heater Jacket	1	0

The following figure presents the geographic distribution of surveyed homes for PY2020. The majority of customers surveyed lived in the Oklahoma City metropolitan area.

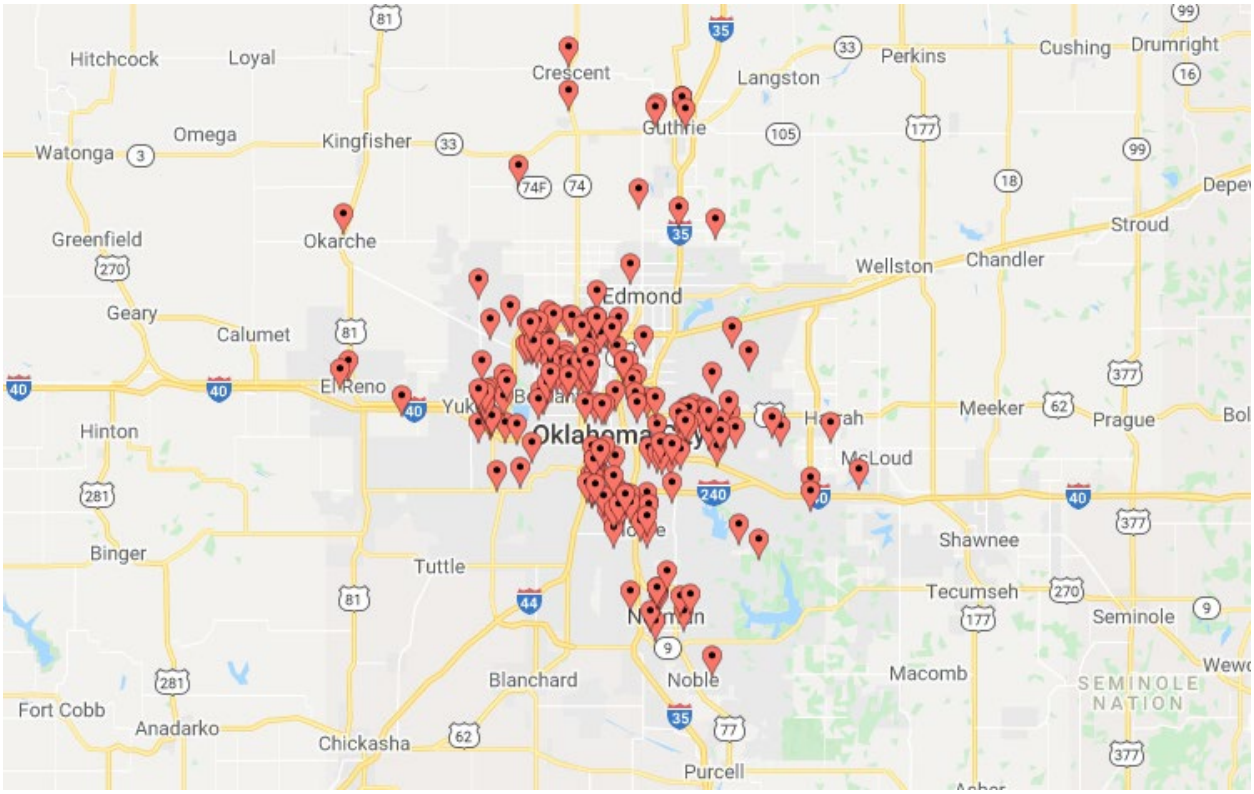

Figure 5-2: Geographical Distribution of WRAP Survey Respondents

5.5.3 Survey Verification Findings

ADM's survey verification effort showed that overall, the weatherization measures had been installed in the quantities reported within program tracking data. Specific notes illustrating the accuracy of program tracking data include:

Contact information: Program tracking data provided accurate information regarding the addresses of homes that were weatherized. The majority of phone numbers were accurate, though we found about 5% of dialed numbers had been

disconnected or incorrect as inputted in the tracking data. Given the large participant population, the contact information was sufficient for EM&V purposes.

Air infiltration: We contacted 200 homes that tracking data indicated received air infiltration improvements. Ninety-nine percent confirmed receiving these improvements. No verification rate adjustments were made to this measure.

Ceiling Insulation: ADM conducted phone surveys with 55 customers that tracking data indicated had ceiling insulation installed. All confirmed the insulation installation, and therefore no verification rate adjustments were made to this measure.

Water Heater Pipe Wrap: ADM confirmed the installation of water heater pipe wrap with two OG&E WRAP participants. Based on the small number of installations in the tracking data and the limited number of verifications ADM could complete, no verification rate adjustments were made to this measure.

Water Heater Jacket: Only 1 verification survey was made for this measure because of the small number of installations in the tracking data. No verification rate adjustments were made to this measure.

LEDs: ADM contacted 195 homes to verify LED installations. Ninety-seven percent confirmed receiving LED lightbulbs from the program. The remaining respondents could not recall (3%) or said they had not received LEDs (3%) through the program. Of the respondents that confirmed receiving LED lightbulbs (n=189), most (87%) confirmed that the number they received was accurately reflected in OG&E's WRAP tracking data. Three percent of the respondents that confirmed receiving LEDs corrected the number of lightbulbs they received, while the other 11% of respondents could not recall how many they had received.[71] The respondents that recalled the number of LEDs they received reported the number that were currently installed; these respondents reported 98% of LEDs received through the program were currently installed. Based on these findings, no verification rate adjustments were made to this measure.

Duct sealing: We called 179 homes that tracking data noted as receiving duct sealing work. Ninety-seven percent of respondents confirmed duct sealing improvements had been made; thus, no verification rate adjustments were made to this measure.

5.6 Impact Evaluation Summary and Findings

This section presents the *ex-post* gross savings resulting from the impact evaluation activities described above.

[71] Does not sum to 100% due to rounding.

One discrepancy that has persisted since 2018 related to the WRAP claimed peak demand reduction for LED lighting. The realization rate for LED lighting's peak demand reduction is 236%. The kWh realization rate is 100%. The unique variable for the demand calculation is the coincidence factor. Therefore, it's likely that the EnerTrek database is using a different CF than 0.10 (OKDS).

ADM noted a minor issue associated with water heater pipe wrap. The less than 100% realization rate for water heater pipe wrap is due to ADM utilizing the pipe diameter and pipe length values provided in the program tracking data and the value for π accurate to fifteen digits. Ex ante data used estimations for the pipe surface area from the OKDS. Table 5-10 presents the overall *ex ante* savings for WRAP by measure.

Table 5-10: Ex Ante Savings by Measure

Measure	*Ex Ante* Peak Demand Savings (kW)	*Ex Ante* Annual Energy Savings (kWh)
Air Infiltration	640	2,957,052
Ceiling Insulation	333	910,150
Duct Sealing	2,349	7,199,900
LED	96	1,833,269
Water Heater Jackets	7	69,497
Water Heater Pipe Wraps	1	13,585
ES Windows	1	821
Total	**3,427**	**12,984,274**

Table 5-11 summarizes the WRAP *ex post* gross energy savings, demand savings, and lifetime gross savings by measure for PY2020.

Table 5-11: Ex Post Gross Savings by Measure

Measure	*Ex Post* Gross Peak Demand Savings (kW)	*Ex Post* Gross Annual Savings (kWh)	*Ex Post* Gross Lifetime Energy Savings (kWh)
Air Infiltration	640	2,957,052	32,527,570
Ceiling Insulation	333	910,150	22,753,741
Duct Sealing	2,355	7,221,721	129,990,984
LED	225	1,837,002	15,020,194
Water Heater Jackets	7.24	69,497	903,466
Water Heater Pipe Wraps	1.28	12,152	157,974
ES Windows	1	821	16,416
Total	**3,562**	**13,008,395**	**201,370,344**

Table 5-12 presents overall energy savings and demand *ex post* gross realization rates by measure. These *ex post* gross realization rates are representative of all Program savings, including all-electric savings presented above.

Table 5-12: Overall Gross Realization Rates by Measure

Measure	*Ex Post* Gross Realization Rate (kWh)	*Ex Post* Gross Realization Rate (kW)
Air Infiltration	100%	100%
Ceiling Insulation	100%	100%
Duct Sealing	100%	100%
LED	100%	236%
Water Heater Jackets	100%	100%
Water Heater Pipe Wraps	89%	90%
ES Windows	100%	100%
Total	**100%**	**104%**

The net-to-gross ratio for WRAP is 1.00, and the gross savings by measure displayed above are equal to net savings.

Table 5-13: Ex Post Net Electricity Savings

Number of Homes	*Ex Post* Net Peak Demand Savings (kW)	*Ex Post* Net Annual Savings (kWh)	*Ex Post* Net Lifetime Savings (kWh)	Net-to-Gross Ratio
3,741	3,562	13,008,395	201,370,344	100%

5.7 Process Evaluation Findings

ADM's 2020 process evaluation of OG&E's WRAP was designed to answer the following research questions:

- Did the program implementation reflect its current design? In what ways did it deviate, and how did that affect program success?
- Do program utility and implementation contractor staff effectively coordinate to deliver the program?
- How have the program implementation and delivery changed, if at all, since the previous program years? How are these changes related to previous evaluation results, and how are they expected to change program impacts in the future?
- Are there ways to improve the design or implementation process?
- How do participants hear about the program? Are there any changes in how participants learn of the program as compared to the prior year?
- Were program participants satisfied with their experience? What was the level of satisfaction with the work performed, the scheduling/application process, and other

program participation aspects? What are the perceived energy and non-energy benefits associated with the program?

- Were there any significant challenges or new obstacles during the program year?
- Looking forward, what, if any, are key barriers and drivers to program success within OG&E's market?

ADM's process evaluation activities included a participant survey, interviews with program staff, and a review of program tracking data to investigate the geographic spread of projects in PY2020 to address these questions.

5.7.1 Program Staff Interviews

Methods and Descriptions of Interviews

ADM staff interviewed OG&E and implementer (Skyline) staff in April and December of 2020. The interviews in April were inquiring about OG&E's plans for operating the programs during the COVID-19 pandemic. The December interviews addressed program progress, including the impacts of COVID-19, program design and implementation, communication, and marketing. For OG&E, we interviewed the WRAP Program Manager (the "Program Manager"). For Skyline, we interviewed the company owner. The 2020 Program year was the Program Manager's second full year as Program Manager.

Roles and Responsibilities

Roles and responsibilities had not changed since the previous program year. The Program Manager has overall responsibility for WRAP. The Program Manager interacts with the owner of Skyline and an external marketing company (Direct Options) in managing and delivering WRAP and works with the OG&E corporate communications team and community affairs managers to promote WRAP. The Skyline owner oversees WRAP implementation, directly supervising all Skyline employees.

Program Progress

Program contacts reported that WRAP had suspended operations and marketing from mid-March through mid-June. OG&E communicated the decision directly to contractors and vendors and via TV commercials.

Before shutting down in mid-March, the program was "about 1%" ahead of the project activity schedule. Contacts reported a backlog of sign-ups from 2019 and that customers continued to sign up for WRAP despite the suspension of marketing.

Both contacts reported that program activity was good after they started back up in mid-June and that the program was on track to meet goals. Information from the contacts

indicated that the cancellation rate after mid-June was consistent with that in previous years.[72]

Program Design and Implementation

Details of program design are documented in the ADM evaluation report for the 2019 program year. Contacts reported that no changes had been made to eligible measures, eligibility criteria, or customer sign-up processes, except for those made to reduce the risk of COVID-19 transmission. The Skyline contact reported doing more thorough duct sealing by adding more sealing around the ducts' register and top side.

The Skyline contact noted that they were not able to communicate with customers during the nine-week program shut-down. When they knew the shut-down was about to go into effect, they contacted all customers who had signed up at that point to let them know about the shut-down and that Skyline would contact them when they were able to return to work. As soon as they could return to work, they began calling customers to let them know they were back and had started scheduling appointments. The contact reported they made almost 1,100 calls during the first week and that 95% of customers were "totally good" with the fact that the pandemic had interrupted the program.

Contacts reported several measures taken to reduce COVID-19 risks such as using mainly paperless contact, including electronic documentation and text messaging to confirm appointments. Before going to a customer's home, Skyline staff went through a questionnaire by phone with the homeowner to assess COVID-19 risk and canceled some appointments because the customer did not pass the screening.[73] While in customer homes, crews were required to wear masks and gloves and change them each time they went in and out of or between homes. They also recommended to customers to be absent when the program crew was there. If a customer was in the home, they reduced the number of field crew who entered the home to maintain social distance: from four to six if the customer was not in the home to three if the customer was in the home.

Contacts also reported that, in some cases, they carried out weatherization work at a house on the same day as the assessment. They did this to speed up the process and minimize the amount of time spent at a given house.

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[72] The OG&E contact reported a 2% cancellation rate during the shut-down period. The Skyline contact reported an overall cancellation rate of 6% but said most of that was from mid-June on. If the sign-up rate from mid-March through mid-June was 50% to 100% of the rate after mid-June, the cancellation rate from mid-June on ranges from 7.2% to 8.2%. The Skyline contact reported a normal rate of 7% to 8%.

[73] The questionnaire asked whether anyone in the home had been out of the country, had been on an airplane, had been infected with COVID-19, had been exposed to an infected person, or had any concerns with having Skyline employees enter their homes wearing personal protective equipment.

The Skyline contact also reported that in 2020 Skyline had begun incorporating optional text messages into customer communication. After the customer contacts OG&E to sign up and Skyline calls the customer to pre-qualify them for the program, Skyline offers the customer the option of scheduling by phone or receiving text notifications to schedule appointments and receive updates. The contact found quicker responses by text than phone calls. Skyline has started the development of this system and plans to roll it out fully in 2021.

The Skyline contact reported that there had been no changes to QA/QC procedures.

Communication

Contacts described effective communication. ADM's 2019 program year evaluation report documented daily communication by phone and email (with seven to eight email exchanges per day) and weekly in-person meetings. In contrast, contacts reported that communication in the 2020 program year was more by phone than in past years because of COVID-19.

Marketing and Outreach

Contacts reported no change to the marketing and outreach plan. As documented in ADM's evaluation of the 2019 program year, WRAP is marketed through direct mail (letters, emails, postcards), social media, and – before COVID-19 – at public events. The program staff would distribute WRAP-related flyers at public events, including those attended by the OG&E corporate communications team and community affairs managers. However, WRAP didn't team up with community groups to carry out weatherization projects as they had in the past.

Contacts reported that WRAP held a "Silver Energy" event at a senior living facility in Oklahoma City connected with Martin Luther King Jr. Day. OG&E had developed the Silver Energy campaign in the 2019 program year to target senior citizens by holding events at senior living facilities.

However, WRAP was unable to carry out other public-event outreach or weatherization activity after March. This included plans to carry out weatherization projects in conjunction with home repair activities done by the Neighborhood Alliance and Rebuilding Together.

The contacts noted that, in 2019, they had made a "little bit" of a change to the marketing plan to engage in more targeted marketing. Previously, OG&E sent letters about the program to all parts of the service territory simultaneously, which resulted in sign-ups from throughout the service territory. Skyline scheduled projects in geographic clusters, prioritizing those with higher volumes of sign-ups to maximize the number of project completions. This resulted in some frustration for customers in other geographic areas. OG&E adopted a plan to time the marketing to geographic areas based on Skyline's

schedule to address this. For example, if Skyline had projects scheduled in a certain area, OG&E would send letters to that area to generate sign-ups.

The Skyline contact reported that both the above-described change instituted in 2019 and the 2020 COVID-19 driven revision were very beneficial to their ability to complete projects efficiently by allowing them to work in a "more compacted" area at a given time.

The contacts reported that the pandemic disrupted that approach. Instead, once the shut-down ended in June, OG&E decided to begin scheduling installations first in the service territory areas that had the lowest COVID-19 incidence, which was Southern Oklahoma. This enabled them to avoid trying to schedule installations in the Oklahoma City Metro area, where they were concerned they would face higher cancellation rates because of greater COVID-19 concerns. The contact reported that by the time they had begun scheduling in the Oklahoma City Metro area, "things had kind of calmed down a bit," and they were able to complete a large number of projects.

Barriers and Challenges

The contacts agreed that the primary challenge to WRAP is continuing to have a good customer base for the program. The Skyline contact reported that, over the program's 11 years of operation, they had serviced almost 40,000 homes and that eventually, they would begin to reach saturation. Both contacts discussed possible solutions. The OG&E contact reported interest in expanding the served customer base of WRAP to millennials. The Skyline contact said they had discussed the possibility of revisiting homes that had been treated before, as most measures have a life expectancy of seven to eight years.

5.7.2 Program Activity by Location

ADM investigated the geographic distribution of OG&E's WRAP from PY2016 through PY2020. We also explored PY2020 exclusively. ADM found that WRAP's distribution of projects remained largely consistent from 2016 to 2020. Figure 5-3 displays the geocoded WRAP projects that have been completed from 2016 to 2020.

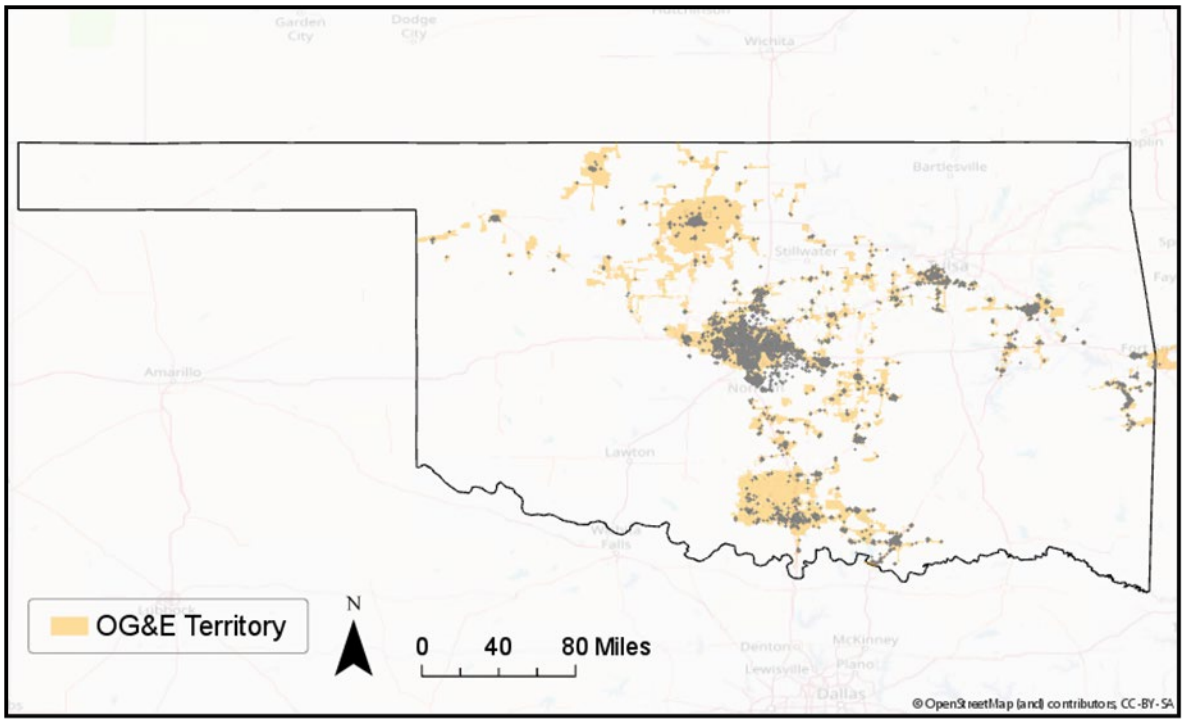

Figure 5-3: WRAP Projects from 2016-2020

We also explored the portion of projects completed in the Oklahoma City metro area to other districts (see Figure 5-4). OG&E has served all areas in its service area through its WRAP; though, the Oklahoma City metro area has consistently received a larger portion of projects. This is partly due to the higher density of housing in the OKC metro area, though comparing 2016-2020 shows that the portion of projects completed in the OKC metro area has varied from year to year.

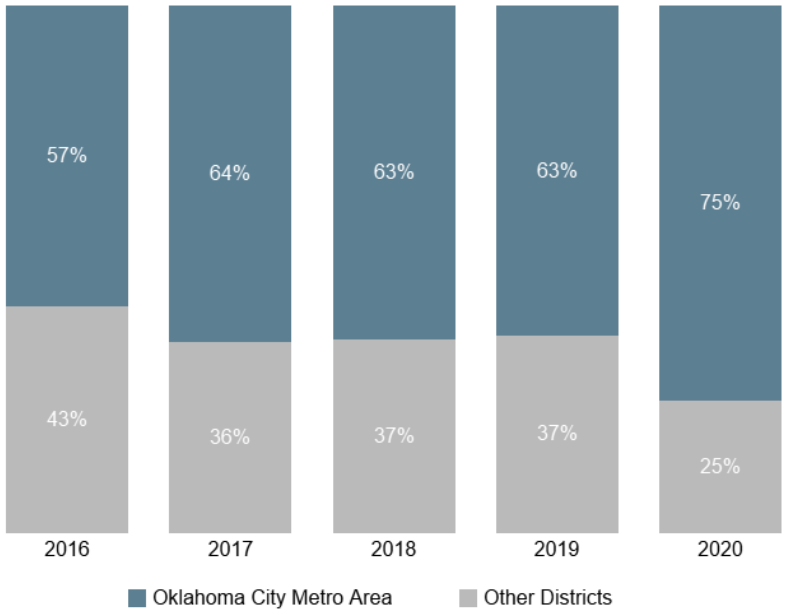

Figure 5-4: WRAP Project by District by Year (Percentage)

Figure 5-5 further illustrates the number of projects completed in districts outside the OKC metro area was below average in 2020. This finding may indicate an opportunity for focusing outreach, marketing, and weatherization efforts in OG&E's service territory outside the OKC metro area.

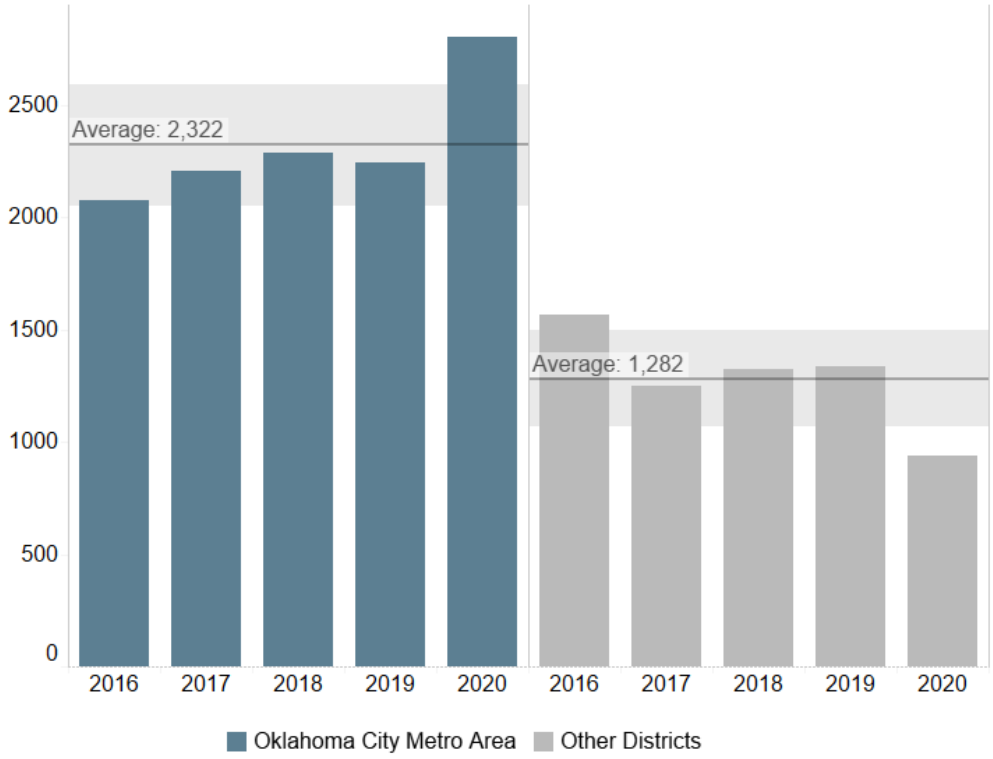

Figure 5-5: WRAP Projects by District by Year (Number)

5.7.3 WRAP Participant Survey

ADM administered a phone survey to 200 WRAP participants in the summer and fall of 2020 after contacting 801 participants (25% response rate). Unless otherwise stated, the calculations, graphs, and tables in this process evaluation use the complete sample (n=200).

5.7.3.1 General Respondent Characterization

Table 5-14 summarizes basic home demographic information of the OG&E WRAP survey respondents. Survey respondents answered questions regarding numerous demographic factors. Respondents typically owned the home that had participated in the program and had natural gas home and water heating. The typical respondent also noted that they lived in a moderately sized home of slightly older vintage. [74] [75] ADM asked respondents about the ages of everyone living in the home that had been weatherized. Though 62%

[74] Sixty-five percent of respondents said their home was less than 2,000 square feet.
[75] Seventy-two percent said their house was built before 1990.

of people responsible for signing up for the program were 55 or older, customers indicated that their households contained people of varying ages.

Table 5-14: WRAP Respondent Household Characteristics

Question	Response	Percent
Do you rent or your home?	Rent	90%
	Own	10%
What is the main fuel used to heat your home?	Electricity	23%
	Natural gas	69%
	Propane	1%
	Don't Know	2%
What is the main fuel used to heat your water?	Electricity	19%
	Natural gas	73%
	Propane	1%
	Don't Know	3%
Including yourself, how many people lived in your household last year?	1	37%
	2	36%
	3	14%
	4	7%
	5 or more	5%
	Prefer not to answer	6%
How old are the people that live at the home that was weatherized?	Under 18 years old	14%
	18-24 years old	6%
	25-34 years old	8%
	35-44 years old	8%
	45-54 years old	7%
	55-64 years old	10%
	65-74 years old	22%
	75-85 years old	13%
	86 years old or older	2%
	I prefer not to answer	10%

ADM also inquired with customers regarding their employment status, ethnicity or race, and gender (see Table 5-15). Most respondents identified as being white and retired or not working and having completed some college or education beyond a high school.

Table 5-15: WRAP Respondent Personal Characteristics

Question	Response	Percent
What is your race or ethnicity?	Caucasian/White	65%
	Black/African American	14%
	Hispanic or Latino	9%
	Native American or Alaska Native	6%
	Asian	1%
	Prefer not to answer	10%
What is your gender?	Male	41%
	Female	53%
	Prefer Not to Answer	6%
Which of the following categories best describes your employment status?	Employed, working up to 30 hours per week	6%
	Employed, working 30 or more hours per week	27%
	Not employed, looking for work	5%
	Not employed, Not retired or disabled	3%
	Retired	48%
	Disabled, not able to work	4%
	Prefer not to answer	8%
What is the highest level of education you have completed?	Less than high school	4%
	High School Graduate/GED	26%
	Associates Degree, Vocation/Technical School, Or some college	33%
	Four-year college degree	22%
	Graduate or professional degree	7%
	I prefer not to answer	9%

5.7.3.2 Program Awareness, Communication, and Marketing

ADM's survey findings indicate that the way customers find out about OG&E's WRAP has remained consistent in the past three program years. Most customers report learning about the program from a utility message they receive in the mail or through word of mouth. Over half of the survey respondents (62%) in PY2020 reported hearing about WRAP through a utility bill message they received in the mail (54%) or through some other sort of information that came in the mail (8%). Word of mouth (18%) was the second most cited manner in which survey respondents learned about the program.

We compared the manner that program participants with different backgrounds became aware of the program. Seventy-three percent of retired respondents noted learning about

the program from a utility bill insert or other message received in the mail, compared to 51% of employed respondents.[76]

Seventy-four percent of the respondents that noted hearing about the program from a friend, relative, or colleague (n=35) said that this person had already participated in WRAP.

The type of messaging or information customers heard about the program before signing up was consistent with 2019 as well. Survey respondents noted that before they had signed up to participate in the program, they had heard or read about several benefits of WRAP participation that may have enticed them to participate. Survey respondents reported hearing that WRAP would reduce their monthly utility bill (52%), save energy (30%), and increase their home's comfort (23%). The majority of respondents (93%) did not have any reservations or concerns before signing up. Eight percent of respondents indicated they had initial reservations (7%) or could not recall (>1%) if they had concerns before signing up. Respondents' initial concerns included that the program was "too good to be true" or that they would incur a cost for their participation. These respondents said their concerns were assuaged by speaking with a customer service representative or through the participation process.

5.7.3.3 Program Participation Experience

Three-quarters of respondents said that they called OG&E's customer service center to request their home visit. Other respondents noted visiting OG&E's website (15%) or not recalling how they had signed up (10%).[77] Two respondents (1%) noted that they signed up using some other method. One customer said they called the WRAP contractor directly, and the other said they received a call directly from OG&E about the program. Ninety-eight percent of survey respondents said signing up for the program was easy.[78]

ADM inquired with survey respondents regarding the wait time to have their first home assessment and the day the contractors returned to install energy efficiency equipment and re-examine the house. Survey results indicate wait times were longer in 2020 than in 2019. Additionally, more respondents felt the wait time was longer than they had expected in 2020. However, most respondents still indicated the program had helped them to set appropriate expectations regarding their home visit timing.

[76] The difference is statistically significant by two-proportion t-test with an alpha of 0.05.
[77] Percentages do not total 100% due to rounding.
[78] Rated the ease of signing up a 4 or 5 on a scale from 1 (very difficult) to 5 (very easy). The remaining respondents rated the level of difficult of signing up a 3 out of 5 (1%) or could not recall how difficult it was to sign up for the program (2%). Percentages do not total 100% due to rounding.

Table 5-16 displays survey respondents' reported wait time between scheduling and their appointment date. Of the respondents that recalled how long their wait time was between the assessment and workday, 57% rated this amount of time as less than expected (3%) or about what they expected (54%). Thirty-nine percent of respondents noted that this amount of time was more than they expected.

Table 5-16: Length of Wait Between Scheduling and Appointment

Wait Length	n	Percent
Less than one week	3	1%
One week to two weeks	17	9%
Three to four weeks	24	12%
More than four weeks	123	61%
Don't Know	34	17%

Table 5-17 displays survey respondents' reported wait time between their first home energy assessment and the day contractors returned to install energy efficiency equipment and re-examine their house. Of the respondents that recalled this wait time, 71% rated this amount of time as less than expected (6%) or about what they expected (64%).[79] Twenty-three percent of respondents noted that this amount of time was more than they expected.

Table 5-17: Length of Wait Between Assessment and Installation

Wait Length	n	Percent
Less than one week	17	8%
One week to two weeks	40	20%
Three to four weeks	28	14%
More than four weeks	73	36%
Don't Know	43	21%

Forty-one percent of respondents said either the wait time for the initial visit or their workday was longer than expected and were asked to elaborate on their experience. Twelve percent of these respondents noted that there might have been some miscommunication or lack of communication with the program contractor. Nineteen percent of these respondents did not know or cite the reason for the delay in receiving services. Other respondents noted that delays were because of the COVID-19 pandemic (43%), high demand for program services (20%), winter holidays (5%), or the program running out of funds at the end of PY2019 and needing to wait for the next calendar year (5%).

[79] Percentages total 71% but were rounded to the nearest whole number.

ADM inquired with survey-takers regarding how much savings they had noticed on their monthly utility bill since participating in OG&E's Weatherization Program.[80] Of these respondents, 30% indicated significant savings[81], and 57% of these reported being satisfied with the savings on their monthly utility bill since participating.[82] A significant portion of respondents either did not know if they had noticed savings (34%) or said they had not noticed savings (37%)[83]. However, it is important to note that ADM conducted the customer survey shortly after customers received services. Hence, there might not have been sufficient time to evaluate savings attributed to the improvements made through OG&E's WRAP.

Regarding improvements in home comfort after participating in WRAP, 63% of respondents said they had experienced improved home comfort since participating in the program.[84]

In addition to energy savings and home comfort, survey respondents also noted that the information that they received through Program participation was useful. Eighty-three percent of respondents said the information provided by the person who did their home assessment was useful.[85] Eleven percent of respondents rated the information a 3 or lower, indicating that most program participants found information shared by the home assessor useful.

5.7.3.4 Customer Satisfaction

The vast majority of survey respondents stated they were satisfied with the performance of the improvements made, quality of the contractor's work, interactions with the

[80] Asked only of those who reported they did not have a fixed or averaged bill pay system.
[81] Provided a rating of 4 (10%) or 5 (20%) on a scale from 1 (no savings) to 5 (substantial savings). n=114.
[82] Rated their satisfaction a 4 (10%) or 5 (47%). n=115.
[83] Provided a rating of 3 or lower on a scale from 1 (no savings) to 5 (substantial savings). n=114.
[84] Sixty-three percent of respondents rated the change in home comfort a 4 (21%) or 5 (42%) out of 5 using a scale where 5 means "a substantial improvement" and 1 means "no improvement".
[85] Eighty-three percent of respondents rated the information they received from the assessor a 4 (16%) or 5 (67%) on a scale from "not at all useful" to "extremely useful".

contractor and OG&E staff (see

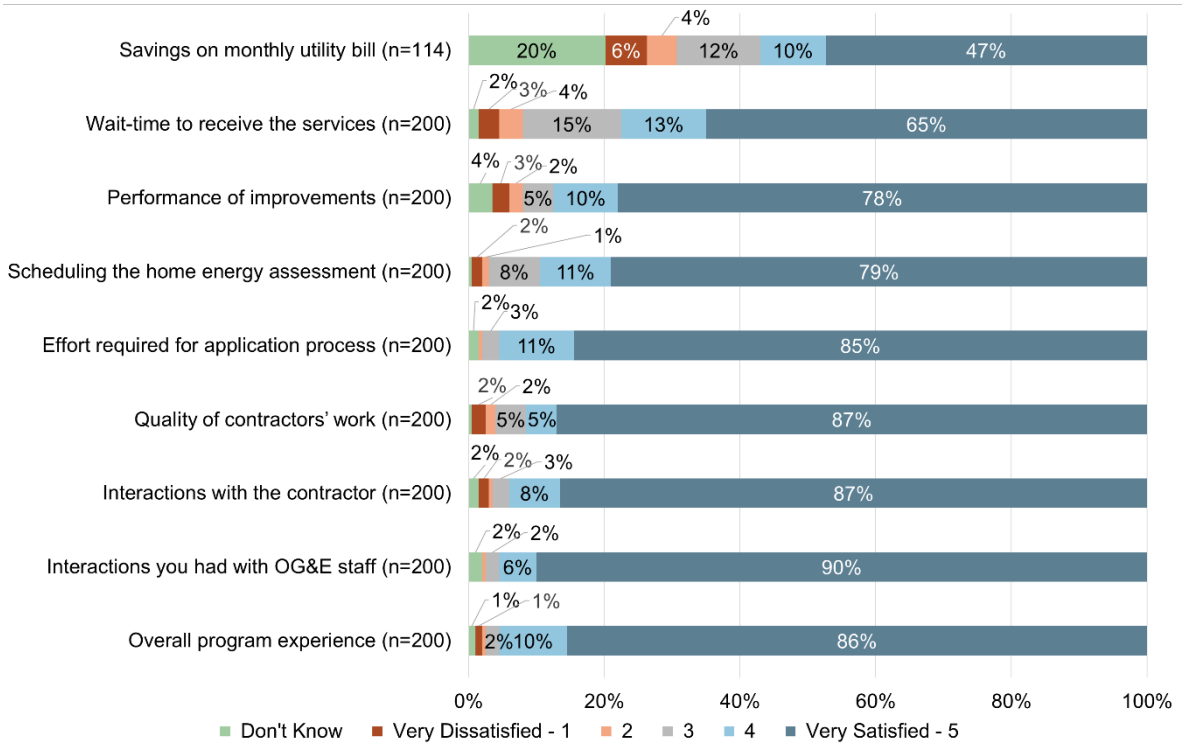

Figure 5-6). Furthermore, nearly all survey respondents indicated satisfaction with their overall program experience and said they were satisfied with OG&E as their electric utility.[86]

[86] Ninety-three percent of respondents rated their overall satisfaction with OG&E a 4 (15%) or 5 (78%).

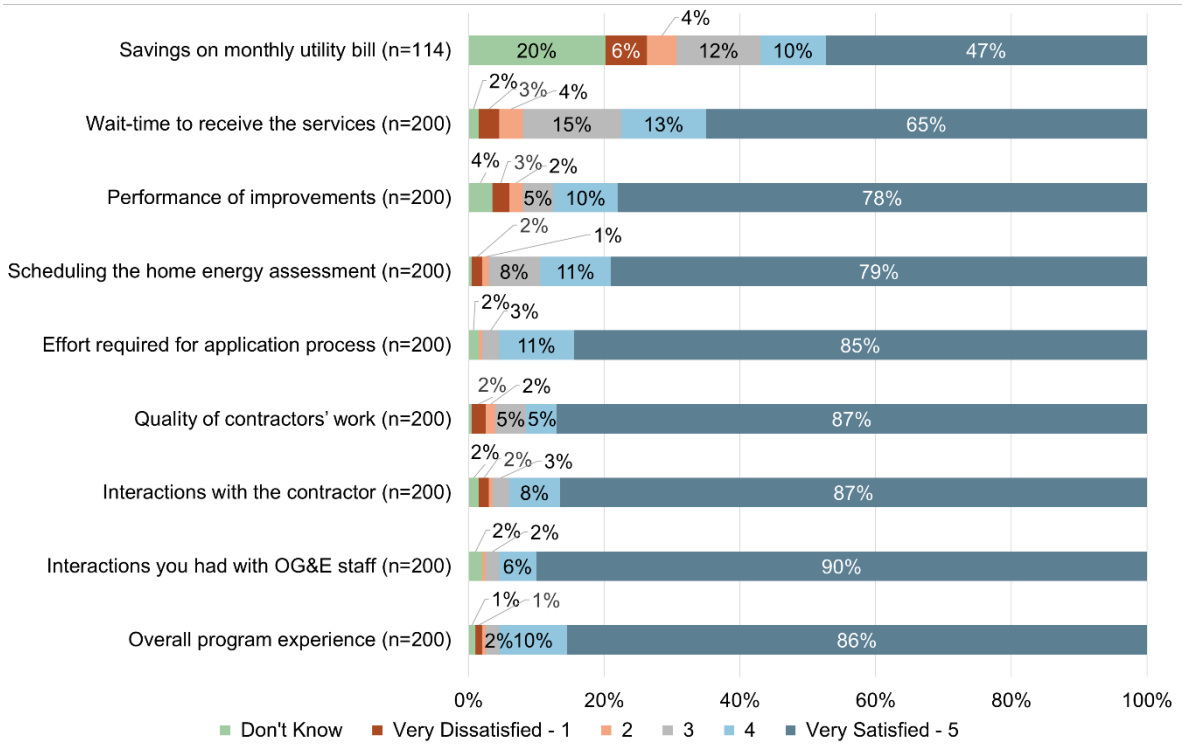

Figure 5-6: WRAP Customer Satisfaction

Ninety-nine percent of survey respondents were satisfied with the program overall. However, 41% (n=81) provided written feedback regarding the program's aspects they were not satisfied with or recommendations to improve the program or OG&E services. Some comments provided some additional detail or insights beyond their ratings, while others provided little or no detail beyond their ratings.

- Sixteen percent of respondents commented about the wait time or availability of services
- Twelve percent mentioned dissatisfaction with the program contractor and either noted dissatisfaction with the amount, quality, or cleanliness of the contractor's work
- Eight percent of respondents said that they had not noticed any savings since participating or noted general dissatisfaction with their bill, though a portion acknowledged that not enough time had passed since their participation in the program to notice savings related to OG&E's WRAP
- Five percent noted an opportunity to improve Program communications or communication from OG&E regarding its services
- Four percent of customers mentioned issues related to power outages at the time of the survey

- One percent were interested in OG&E offering solar energy or installation for its customers

5.7.4 WRAP Multifamily Property Manager Survey

In August 2020, ADM spoke with a fifteen-building senior cottage complex property manager who participated in OG&E's WRAP in 2020. The property manager stated that each building has four units to rent. He mentioned that there are both 750 square foot one-bedroom units and 950 square-foot two-bedroom units.

He was not aware of the program's sign-up process but noted that the Urban League of Oklahoma City had informed his property of the program. The property manager was also unable to assess the amount of savings that the property had experienced since participating.

The property manager was satisfied with the performance of the improvements made and interactions with the contractor and OG&E staff. He said that though he was satisfied with the quality of the contractor's work and improvements made overall, the water heater blankets installed through the program started to sag after installation and had to be readjusted by the property's staff. He noted that he was satisfied with their experience with the program overall as well.

5.8 Conclusions and Recommendations

5.8.1 Conclusions

Key conclusions from the PY2020 evaluation of the WRAP include:

- **The program met its energy savings goals**. When interviewed in Winter 2020, OG&E and Skyline contacts said WRAP would achieve its kWh savings and kW peak demand reduction goals for PY2020. ADM's review of final program data confirmed that the program attained its savings goals.
- **The program had an overall realization rate of 100% and realization rates at or close to 100% for most measures.** The two exceptions were LED light bulbs and water heater pipe wrap.
    - It appears that the EnerTrek database used a different CF for LEDs than the 0.10 specified in the OKDS. ADM identified this issue in 2018; it has persisted in 2019 and 2020. This issue causes *ex ante* and verified savings to differ for LED light bulbs. Rectifying this would likely align WRAP's LED peak demand reduction realization rate.
    - For water heater pipe wrap, the reason for the less than 100% realization rates for water heater pipe wrap kW demand reduction and kWh savings is

due to ADM utilizing the pipe diameter and pipe length values provided in the program tracking data as well as the value for π accurate to fifteen digits. *Ex ante* data used estimations for the pipe surface area from the OKDS.

- **Overall program satisfaction was high, though a significant portion of respondents offered recommendations for program improvement.** About one-third of respondents noted areas for program improvement, ranging from providing more communication to additional service offerings.
- **A larger portion of the program's participants were multifamily properties in PY2020 than PY2019, indicating an opportunity to expand or shift the program's focus to enroll multifamily properties.** Similar to past program years, most participants were single family home residents. However, about 13% of participating homes were classified as either multifamily or duplexes in PY2020 compared to 6% in PY2019. ADM's conversation with the manager of a participating multifamily property in August 2020 suggested that OG&E's WRAP is a unique, impactful opportunity for multifamily properties to reduce energy usage and improve residents' comfort.
- **Staff interviews and survey results indicate an opportunity to increase program participation with Millennial, Gen X, and young Baby Boomer OG&E customers.** While the 25-64-year-old age group makes up 61% of program-eligible Oklahoma householders, they made up 43% of the reported adult (i.e., over 18 years old) residents of treated homes. By contrast, the 65+ age group makes up 32% of program-eligible householders but 49% of adult residents of treated homes.
- **The program continued to improve its strategies for customer communication and coordination, though room for improvement remains.** Survey findings indicate that some customers experienced a lack of clarity regarding the program's measure offerings or the timeline for receiving service. The implementation contractor began incorporating optional text messages into customer communication and would fully roll out a text message notification system in 2021.

5.8.2 Recommendations

The following recommendations are offered for continued improvement of the Home Weatherization program:

- **Continue to align program tracking data *ex ante* savings and peak demand reduction methodologies.** Minor adjustments to the program's tracking data are needed to align savings calculations for LED light bulbs and water heater pipe wrap.

- **Continue to improve communication with customers regarding scheduling and WRAP's offerings as well as other OG&E services.** Survey findings indicate that most participants were well-informed about program offerings and the scheduling of their WRAP home assessment and "workday" visit. However, some respondents noted miscommunication regarding the timing of their WRAP visits or lack of clarity regarding WRAP and other OG&E programs' service offerings.
- **Consider targeted outreach to multifamily property owners or managers**. Multifamily properties may represent a largely untouched market with substantial potential for energy savings in OG&E's service territory. Targeting property managers or owners with phone calls or in-person outreach could lead to recruitment of low-income or otherwise eligible properties that could benefit greatly from weatherization services offered through the Program.
- **Increase Millennial/Gen X participation by marketing the program through email and social media (e.g., Reddit, Instagram).** Millennial and Gen X customers who pay bills online may be more inclined to interact with OG&E when prompted by digital communication rather than through physical mail outreach. This demographic may be primarily engaged with paying their utility bill and monitoring their energy usage through OG&E's online portal after receiving a monthly bill via email.
- **Add customer email addresses to the WRAP data tracking system.** Adding customer email addresses to program tracking data would enable ADM to conduct mixed-mode surveys. It would expand survey efforts and allow additional participants to provide feedback to improve the program.

6 Commercial Energy Efficiency Program (CEEP)

6.1 Summary of Impact Evaluation Findings

The verified *ex post* kWh and kW savings for the PY2020 CEEP are summarized below in Table 6-1.

Table 6-1: Ex Ante and Ex Post kWh Savings

Stratum Name[87]	*Ex Ante* kWh Savings	*Ex Post* kWh Savings	Gross kWh Realization Rate	*Ex Ante* kW Savings	*Ex Post* Gross kW Savings	Gross kW Realization Rate
CIS, SAGE, SBDI 1	14,600,033	14,977,308	103%	2,322	2,396	103%
CIS, SAGE, SBDI 2	15,857,607	15,877,136	100%	1,775	1,785	101%
CIS, SAGE, SBDI 3	13,643,862	13,644,019	100%	1,471	1,471	100%
CIS, SAGE, SBDI 4	15,714,441	15,616,212	99%	2,073	2,593	125%
CIS, SAGE, SBDI 5	3,192,136	3,192,136	100%	234	0	0%
Small Business Midstream	22,928,335	22,013,372	96%	3,519	3,539	101%
HVAC Replacement and Tune-Up	3,535,357	3,516,956	99%	2,049	2,041	100%
CEI	23,303,553	23,975,722	100%	2,015	1,775	88%
Total	**112,775,323**	**112,812,861**	**100%**	**15,457**	**15,599**	**101%**
Sums may differ due to rounding.						

Table 6-2 and Table 6-3 present the CEEP net kWh and kW savings summary by Channel, respectively.

[87] Strata are ordered by project size with the smallest projects in each sampling group being included in stratum "1" and the largest projects being included in stratum "3" or "4".

Table 6-2: CEEP Net kWh Savings Summary

Program Channel	Gross Annual Energy Savings (kWh)		Gross Realization Rate	Net Impacts	
	Ex Ante	*Ex Post*		NTG Ratio	Net Annual Energy Savings (kWh)
CIS	43,509,483	43,661,447	100%	102%	44,618,489
SAGE	12,537,137	12,553,413	100%	108%	13,513,906
SBDI	6,961,458	7,091,952	102%	100%	7,091,952
Small Business Midstream	22,928,335	22,013,372	96%	80%	17,662,649
HVAC Replacement and Tune-Up	3,535,357	3,516,956	99%	100%	3,514,959
CEI	23,303,553	23,975,722	103%	100%	23,975,722
Total	**112,775,323**	**112,812,861**	**100%**	**98%**	**110,377,677**
Sums may differ due to rounding.					

Table 6-3: CEEP Net kW Savings Summary

Program Channel	Gross Annual Energy Savings (kW)		Gross Realization Rate	Net Impacts	
	Ex Ante	*Ex Post*		NTG Ratio	Net Annual Energy Savings (kW)
CIS	4,902	5,131	105%	102%	5,255
SAGE	2,102	2,215	105%	108%	2,396
SBDI	871	897	103%	100%	897
Small Business Midstream	3,519	3,539	101%	80%	2,840
HVAC Replacement and Tune-Up	2,049	2,041	100%	100%	2,040
CEI	2,015	1,775	88%	100%	1,775
Total	**15,457**	**15,599**	**101%**	**97%**	**15,204**
Sums may differ due to rounding.					

Table 6-4 outlines the verified *ex post* lifetime energy savings by channel for the PY2020 CEEP.

Table 6-4: CEEP Gross Lifetime Savings by Channel

Program Channel	*Ex Post* Savings (kWh)	Effective Useful Life (years)	*Ex Post* Lifetime Energy Savings (kWh)	*Ex Post* Net Lifetime Savings (kWh)
CIS	43,661,447	14	615,770,332	629,267,788
SAGE	12,553,413	14	179,297,427	193,015,921
SBDI	7,091,952	13	91,534,494	91,534,494
Small Business Midstream	22,013,372	14	301,959,630	242,280,321
HVAC Replacement and Tune-Up	3,516,956	5	18,868,119	18,857,407
CEI	23,975,722	1	23,975,722	23,975,722
Total	**112,812,861**	**11**	**1,231,405,725**	**1,198,931,653**
Sums may differ due to rounding.				

6.2 Program Overview

In July of 2008, OG&E implemented a portfolio of Demand Side Management (DSM) Quick Start programs. Those programs were the starting point for many of the programs implemented in OG&E's first Comprehensive Demand Portfolio in program years 2010-2012. The first demand portfolio included a Standard Offer Program that provided financial inducements to C&I customers who installed equipment that reduced peak demand. In 2013, OG&E separated the Standard Offer Program into Commercial Lighting, Commercial Energy Efficiency, and Industrial Energy Efficiency Programs. In 2016, these Programs were combined and implemented as a single Program, the Commercial Energy Efficiency Program (CEEP). The CEEP provides financial inducements to all C&I customers and includes a variety of Channels for participation. The Channels are designed to maximize participation among the C&I customer base.

OG&E's CEEP seeks to generate energy and demand savings for large and small C&I customers by promoting high efficiency electric end-use products, including (but not limited to): lighting, retrofit of existing equipment, HVAC replacement, and retro-commissioning. The Program provides OG&E's C&I customers with flexibility in choosing how to participate, either self-sponsoring or working through a third-party service provider to leverage technical expertise. The Program offers financial inducements and technical assistance to all eligible C&I customers who seek to improve existing facilities' efficiency, the efficiency of new equipment purchases, facility modernization, new construction projects, and industrial improvement projects. Both prescriptive and custom inducement structures are available to maximize customer participation across various energy efficiency measures.

In 2020, the evaluation of CEEP grouped projects into six Program Channels. Note that the grouping of program offerings for evaluation purposes is not the same as the program channels as outlined in the portfolio plan described in section 2.1 of this report. The

description of each Channel below details how the planned Channels fit into the evaluation grouping.

- **Small Business Midstream**: The Small Business Small Business Midstream Channel of CEEP encourages customers to participate by providing point of sale (POS) discounts on selected products through local lighting distributors. Through this Channel, financial inducements are paid to the lighting distributor to reduce costs for the end customer.
- **Schools and Government Efficiency (SAGE)**: The SAGE Channel of CEEP is marketed towards public school districts, private schools, universities and colleges, and government agencies. This Channel includes financial inducements for both lighting and non-lighting measures and both prescriptive and custom projects.
- **Commercial and Industrial Solutions (CIS)**: The CIS Channel of CEEP offers inducements to customers with a peak demand greater than 150 kW at a single site or greater than 250 kW at multiple sites with the same tax ID. Inducements are paid directly to customers who install energy efficient equipment. This Channel focuses on four key areas; lighting, retrofit of existing equipment, HVAC replacement, and retro-commissioning. The Retro Commissioning (RCx) Channel mentioned in the portfolio plan was grouped with CIS for evaluation purposes. There were only four RCx projects in the population for 2020, so they were included in the sampling strata for CIS, SAGE, and SBDI.
- **Small Business Direct Install (SBDI)**: The SBDI Channel offers inducements to customers with a peak demand of less than 150 kW at a single site or less than 250 kW at multiple sites with the same tax ID. The SBDI Channel provides lighting audits and equipment installation through approved trade allies.
- **HVAC Replacement and Tune-Up**: The HVAC Replacement and Tune-Up Channel offers inducements to customers who have qualified HVAC equipment tuned up by approved trade allies. Tune-Up services include cleaning, duct sealing, and refrigerant charge adjustments. The portfolio plan lists the HVAC Tune-up effort as an offering within CIS, but due to the homogenous population of projects, this is considered a separate channel in the evaluation and associated sampling plan.
- **Continuous Energy Improvement (CEI)**: The CEI Channel was offered to large C&I customers and included energy benchmarking, walk-through energy assessments, and energy efficiency training for participating customers. This behavioral component focuses mainly on low-cost/no-cost improvements to facilities.

CLEAResult was contracted to implement all aspects of CEEP and was responsible for Program planning, development of marketing material, quantifying *ex ante* energy savings estimates, and paying appropriate inducements to customers. They also identified and approved Trade Allies and distributors for participation in the SBDI, HVAC Replacement and Tune-Up, and Small Business Midstream Channels of the Program. CLEAResult was also responsible for recruiting customers to participate in all cohorts of the CEI Channel.

Service providers (Trade Allies and distributors) were recruited to submit rebate applications on behalf of customers implementing qualifying energy efficiency measures. OG&E's website contains lists of registered service providers and the associated products/services they provide.

The Program seeks to combine financial inducements with access to technical expertise to maximize Program penetration across the range of potential C&I customers. The Program has the following additional goals:

- Increase customer awareness of applicable energy saving measures
- Achieve customer cost savings
- Increase the market share of commercial-grade high efficiency technologies sold through market Channels
- Increase the installation rate of high efficiency technologies in C&I facilities by businesses that would not have done so absent the Program

The Program offers prescriptive inducements for electric energy efficiency equipment upgrades and improvements, including lighting, HVAC, commercial refrigeration, and miscellaneous measures. Inducements are provided for qualified equipment installed as a retrofit or equipment replacement, and new construction or major refurbishment. The Program also offers inducements for custom measures, including most measures that reduce electric energy use not included in the Program as prescriptive measures.

The program's impact evaluation results are intended to provide 10% precision at the 90% confidence interval for the overall Program based upon site-by-site verification activities.

ADM used four methods to identify the number of projects in each Channel. CIS, SAGE, and SBDI used the count of unique enrollment IDs. Small Business Midstream used the unique count of check IDs. HVAC Replacement and Tune-Up used the number of installs. CEI used the number of participating companies. A summary of CEEP performance metrics is displayed in Table 6-5.

Table 6-5: CEEP Program Summary

Program Pathway	Number of Projects	*Ex Ante* kWh Savings	*Ex Ante* Peak kW Savings	Percent of Program kWh Savings	Total Inducement ($)
CIS	223	43,509,483	4,902	39%	$3,856,234
SAGE	53	12,537,137	2,102	11%	$1,715,139
SBDI	228	6,961,458	871	6%	$1,049,211
Small Business Midstream	184	22,928,335	3,519	20%	$1,550,320
HVAC Replacement and Tune-Up	119	3,535,357	2,049	3%	$294,613
CEI	33	23,303,553	2,015	21%	$508,834
Total	**840**	**112,775,323**	**15,457**	**100%**	**$8,974,350**

Figure 6-1 below shows the *ex ante* savings and completed projects[88] by month for the PY2020 Program.

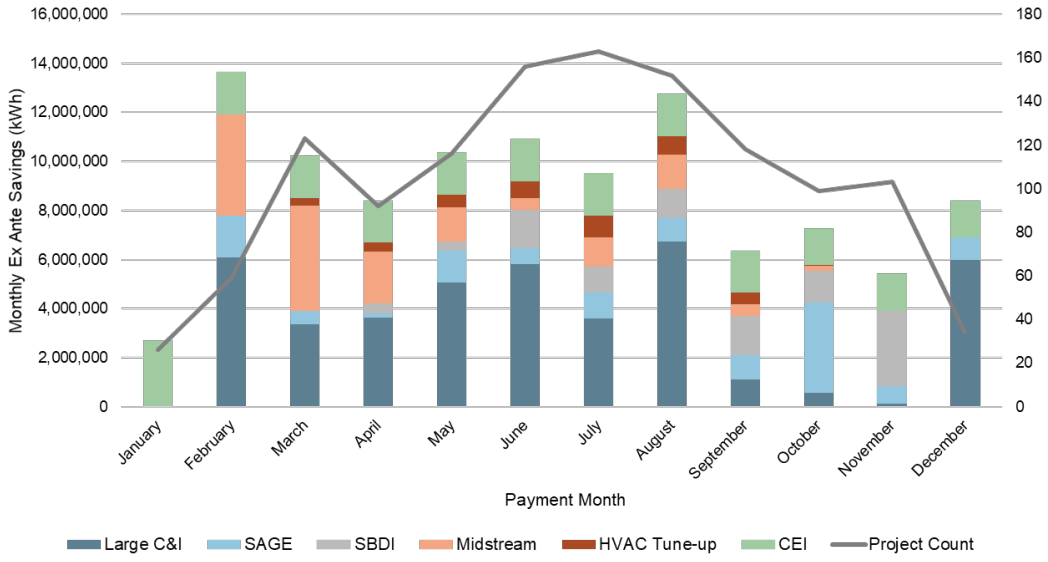

Figure 6-1: CEEP Savings and Project Count by Month

Due to the comprehensive design of the CEEP, energy savings occur in a wide range of measure categories, depending on the Program Channel. The CIS Channel had savings

[88] The total projects shown in Figure 6-1 do not sum to the total projects reported in Table 6-5 due to project numbers in both HVAC Replacement and Tune-Up and CEI Channels being used multiple times in the final *ex ante* data set. For HVAC Replacement and Tune-Up projects, the same project number or Enroll ID is used during a pre-cleaning service, and a second time during post measurement activity when the tune-up process is completed. Similarly, for CEI projects, savings are reported monthly and an Enroll ID unique to each customer is repeated each month savings are claimed.

in numerous measure groups, shown in Figure 6-2. The Lighting measure category was the single highest contributor to *ex ante* savings. This specific measure category includes interior and exterior lighting retrofits and lighting controls (lighting control measures were not specifically identified in the *ex ante* data). Compressed air and custom projects, which includes a wide range of measures that do not have prescriptive inducements and use custom energy savings algorithms, accounted for next highest saving contributions.

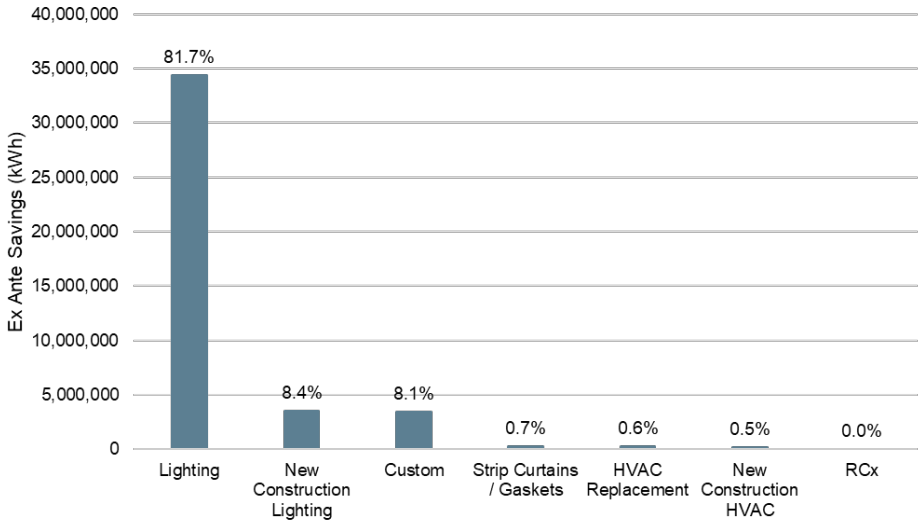

Figure 6-2: Contributions to Savings by Measure – CIS

The SAGE Channel offers prescriptive inducements for measures similar to CIS but has typically had less participation in fewer measure categories. The SAGE Channel included lighting and non-lighting measure categories. The measure categories for SAGE are shown in Figure 6-3 below. Almost all the Channel's savings came from lighting measures.

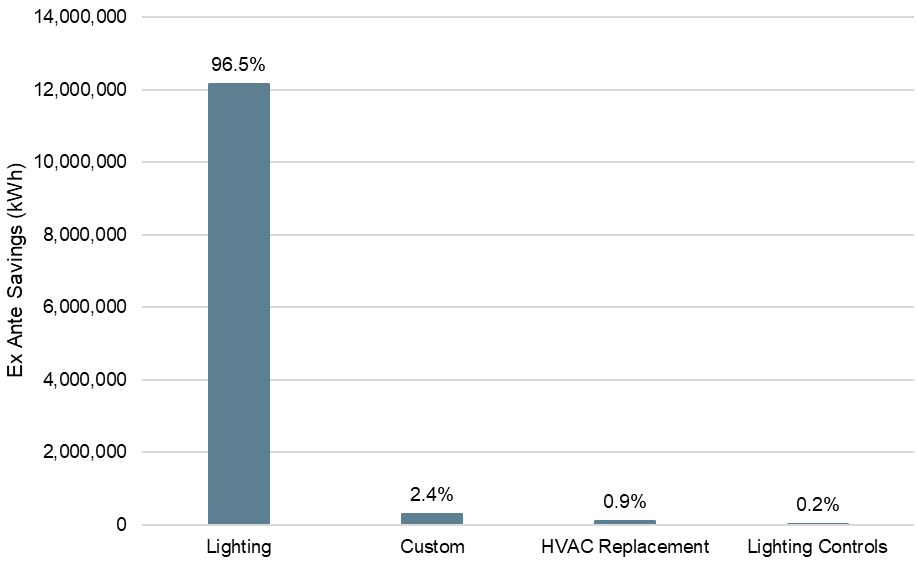

Figure 6-3: Contributions to Savings by Measure – SAGE

The SBDI Channel consisted of lighting and refrigeration projects in PY2020. SBDI is a contractor-driven Channel that focuses on the retrofit of existing lighting fixtures and lamps. Nearly all Channel savings, 100%, were induced as retrofit lighting, with the remaining savings coming from refrigeration measure (gaskets or strip curtains). The categories that were included within this Channel are shown in Figure 6-4.

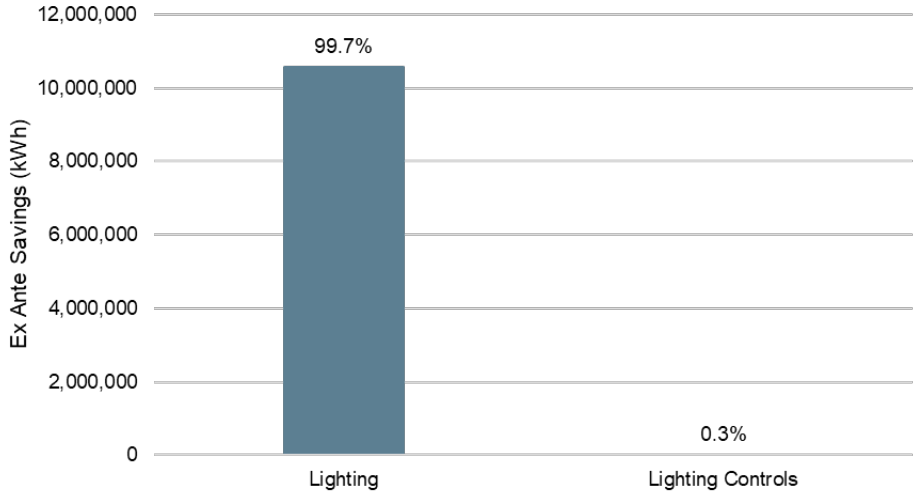

Figure 6-4: Contributions to Savings by Measure – SBDI

The Small Business Midstream Channel is specifically designed to offer inducements for high efficiency lighting. Thus, all savings associated with this Channel are due to lighting measures. The Small Business Midstream Channel's reported energy savings are categorized by lamp or fixture type, as shown in Figure 6-5. The final PY2020 Program data for Small Business Midstream included numerous different lighting categories.

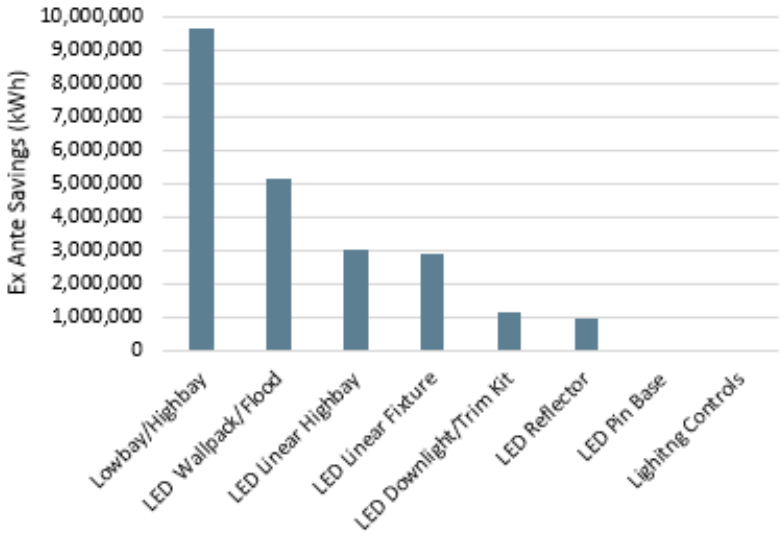

Figure 6-5: Contributions to Savings by Measure – Small Business Midstream

The HVAC Replacement and Tune-Up Channel included only HVAC tune-up measures.

The final Channel, CEI, included a mix of behavioral and low or no-cost measures. This Channel used an International Performance Measurement Verification Protocol[89] (IPMVP) Option C approach to calculate savings using whole building meter data. This approach does not allow for disaggregation of savings by measure type.

6.3 Gross Impact Evaluation

The evaluation of gross energy savings and peak demand reduction from projects rebated through the CEEP can be broken down into the following steps:

First, the implementation contractor's Program tracking database was reviewed to determine the Program's scope and to ensure there were no duplicate project entries. The tracking database was used to define a discrete set of projects that made up the Program population. A random sample of projects was then drawn from the population established in the tracking system review. ADM reviewed a census of projects for both the Small Business Midstream and HVAC Replacement and Tune-Up Channels. Similarly, for the CEI Channel, ADM performed a census review of the *ex ante* regression models.

Next, a detailed desk review was conducted for each project sampled for measurement and verification. The desk review process includes a thorough examination of all project materials, including invoices, equipment cut sheets, pre-and post-inspection reports, and

[89] https://evo-world.org/en/products-services-mainmenu-en/protocols/ipmvp

estimated savings calculators. This review process informed ADM's fieldwork by identifying potential uncertainties, missing data, and sites where monitoring equipment was needed to verify key inputs to the reported savings calculations. Additionally, the review process involved assessing the reasonableness of deemed savings values given in the AR TRM 8.1 and calculation input assumptions.

After reviewing the project materials, if deemed needed, virtual or on-site verification and data collection visits were scheduled for selected sampled projects in the CIS, SBDI, and SAGE Channels. The virtual or on-site visit was used to collect data for savings calculations, verify measure installation, and determine measure operating parameters.

Next, the data collected during the on-site verification visit was used to revise savings calculations as necessary. For example, if the reported savings calculations relied on certain measure operating hours that were determined inaccurate based on the facility type or the facilities' actual schedule, changes were made to reflect actual operating conditions more accurately.

For the Small Business Midstream and HVAC Replacement and Tune-Up Channels, no on-site inspections were conducted. Instead, we reviewed the implementation contractor's databases to determine methodologies and assumptions used to determine *ex ante* savings. For these Channels, *ex post* savings are determined through the database review process.

Finally, after determining the *ex post* savings impacts for each sampled project, results were extrapolated to the Program population using project-specific sampling weights. This allows for the estimation of Program *ex post* gross energy savings with a given amount of sampling precision and confidence. For the CEEP, the sample was designed to ensure ±10% or better relative precision at the 90% confidence level for kWh reductions.

6.3.1 Small Business Midstream Impact Evaluation Activities

Ex post savings from the Small Business Midstream Channel were determined by reviewing the database used by CR for tracking lamps and fixtures sold through the Program. CLEAResult collected Point of Sale (POS) data from distributors throughout the Program year. The POS data included information on the quantities of each lamp type sold, model, numbers of lamps, customer or contractor names who purchased the lamps, and customer or business name where the lamps would be installed. The POS data also included lighting distributor invoice numbers that were used to support the lamp sales.

We employed an engineering analysis to determine the *ex post* verified energy savings for each lamp or fixture type sold. The verified energy savings per fixture or lamp were calculated with methods consistent with chapter 6 of *The Uniform Methods Project:*

Methods for Determining Energy Efficiency Savings for Specific Measures.[90] The calculations used the following equations and baseline:

Equation 6-1: Small Business Midstream Lighting Annual Energy Savings

$$Annual\ kWh\ savings = Q * \left(\frac{(Wbaseline - Wmeasure) * AOH * IEF * ISR}{1000}\right)$$

Equation 6-2: Small Business Midstream Lighting Demand Reduction

$$Peak\ kW\ savings = Q * \left(\frac{(W_{baseline} - W_{measure}) * IEF * CF * ISR}{1000}\right)$$

Where:

Q = quantity purchased
$W_{measure}$ = measure wattage
$W_{baseline}$ = baseline wattage per category
1000 = conversion factor for Watts per kW
AOH = annual hours of use determined by lamp type installed
IEF_e = Heating & Cooling Interactive-Effects Factor, determined to be 1.07 for kWh, and 1.15 for kW, except for exterior fixtures, which was set at 1.0
ISR = In-Service Rate, the percentage of Program units that are installed, estimated to be 0.98 for all screw-in lamps, and 1.0 for all other fixtures
CF = Coincidence factor, a ratio between 0.0 and 1.0 that adjusts the change in connected electric load from lighting efficiency projects for electric peak demand savings.

To verify the number and types of lamps sold through the Program, we requested a random selection of distributor invoices. These invoices were reviewed and cross-checked against the POS data to verify the model numbers and quantities of lamps sold. Additionally, the invoices were used to verify correct lamp quantities, and model numbers were claimed in the final *ex ante* savings.

Lamp and fixture wattages for units sold through the Program were calculated using manufacturer name, make and model, and SKU numbers provided by the lighting distributors and included in the implementation contractor's POS data. Using the provided SKU number for each lamp or fixture, specifications were found via manufacturer catalogs, including wattage, lumens, and rated hours of life. Other sources such as Design Lights Consortium (DLC), ENERGY STAR®, and Rebate Bus were also used to verify replacement wattages and specifications.

[90] https://www.nrel.gov/docs/fy18osti/70472.pdf

Baseline lamp wattages used in both *ex ante* and *ex post* analyses were determined based on the purchased lamp wattage and lumen output. Once the replacement wattage and lumen output were determined for the actual lamp or fixture sold through the Program, a baseline wattage was determined using data from the PA TRM version 2 and the IL TRM version 5. These TRMs provide baseline wattage for lamps and fixtures based on the lumen output of the replacement fixture. Given a verified lumen output for a given LED fixture, the data provided in these TRMs can be used to determine a reasonable wattage estimate for a standard (non-high efficiency) lamp or fixture that produces a similar lumen output. The lumen ranges and lamp designations were then used to determine the baseline wattage. The resulting baseline lamp wattages and respective lumen outputs per lamp type are shown in Table 6-6. Due to unknown heating/cooling equipment types in the facilities where the lamps are installed, all fixture types used the same IEF_e, 1.15 for kW savings and 1.07 for kWh, except for exterior wall packs and floodlights, for which both were assumed to be 1.0.

The AOH and CFs used in the *ex ante* calculations were developed using the 2015 Energy Information Administration's Commercial Buildings Energy Consumption Survey (CBECS) and the 2010 U.S. Department of Energy Lighting Market Characterization Study. The studies were used to determine both the mix of businesses in the OG&E service territory and the estimated mixture of lamp types within each business. The CBECS report provides estimated square-footage of commercial spaces by industry (or facility) type regionally throughout the US. This report was used to estimate the mixture of commercial facility types within the Small Business Midstream Channel territory, allowing a weighted average of AR TRM deemed values to be calculated for AOH, IEF_e, and CF. The DOE Lighting Market Characterization study identifies the mixture of lighting in various commercial facility types throughout the US. This study was used to estimate the mixture of lamps within each facility type and informed the use of deemed AOH and CF specified in the AR TRM. Using the DOE study and the results of the CBECS, it was possible to estimate AOH, IEF_e, and CF per lamp type.

Table 6-6: Baseline Watts by Fixture Type and Lumen Output

Lamp Type	Min Lumen	Max Lumen	$W_{baseline}$
2x2 Troffer and Linear Ambient LED	1,500	3,499	54
2x2 Troffer and Linear Ambient LED	3,500	5,999	94
2x2 Troffer and Linear Ambient LED	6,000	7,000	126
2x4 Troffer and Linear Ambient LED	3,500	5,999	94
2x4 Troffer and Linear Ambient LED	6,000	10,000	126
4 Pin-Base Lamp LED (G24)	700	2,500	33
A-Line (A15, A17, A19)	450	799	29
A-Line (A15, A17, A19)	800	1,099	43
A-Line (A15, A17, A19)	1,600	1,999	72
A-Line (A21, A23)	1,600	2,549	72
A-Line (A21, A23)	2,550	3,000	150
Downlight Retrofit LED	500	649	50
Downlight Retrofit LED	650	1,199	65
Downlight Retrofit LED	1,200	2,174	49
Exterior Wall Pack/Flood 7-29 Watts	1,000	2,999	101
Exterior Wall Pack/Flood 30-80 Watts	3,000	4,999	183
Exterior Wall Pack/Flood 30-80 Watts	5,000	8,999	288
Exterior Wall Pack/Flood 30-80 Watts	11,051	11,500	462
Exterior Wall Pack/Flood >80 Watts	9,000	19,999	448
Exterior Wall Pack/Flood >80 Watts	20,000	54,999	1,078
Linear Lamp T5 LED - 4 ft	3,200	6,000	58
Linear Lamp T8 LED - 4 ft & U-Bend	1,500	3,199	28
Linear Lamp T8 LED - 8 ft	3,000	6,399	57
Lowbay/Highbay LED 30-60 Watts	3,000	7,499	208
Lowbay/Highbay LED 61-100 Watts	7,500	11,999	288
Lowbay/Highbay LED 61-100 Watts	12,000	15,000	289
Lowbay/Highbay LED >100 Watts	12,000	24,999	443
Lowbay/Highbay LED >100 Watts	25,000	60,000	1,065
Parabolic Reflector LED - MR16	473	524	45
Parabolic Reflector LED - MR16	525	714	50
Parabolic Reflector LED - PAR20	473	524	45
Parabolic Reflector LED - PAR30	800	937	65
Parabolic Reflector LED - PAR38	715	937	65
Parabolic Reflector LED - PAR38	938	1,259	75
Parabolic Reflector LED - PAR38	1,260	1,399	90
Parabolic Reflector LED - PAR38	1,400	1,739	100
Parabolic Reflector LED - PAR38	2,175	2,624	150
Parabolic Reflector LED - PAR38	2,625	2,999	175
Parabolic Reflector LED - PAR38	3,000	4,500	200
Reflector LED - BR30	650	1,199	65
Reflector LED - BR40	650	1,199	65
Specialty LED – Decorative	300	499	40
Specialty LED – Decorative	500	699	60
Specialty LED – Globe	350	499	29
Specialty LED – Globe	650	1,099	72

The AOH and CFs used in the *ex post* analysis were based on the lamps' installation facility. Using the Program and POS data provided by the implementation contractor, the

facility type was identified for each lamp sold through the Program. The deemed AOH and CF from the AR TRM were then applied to the respective building types.

Verified savings associated with occupancy sensors were based on each sensor using a deemed change in wattage provided by CLEAResult. The wattage change in ceiling occupancy sensors was 312.88 watts and 187.73 watts for wall occupancy sensors. Using a deemed wattage change, savings come from a 30% reduction in AOH which was assigned according to the facility location of installation.

To determine the Small Business Midstream Channel's net impact, we conducted a phone survey on a random sample of end-users in the Program. The POS data included end customer business names, addresses, and phone numbers. We used the end customer business name in the POS data to select a random sample of end customers for the NTG survey.

For the calculation of NTG sample size for survey completes, a coefficient of variation of 0.5 was assumed.[91] With this assumption, a minimum sample size of 68 participants was required, as shown in the following formula:

Equation 6-3: NTG Sample Size Calculation

$$n_0 = \left(\frac{Z * CV}{RP}\right)^2 = \left(\frac{1.645 * 0.5}{0.10}\right)^2 = 68$$

Where:

n_0 = minimum sample size

Z = Z-statistic value (1.645 for the two-sided 90% confidence level)

CV = Coefficient of Variation (assumed to be 0.5)

RP = Relative Precision (0.10)

The NTG survey sample was selected by lamp type sold according to the POS data. Creating a sample based on lamp type ensured we obtained NTG data on all lamp types sold through the Program. Eighty-one end users completed the phone survey. The additional survey completes above the goal (68) increase the chance all measure types induced by the program were captured.

[91] The coefficient of variation, cv(y), is a measure of variation for the variable to be estimated. Its value depends on the mean and standard deviation of the distribution of values for the variable (i.e., cv(y) = sd(y)/mean(y)).

6.3.2 HVAC Replacement and Tune-Up Impact Evaluation Activities

HVAC Replacement and Tune-Up *ex ante* savings are claimed using the CLEAResult CoolSaver™ program. The HVAC Replacement and Tune-Up Channel provides financial inducements to encourage commercial customers to improve their HVAC systems' efficiency.

The HVAC equipment tune-ups are provided by a qualified technician and involve testing the unit's performance before and after measures are implemented. Typical measures implemented as part of the tune-up procedure include airflow correction, cleaning of the indoor blower, evaporator coils, condenser coils, and refrigerant charge correction.

Evaluation of the Channel is based on the CoolSaver™ M&V plan provided by CLEAResult. ADM reviewed a census of Channel database participants to assess savings by measure. We examined the data and re-created the overall savings calculations. Savings from Air Conditioner (AC) and heat pump (HP) tune-ups were based on AR TRM stipulated equivalent full-load hours (EFLH) along with unit-specific capacity and deemed efficiency loss recovered due to work performed in accordance with the Channel.

6.3.3 CEI Impact Evaluation Activities

The *ex ante* savings associated with this Channel are determined through an IPMVP Option C, whole building meter data analysis. This analysis approach uses linear regression models to predict the baseline energy usage during the treatment period. The regression model inputs include whole building meter data (monthly or weekly intervals depending on availability), weather data, and any other applicable modeling variables (production data, infrastructure projects, changes in manufacturing processes, school days, and other variables with significant energy usage). The regression models are used to estimate baseline energy usage after the CEI curriculum has been initiated. Program savings is calculated as the difference between the baseline energy usage and actual billed energy usage.

Ex ante savings were based on preliminary models submitted in late October. The preliminary models include forecasted savings for November and December. Final models were submitted in February. The final replaced the forecasted savings in November and December with measured savings.

To determine *ex post* savings, we first re-create the regression models using the implementation contractor's data. The *ex post* models use final model inputs and actual data provided by the implementer. Furthermore, we check to ensure no input or model errors were included in the *ex ante* analysis. The *ex post* regression savings is calculated by subtracting the actual billed usage from the model estimated baseline usage.

Next, we subtract any *ex ante* savings found in other CEEP Channels from the CEI *ex post* regression savings. Energy saving projects completed outside of the CEI Channel affect the regression models and are accounted for with this subtraction.

6.4 Impact Data Collection Activities

Data for the evaluation were collected through review of Program materials, virtual or on-site inspections, end-use metering, and interviews with participating customers and service providers. Based on Program tracking data provided by CLEAResult, sample design was developed for M&V data collection. The central Program database, where Program activities are tracked, and project documentation is stored, was developed and managed by CLEAResult. The verification and data collection samples were drawn to provide gross impact estimates with ±10% precision or better at the 90% confidence level for the overall Program. Within this, precision by Program Channel was addressed as well. The sample was designed to meet the ±10% precision for the overall Program population and the combined population of the CIS, SBDI, and SAGE Channels. The Small Business Midstream, HVAC Replacement and Tune-Up, and CEI Channels included a census review of projects.

Virtual and on-site visits, interviews, and desk reviews of project documentation were used to collect data for gross impact calculations, to verify measure installation, and to determine measure operating parameters. When deemed values were used to determine *ex post* energy savings, including EFLH for heating and cooling projects, or AOH for lighting projects, we referred to the AR TRM. Facility staff members were interviewed to determine the AOH of the lighting projects and to provide any additional operational characteristics relevant to calculating energy savings. When accurate operating hours could be determined through an interview with facility staff, custom hours were used in energy savings calculations.

Table 6-7 below shows the sample design that was used. Projects were sample randomly from the CIS, SAGE, and SBDI Channels. We reviewed all the projects in the Small Business Midstream, HVAC Replacement and Tune-Up, and CEI Channels.

Table 6-7: Sample Design

Stratum Name	Ex Ante kWh per strata	Strata Minimum (kWh)	Strata Maximum (kWh)	Population of Projects	Design Sample Size
1	14,600,033	0	150,000	400	34
2	15,857,607	150,000	400,000	67	17
3	13,643,862	400,000	800,000	23	12
4	15,714,441	800,000	infinite	11	8
5	3,192,136	null	null	3	3
Small Business Midstream	22,928,335	N/A	N/A	22	22
HVAC Replacement and Tune-Up	3,535,357	N/A	N/A	119	119
CEI	23,303,553	N/A	N/A	33	33
Total	**112,775,323**			**678**	**248**

6.5 Net-to-Gross (NTG) Evaluation Activities

ADM collected free ridership and spillover data from all CEEP Channels. CEI Channel NTG information was gathered solely for investigative purposes as savings associated with the Channel are based on behavioral changes and have an estimated NTG ratio of 1.0. The following sections summarize the methodologies used to estimate free ridership impacts for the Small Business Midstream Channel, the downstream Channels, as well as the HVAC Replacement and Tune-Up Channel in PY2020.

Net savings analysis determines what portion of gross savings is the direct result of Program influence. Net savings may be less than gross savings because of free ridership impacts. Free riders for a program are defined as those who would have installed the same energy efficiency measures without the Program. Conversely, net savings may be greater than gross savings due to energy saving spillover attributable to the program. Participants implementing additional energy efficiency measures due to the Program's influence without receiving inducements for those measures is spillover.

Information collected from a sample of Program participants through customer decision-maker surveys was used for NTG analysis. These responses were reviewed to assess the likelihood that participants were free riders or had spillover savings.

6.5.1 Small Business Midstream NTG Methodology

ADM used self-reported responses from a random sample of customers who had purchased efficient lamps and fixtures during the current Program year to estimate free ridership as well as potential spillover savings.

Free Ridership Methodology

ADM administered a phone survey about lamp and fixture purchases made during the current Program year to a random sample of OG&E customers. As it relates to net

impacts, the goal of these surveys was to elicit information from which to estimate the number of lamps or fixtures that the customer would have purchased in the counterfactual scenario where the efficient light bulbs were not discounted.

ADM did not assess spillover for the Small Business Midstream Channel for two reasons. ADM's surveys of participating end-users from 2016 to 2019 have not yielded spillover.[92] Additionally, the information required to calculate spillover accurately is burdensome and difficult for survey respondents to provide or estimate.

Survey respondents were asked a series of questions to elicit feedback regarding influences on their purchasing decisions. Each respondent was then assigned a free ridership score based on a consistent free ridership scoring algorithm. The scoring algorithm used is based on the methodology described in the AR TRM.

The final respondent net-to-gross score was calculated as follows:

Equation 6-4: Small Business Midstream NTG

$$NTG = 1 - Free\ ridership + Spillover$$

The free ridership scoring algorithm for Small Business Midstream purchases from the surveys is shown in Figure 6-6.

[92] Because of the Midstream Channel's design, it is unlikely to influence customers as a downstream program might. Thus, there have been no or very low reports of buying un-incented energy efficient equipment and being influenced by the Midstream Channel for these purchases.

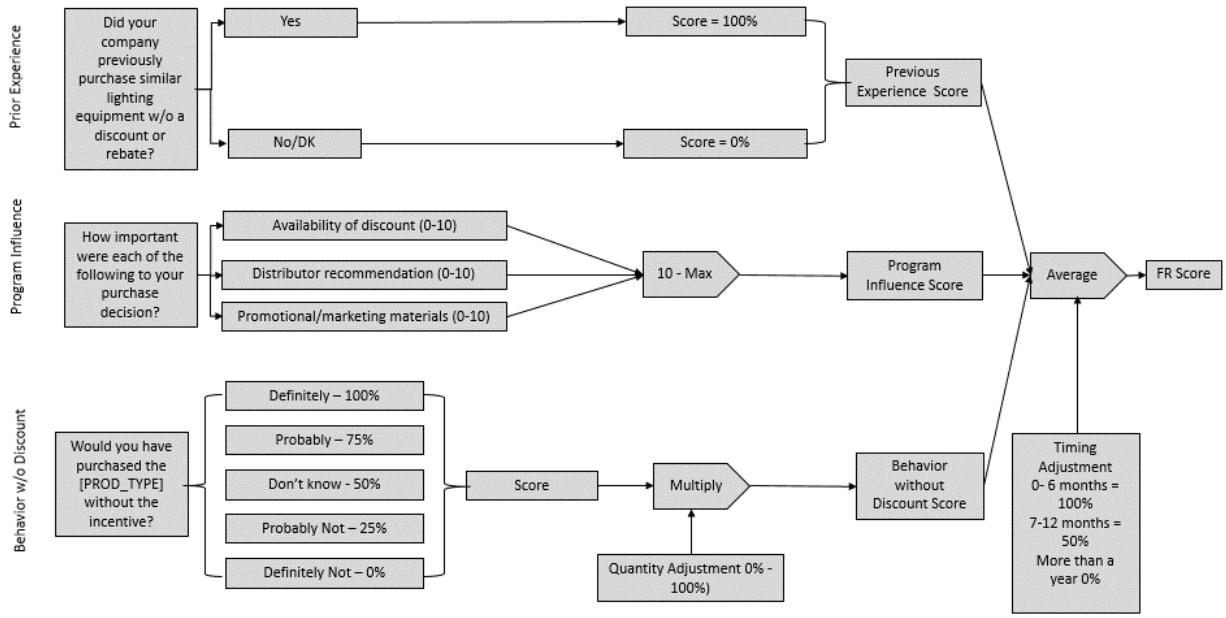

Figure 6-6: Free ridership Scoring for Small Business Midstream Survey Respondents

6.5.2 Downstream and HVAC Replacement and Tune-Up Channel NTG Methodology

Free Ridership Methodology

Information collected from a sample of Program participants through a customer decision-maker survey was used to estimate free ridership. These survey responses were reviewed to assess the likelihood that participants were free riders.

Several criteria were used for determining the likelihood that a customer was a free rider. The first criterion was based on the response to the following questions:

- "Would you have been financially able to complete energy efficient [Measure/Equipment project] at the location without the financial inducement from the program?"
- "To confirm, your organization would NOT have allocated the funds to complete a similar [Measure/Equipment] project if the program inducement was not available. Is that correct?"

Customers who answered "No" to the first question and "Yes" to the second question were not deemed free riders.

The second criterion was the impact of the Program timing on the decision to implement the energy efficiency measure. The AR TRM stipulates a decision-maker who would have

installed a measure within one year for full free ridership. ADM determined customers were not free riders if they stated that they would have installed a measure in more than one year. Specifically, respondents were asked the following questions:

- Did you implement the measure earlier than you otherwise would have because of the information and inducements available through the program?
- When would you otherwise have installed the measure?

Respondents who answered yes to the first question and indicate that they would have installed the measure one or more years later in the second question were deemed not to be free riders.

For decision-makers that indicated that they were able to undertake energy efficiency projects without financial assistance from the Program and would have done so within one year of when they undertook it, three factors were analyzed to determine the likelihood of free ridership. The three factors were:

- Plans and intentions of the firm to install a measure even without support from the Program
- The influence that the Program had on the decision to install a measure
- A firm's previous experience with a measure installed under the Program

For each of these factors, rules were applied to develop binary variables indicating if a participant's behavior indicated free ridership.

The first factor required determining if a participant states they intended to install an energy efficiency measure even without the Program. The answers to a combination of several questions were used with a set of rules to determine whether a participant's behavior indicated likely free ridership. Two binary variables were constructed to account for customer plans and intentions: one, based on a more restrictive set of criteria that may describe a high likelihood of free ridership, and a second, based on a less restrictive set of criteria that may describe a relatively lower likelihood of free ridership.

The first, more restrictive criteria indicating customer plans and intentions that likely signify free ridership was as follows (Definition 1):

- The respondent answers "yes" to the following two questions: "Did you have plans to install energy efficient [Measure/Equipment] before deciding to participate in the program?" and "Would you have gone ahead with this planned project if you had not received the inducement through the program?"
- The respondent answers "definitely would have installed" to the following question: "If the inducements from the program had not been available, how likely is it that

you would have installed energy efficient [Measure/Equipment] at the location anyway?"

- The respondent answers "no, program did not affect level of efficiency chosen for equipment" in response to the following question: "Did you choose equipment that was more energy efficient than you would have chosen had you not participated in the program?"
- The respondent answers, "no, the program did not affect timing of project" in response to the following question: "Did you install the [Equipment/Measure] earlier than you otherwise would have because of the information and inducements from [UTILITY]'s program?"

The second, less restrictive criteria indicating customer plans and intentions that likely signify free ridership was as follows (Definition 2):

- The respondent answers "yes" to the following two questions: "Did you have plans to install energy efficient [Measure/Equipment] at the location before participating in the program?" and "Would you have gone ahead with this planned installation even if you had not participated in the program?"
- The respondent answers "definitely would have installed" or "probably would have installed" to the following question: "If the inducements from the program had not been available, how likely is it that you would have installed energy efficient [Measure/Equipment] at the location anyway?"
- The respondent answers "no, program did not affect level of efficiency chosen for equipment" in response to the following question: "Did you choose equipment that was more energy efficient than you would have chosen had you not participated in the program?"
- The respondent answers, "no, the program did not affect timing of project" in response to the following question: "Did you install the [Equipment/Measure] earlier than you otherwise would have because of the information and inducements from [UTILITY]'s program?"

The second factor requires determining if a customer reported that a recommendation from a program representative or past experience with the program was influential in the decision to install a particular piece of equipment or measure.

The criterion indicating that Program influence may signify a lower likelihood of free ridership is that either of the following conditions is true:

- The respondent answers "very important" to the following question: "How important was previous experience with the program in making your decision to install energy efficient [Measure/Equipment] at the location?"

- The respondent answers “probably would not have” or “definitely would not have” to the following question: “If the program representative had not recommended [Measure/Equipment], how likely is it that you would have installed it anyway?”

The third factor required determining if a participant indicated they had previously installed an energy efficiency measure similar to one that they installed under the Program without an inducement in the last three years. A participant indicating that he or she had installed a similar measure is considered to have a likelihood of free ridership.

The criteria indicating that previous experience may signify a higher likelihood of free ridership are as follows:

- The respondent answers “yes” to the following question: “Before participating in the Program, had you installed any equipment or measure similar to energy efficient [Measure/Equipment] at your facility?”
- The respondent answers “yes, purchased energy efficient equipment but did not apply for financial inducement.” to the following question: “Has your organization purchased any energy efficient equipment in the last three years for which you did not apply for a rebate through the program?”

The four factors described above were used to construct four different indicator variables that address free ridership behavior. For each customer, a free ridership value was assigned based on the combination of variables. The four indicator variables result in 12 possible combinations for assigning free ridership scores for each respondent. Table 6-8 shows these values, and Figure 6-7 further illustrates the scoring methodology.

Table 6-8: Free Ridership Scores for Combinations of Indicator Variable Responses

Had Plans and Intentions to Install Measure without C&I Program? (Definition 1)	Had Plans and Intentions to Install Measure without C&I Program? (Definition 2)	C&I Program influenced Decision to Install Measure?	Had Previous Experience with Measure?	Free Ridership Score
Y	N/A	Y	Y	100%
Y	N/A	N	N	100%
Y	N/A	N	Y	100%
Y	N/A	Y	N	67%
N	Y	N	Y	67%
N	Y	N	N	33%
N	Y	Y	N	0%
N	Y	Y	Y	33%
N	N	N	Y	33%
N	N	N	N	0%
N	N	Y	N	0%
N	N	Y	Y	0%

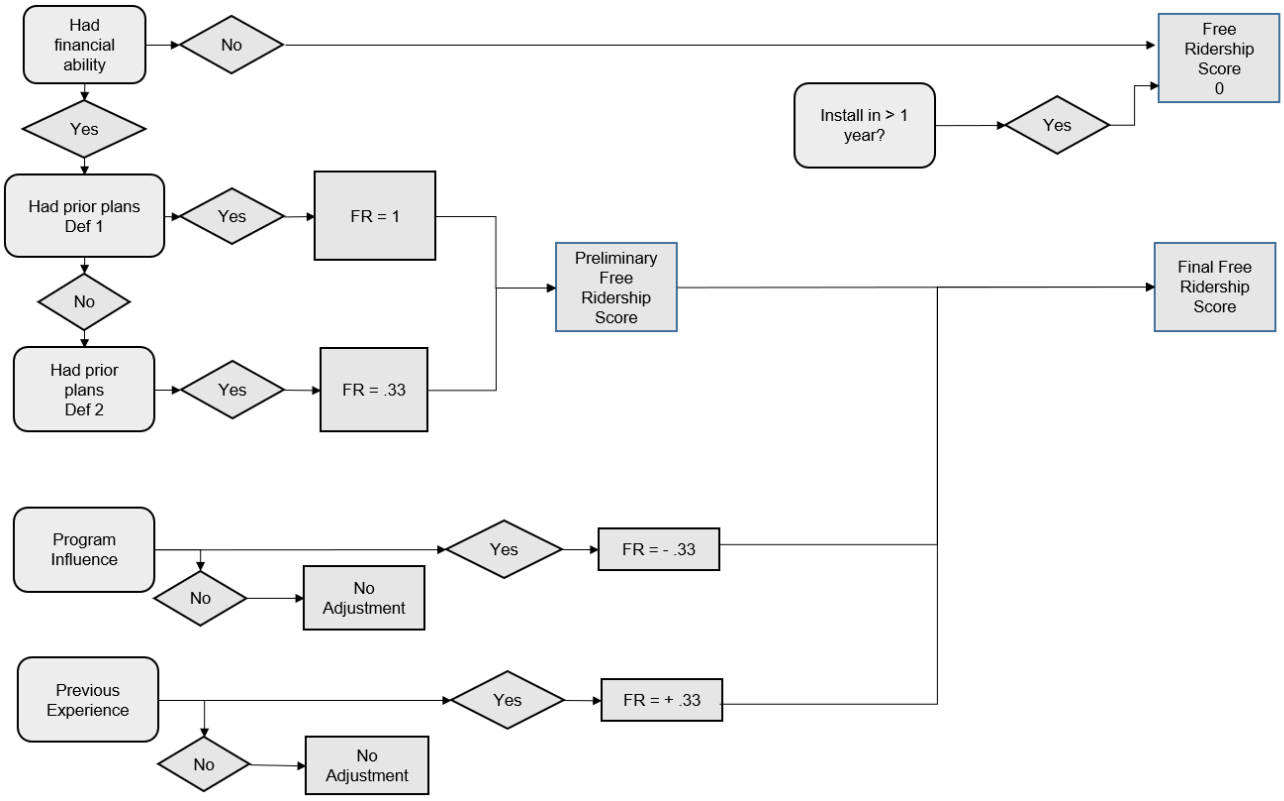

Figure 6-7: Free ridership Scoring for Downstream and HVAC Tune-up Survey Respondents

Spillover Estimation

The customer decision-maker survey included a series of questions used to analyze potential spillover effects associated with non-rebated purchases by Program participants.[93] Specifically, survey respondents were asked:

- "We would like to know if you have installed any additional energy efficient equipment because of your experience with the program that you DID NOT receive an incentive for. Since participating in the program, has your organization installed any ADDITIONAL energy efficiency measures at this facility or at your other facilities within [UTILITY]'s service territory that did NOT receive inducements through [UTILITY]'s program?"

Customers who indicate "yes" were identified as potential spillover candidates. Potential spillover candidates were also asked to identify the type of additional equipment installed and provide information about the equipment for estimating energy savings. For each

[93] The spillover analysis is limited to participant spillover. Non-participant spillover effects may exist for the program, but they are not estimated and therefore assumed to be zero.

type of equipment that respondents report installing, respondents were asked the following two questions, which were used to assess if any savings resulting from the additional equipment installed was attributable to the Program.

- [SP1] How important was your experience with the program in your decision to install this [Equipment/Measure]? [Rated on a scale where 0 means not at all important and 10 meant very important]
- [SP2] If you had NOT participated in the program, how likely is it that your organization would still have installed this [Equipment/Measure]? [Rated on a scale where 0 means not at all likely and 10 meant very likely]

A spillover score was developed based on these responses as follows:

Equation 6-5: Downstream and HVAC Replacement and Tune-Up Spillover

$$Spillover\ Score\ =\ Average\ (SP1, 10 - SP2)$$

The energy savings of equipment installations associated with a spillover score greater than six are attributed to the Program.

6.6 Gross Impact Findings

The CEEP Program results are shown in Table 6-9.

Table 6-9: Ex Ante and Ex Post kWh Savings

Program Channel	Gross Annual Energy Savings (kWh)		Gross Realization Rate	Gross Annual Energy Savings (kW)		Gross Realization Rate
	Ex Ante	*Ex Post*		*Ex Ante*	*Ex Post*	
CIS	43,509,483	43,661,447	100%	4,902	5,131	105%
SAGE	12,537,137	12,553,413	100%	2,102	2,215	105%
SBDI	6,961,458	7,091,952	102%	871	897	103%
Small Business Midstream	22,928,335	22,013,372	96%	3,519	3,539	101%
HVAC Replacement and Tune-Up	3,535,357	3,516,956	99%	2,049	2,041	100%
CEI	23,303,553	23,975,722	103%	2,015	1,775	88%
Total	**112,775,323**	**112,812,861**	**100%**	**15,457**	**15,599**	**101%**

The achieved sample design resulted in gross *ex post* kWh estimates with a relative precision of less than 10% at the 90% confidence interval. The most significant cause for the lower *ex post* savings was the verification of savings through the CEI Channel. This Program Channel accounted for a significant percentage of *ex ante* savings and resulted in a gross realization rate of less than 100%. The lower *ex post* savings associated with this Program Channel were mostly due to savings being removed from the CEI Channel due to modeling versioning and cross-participation in other Program Channels.

6.6.1 CIS, SAGE, SBDI

The CIS, SBDI, SAGE Channels were grouped and evaluated as one Channel for our gross evaluation. The sampling plan for the CIS, SAGE, SBDI Channels included five sampling strata. Sampled sites were chosen randomly based on project savings from all three Channels. See Table 6-10 for a summary of savings by stratification.

Table 6-10: CIS, SAGE, SBDI, PY2020 Savings by Strata

Stratum Name	*Ex Ante* kWh Savings	*Ex Post* kWh Savings	Gross kWh Realization Rate	*Ex Ante* kW Savings	*Ex Post* Gross kW Savings	Gross kW Realization Rate
1	14,600,033	14,977,308	103%	2,322	2,396	103%
2	15,857,607	15,877,136	100%	1,775	1,785	101%
3	13,643,862	13,644,019	100%	1,471	1,471	100%
4	15,714,441	15,616,212	99%	2,073	2,593	125%
5	3,192,136	3,192,136	100%	234	0	0%
Total	**63,008,078**	**63,306,811**	**100%**	**7,874**	**8,244**	**105%**

Most sample sites had a gross realization rate (GRR) between 95% and 100%. The distribution of projects by GRR is shown in Figure 6-8.

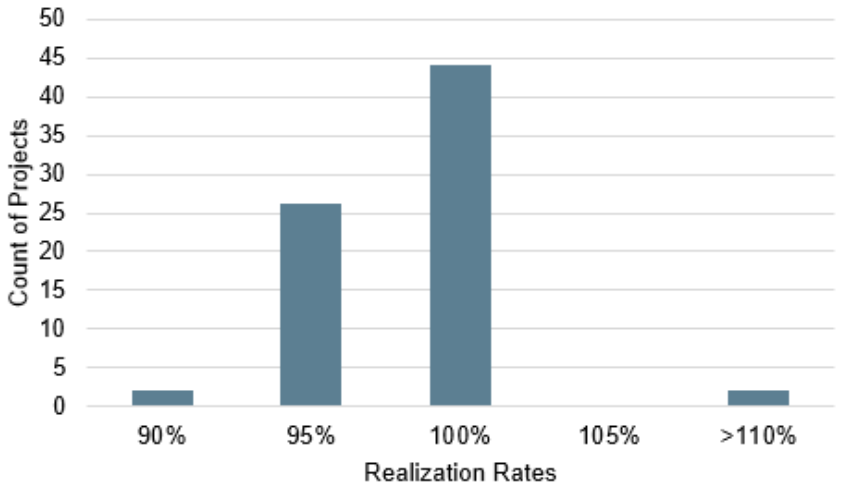

Figure 6-8: Distribution of Project Level GRR - CIS, SAGE, SBDI

The high number of projects with GRRs between 95-105% indicates that the *ex ante* and *ex post* methodologies are well aligned. Those projects with low GRRs typically had project-specific conditions that lead to the lower *ex post* savings and were relatively infrequent. The project with the lowest realization rate had issues with its lighting annual operating hours.

The majority of sampled sites were lighting sites. These sites had an average kWh and kW realization rate near 100%. For those sites that did have differing *ex post* savings, the most common difference between *ex ante* and *ex post* calculations was the AOH value

used. During our verification efforts, site contacts were interviewed to determine actual annual operating hours of the lighting fixtures. This allowed for the use of custom operating hours wherever possible. However, if the interviewed site contact was not knowledgeable about operating hours, or if no contact was available for interview, the *ex post* analyses defaulted to TRM prescriptive values.

Of all projects sampled in the CIS, SBDI, and SAGE Channels, 22% were non-lighting sites. The kWh and kW GRRs being close to 100% indicates the methodologies of the implementation and M&V contractors are aligned, or no significant or systematic discrepancies are being found during the M&V process.

6.6.2 Small Business Midstream

The Small Business Midstream Program Channel accounted for 20% of the overall Program claimed energy savings and included 90,849 items sold with *ex ante* energy savings of 22,928,335 kWh and *ex post* savings of 22,013,372 kWh, resulting in a GRR of 96%. The Program Channel also claimed a peak demand savings of 3,519 kW, while we calculated an *ex post* peak demand savings of 3,539, a realization rate of 101%. A summary of the Channel level savings is shown in Table 6-11.

Table 6-11: Summary of Small Business Midstream Savings

Ex Ante kWh Savings	*Ex Post* kWh Savings	Gross kWh Realization Rate	*Ex Ante* kW Savings	*Ex Post* kW Savings	Gross kW Realization Rate
22,928,335	22,013,372	96%	3,519	3,539	101%

We determined *ex post* savings for this Channel by reviewing two tracking databases provided by the implementation contractor. We reviewed the databases to ensure there were no input errors or repeat entries and used the data provided to determine quantities and wattages of each lamp type sold. The Program Summary database was used to determine the final *ex ante* kWh and kW savings and distributor names. The POS database was reviewed to determine the number of lamps sold, end customer name, lamp type, inducement amount, and sold lamp wattage. All *ex post* savings were calculated using lamp types, wattages, and quantities provided in the POS database.

A component of the *ex post* analysis for this Channel was determining what business types are participating in the program. This was determined by reviewing POS data provided by the implementation contractor and categorizing program sales according to the AR TRM's facility types. A summary of *ex post* savings by business type is shown in Figure 6-9. For the second consecutive year, the most common facility type was Exterior Lighting, accounting for 23% of *ex post* savings. Offices were the second largest contributor to program sales, accounting for roughly 20% of *ex post* savings.

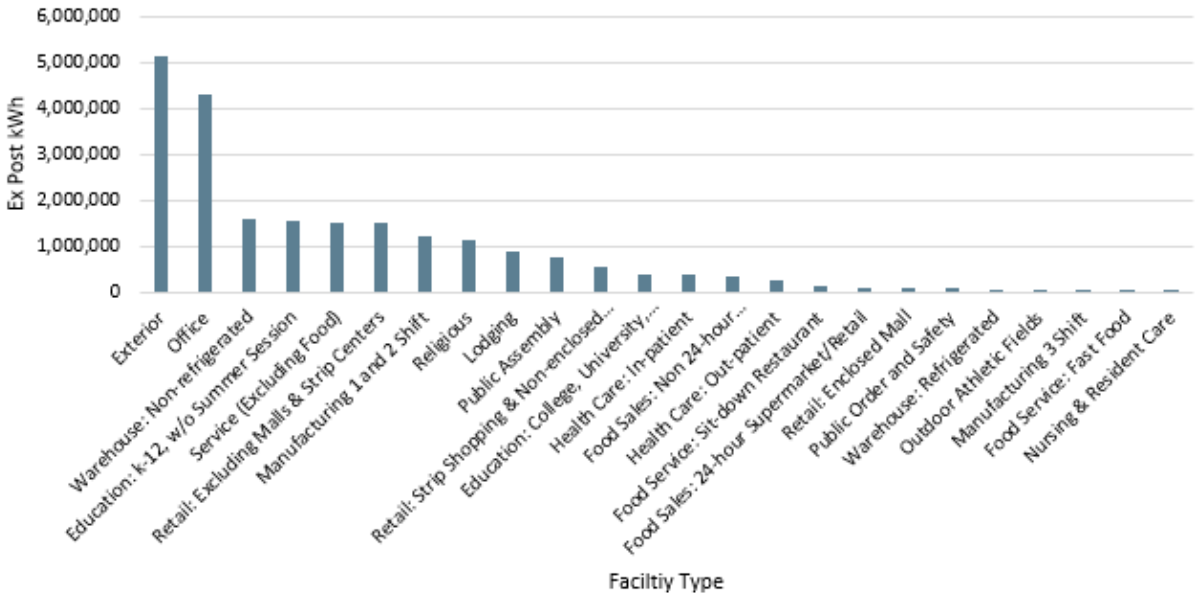

Figure 6-9: Small Business Midstream Contribution to Savings (ex post) by Building Type

For PY2020, AOH and CF were applied by lamp type. Each AOH and CF per lamp type was calculated using a 3-year weighted average from program data in PY2017, PY2018, and PY2019. The AOH and CF applied in PY2020 are shown in Table 6-12.

Table 6-12: Small Business Midstream Ex Post AOH and CF

Lamp Type	AOH	CF
2x2 Troffer and Linear Ambient LED	3,531	0.67
2x4 Troffer and Linear Ambient LED	3,310	0.65
4 Pin-Base Lamp LED (G24)	3,632	0.70
A-Line (A15, A17, A19)	4,128	0.77
A-Line (A21, A23)	4,163	0.73
Ceiling Occupancy Sensor	3,417	0.71
Downlight Retrofit LED	3,993	0.52
Exterior Wall Pack/Flood >80 Watts	3,996	0.00
Exterior Wall Pack/Flood 30-80 Watts	3,996	0.00
Exterior Wall Pack/Flood 7-29 Watts	3,996	0.00
Linear Florescent	3,228	0.54
Linear Lamp T5 LED - 4 ft	3,331	0.66
Linear Lamp T8 LED - 4 ft & U-Bend	3,318	0.64
Linear Lamp T8 LED - 8 ft	3,293	0.68
Lowbay/Highbay LED >100 Watts	3,496	0.78
Lowbay/Highbay LED 30-60 Watts	3,420	0.65
Lowbay/Highbay LED 61-100 Watts	3,389	0.65
Parabolic Reflector LED - MR16	3,717	0.74
Parabolic Reflector LED - PAR20	3,818	0.70
Parabolic Reflector LED - PAR30	3,696	0.78
Parabolic Reflector LED - PAR38	3,497	0.73
Reflector LED - BR20	4,017	0.78
Reflector LED - BR30	3,445	0.71
Reflector LED - BR40	3,906	0.76
Reflector LED - R20	3,598	0.77
Reflector LED - R30	3,715	0.66
Reflector LED - R40	3,429	0.90
Specialty LED - Decorative	3,828	0.75
Specialty LED - Globe	3,950	0.73
Wall Occupancy Sensor	3,558	0.61

Per the 2020 M&V Portfolio Report, ADM recommended *ex ante* estimates apply the AOH and CF in Table 6-12 above. The implementation contractor did not implement the recommended AOH and CF until quarter three of the project year. Table 6-13 shows a summary of Channel level kWh savings by quarter and the respective realization rates. Shown in Table 6-13 below, the Channel level realization rates improved in the second half of the year after implementing the AOH and CF in Table 6-12. Different AOH applied in the first two quarters is the largest contribution to the lower Channel level realization rate.

Table 6-13: Summary of kWh Savings by Quarter

Quarter	Ex Ante kWh Savings	*Ex Post* kWh Savings	Gross kWh Realization Rate
1	2,238,617	2,076,514	93%
2	8,903,475	8,200,221	92%
3	4,756,658	4,628,905	97%
4	7,029,586	7,107,732	101%

Additional variation between *ex ante* and *ex post* calculations were attributable to minor differences in ADM verified efficient wattages and claimed efficient wattages from the tracking data. Given the efficient lamp lumen output, there was also minor baseline wattage variation between *ex ante* and *ex post* calculations. See section 6.3.1 for ADM wattage verification methodologies. Differences in lamp wattages made up roughly 1% of Channel savings variation.

PY2020 was the first year to use the methodology to determine AOH and CF values and has removed prior uncertainty in the Channel evaluation. ADM has calculated the 3-year rolling average AOH and CF using data from PY2018-PY2020. ADM recommends using the 3-year rolling average AOH and CF in future *ex ante* and *ex post* estimates. A summary of the recommended values can be found in Table 6-14.

Table 6-14: Three Year Rolling Average AOH and CF Values

Lamp Type	Recommended PY21 AOH	Recommended PY21 CF
2x2 Troffer and Linear Ambient LED	3,613	0.67
2x4 Troffer and Linear Ambient LED	3,289	0.65
4 Pin-Base Lamp LED (G24)	3,596	0.70
A-Line (A15, A17, A19)	4,082	0.77
A-Line (A21, A23)	3,902	0.73
Ceiling Occupancy Sensor	3,409	0.71
Downlight Retrofit LED	4,079	0.52
Exterior Wall Pack/Flood >80 Watts	3,996	0.00
Exterior Wall Pack/Flood 30-80 Watts	3,996	0.00
Exterior Wall Pack/Flood 7-29 Watts	3,996	0.00
Linear Florescent	3,228	0.54
Linear Lamp T5 LED - 4 ft	3,523	0.66
Linear Lamp T8 LED - 4 ft & U-Bend	3,278	0.68
Linear Lamp T8 LED - 8 ft	3,429	0.65
Lowbay/Highbay LED >100 Watts	3,476	0.68
Lowbay/Highbay LED 30-60 Watts	3,313	0.70
Lowbay/Highbay LED 61-100 Watts	3,423	0.69
Parabolic Reflector LED - MR16	3,735	0.75
Parabolic Reflector LED - PAR20	3,914	0.69
Parabolic Reflector LED - PAR30	3,904	0.71
Parabolic Reflector LED - PAR38	3,453	0.73
Reflector LED - BR20	4,017	0.78
Reflector LED - BR30	3,619	0.66
Reflector LED - BR40	3,794	0.71
Reflector LED - R20	3,386	0.77
Reflector LED - R30	3,715	0.66
Reflector LED - R40	3,965	0.90
Specialty LED - Decorative	3,875	0.75
Specialty LED - Globe	3,935	0.73
Wall Occupancy Sensor	3,227	0.61

6.6.3 HVAC Replacement and Tune-Up

The HVAC Replacement and Tune-Up Channel accounted for a small portion of the overall Program claimed savings. Its Channel savings are shown in Table 6-15.

Table 6-15: Summary of HVAC Replacement and Tune-Up Savings

Ex Ante kWh Savings	*Ex Post* kWh Savings	Gross kWh Realization Rate	*Ex Ante* kW Savings	*Ex Post* kW Savings	Gross kW Realization Rate
3,535,357	3,516,956	99%	2,049	2,041	100%

ADM determined *ex post* savings for the HVAC equipment that received treatment through this Channel by reviewing the implementation contractor's tracking database. We reviewed the database to ensure there were no input errors or repeat entries and verified the savings were calculated as described in the CLEAResult CoolSaver™ M&V plan. Two parameters used in the *ex post* savings were obtained independently and used in the calculation. We used a zip code lookup to identify the correct weather zone for each participating customer. Using the weather zone, and the building type included in the *ex ante* database, we determined the EFLH for the *ex post* calculations using deemed values from the AR TRM.

6.6.4 CEI

The CEI Channel accounted for the second-largest contribution to savings in CEEP. During the M&V process, we reviewed the regression models created for each CEI participant. Through this review, the savings model was recreated by re-calculating regression coefficients using the provided energy usage, production, and weather data. Next, energy efficiency measures installed at participants' facilities induced through other CEEP Channels were identified, quantified, and subtracted from a site's modeled savings.

Furthermore, savings attributed to site-level facility changes impacted by COVID-19 were subtracted from savings model. However, most energy models for industrial sites were not impacted by pandemic closures, as many were likely deemed an essential business. Another reason industrial site energy models were less impacted was because the variables were dependent on production data. A few of the C&I and schools' facilities had savings subtracted due to temporary closures in response to state and local safety measures. COVID-19 impacts were calculated by implementing a model variable accommodating changes in facility operating hours in 2020. The pandemic-related energy impacts were summed across all facilities and subtracted from total energy savings in the program year.

A summary, by customer/location, of the *ex ante* and *ex post* savings is shown in Table 6-16.

Table 6-16: CEI Findings Summary

Company	*Ex Ante* kWh Savings	*Ex Post* kWh Savings	Gross kWh Realization Rate (%)	*Ex Ante* kW Savings	*Ex Post* kW Savings	Gross kW Realization Rate (%)
Company 1	3,268,804	2,699,923	83%	0	0	100%
Company 2	2,669,900	1,985,625	74%	0	0	100%
Company 3	2,261,045	2,256,900	100%	484	484	100%
Company 4	2,226,429	1,944,322	87%	0	0	100%
Company 5	1,995,562	1,581,622	79%	0	0	100%
Company 6	1,511,938	1,496,167	99%	402	432	107%
Company 7	1,292,725	1,195,400	92%	0	0	100%
Company 8	1,268,403	1,308,893	103%	245	197	80%
Company 9	930,417	1,003,949	108%	0	0	100%
Company 10	863,194	779,624	90%	0	0	100%
Company 11	850,616	1,040,248	122%	130	126	97%
Company 12	788,538	502,005	64%	250	0	0%
Company 13	600,428	3,211,914	535%	0	0	100%
Company 14	481,041	478,281	99%	0	0	100%
Company 15	399,415	504,647	126%	55	55	100%
Company 16	317,190	388,945	123%	103	125	121%
Company 17	293,682	316,352	108%	61	61	100%
Company 18	269,673	268,284	99%	0	0	100%
Company 19	269,362	266,698	99%	76	72	95%
Company 20	239,051	239,846	100%	52	52	100%
Company 21	199,426	220,969	111%	54	89	165%
Company 22	142,596	70,367	49%	39	19	48%
Company 23	135,629	186,253	137%	56	56	100%
Company 24	28,488	28,488	100%	7	7	100%
Company 25	0	0	100%	0	0	100%
Company 26	0	0	100%	0	0	100%
Company 27	0	0	100%	0	0	100%
Company 28	0	0	100%	0	0	100%
Company 29	0	0	100%	0	0	100%
Company 30	0	0	100%	0	0	100%
Company 31	0	0	100%	0	0	100%
Company 32	0	0	100%	0	0	100%
Company 33	0	0	100%	0	0	100%
Total	**23,303,553**	**23,975,722**	**103%**	**2,015**	**1,775**	**88%**

The general modeling methodology used in both the *ex ante* and *ex post* models are well aligned. Both analyses use the same input data in the regression models, except for the

last portion of the program year when the *ex post* analysis replaces forecasted savings with measured savings.

The only exception was one participant who had a realization rate of 539%. Its preliminary model has a measurement period from 1/1/2020 to 4/4/2020. In contrast, its *ex post* final model used a measurement period of 1/1/2020 to 12/26/2020. The site contact provided model inputs for the whole year after the final *ex ante* data was submitted to OG&E.

Nine sites, which claimed zero *ex ante* savings, were given zero *ex post* savings. These participants were given partial inducement payments for their partial participation. Partial participation means a site did not meet all the documentation requirements, or the facility or facility's operation changed significantly over the measurement period. The partial inducements were distributed mid-year to entice participants to provide the proper documentation and encourage yearlong participation.

The most significant difference between the *ex ante* and *ex post* was due to model versioning. The *ex ante*, or preliminary models, use measured savings and forecasted savings. Whereas the *ex post*, or final models, use only measured savings. CLEAResult forecasts Program year savings before the end of the year to allow for final inducement payments to be paid before the Program year's end. No forecasting was included in the *ex post* models because the forecasted savings were replaced with measured savings using actual weather, production, and energy usage data.

Other differences between the *ex ante* and *ex post* come from cross participation identification. We review the claimed savings from all other CEEP Channels, removing any savings associated with capital projects that have been induced through other Program Channels. The removal of these cross-participation savings is a requirement of the IPMVP Option C analysis approach, which would cause savings to be double counted if they are not removed. During the PY2020 analysis, it was found that the *ex ante* estimates did not sufficiently account for and remove savings claimed through other Program Channels for many of the CEI participants.

6.7 Net Savings Results

The following sections summarize the net savings results of each Channel of CEEP. Table 6-17 summarizes the number of respondents used to analyze net savings and the calculated NTG ratio for each CEEP Channel.

Table 6-17: Sample Sizes for CEEP Participant Surveys

Program Channel	Sample Size	PY2020 NTG Ratio
CIS	43	102%
SAGE	15	108%
SBDI	18	100%
Small Business Midstream[94]	119	80%
HVAC Replacement and Tune-Up	119	100%
CEI[94]	33	100%
Total	**248**	**97%**

6.7.1 CIS

Channel free ridership was estimated by weighting each participant's response by the gross energy savings or peak demand reductions associated with the measures.

Table 6-18 and Table 6-19 summarize the realized net kWh savings and peak kW demand reductions for the CIS Channel. The reason for the greater than 100% net-to-gross ratio for the CIS Channel is that ADM attributed spillover to one respondent who noted being influenced by the Channel to install additional energy efficiency equipment.

Table 6-18: Summary of Net Annual Energy Savings – CIS

Program Channel	Annual Energy Savings (kWh)		Gross Realization Rate	Net Impacts	
	Ex Ante	*Ex Post*		NTG Ratio	Net Annual Energy Savings (kWh)
CIS	43,509,483	43,661,447	100%	102%	44,618,489

Table 6-19: Summary of Net Peak Demand Reductions – CIS

Program Channel	Peak Demand Reduction (kW)		Gross Realization Rate	Net Impacts	
	Ex Ante	*Ex Post*		NTG Ratio	Net Peak Demand Reduction (kW)
CIS	4,902	5,131	105%	102%	5,255

6.7.2 SAGE

Channel free ridership was estimated by weighting each participant's response by the gross energy savings or peak demand reductions associated with the measures.

[94] Small Business Midstream and CEI were conducted as census studies.

Table 6-20 and Table 6-21 summarize the realized net kWh savings and peak kW demand reductions of this Channel. The reason for the greater than 100% net-to-gross ratio is that ADM attributed spillover to two respondents who noted being influenced by the SAGE Channel to install additional energy efficiency equipment.

Table 6-20: Summary of Net Annual Energy Savings – SAGE

Program Channel	Annual Energy Savings (kWh)		Gross Realization Rate	Net Impacts	
	Ex Ante	*Ex Post*		NTG Ratio	Net Annual Energy Savings (kWh)
SAGE	12,537,137	12,553,413	100%	108%	13,513,906

Table 6-21: Summary of Net Peak Demand Reductions – SAGE

Program Channel	Peak Demand Reduction (kW)		Gross Realization Rate	Net Impacts	
	Ex Ante	*Ex Post*		NTG Ratio	Net Peak Demand Reduction (kW)
SAGE	2,102	2,215	105%	108%	2,396

6.7.3 SBDI

Channel free ridership was estimated by weighting each participant's response by the gross energy savings or peak demand reductions associated with the measures.

Table 6-22 and Table 6-23 summarize the realized net kWh savings and peak kW demand reductions of the Program.

Table 6-22: Summary of Net Annual Energy Savings – SBDI

Program Channel	Annual Energy Savings (kWh)		Gross Realization Rate	Net Impacts	
	Ex Ante	*Ex Post*		NTG Ratio	Net Annual Energy Savings (kWh)
SBDI	6,961,458	7,091,952	102%	100%	7,091,952

Table 6-23: Summary of Net Peak Demand Reductions – SBDI

Program Channel	Peak Demand Reduction (kW)		Gross Realization Rate	Net Impacts	
	Ex Ante	*Ex Post*		NTG Ratio	Net Peak Demand Reduction (kW)
SBDI	871	897	103%	100%	897

6.7.4 Small Business Midstream

Table 6-24 and Table 6-25 summarize the realized net kWh savings and peak kW demand reductions for the Small Business Midstream Channel.

Table 6-24: Summary of Net Annual Energy Savings – Small Business Midstream

Program Channel	Annual Energy Savings (kWh)		Gross Realization Rate	Net Impacts	
	Ex Ante	*Ex Post*		NTG Ratio	Net Annual Energy Savings (kWh)
Small Business Midstream	22,928,335	22,013,372	96%	80%	17,662,649

Table 6-25: Summary of Net Peak Demand Reductions – Small Business Midstream

Program Channel	Peak Demand Reduction (kW)		Gross Realization Rate	Net Impacts	
	Ex Ante	*Ex Post*		NTG Ratio	Net Peak Demand Reduction (kW)
Small Business Midstream	3,519	3,539	101%	80%	2,840

6.7.5 HVAC Replacement and Tune-Up

Table 6-26 and Table 6-27 summarize the realized net kWh savings and peak kW demand reductions of the Channel.

Table 6-26: Summary of Net Annual Energy Savings – HVAC Replacement and Tune-Up

Program Channel	Annual Energy Savings (kWh)		Gross Realization Rate	Net Impacts	
	Ex Ante	*Ex Post*		NTG Ratio	Net Annual Energy Savings (kWh)
HVAC Replacement and Tune-Up	3,535,357	3,516,956	99%	100%	3,514,959

Table 6-27: Summary of Net Peak Demand Reductions – HVAC Replacement and Tune-Up

Program Channel	Peak Demand Reduction (kW)		Gross Realization Rate	Net Impacts	
	Ex Ante	*Ex Post*		NTG Ratio	Net Peak Demand Reduction (kW)
HVAC Replacement and Tune-Up	2,049	2,041	100%	100%	2,040

6.7.6 CEI

The CEI Channel free ridership was estimated at 0%. Table 6-28 summarizes the realized net kWh savings of the Channel.

Table 6-28: Summary of Net Annual Energy Savings – CEI

Program Channel	Annual Energy Savings (kWh)		Gross Realization Rate	Net Impacts	
	Ex Ante	*Ex Post*		NTG Ratio	Net Annual Energy Savings (kWh)
CEI	23,303,553	23,975,722	103%	100%	23,975,722

Table 6-29 provides a summary of the net peak demand reductions for the CEI Channel.

Table 6-29: Summary of Net Peak Demand Reductions – CEI

Program Channel	Peak Demand Reduction (kW)		Gross Realization Rate	Net Impacts	
	Ex Ante	*Ex Post*		NTG Ratio	Net Peak Demand Reduction (kW)
CEI	2,015	1,775	88%	100%	1,775

6.7.7 Summary of Net Savings Results

Table 6-30 and Table 6-31 summarize CEEP net savings.

Table 6-30: Summary of CEEP Net Annual Energy Savings

Program Channel	Annual Energy Savings (kWh)		Gross Realization Rate	Net Impacts	
	Ex Ante	*Ex Post*		NTG Ratio	Net Annual Energy Savings (kWh)
CIS	43,509,483	43,661,447	100%	102%	44,618,489
SAGE	12,537,137	12,553,413	100%	108%	13,513,906
SBDI	6,961,458	7,091,952	102%	100%	7,091,952
Small Business Midstream	22,928,335	22,013,372	96%	80%	17,662,649
HVAC Replacement and Tune-Up	3,535,357	3,516,956	99%	100%	3,514,959
CEI	23,303,553	23,975,722	103%	100%	23,975,722
Total	**112,775,323**	**112,812,861**	**100%**	**98%**	**110,377,677**
Sums may differ due to rounding.					

Table 6-31 Summary of CEEP Net Peak Demand Reductions

Program Channel	Peak Demand Reduction (kW)		Gross Realization Rate	Net Impacts	
	Ex Ante	*Ex Post*		NTG Ratio	Net Peak Demand Reduction (kW)
CIS	4,902	5,131	105%	102%	5,255
SAGE	2,102	2,215	105%	108%	2,396
SBDI	871	897	103%	100%	897
Small Business Midstream	3,519	3,539	101%	80%	2,840
HVAC Replacement and Tune-Up	2,049	2,041	100%	100%	2,040
CEI	2,015	1,775	88%	100%	1,775
Total	**15,457**	**15,599**	**101%**	**97%**	**15,204**
Sums may differ due to rounding.					

6.8 Process Evaluation Summary and Findings

This section presents the methods, findings, conclusions, and recommendations of the 2020 process evaluation for the OG&E CEEP.

6.8.1 CEEP Staff In-Depth Interviews

ADM spoke with OG&E's CEEP Program Manager and Senior EM&V Analyst and six staff from the program implementer, CLEAResult: the Program Portfolio Manager (the "Portfolio Manager"); the managers for the CEEP CIS, Schools and Government Efficiency (SAGE), Small Business Direct Install (SBDI), Small Business Midstream, HVAC and Continuous Energy Improvement (CEI) program Channels; and two CEI coaches. The interviews covered the respondents' roles and responsibilities, program goals and performance, program design, marketing, communication, reporting and data management, and quality assurance/quality control (QA/QC).

Roles and Responsibilities

Neither the OG&E interviewees, the CLEAResult Portfolio Manager, the CEI Program Manager, or any of the CEEP program managers reported any changes in program roles or responsibilities.

The process evaluation for the program year 2020 reported that the CEEP Program Manager has overall responsibility for the program, which includes: works with CLEAResult to ensure that goals are met and overseeing program promotion and marketing, trade ally recruitment, check delivery, and customer follow-up. The Senior EM&V Analyst reviews CLEAResult reporting and prepares annual program filings for the utility commission. The CLEAResult Portfolio Manager is responsible for CLEAResult's

implementation of the program portfolio, overseeing managers responsible for the various program Channels.

Program Goals and Performance

Contacts reconfirmed that OG&E imposes no specific savings goals for the various program Channels: OG&E is focused on overall portfolio savings. However, OG&E does "keep an eye on" Small Business Midstream, as that is the only Channel that did not have a net-to-gross ratio of more than 90% in 2020.

Contacts for both OG&E and CLEAResult reported that CEEP was on target to achieve 110% of overall savings goals despite being largely shut down from March through May because of the COVID-19 pandemic. The partial shutdown from March through May occurred because of measures OG&E took to reduce the risk of COVID-19 infections. CLEAResult staff was not allowed to have face-to-face interactions with customers or do lighting installations.

Contacts clarified that the program overachieved in the CIS, Small Business Midstream, and CEI Channels. SAGE, SBDI, and HVAC were the Channels most affected by the pandemic.

Contacts reported that in June, OG&E put several safety policies into place. Among these were to require installation contractors to call customers and go through a questionnaire about COVID-19 risks before going on site. Another requirement was to send CLEAResult a monthly "no COVID-19 contact" report stating they had not had any issues in the past month that had caused them to have to cancel an appointment. This allowed CLEAResult to go back into the field in July.

The following subsections provide details of how COVID-19 affected the various program Channels.

CIS

As noted above, CIS was one of the least affected Channels. One of the factors that helped that Channel overcome the challenges that COVID-19 had created was an ongoing effort to transition to more custom and retro-commissioning projects. These types of projects provide greater savings per project. Also, a "significant" number of projects had come from a local Air Force base.

CLEAResult performed "a ton" of SAGE and CIS pre-inspections in late February for jobs that already were in the pipeline in anticipation of the shutdown. Further, an OG&E contact noted that CLEAResult did some "virtual" pre-inspections by having customers and their contractors take pictures of the pre-existing equipment.

A CLEAResult contact was concerned they might have to reduce the number of post-inspections they would do during and after the shutdown or use alternative

methods, such as relying on reviewing invoices and "truing them up" with photographs of the installed equipment. However, the contact said that, in the end, CLEAResult was able to do all normal post-inspections.

Small Business Midstream

Small Business Midstream also was one of the least affected Channels. OG&E did not shut down this Channel in March because it did not involve face-to-face contact. OG&E made some changes to the budget allocation for this program to fund more product discounts when other Channels were temporarily closed. Specifically, OG&E doubled the allocation limit to participating distributors during the shut-down period and allowed them to be reimbursed for discounted products twice per month rather than once per month. The Small Business Midstream Channel's additional savings offset lost savings from the other Channels during the shut-down period. It also provided additional revenue to the participating distributors affected by decreased revenue resulting from the temporary closure of other Channels.

SAGE

The OG&E and CLEAResult contacts agreed that 2020 had been a tough year for SAGE – which, according to the CLEAResult contact, is a "difficult program to begin with." The challenge was compounded because many schools were closed for a "significant" amount of time because of COVID-19. Furthermore, the OG&E contact noted that even when schools were open, they prioritized making sure the schools were clean and otherwise provided a healthy and safe environment for students over dealing with energy efficiency projects. As a result, many projects were postponed.

Notably, while the OG&E and CLEAResult contacts agreed that 2020 had been a difficult year for SAGE, a CLEAResult contact said that SAGE still had a "good year" and would achieve about 12M kWh.

SBDI

A CLEAResult contact noted that COVID-19 had hurt the sales of many small businesses, which had an impact on the SBDI Channel. One strategy CLEAResult carried out to mitigate the impact of COVID-19 on the SBDI Channel was to identify businesses that were still doing well, such as grocery stores and convenience stores. This strategy made "lemonade out of probably a real lemon situation" by enabling SBDI to get very close to 7M kWh savings.

HVAC Replacement and Tune-Up

According to contacts, "about half" of the HVAC contractors decided not to participate in the HVAC Channel because they did not agree to OG&E's safety

policies or did not want to subject their customers to possible health risks. Despite this, the HVAC Channel was on target to achieve about 90% of its goals. This Channel was allowed to continue gathering savings because most HVAC units are on the rooftops of schools. HVAC tune-ups were performed without going inside the facilities.

Program Design, Implementation, and Delivery

Contacts said there had been no major changes to program design or inducement levels – with one exception, discussed below. They also reconfirmed that OG&E imposes no measure diversity goals. The CLEAResult contact noted continued effort to obtain more savings from non-lighting measures, specifically from custom and retro-commissioning measures. In the past year, they had also tried to get more savings from compressed air measures.

The CLEAResult staff reported one change to inducements. This year, in cooperation with OG&E, CEEP provided an upfront inducement to cover 50% of the cost of a feasibility study for retro-commissioning and retro-commissioning lite projects. Suppose a customer who receives the upfront inducement completes the energy efficiency measures identified through the study and, in doing so, achieve at least 3% of their annual energy usage. In that case, CLEAResult will pay the other 50% of the cost of the study. One reason for making this change was to attract more retro-commissioning contractors to the program, particularly from outside the state. Contacts noted (and had noted in the prior evaluation) that there are relatively few such contractors in Oklahoma, which was the primary challenge to doing retro-commissioning projects. A CLEAResult contact indicated that this had been a “big win” for everybody involved.

CLEAResult’s CEI contact noted that a midyear inducement that was introduced last year had been successful. The inducement was for participants who provide data that CLEAResult needs to develop models to estimate energy savings. If the participant does not provide that information by midyear, the model’s development can be delayed. A second purpose of the midyear inducement was to help maintain overall engagement in CEI among participating customers. The contact reported that customers were happy about the inducement. This was especially the case among smaller customers, particularly schools, which often struggle financially. The contact noted that the timing of the midyear inducement coincides with the beginning of the school fiscal year: any inducement received at that time helps “justify” the energy efficiency work done by maintenance staff. This is important, as schools typically do not have a standalone energy manager, as large C&I entities often do. However, the contact noted that even among the large C&I customers, the inducement generated “inertia” to help carry the energy team through the pandemic.

Marketing and Outreach

Contacts confirmed prior information on marketing. Much of the marketing uses social media (Facebook, Twitter, Instagram) and billboards and TV ads to create brand awareness, mainly for SBDI and HVAC Replacement and Tune-Up. Also, some case studies are created and posted to the program website.

Contractors also market the program. This often is done through direct outreach to customers. Some contractors have created “pretty slick” “before and after” videos of projects.

CLEAResult also does direct outreach to contacts developed through the CEI Program. Both CLEAResult and OG&E will do “internal referrals” – that is, contact customers who participated in one program Channel and refer them to another Channel. Many referrals are made to HVAC Replacement and Tune-Up, according to the contact.

CLEAResult staff noted a major challenge in marketing to large C&I is getting to the right person. That contact noted that the individual who opened a company’s account with OG&E might have retired 10 to 15 years ago, but that person is still listed as the point of contact.

Communication

Contacts from both OG&E and CLEAResult reported that communication between the two organizations had been excellent. No contact noted any communication challenges.

Reporting and Data Management

Contacts identified no concerns about reporting or data management. A contact for CLEAResult indicated that they would begin migrating the SBDI Channel to the same project tracking tool for SBDI that CIS and SAGE have been using.

Quality Assurance/Quality Control

None of the contacts identified any quality assurance/quality control issues. As noted above, the CLEAResult contact said that they could do all of the post-inspections for the CIS Channel that they normally would have done.

Program Challenges

Apart from the effects of the COVID-19 pandemic, the primary challenge noted was the lack of contractors to do retro-commissioning projects. As noted above, the introduction of the upfront inducement for feasibility studies helped mitigate that challenge.

6.8.2 Downstream Channel & HVAC Replacement and Tune-Up Channel Participant Surveys

ADM surveyed CEEP downstream Channel (Small Business Direct Install, Schools and Government Efficiency, and CIS) and HVAC Replacement and Tune-Up Channel participants using an online survey administered via email and through ADM's inhouse survey team from September 2020 to February 2021. The survey gathered information regarding OG&E CEEP participants' Program awareness, decision making, satisfaction, and participation process.

A total of 122 Program participants completed the survey, representing almost half of OG&E CEEP downstream and HVAC Tune-up Channels' total kWh savings. Table 6-32 displays the email and telephone surveys completed by the CEEP Channel. The following subsections provide Channel-specific characterizations of survey respondents and summaries of their responses.

Table 6-32: Survey Completes by Channel

Channel	# of Respondents	% of Participants	% of Savings
CIS	34	34%	39%
Small Business Direct Install	56	41%	38%
Schools and Government Efficiency	16	47%	53%
HVAC Replacement and Tune-up	16	44%	69%
All Downstream & HVAC	122	40%	44%

6.8.2.1 Commercial and Industrial Solutions Participants

ADM surveyed thirty-four CEEP Commercial and Industrial Solutions (CIS) Channel participants from September 2020 to February 2021. ADM first attempted to gather participants' responses with an email invitation, reminder, and then conducted targeted phone calls. ADM invited 100 Channel participants to take the survey and 34 replied (response rate of 34%). Fifteen survey responses were collected via email invitation, and 19 were collected via follow-up phone calls.

The respondents reported filling an assortment of different roles or responsibilities at their respective organizations (see Table 6-33).

Table 6-33: CIS Respondents' Role or Title[95]

Role or Title	n	Percent
Facilities Manager	8	23%
Manager	7	20%
President/CEO/Superintendent/Other Executive Role	5	14%
Energy Manager or Analyst	4	11%
Other facilities management/maintenance position	4	11%
Proprietor/Owner	4	11%
Chief Financial Officer	2	6%
Other financial/administrative position	1	3%

Most of the respondents (88%) said their organization owned the facility that had participated in the OG&E CEEP CIS Channel. Nine percent of respondents said they owned the facility and leased it to someone else, while 3% said their company leases the facility from someone else.

Ninety-four percent of respondents confirmed their organization paid the electric bill at the facility that participated in the Channel. The remaining 6% of respondents did not know if their company paid the electric bill.

Survey respondents reported their business type or primary activity at the location where the improvements were made. Industrial/manufacturing and retail were the most cited business types (see Table 6-34).

Table 6-34: CIS Business' Type or Activity

Response	Count	Percent
Industrial/Manufacturing	12	35%
Retail	10	29%
Office	4	12%
Warehouse or distribution center	2	6%
Grocery	1	3%
Hospital	1	3%
Other	4	12%

Respondents reported having indoor space ranging from less than 5,000 to more than 1,000,000 square feet, though 30% of respondents did not know their property's size. Thirty percent said they had over 100,000 square feet of indoor space, and 33% said their facility had between 20,000 and 100,000 square feet of indoor space.

[95] n=35. ADM interviewed two individuals with different roles that represented one respondent/customer.

Sixty-seven percent of respondents said their budget decisions were made locally, while about 18% stated that their budget decisions were made nationally. Other respondents noted that their budget decisions were made regionally (12%) or were unsure (6%) of their company's budget decision process.

Respondents reported on their organizations' policies or strategies to save energy (see Table 6-35). Over one-third reported that their company did not have any formal policy or strategy to save energy signaling the importance of programs and opportunities such as OG&E's CEEP to help companies reduce energy consumption.

Table 6-35: What policies or strategies do CIS respondents have for saving energy?[96]

Response	Count	Percent
A person or persons responsible for monitoring or managing energy	17	50%
Defined energy savings goals	11	32%
A specific policy requiring that energy efficiency be considered when purchasing equipment	9	26%
Carbon reduction goals	3	9%
None of the above	13	38%
Don't know	1	3%

ADM asked respondents whether their companies require energy efficiency investments to meet certain return on investment (ROI) or simple payback thresholds. Sixty-one percent of respondents said they did not have these requirements (48%) or were unaware of them (12%).[97] Twenty-seven percent of respondents noted that their company had simple payback requirements, and 3% said their company had specific ROI requirements.

Channel Awareness

ADM asked respondents how they heard about the OG&E CEEP CIS Channel. The most commonly cited ways that respondents noted learning about the Channel were through a vendor, contractor, or OG&E or CLEAResult representative (see Table 6-36).

[96] Respondents could cite multiple energy saving strategies or management practices.
[97] Do not sum to 61% due to rounding.

Table 6-36: CIS Respondent Sources of Channel Awareness[98]

Response	n	Percent
Contractor/vendor	26	76%
Business Energy Advisor or Program Representative	5	15%
Word of mouth	3	9%
OG&E website	3	9%
Email from OG&E	1	3%

Forty-one percent of respondents noted that they had experience with OG&E's energy efficiency programs before participating in the CIS Channel in 2020, and 86% of these respondents noted that this previous experience had been important in their decision to complete their 2020 CIS project.[99]

Participation Process

Thirty-two percent of respondents said they completed the paperwork or application themselves, and all the respondents that provided a rating rated their satisfaction with the process highly.[100]

Fifty-nine percent of respondents said that a contractor or vendor implemented the project completely. Fifteen percent said a contractor completed the project with substantial help from their organization. The other respondents said that either their organization did the project with contractor or vendor substantial support (9%) or completely or nearly completely without any outside assistance (18%).

The two most commonly cited reasons for participating in the Channel were to reduce energy costs or use (see Table 6-37).

[98] Respondents could cite multiple sources of awareness.

[99] n=14. Eighty-six percent rated the importance as "somewhat important" or "very important". The remaining 13% did not know how important their past experience was in their decision to complete this project.

[100] n=10. All rated their satisfaction a 4 or 5 on a scale from 1 (very dissatisfied) to 5 (very satisfied) One respondent did not provide a rating of their satisfaction with the process.

Table 6-37: CIS Respondents' Reasons for Participating[101]

Response	n	Percent
To reduce energy costs	27	79%
To reduce energy use	29	85%
Improve/increase lighting levels	16	47%
To replace old or outdated equipment/get latest technology	14	41%
The maintenance downtime and associated expenses for the old equipment were too high	14	41%
To improve the product quality	7	21%
To improve workers' or students' environment	8	24%
To improve equipment performance	9	26%
Old equipment had failed	7	21%
As part of a planned remodeling, build-out, or expansion	5	15%
To reduce power outages	4	12%
To protect the environment	1	3%

COVID-19 Impacts

Thirty-four percent of Channel survey respondents noted that the pandemic had not impacted their organization in any significant way. Forty-nine percent of respondents noted an adverse or negative impact related to the COVID-19 pandemic (see Table 6-38). Nine percent of respondents mentioned other impacts such as decreased energy usage (6%) and increased business and capital funds for improvement projects (3%). One respondent did not provide information regarding the impacts of the pandemic on their business.

Table 6-38: Adverse Impacts of COVID-19 Pandemic for CIS Survey Respondents

Impact	n	Percent
Decrease revenue/business/production	10	29%
Delayed energy efficiency improvement project or timeline	4	11%
Laid off workers	3	9%
Increased operating or energy usage costs	3	9%
Staff have fallen ill with COVID-19	2	6%
Difficulty obtaining supplies	1	3%
Closed facility or reduced occupancy	1	3%
More workers teleworking	1	3%

[101] Respondents could cite multiple reasons for participating.

Channel Satisfaction

All CIS survey respondents indicated that they were satisfied with their experience with participating in the Channel overall. None of the respondents indicated any dissatisfaction with any specific aspect of the Channel (see Figure 6-10).

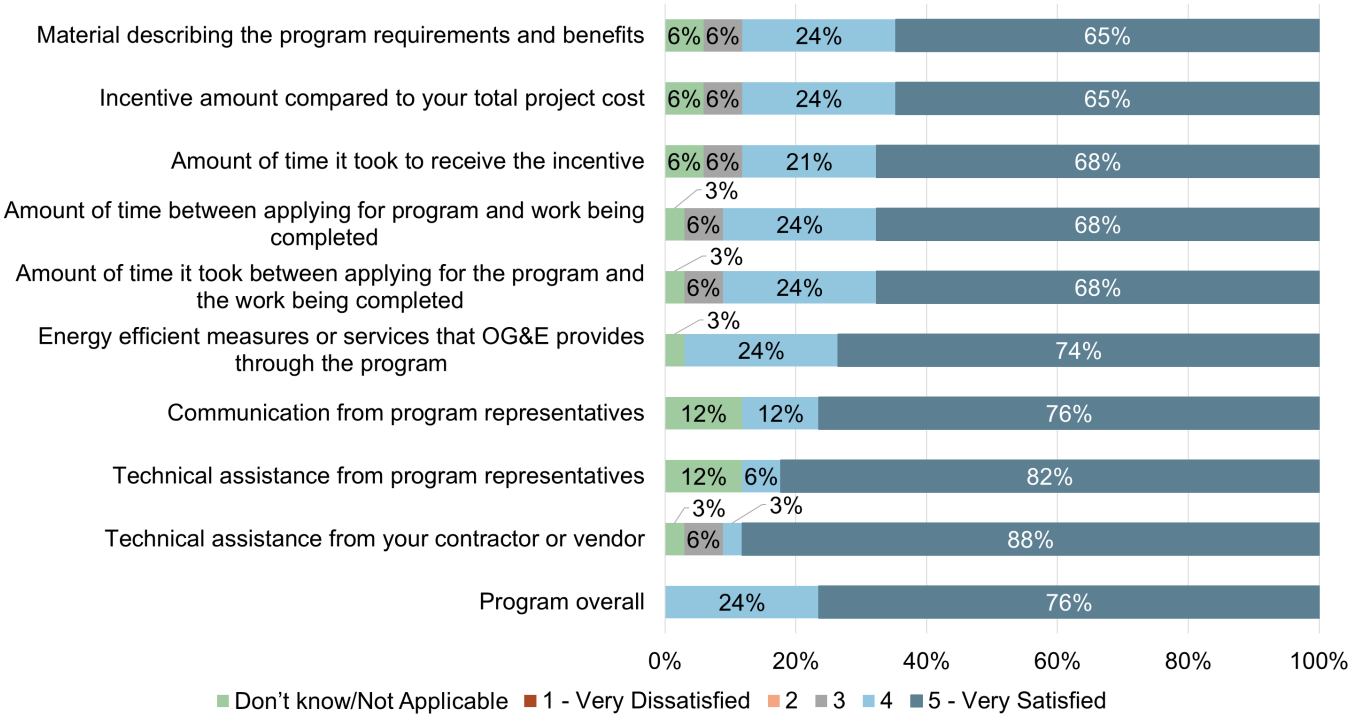

Figure 6-10: CIS Channel Participant Satisfaction

Sixty-one percent of respondents said they would not make any improvements (58%) or did not know what aspect they would improve (3%). The remaining 30% of respondents made one or more recommendations to improve the Channel (see Table 6-39).

Table 6-39: CIS Respondents' Recommendations to Improve Channel[102]

Response	Count	Percent
Prompted Responses – Selected All That Apply		
Increase communication from OG&E regarding this and other available OG&E incentives/programs	8	24%
Increase incentive amount	7	21%
Improve initial processing time	2	6%
Program could provide more information about savings/incentive calculations	1	3%
Improve the program application / paperwork process	1	3%
Unprompted Responses – Open-end or "Other" Recommendations		
Improve communication regarding rebate payment timeline.	1	3%
Increase overall Channel funding to avoid running out.	1	3%

6.8.2.2 SBDI Participants

ADM surveyed 58 CEEP Small Business Direct Installation (SBDI) Channel participants from September 2020 to February 2021. ADM first attempted to gather participants' responses with an email invitation, reminder, and then conducted targeted phone calls. ADM invited 129 Channel participants to take the survey, and 58 replied (response rate of 45%). Thirty-four survey responses were collected via email invitation, and 24 were collected via follow-up phone call.

The respondents reported filling an assortment of roles at their respective organizations (see Table 6-40). About half of respondents identified as an owner/proprietor or held an executive role such as president, CEO, or superintendent.

Table 6-40: SBDI Respondents' Role or Title

Role or Title	n	Percent
Proprietor/Owner	17	29%
President/CEO/Superintendent/Other Executive Role	12	21%
Manager	13	22%
Facilities Manager	8	14%
Other financial/administrative position	3	5%
Other facilities management/maintenance position	2	3%
Other	3	5%

[102] Respondents could provide more than one recommendation.

Seventy-nine percent of respondents said their organization owned the facility that had participated in the OG&E CEEP SBDI Channel. In contrast, the remaining respondents said they leased the facility from someone else (14%) or owned and rented the facility to someone else (7%). Ninety-three percent of respondents said their organization paid the electric bill.

Most said that budget decisions were made locally (84%), though some noted that they made decisions regionally (7%), nationally (5%), or on a worldwide basis (2%). One respondent (2%) noted that their decisions were made both locally and "out-of-state."[103]

Similar to ADM's 2019 survey, the SBDI survey respondents represented an array of business types and sizes (see Table 6-41). Most respondents (69%) said their business had 50,000 or less square feet of indoor space at their property, 10% said their business had between 50,001-250,000 square feet of indoor space, and the remaining 21% did not know how much indoor space there was at their property.

Table 6-41: SBDI Survey Respondent Business Types[104]

Response	Count	Percent
Retail	15	26%
Restaurant	8	14%
Other healthcare	6	10%
Office	5	9%
Industrial/Manufacturing	6	10%
Warehouse or distribution center	4	7%
Religious worship	4	7%
Grocery	1	2%
Agricultural	1	2%
Institution/government	1	2%
Lodging	1	2%
Public assembly	1	2%
Vacant	1	2%
Other[105]	5	9%

We asked respondents whether their companies require a certain return on investment (ROI) or a simple payback threshold for energy efficiency investments. One respondent (2%) reported that their company requires a specific ROI for these investments. Ten percent of respondents noted their companies had policies requiring energy efficiency

[103] Does not sum to 100% because of rounding.

[104] Does not sum to 100% because one respondent indicated multiple business types.

[105] Other facility or business types included fire station, maintenance garage, automotive shop, and storage.

investments meet simple payback thresholds, 69% of respondents said their company did not have any policies for energy efficiency investments and 12% of respondents were not aware if their company had energy efficient investment requirements.

Thirty-one percent of the SBDI survey-takers indicated that their business had some policy or person responsible for monitoring or managing energy usage focused on saving energy. This represents a larger portion of respondents than ADM's 2019 SBDI survey, indicating that respondents to ADM's 2020 SBDI Channel survey had a greater focus on energy efficiency and savings.[106]

Eighty-three percent of respondents said that their organization did not have or were unaware of any staff dedicated to monitoring or managing energy at their company. The same portion of respondents said they did not have energy savings goals. Five percent of respondents said their company had a specific policy requiring that energy efficiency be considered when purchasing equipment.

Channel Awareness

The most commonly cited ways that respondents noted learning about the SBDI Channel were through a vendor or contractor or word of mouth conversations with friends, colleagues, or others (see Table 6-42).

Table 6-42: SBDI Respondent Sources of Channel Awareness[107]

Response	n	Percent
Contractor/vendor	32	55%
Word of mouth	18	31%
Business Energy Advisor or Program Representative	4	7%
OG&E website	6	10%
Email from OG&E	2	3%
Conference/trade show/expo	2	3%
Radio/TV advertising	1	2%
Other	2	3%

[106] In 2019 only one of the 36 SBDI survey-takers (3%) indicated that their business had any policy or person responsible for monitoring or managing energy usage focused on saving energy. This compares to 31% of respondents in 2020. ADM compared the proportions with a two-proportion z-test. This difference was significant with an alpha of 0.05.

[107] Respondents could cite multiple sources of awareness. "Other" sources of Channel awareness included a landlord and participating in the "Tulsa First Program".

Twenty-one percent of respondents mentioned having experience with OG&E's energy efficiency programs before participating in the SBDI Channel in 2020. All of these respondents said that their experience was important in their decision to complete their SBDI Channel project.[108]

Participation Process

Similar to ADM's 2019 SBDI Channel survey, most respondents (81%) noted that a vendor or contractor completed their required paperwork. Fourteen percent of respondents (8 participants) said they completed the paperwork or application themselves. The other respondents noted that someone else at their company (3%) or an OG&E or CLEAResult representative (2%) completed their application.

Seven of the respondents that noted completing the paperwork themselves rated their experience.[109] Five rated their satisfaction with the process highly, two were not satisfied, and the other respondent's level of satisfaction was not recorded.[110] One of the respondents who was dissatisfied with the application process suggested having more contractors to educate customers, while the other mentioned offering inducements for additional equipment types such as air conditioners.

Ninety-three percent of respondents said that a contractor or vendor implemented the project completely (91%) or with substantial help from their organization (2%). The other respondents said their organization did the project with substantial assistance from a contractor (5%) or without any outside assistance (2%).

The three most commonly cited reasons for participating in the Channel were to reduce energy costs or use and to improve lighting levels (see Table 6-43).

[108] Rated the importance of their past experience as "somewhat important" or "very important".
[109] One respondent did not provide a rating of their application experience.
[110] Rated their satisfaction a 4 or 5 on a scale from 1 (very dissatisfied) to 5 (very satisfied)

Table 6-43: SBDI Respondents' Reasons for Participating[111]

Response	n	Percent
To reduce energy costs	51	88%
To reduce energy use	45	78%
Improve/increase lighting levels	31	53%
To replace old or outdated equipment/get latest technology	24	41%
The maintenance downtime and associated expenses for the old equipment were too high	16	28%
To improve the product quality	16	28%
To improve workers' or students' environment	12	21%
To improve equipment performance	12	21%
Old equipment had failed	9	16%
As part of a planned remodeling, build-out, or expansion	5	9%
To protect the environment	3	5%
To reduce power outages	2	3%

COVID-19 Impacts

Half of the SBDI Channel survey respondents (47%) said that the COVID-19 pandemic had not impacted their organization or had a minimal impact on it. The most commonly reported impact was decreased business or revenues (24%). Other reported impacts included increased telework, labor shortages, business closures, changes to operational procedures, and altered energy use patterns or requirements.

Channel Satisfaction

The SBDI survey respondents indicated that they were satisfied with specific aspects of the Channel and with their participation in the Channel overall (see Figure 6-11). Additionally, 72% of survey respondents stated that they had recommended the SBDI Channel to someone else.

[111] Respondents could cite multiple reasons for participating.

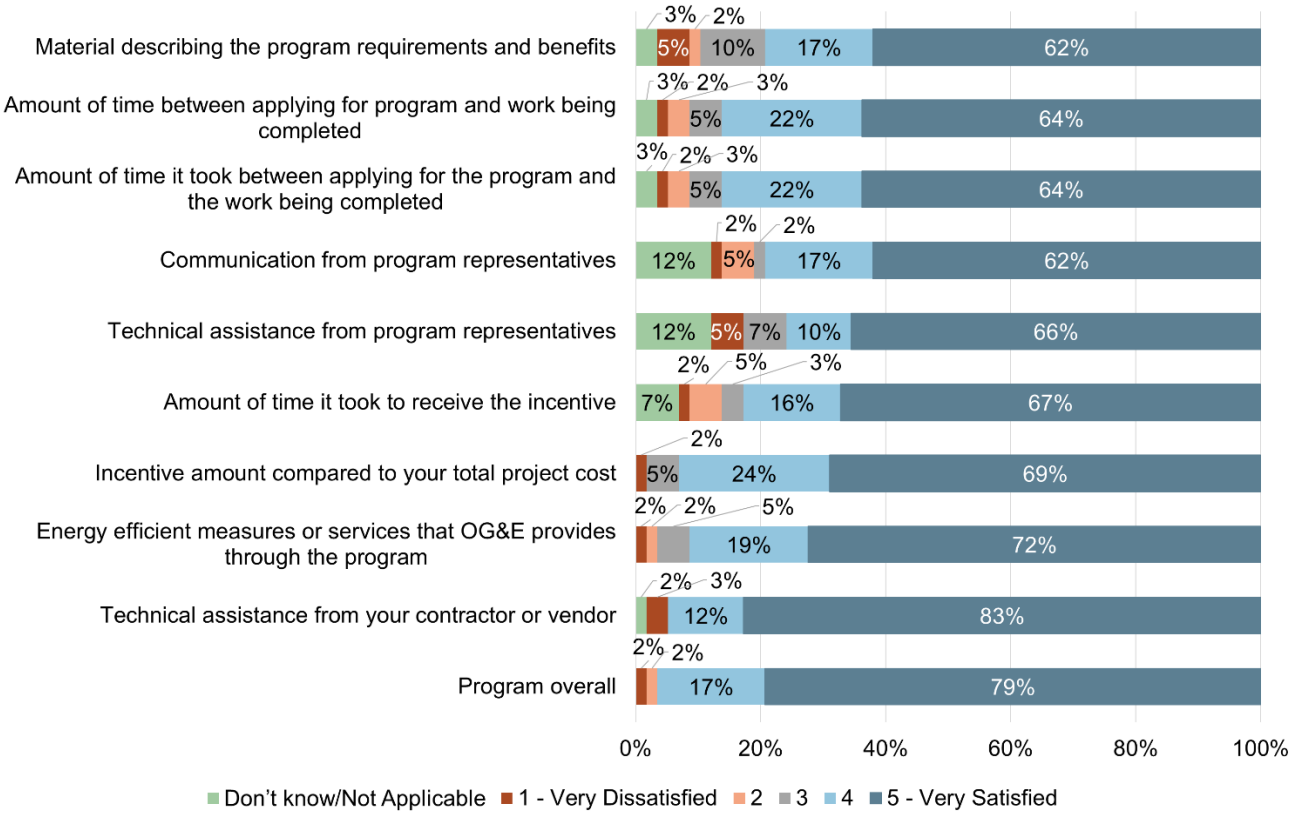

Figure 6-11: SBDI Channel Participant Satisfaction

Though most respondents were satisfied with their experience, 29% provided recommendations or suggestions to improve the Channel. Table 6-44 displays respondents' recommendations for Channel implementation or design improvements.

Table 6-44: SBDI Respondents' Recommendations to Improve Channel[112]

Response	Count	Percent
Prompted Responses – Selected All That Apply		
Increase communication from OG&E regarding this and other available OG&E incentives/programs	16	28%
Increase incentive amount	5	9%
Improve initial processing time	4	7%
Program could provide more information about savings/incentive calculations	3	5%
Improve the program application / paperwork process	2	3%
Unprompted Responses – Open-end or "Other" Recommendations		
Allow additional contractors to participate in the Channel	1	2%
Ensure contractors fully educate customers on the Channel induced lighting products and their attributes and features.	1	2%

[112] Respondents could provide more than one recommendation.

6.8.2.3 SAGE Participants

ADM conducted a mixed-mode survey to sixteen CEEP Schools and Government Efficiency (SAGE) Channel participants from September 2020 to February 2021. ADM first attempted to gather participants' responses with an email invitation, reminder, and then conducted targeted phone calls. ADM invited 33 SAGE participants to take the survey, and 16 replied (response rate of 48%). All survey responses were collected via email invitation; none of ADM's follow-up calls yielded a response.

The respondents reported filling an assortment of different roles or responsibilities at their respective organizations (see Table 6-45).

Table 6-45: SAGE Respondents' Role or Title

Role or Title	n
President/CEO/Superintendent	4
Facilities Manager	4
Chief Financial Officer	3
Energy Manager	2
Other financial/administrative position	1
Manager	1
IT Director	1

All sixteen of the respondents said their organization owned the facility that had participated in the OG&E CEEP SAGE Channel. Fifteen of the respondents said their organization paid the electric bill.

Ten respondents that represented schools participated in ADM's survey. The other six respondents represented other public organizations, such as branches of nonprofits, government, and colleges.

Respondents reported having indoor space ranging from 5,001 to more than 1,000,000 square feet. Six said their facility had 100,000 or more square feet of indoor space, while five noted their organization had less than 100,000 square feet. Five of the respondents did not know how many square feet their facility occupied.

Respondents reported on their organizations' policies or strategies in place to save energy. Five respondents indicated that they did not have any policy or person responsible for monitoring or managing energy usage or reduction goals. Figure 6-12 displays the policies or practices that SAGE survey respondents indicated using to manage or reduce energy usage.

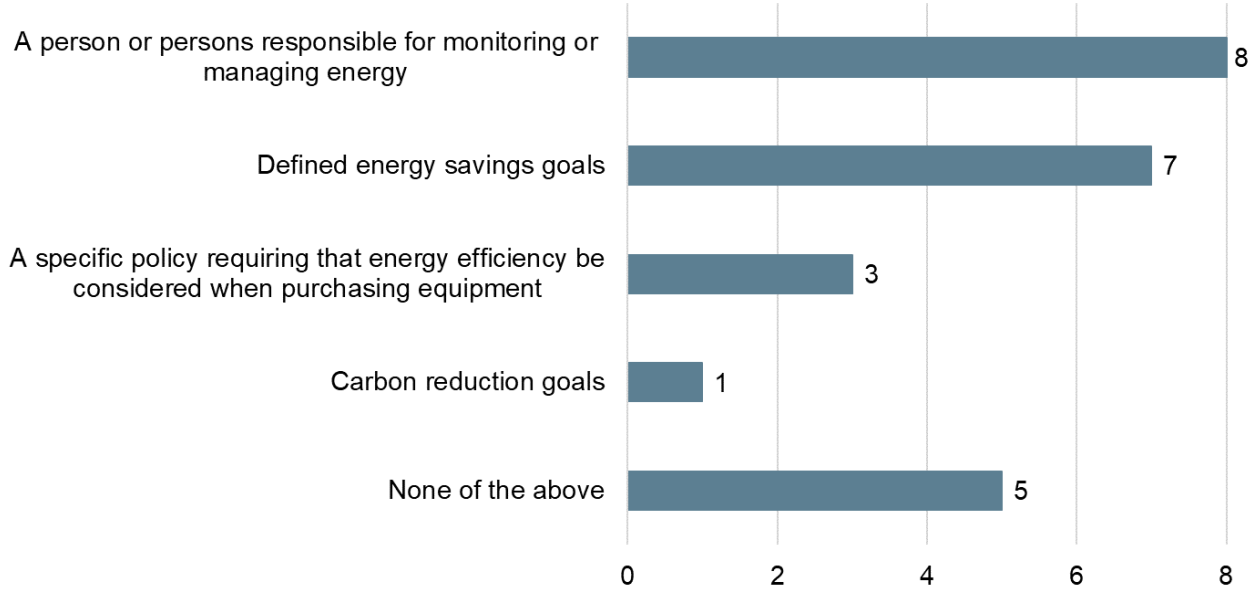

Figure 6-12: What policies or strategies do SAGE respondents have for saving energy?[113]

Two respondents noted that their company had a simple payback requirement for energy efficiency improvements. One said they had a specific ROI (return on investment) required for energy efficiency investments. Ten respondents said they did not have any energy efficiency investment requirements, and three were unaware of any company policies regarding energy management or usage.

Channel Awareness

ADM asked respondents how they heard about the OG&E CEEP SAGE Channel. The most commonly cited ways that respondents noted learning about the Channel were through a vendor, contractor, or OG&E or CLEAResult representative (see Table 6-46).

[113] Respondents could cite multiple energy saving strategies or management practices.

Table 6-46: SAGE Respondent Sources of Channel Awareness[114]

Response	n
Contractor/vendor	10
OG&E or CLEAResult representative	5
Word of mouth	4
Email from OG&E	2
Mail from OG&E	2
OG&E Website	2
Oklahoma Public School Resource Center	1

Twelve of the respondents noted that they or their organization had previous experience with the measure that they had implemented through OG&E's SAGE Channel before participating in the Channel in 2020. Eight mentioned having experience with OG&E's energy efficiency programs before participating in the SAGE Channel in 2020. Seven of these respondents noted that this previous engagement had been very important in their decision to complete their 2020 SAGE project.[115]

Participation Process

Seven respondents said they completed the paperwork or application themselves, and all these respondents rated their satisfaction with the process highly.[116]

Twelve respondents said that a contractor or vendor implemented the project completely (9 respondents) or with substantial help from their organization (3 respondents). The other four respondents said that either their organization did the project with substantial contractor or vendor support (2 respondents) or without any outside assistance (2 respondents).

The two most commonly cited reasons for participating in the Channel were to reduce energy costs or use (see Table 6-47).

[114] Respondents could cite multiple sources of awareness.
[115] Rated the importance of their past participation as "very important".
[116] Rated their satisfaction a 4 or 5 on a scale from 1 (very dissatisfied) to 5 (very satisfied)

Table 6-47: SAGE Respondents' Reasons for Participating[117]

Response	n
Prompted Responses – Selected All That Apply	
To reduce energy use	15
To reduce energy costs	13
To improve equipment performance	10
Improve/increase lighting levels	10
To improve workers' or students' environment	8
To replace old or outdated equipment/get latest technology	8
The maintenance downtime and associated expenses for the old equipment were too high	7
To improve the product quality	7
As part of a planned remodeling, build-out, or expansion	5
Old equipment had failed	3
To reduce power outages	2
To protect the environment	1
Unprompted Responses – Open-end or "Other" Reasons	
Security	1

COVID-19 Impacts

Eleven of the SAGE Channel survey respondents noted that the pandemic had impacted their organization in a significant way. The other five respondents said that COVID-19 had not impacted their organization (4 respondents) or did not know of its impacts (1 respondent). Specific impacts that the respondents noted included financial challenges, variance in occupancy, decreased student enrollment, shutting down intermittently, increased telework, loss of revenue, slower project completion because of COVID-19 infection, and challenges planning for future projects and energy usage management because of uncertain conditions.

Channel Satisfaction

The SAGE survey respondents indicated that they were satisfied with specific aspects of the Channel and their participation in SAGE overall. Furthermore, twelve of the respondents said they would not improve or change anything about their experience with the Channel. One did not know what they would change about it.

Figure 6-13 displays respondents' satisfaction with various aspects of SAGE as well as the Channel overall. Two respondents suggested increasing communication from OG&E regarding other available OG&E inducements/programs, and one suggested that the

[117] Respondents could cite multiple reasons for participating.

Channel provide more information about savings/inducement calculations. One respondent suggested increasing the inducement amount.

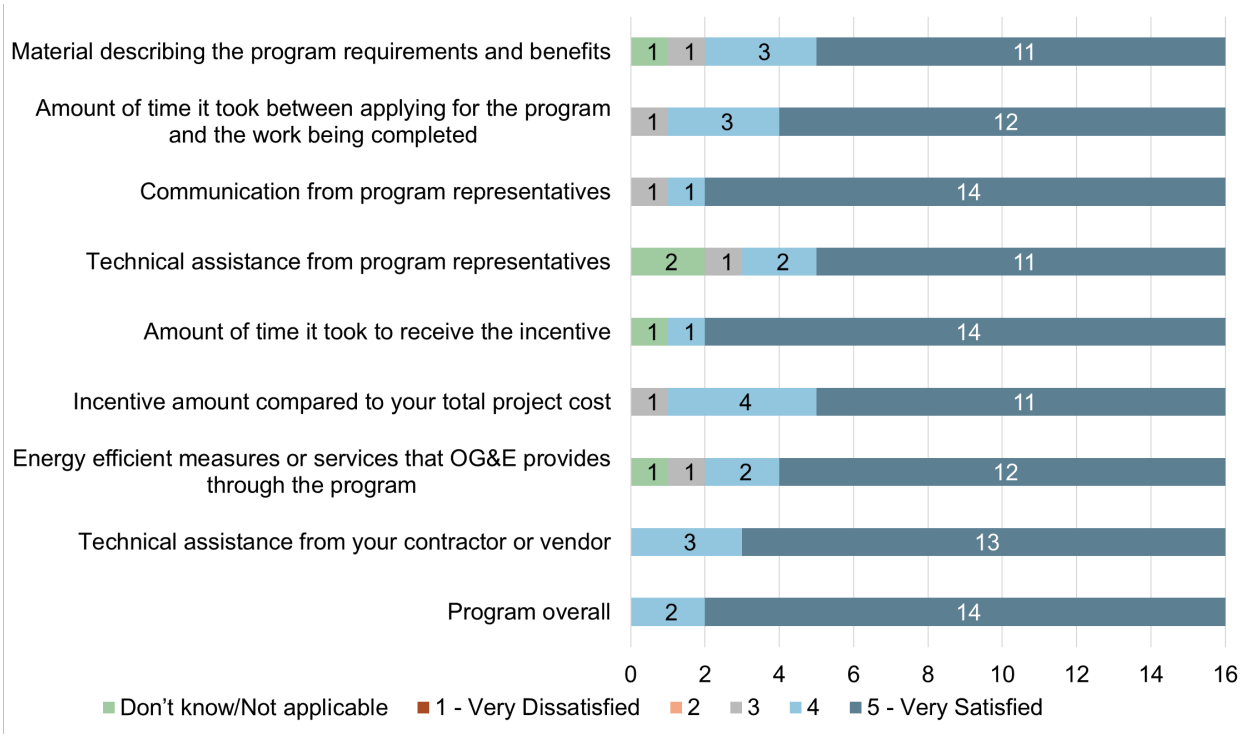

Figure 6-13: SAGE Channel Participant Satisfaction

6.8.2.4 HVAC Replacement and Tune-Up Participant Survey

ADM administered a survey to sixteen CEEP HVAC Tune-up participants from November 2020 to January 2021. ADM first attempted to gather participants' responses with an email invitation, reminder, and then conducted targeted phone calls. ADM invited 34 Channel participants to take the survey, and 16 replied (response rate of 47%). Sixteen survey responses were collected by ADM's in-house survey administration team. One was collected via email invitation.

Survey respondents mentioned having various job titles or roles. Six respondents indicated that they were in facilities management or maintenance roles. Three said they were in either financial or administrative roles. Three respondents said they were the owner or proprietor of the company that participated in OG&E's CEEP HVAC Tune-up Channel. One respondent mentioned that they were their organization's Director of Operations, while the final respondent said they were an energy manager.

Fourteen respondents said their organization owned the facility that had received the OG&E HVAC Replacement and Tune-Up. The other two respondents said that their organization leased the facility from someone else. All respondents stated that their company paid the electric bill at their facility.

Nine respondents that represented schools participated in ADM's survey. The other seven respondents represented various organization types, including a church, bank, insurance agency, and natural gas refinery. However, OG&E CEEP tracking data indicated that these respondents represented large or small office facilities.

Ten respondents shared information regarding their facility size. Five stated that their facility had 50,000 square feet or less of indoor space and four noted having 75,000 or more. Seven of the respondents did not know how many square feet their facility occupied.

Eleven respondents reported that their organization had some type of energy-saving policy or practice in place. Of those, seven said they had a person or persons responsible for monitoring or managing energy, five said they had some sort of defined energy saving goals, and five reported a policy of considering energy efficiency when purchasing equipment. One noted that their organization had carbon reduction goals.

One respondent stated that their company had a simple payback requirement for energy efficiency improvements. The remaining 15 respondents had either no payback or return on investment policy (11 respondents) for energy efficiency improvements or were unsure whether their company had these policies (4 respondents).

Channel Awareness

The most commonly cited ways that respondents noted learning about the Channel were through an OG&E or CLEAResult representative or through word-of-mouth conversations with colleagues, friends or others (see Table 6-48).

Table 6-48: HVAC Tune-up Respondent Sources of Channel Awareness[118]

Response	n
OG&E or CLEAResult representative	6
Word of mouth	5
Contractor/vendor	4
Email from OG&E	3
Mail from OG&E	1

Nine of the fifteen respondents noted that they or their organization had previous experience with OG&E's energy efficiency programs before participating in the CEEP HVAC Tune-up Channel in 2020.

[118] Respondents could cite multiple sources of awareness.

Customer Prior Tune-up Experience

Eleven respondents said their organization had tune-ups of their HVAC equipment performed by a contractor every year or more frequently. Nine of these respondents said that their organization's last tune-up had been within the last two years, one said it was between 3-5 years ago, and the last respondent said they could not recall when their last tune-up had been. The other five respondents said their organization only had tune-ups as needed for repairs and had never had a tune-up in the past.

Participation Process

Nine respondents said that a contractor or vendor had completed their application, two said someone else at their company completed the application, and one said OG&E or CLEAResult completed the required paperwork to participate in the HVAC Channel.

Two noted completing the paperwork or application themselves and both rated their satisfaction with the process highly.[119] The other respondent could not recall who completed their paperwork.

All the respondents said a contractor or vendor conducted the HVAC Tune-ups.

Ten respondents recalled that the contractor that performed their tune-up explained the difference between an OG&E HVAC tune-up and a standard tune-up. Eight of these respondents could recall specific differences between an OG&E CEEP Tune-up and a standard tune-up. The respondents said their contractor mentioned differences such as the more in-depth nature of an OG&E tune-up, cleaning the coils, thickness of filters used, checking freon levels, listening for sound of HVAC unit running, checking each units' efficiency.

COVID-19 Impacts

Twelve of the HVAC Tune-up Channel survey respondents said that the COVID-19 pandemic had impacted their organization in a significant way. These respondents mentioned decreased occupancy (9 respondents) or partial or full closures (6 respondents). Three respondents explicitly noted decreased energy use related to less need to use HVAC or lighting. One respondent noted higher energy usage because teachers still use the facility and now the school is charging devices for every student. Five respondents said there were no or only modest impacts.

[119] Rated their satisfaction a 4 or 5 on a scale from 1 (very dissatisfied) to 5 (very satisfied)

Channel Satisfaction

Fifteen respondents indicated that they were satisfied with their participation in the HVAC tune-up Channel overall. Figure 6-14 displays respondents' satisfaction with various aspects of the HVAC tune-up Channel.

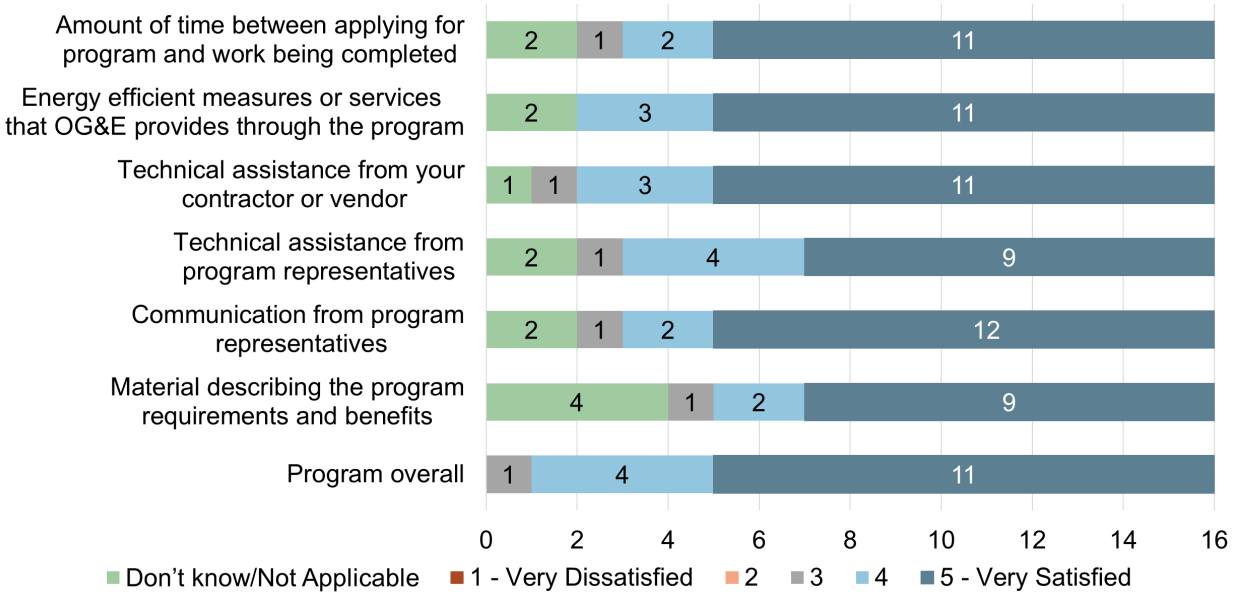

Figure 6-14: HVAC Channel Participant Satisfaction

Ten respondents stated that they would not change anything about the Channel (eight respondents) or did not know what they would change (two respondents). Eleven mentioned that they had recommended the HVAC Replacement and Tune-Up to someone else. Six respondents provided recommendations to improve the Channel (Table 6-49).

Table 6-49: How could the Residential HVAC Replacement & Tune-Up Channel improve?

Response	Count
Unprompted Responses – Open-end or "Other" Recommendations	
Expand the Channel to include an inducement for equipment repairs.	1
Broaden guidelines for eligible types of units.	1
Add an energy audit to the Channel to help customers understand their energy usage.	1
Simplify the Channel paperwork and informational material.	1
Ensure all eligible units are tuned up. Some of eligible rooftop units were not tuned up because of staff oversight.	1
Ensure equipment is able to be productive in all conditions. The contractor's HVAC equipment (i.e., laptop) became too hot to operate and required pauses in order to complete the OG&E CEEP HVAC Tune-up.	1

6.8.3 CEI Participant Survey

ADM conducted a mixed-mode survey (phone/email) of Continuous Energy Improvement (CEI) Channel participants in January 2020.

CLEAResult provided ADM with a list of 32 unique Channel participants and ADM received 18 responses from individuals in various positions (see Table 6-50).

Table 6-50: CEI Survey Respondents' Roles

Role or title	n
Facilities/Maintenance Manager	9
Energy Manager or another analyst	5
COO/Director of Operations	2
Environmental Manager	2

All respondents noted that their organization owned and occupied the facility that participated in the OG&E CEI Channel. Fourteen respondents said that their company paid the electric bill at that address.

Ten CEI participants said their company had more than 500 full and part-time employees. Five said they had between 100 and 400 employees. The remaining three respondents said their companies had between 30 and 75 employees.

Thirteen respondents said that their organization's budget decisions were made locally. Two respondents said their budget decisions were made nationally. One respondent noted that budget decisions over $10,000 required approval from their overseas office. The remaining two respondents described budget decision-making processes that varied by the type of decision.

ADM inquired with survey-takers regarding the strategies their organizations were utilizing to save or manage energy usage. Sixteen respondents said their company had a person that was responsible for monitoring or managing energy usage. Twelve said that their company or organization had defined energy saving goals, while three individuals noted that their organization had carbon reduction goals. Eleven respondents noted that their company had a specific policy requiring that energy efficiency be considered when purchasing equipment. Two respondents noted that their organization did not have a specific policy or strategy to reduce their energy usage.

Similar to ADM's 2019 CEI Channel participant survey, over half of the respondents (11 of the 18) said their organization did not require an energy efficiency investment meet certain return on investment (ROI) or simple payback thresholds in order to be purchased and installed. Four respondents said that the investment had to meet a certain return on investment, while two respondents indicated that their investments had to meet simple

payback thresholds. One of the respondents said they were not aware of whether their organization had any ROI or payback requirements.

Twelve respondents mentioned that they had applied for or received OG&E inducements for equipment replacements, building upgrades, or other energy efficient measures before participating in the Continuous Energy Improvement Channel in 2020.

Channel Awareness and Application Process

ADM asked survey respondents that did not complete ADM's survey in 2019 (n=12) about the way or ways in which they learned about the CEI Channel and the sign-up process. Ten of the respondents said they learned about the OG&E CEI Channel through a Business Energy Advisor or other OG&E or CLEAResult representative. One respondent said he heard about CEI through his relationships with other facilities managers and the OG&E website. One respondent did not recall how they learned about the Channel.

Six survey-takers said they completed the necessary paperwork to participate in the Channel themselves without assistance. Two respondents said someone else at their company completed the paperwork, and two said an OG&E or CLEAResult representative completed it. Two CEI Channel participants could not recall who completed their paperwork. Five of the seven respondents that had some part in completing their organization's application were satisfied with the process.[120] One respondent was not satisfied with the process, and the other could not recall how satisfied they were with the application process. The dissatisfied respondent did not offer any recommendations.

Energy Saving Actions Implemented

ADM asked survey respondents whether they had implemented any of the energy saving actions that were recommended through either the Channels' energy scans or cohort workshops. Thirteen respondents said that they had either taken at least one of the CEI Channel's cohort workshop energy efficiency recommendations or made an improvement recommended during their site's Energy Scan. Respondents reported completing a wide range of energy saving activities that were recommended during the Channels' energy scans or cohort workshops. The most common improvements respondents made after their recommendation during an energy scan was energy efficient lighting (8 respondents). The most common actions taken as a result of cohort workshops were scheduling/operational changes to minimize energy use, operational setting changes on machines, HVAC tune-ups, and installation of energy efficient lighting (4 respondents noted taking each of these actions).

[120] Rated their satisfaction with the process a 4 or 5 on a scale from 1 (very dissatisfied) to 5 (very satisfied)

Four of the thirteen respondents who mentioned taking action recommended during a CEI Channel Energy Scan or Cohort Workshop stated that some or all of the actions they had taken were discounted through another OG&E program (e.g., the OG&E Commercial Energy Efficiency Program's CIS or HVAC Replacement and Tune-Up Channel).

Five respondents stated that they had not completed any energy efficiency upgrade, improvement, or action that had been recommended at either their site's energy scans or the CEI Channel's cohort workshops.

Decision-making

Survey findings indicate about half of the participants would have likely completed some or all of the CEI Channel recommended improvements if they had not participated in the Channel. Ten respondents noted that they had plans to complete the energy efficiency improvements recommended to them through the CEI Channel before signing up. Nine said they probably (8 respondents) or definitely (1 respondent) would have completed the energy savings actions even if the CEI Channel representative had not recommended them. Eight respondents said their organization probably would have (5 respondents) or definitely (3 respondents) made the CEI Channel recommended improvements if the inducement had not been available.

Seven respondents said that the CEI Channel had not affected the amount or extent to which their organization engaged in energy saving actions. The Channel did not influence them to take more drastic energy saving actions. Two respondents were unsure of the CEI Channel's effect on the amount or extent of energy saving actions taken by their organization.

Furthermore, half of the respondents said that their organization would have had the financial ability to complete the recommended actions if the CEI Channel had not been available. Seven respondents indicated that the Channel did influence or expedite their organization's energy efficiency improvement timeline.

COVID-19 Impacts

Fourteen of the CEI Channel survey respondents noted that the pandemic had impacted their organization in a significant way. The respondents noted impacts including a reduction in workforce, increased HVAC consumption, variance in occupancy, increasing telework, reduced operations, and revenue loss.

Eight respondents said that the pandemic had impacted their organizations' ability to take advantage of or participate in OG&E services and inducements. Four said that their organizations' financial ability or capacity to make energy efficiency improvements had been adversely affected by the pandemic. Three mentioned that the pandemic created challenges coordinating site visits, communicating with CLEAResult staff, or learning

about the Channel's activities. One said that making behavioral changes had become more difficult because of the pandemic.

Satisfaction

ADM found that all of the survey respondents were satisfied with their overall experience with the CEI Channel, and most were satisfied with different aspects of the Channel (see Figure 6-15).[121] Thirteen of the CEI survey-takers stated that they had recommended the CEI Channel to someone else. Similarly, all survey-takers were satisfied with OG&E as their electric service provider.

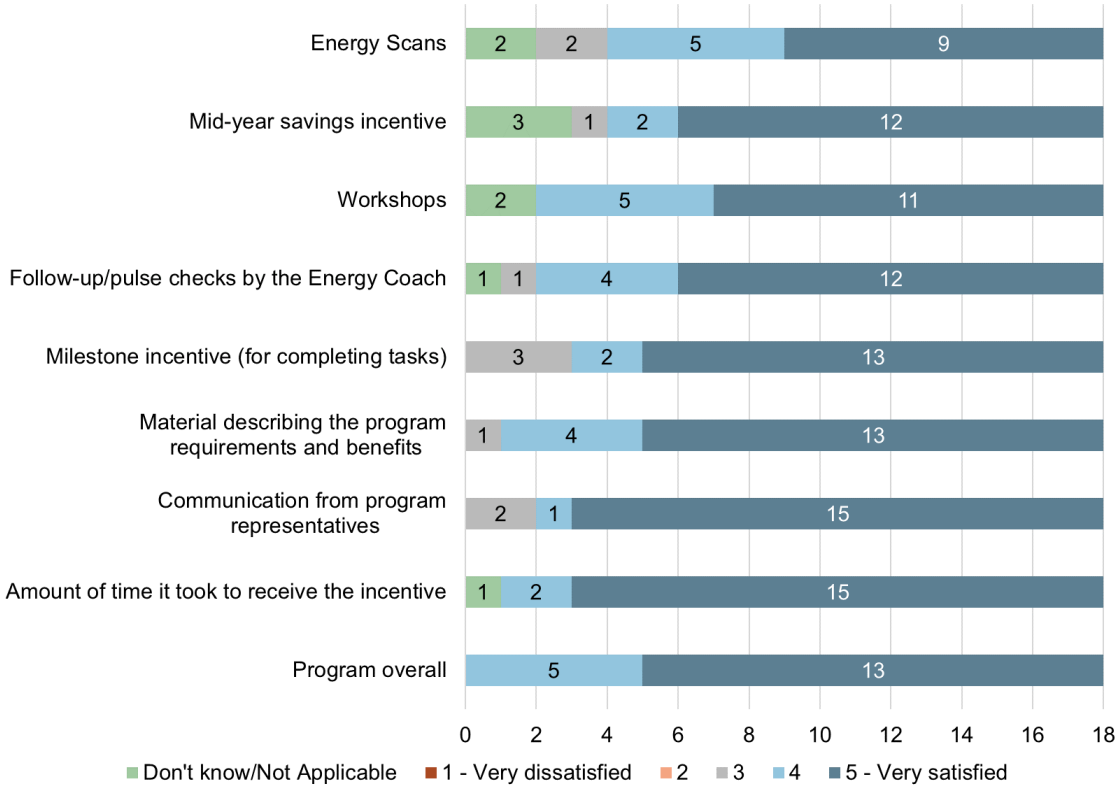

Figure 6-15: CEI Channel Participant Satisfaction

Ten of the respondents said they would not change anything about the Channel or did not know what they would change to improve it. The other eight respondents provided various ideas to improve the CEI Channel (see Table 6-51).

[121] Rated their satisfaction with a 4 or 5 on a scale from 1 (very dissatisfied) to 5 (very satisfied)

Table 6-51: How could the CEI Channel improve?

Response	Count
Prompted Responses – Selected All That Apply	
Increase communication from OG&E regarding other available OG&E incentives/programs	3
Increase incentive amount	3
Improve workshop content	1
Increase number of workshops	1
Decrease number of workshops	1
Unprompted Responses – Open-end or "Other" Recommendations	
Increase communication and clarity about payout structure, meeting days and times, and next steps	3
Decrease wait time for site visits or site review by CEI Channel representatives	1
Provide in-person training for new CEI Channel participants	1
Consider rebates for partial project completions	1
Revise equipment included within the Program. Revise HVAC requirements	1
Make document links more user friendly or improve communication on how-to access the tools and documentation	1

6.8.4 Small Business Midstream End-User Survey

ADM conducted a survey of customers that purchased lighting through the OG&E Small Business Midstream Channel in November and December 2020. ADM sent 661 Small Business Midstream customers a survey invitation and one reminder email. ADM also made 296 phone calls to 260 customers. Table 6-52 shows the different types of lighting respondents purchased through OG&E's Small Business Midstream Channel in 2020. ADM invited 612 Channel participants to take the survey, and 92 replied (response rate of 15%). Fifty-five survey responses were collected via email invitation, and thirty-seven were collected via follow-up phone call.

Table 6-52: Small Business Midstream Survey Respondent Purchase Type[122]

Measure	Number of Respondents	Percentage of Respondents
LED Lowbay/Highbay Fixture	34	37%
LED Linear Fixture(s)	32	35%
LED Linear Lamp(s)	32	35%
LED Wall Pack/Flood Lamp(s)	32	35%
PAR Lamp(s)	7	8%
LED Downlight(s)/Trimkit(s)	6	7%
LED CFL Pin Base Direct Replacement Lamp(s)	3	3%
BR Type Lamp(s)	2	2%
MR Type Lamp(s)	2	2%
Ceiling Sensor(s)	1	1%
Wall Sensor(s)	1	1%

Customers reported that discounted lighting had been installed in a variety of work settings. Table 6-53 displays the type of work done in the buildings where survey respondents stated that the discounted lights were installed. None of the survey-takers noted installing any of the discounted products outside of OG&E territory.

[122] Percentages exceed 100% because respondents may have purchased multiple discounted lighting product types.

Table 6-53: What type of work is done in the building where the lights were installed?[123]

Type of Work	Number of Respondents	Percent of Respondents (n=92)
Office	16	17%
Retail	11	12%
Warehouse or distribution center	11	12%
Religious worship	11	12%
Industrial/Manufacturing	10	11%
School K-12	6	7%
Institution/government	5	5%
Other healthcare	4	4%
Grocery	2	2%
Hospital	2	2%
College/university	2	2%
Lodging	2	2%
Restaurant	2	2%
Vacant	1	1%
Other	10	11%
I do not recall/Prefer not to say	3	3%

Program Awareness & Experience

Eighty-three percent of respondents knew all of their lighting products were discounted. The remaining respondents did not know their purchase had been discounted (4%), were only aware that some of their purchase had been discounted (12%), or preferred not to say whether they were aware of the discount at the time of purchase (1%). Nearly all (97%) of the respondents that were aware that their purchase had been discounted said they knew OG&E was responsible for providing the discount.

Respondents noted learning about the program from a variety of sources (see Table 6-54). The most commonly cited source of awareness of the program discounts were distributor store employees (59%).

[123] Percentages exceed 100% because some respondents installed lighting in multiple facility types. Other types of businesses included: highway construction, fitness gym, auto repair, trucking, aviation, mechanical contracting, machine shop, scrap/recycling facility, and real estate development.

Table 6-54: How did you first learn about the discounts?[124]

Method	Number of Respondents	Percent of Respondents (n=87)
From a lighting distributor employee	51	59%
Prior experience with the program or participating distributor	14	16%
Contractor/electrician	10	11%
OG&E staff, mailing, or email	3	3%
From marketing materials displayed at the store	2	2%
I do not recall	7	8%

Seventy-eight percent of respondents recalled a sales representative at the lighting distributor discussing the discounted lighting benefits with them. Of the respondents who recalled a sales representative discussing the energy efficient lighting benefits, most recalled them discussing energy savings (94%) or discounts (85%). A smaller portion of respondents recalled the salesperson discussing the bulb or fixture's long life (74%) or the quality of the discounted bulbs or fixtures (43%). Two respondents (3%) recalled other benefits the sales representative mentioned, including the color of the discounted lighting and the limited time of the available discounts.

Decision-making and Other Program Experience

ADM inquired with survey respondents regarding the factors they consider when selecting lamps or fixtures. Respondents cited price and energy efficiency most frequently. Figure 6-16 displays the factors respondents noted considering when they purchase lamps or fixtures.

[124] Other methods of learning about the discount included word-of-mouth from customers, OG&E emails or other direct contact from OG&E, meetings, and participating in other states

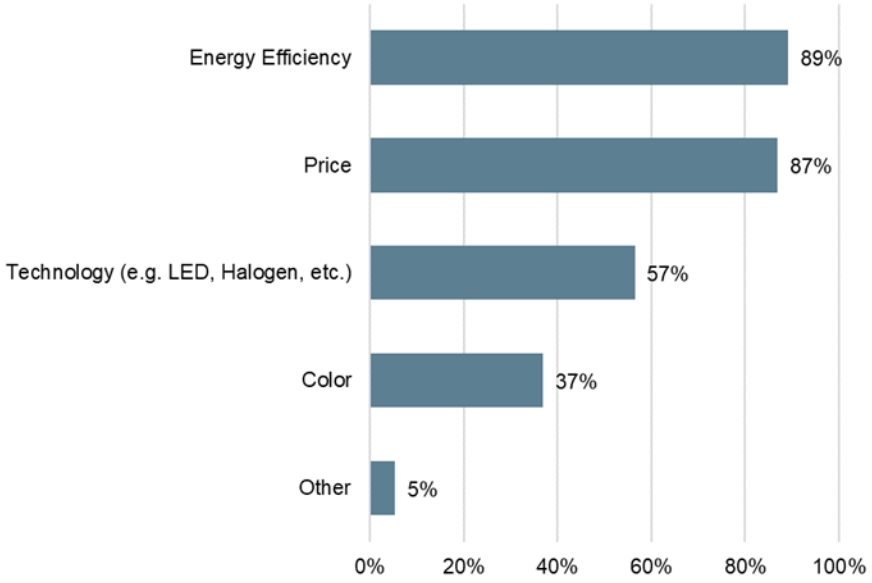

Figure 6-16: What factors do respondents consider when purchasing lamps/fixtures?[125]

Fifty-four percent of survey respondents reported their business had completed a lighting project that applied for an OG&E efficiency program rebate. This compares to 19% of respondents in ADM's 2019 customer survey that reported their business had completed a lighting project that had applied for an OG&E efficiency rebate.[126]

Similar to 2019, one-fifth of respondents said there were additional lamp or fixture types that should be incentivized by OG&E. These respondents indicated an interest in additional inducements for corn, flood, wall, T-8, can, low bay, 4-pin PLC, and A19 LED lighting as well as for parking lot, sports, and airport lighting. One customer mentioned adding an inducement for PL-based compact fluorescent lighting, while one explicitly noted having purchased lighting sensors but was unaware of available discounts.

COVID-19 Impacts

ADM asked survey respondents open-ended questions about how the COVID-19 pandemic impacted their business and ability to take advantage of OG&E inducements. Customers' responses were recorded verbatim or in an open-ended text box. Respondents could cite multiple impacts. Forty percent of survey respondents noted that the COVID-19 pandemic had decreased their business by reducing revenue, impacting attendance, or causing occupancy limitations. Twenty-six percent of respondents

[125] Other important factors included the availability, compatibility, and lifespan of the of lighting product types.

[126] ADM compared the two proportions with a two-proportion t-test. The difference is significant with an alpha of 0.05.

mentioned that the pandemic had impacted their ability to take advantage of OG&E inducements or to implement energy efficiency upgrade projects as their budgets had been adversely affected. Other respondents noted operational changes such as an increase in telework, closures or reduced hours (15%), decreased electricity usage (3%), their employees becoming sick (2%), increased business (1%), and being unable to source products (1%).

General Feedback and Suggestions

Respondents were allowed to share comments, suggestions, and general feedback regarding Small Business Midstream Channel and OG&E's services. Table 6-55 provides a summary of the respondents' comments.

Table 6-55: Small Business Midstream Channel Survey Respondents Comments[127]

Response	Count	Percent
Increase marketing or promotional efforts to ensure awareness of the available inducements.	8	9%
Increase the available inducements (add measures, programs or offerings).	7	8%
General support, appreciation, or interest in the continuation of the Channel's inducements.	4	4%
Extend the availability of inducements or the time horizon for the Channel.	3	3%
Reduce power interruptions and impacts on business.	1	1%
Make the SBDI "Open Tool" more user friendly and less difficult to navigate.	1	1%
Streamline available information on available Midstream inducements.	1	1%
Ensure an easier process of determining the appropriate account numbers to use for companies with multiple buildings. Companies that manage multiple properties and have multiple account numbers encounter difficulties with determining the correct account number.	1	1%
Remove distributors from the Midstream inducement process. Allow customers to purchase induced LEDs on Amazon or elsewhere. The Channel allows participating distributors to increase their profit margin.	1	1%

6.9 Program Conclusions and Recommendations

6.9.1 Conclusions

Based on the findings from the 2020 evaluation of CEEP, we have developed the following conclusions:

[127] Respondents could provide more than one recommendation.

Achievement of Goals, Accuracy of Savings Estimates

- Program staff contacts indicated that OG&E's CEEP achieved its overall ex ante savings goal. Staff said the SAGE, SBDI, and HVAC Channels were affected by the COVID-19 pandemic, though they were able to strategize and adapt to achieve considerable savings through these Channels.
- The CEI Channel accurately estimates savings. ADM found a few issues with model versioning, model inputs, and cross participation. A few model's final savings changed significantly after ex ante savings was first reported. One site reported ex ante savings with a measurement period from 1/1/2020 to 4/4/2020, but its final model claimed savings with measurement period 1/1/2020 to 10/24/2020. A few sites included inaccurate model inputs. Lastly, more cross-participation projects were identified by the implementation contractor.

Awareness and Program Communication

- Survey responses and interviews indicate that trade allies are a strong source of Program awareness for the downstream and HVAC Replacement and Tune-Up CEEP Channels. However, they are a more common source of awareness for CIS and SBDI participants than SAGE participants.
- Customers are interested in hearing from OG&E regarding their available inducements and programs available for business customers, as indicated by survey results showing continued interest in more communication.

Program Satisfaction and Repeat Participation

- Survey results and interviews indicate that OG&E's CEEP was implemented successfully in 2020 with minimal comments, concerns, or trade ally and participant complaints.
- Overall satisfaction is high with the Downstream Channel and HVAC Replacement and Tune-Up Channel though some respondents noted opportunities to improve OG&E's energy efficiency inducement opportunities.
- CEEP may engender interest among OG&E customers in continuing to improve their facilities' energy efficiency, as indicated by the fact that more than half of Small Business Midstream Channel survey respondents reported their business had applied for and completed an OG&E induced lighting project in the past.
- Slightly more than half of CIS, School and Government Efficiency, and HVAC Replacement and Tune-Up Channel survey respondents had participated in OG&E's CEEP in the past. It is not surprising that much of CEEP's current strength comes from repeat participation; this is common among programs that serve large commercial and institutional customers. As such programs mature, however, the

ability to maintain savings through the existing customer base may begin to erode, requiring more effort to generate new participants.

COVID-19 Effects

- The COVID-19 pandemic had a significant impact on most businesses, though it only affected the ability of some to take advantage of OG&E inducements. It had minimal impact on about one-third of the participants.

6.9.2 Recommendations

Based on the findings from the 2020 evaluation of CEEP, we have developed the following recommendations:

- Ensure Program participants are aware of all available OG&E CEEP inducements; consistent with 2019, survey findings suggest that Program participants want more information from OG&E about available inducement offerings. OG&E and CLEAResult could consider developing targeted marketing campaigns for specific types of businesses or organizations, with case studies and examples of projects, available inducements, and energy savings achieved through the various Channels' past participants.

Impact-Evaluation-Specific Recommendations

- We recommend performing a utility billing regression analysis for any projects with projected annual savings over 400,000 kWh. A regression is feasible only if the savings are over 10% of the estimated annual energy usage. This regression analysis will be useful to help substantiate savings demonstrated when pre- and post-trending data are not available. Suppose a utility billing regression does not show similar savings to the custom calculations. In that case, additional research should be done to determine why the billing regression does not match the custom calculations.
- We recommend that the facility's annual energy usage be added to the CEEP tracking data. This will help flag projects that save 10% or more of the estimated annual energy usage. ADM intends to use a billing analysis along with measure level calculators on these sites.
- We recommend the pre-construction review process continue to be implemented for large or custom projects. The pre-construction review is designed to allow both implementer and evaluator access to project documentation and *ex ante* savings calculations before projects are completed and inducements are paid. This process was used for selected projects or new measure categories during PY2020 and resulted in improved collaboration. ADM recommends continued development

of the pre-review process and using it more extensively on large, custom, or new measures.

- We recommend that the AOH per lamp type be updated using three-year rolling average values based on actual Program participants. Both *ex ante* and *ex post* savings should be calculated using the same average values. The proposed values for the 2021 Program year are provided in section 6.6.2.
- The implementation contractor should provide a list of all active names, addresses, and meter numbers included in all the participants' models to ADM in the late summer. This would give the implementation contractor and ADM time to collaborate to preliminary identify cross participations mid-year. This collaboration will likely eliminate most differences in the two parties' cross participation identification.
- The implementation contractor should remove forecasting or annualization from preliminary models. *Ex ante* savings is on preliminary models. The forecasted savings often overestimates the measured savings in the forecasted periods, approximately two months. The savings claimed in forecasted periods usually have a higher savings per period than the average savings per period during the *ex ante* measurement period, usually 10 months. The *ex ante* measurement period usually includes two swing space conditioning periods and the cooling season. CEI sites usually have a higher saving per period in the swing space conditioning periods (spring, fall) than the savings per period in the heating and cooling months (summer, winter). If only considering the forecasting impacts, a site with forecasting would likely receive a realization rate lower than 100%. In contrast, a site that does not use forecasting would likely receive a realization rate above 100%. If forecasting is removed, the preliminary models and final models would only use measured savings. The difference would be that the preliminary models would have a measurement period of 10 months, and the final models would have a measurement period of 12 months.
- The implementation contractor should re-baseline a site if that site stops its participation before the end of the current program year but intends to participate in the next program year. An example of this requirement is mandating model re-baselining for all the PY2020 participating schools before participating in future program years. All the school participants ended their participation in late October 2020, thus avoiding calculating any negative (or positive) savings contributions from November and December 2020. Usually, the savings per period in the heating season are less than the annual average savings per period.

Appendix A. Portfolio Cost-effectiveness

A.1 Overview

We estimated the cost-effectiveness for the overall Demand Program portfolio and programs based on 2020 costs and savings estimates provided by OG&E and their third-party implementers. This appendix provides the cost-effectiveness results, as well as a brief overview of the approach taken.

The portfolio, and programs, pass all the cost-effectiveness tests except the RIM test. The table below presents the cost-effectiveness results for the PY2020 portfolio.

Table A-1: Cost-Effectiveness Results

Program	TRC	UCT	RIM	PCT	SCT
HEEP	1.90	2.52	0.63	3.60	3.13
WRAP	2.31	2.38	0.76	3.37	3.98
CEEP	1.45	3.81	0.64	2.55	2.22
Energy Education Res	0.00	0.00	0.00	0.00	0.00
Energy Education C&I	0.00	0.00	0.00	0.00	0.00
Planning	0.00	0.00	0.00	0.00	0.00
Regulatory	0.00	0.00	0.00	0.00	0.00
R&D	0.00	0.00	0.00	0.00	0.00
Total	**1.62**	**3.08**	**0.65**	**2.85**	**2.57**

A.2 Approach

The California Standard Practice Model and guidance from the AR TRM were used as guidelines for the calculations, along with guidance from the AR TRM. The cost-effectiveness analysis methods which were used in this analysis are among the set of standard methods used in this industry and include the Utility Cost Test (UCT), Total Resource Cost Test (TRC), Ratepayer Impact Measure Test (RIM), and Participant Cost Test (PCT). All tests weigh monetized benefits against costs. These monetized amounts are presented as Net Present Value (NPV) evaluated over the measures' lifespan. The benefits and costs differ for each test based on the perspective of the test. The definitions below are taken from the California Standard Practice Manual.

- **The Total Resource Cost Test (TRC)** measures a demand-side management program's net costs as a resource option based on the Program's total costs, including both the participant and the utility costs.
- **The Utility Cost Test (UCT)** measures the net costs of a demand-side management program as a resource option based on the utility costs (including inducement costs) and excluding any net costs incurred by the participant. The benefits are similar to the TRC benefits. Costs are defined more narrowly.

- **The Participants Cost Test (PCT)** measures the quantifiable benefits and costs to the customer due to participation in a program. Since many customers do not base their decision to participate in a program entirely on quantifiable variables, this test cannot be a complete measure of a program's benefits and costs to a customer.
- **The Ratepayer Impact Measure Test (RIM)** measures the change in customer bills or rates due to changes in utility revenues and operating costs caused by the Program. Rates will go down if the change in revenues from the Program is greater than the change in utility costs. Conversely, rates or bills will go up if revenues collected after Program implementation are less than the utility's total costs in implementing the Program. This test indicates the direction and magnitude of the expected change in customer bills or rate levels.

A common misperception is that there is a single best perspective for the evaluation of cost-effectiveness. Each test is useful and accurate, but each test is intended to answer a different set of questions. The questions to be addressed by each cost test are shown in the table below.

Table A-2: Questions Addressed by the Various Cost Tests

Cost Test	Questions Addressed
Participant Cost Test (PCT)	▪ Is it worth it to the customer to install energy efficiency?
	▪ Is it likely that the customer wants to participate in a utility program that promotes energy efficiency?
Ratepayer Impact Measure (RIM)	▪ What is the impact of the energy efficiency project on the utility's operating margin?
	▪ Would the project require an increase in rates to reach the same operating margin?
Utility Cost Test (UCT)	▪ Do total utility costs increase or decrease?
	▪ What is the change in total customer bills required to keep the utility whole?
Total Resource Cost Test (TRC)	▪ What is the regional benefit of the energy efficiency project (including the net costs and benefits to the utility and its customers)?
	▪ Are all of the benefits greater than all of the costs (regardless of who pays the costs and who receives the benefits)?
	▪ Is more or less money required by the region to pay for energy needs?
Societal Cost Test (SCT)	▪ What is the overall benefit to the community of including indirect benefits?
	▪ Are all of the benefits, including indirect benefits, greater than all of the costs (regardless of who pays the cost and who receives the benefits)?

Overall, the results of all five-cost-effectiveness tests provide a more comprehensive picture than the use of any lone test. The TRC and SCT cost address whether energy efficiency is cost-effective overall. The PCT, UCT, and RIM address whether the selection of measures and design of the Program is balanced from the perspectives of participants, utilities, and non-participants. The scope of the benefit and cost components included in each test are summarized in the table below.

Table A-3: Benefits and Costs Included in each Cost-Effectiveness Test

Test	Benefits	Costs
PCT (Benefits and costs from the perspective of the customer installing the measure)	▪ Inducement payments ▪ Bill Savings ▪ Applicable tax credits or inducements	▪ Incremental equipment costs ▪ Incremental installation costs
UCT (Perspective of utility, government agency, or third party implementing the Program	▪ Energy-related costs avoided by the utility ▪ Capacity-related costs avoided by the utility, including generation, transmission, and distribution	▪ Program overhead costs ▪ Utility inducement costs
TRC (Benefits and costs from the perspective of all utility customers in the utility service territory)	▪ Energy-related costs avoided by the utility ▪ Capacity-related costs avoided by the utility, including generation, transmission, and distribution ▪ Additional resource savings ▪ Monetized non-energy benefits.	▪ Program overhead costs ▪ Program installation costs ▪ Incremental measure costs
SCT (Benefits and cost to all in the utility service territory, state, or nation as a whole).	▪ Energy-related costs avoided by the utility ▪ Capacity-related costs avoided by the utility, including generation, transmission, and distribution ▪ Non-energy benefits.	▪ Program overhead costs ▪ Program installation costs ▪ Incremental measure costs
RIM (Impact of efficiency measure on non-participating ratepayers overall)	▪ Energy-related costs avoided by the utility ▪ Capacity-related costs avoided by the utility, including generation, transmission, and distribution	▪ Program overhead costs ▪ Lost revenue due to reduced energy bills ▪ Utility installation costs

A.3 Economic Inputs for Cost-Effectiveness Analysis

We used the avoided costs provided by OG&E for the cost-effectiveness analysis. We also used the discount rates provided by OG&E to perform the cost-effectiveness analysis, and these values align with the rates used in the Plan.

The evaluated net energy savings and demand reduction values utilized in the cost-effectiveness analysis include a line loss factor of 1.0783 for demand and 1.0693 for energy.

A.4 Results

The following tables outline each test's results for both the programs and the portfolio as a whole.

Table A-4: Cost-Effectiveness Results by Program

Program	TRC	UCT	RIM	PCT	SCT
HEEP	1.90	2.52	0.63	3.60	3.13
WRAP	2.31	2.38	0.76	3.37	3.98
CEEP	1.45	3.81	0.64	2.55	2.22
Energy Education Res	0.00	0.00	0.00	0.00	0.00
Energy Education C&I	0.00	0.00	0.00	0.00	0.00
Planning	0.00	0.00	0.00	0.00	0.00
Regulatory	0.00	0.00	0.00	0.00	0.00
R&D	0.00	0.00	0.00	0.00	0.00
Total	**1.62**	**3.08**	**0.65**	**2.85**	**2.57**

Table A-5: Cost-Effectiveness Benefits by Program

Program	TRC Benefits	UCT Benefits	RIM Benefits	PCT Benefits	SCT Benefits
HEEP	$27,948,104	$27,138,807	$25,786,068	$36,439,597	$45,885,173
WRAP	$13,173,494	$13,564,993	$13,173,494	$16,947,076	$22,723,677
CEEP	$60,731,396	$64,053,308	$60,731,396	$87,045,181	$93,199,267
Energy Education Res	$0	$0	$0	$0	$0
Energy Education C&I	$0	$0	$0	$0	$0
Planning	$0	$0	$0	$0	$0
Regulatory	$0	$0	$0	$0	$0
R&D	$0	$0	$0	$0	$0
Total	**$101,852,994**	**$104,757,108**	**$99,690,958**	**$140,431,854**	**$161,808,117**
Sums may differ due to rounding.					

Table A-6: Cost-Effectiveness Costs by Program

Program	TRC Costs	UCT Costs	RIM Costs	PCT Costs	SCT Costs
HEEP	$14,674,029	$10,777,777	$40,964,483	$10,135,143	$14,674,029
WRAP	$5,706,472	$5,706,472	$17,410,274	$5,032,370	$5,706,472
CEEP	$41,992,207	$16,833,729	$94,868,176	$34,132,828	$41,992,207
Energy Education Res	$223,898	$223,898	$223,898	$0	$223,898
Energy Education C&I	$273,653	$273,653	$273,653	$0	$273,653
Planning	$61,323	$61,323	$61,323	$0	$61,323
Regulatory	$23	$23	$23	$0	$23
R&D	$87,284	$87,284	$87,284	$0	$87,284
Total	**$63,018,888**	**$33,964,158**	**$153,889,113**	**$49,300,341**	**$63,018,888**
Sums may differ due to rounding.					

Table A-7: Cost-Effectiveness Net Benefits by Program

Program	TRC Net Benefits	UCT Net Benefits	RIM Net Benefits	PCT Net Benefits	SCT Net Benefits
HEEP	$13,274,075	$16,361,030	($15,178,415)	$26,304,454	$31,211,143
WRAP	$7,467,022	$7,858,521	($4,236,780)	$11,914,706	$17,017,205
CEEP	$18,739,189	$47,219,579	($34,136,780)	$52,912,353	$51,207,061
Energy Education Res	($223,898)	($223,898)	($223,898)	$0	($223,898)
Energy Education C&I	($273,653)	($273,653)	($273,653)	$0	($273,653)
Planning	($61,323)	($61,323)	($61,323)	$0	($61,323)
Regulatory	($23)	($23)	($23)	$0	($23)
R&D	($87,284)	($87,284)	($87,284)	$0	($87,284)
Total	**$38,834,106**	**$70,792,951**	**($54,198,155)**	**$91,131,513**	**$98,789,229**
Sums may differ due to rounding.					

7.2 Marketing Materials

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July 20, 2020 ·

Have your home weatherized with up to $3,000 of home energy efficiency upgrades – at no additional cost to you! Increase the comfort of your home and lower your costs with the OG&E Weatherization Program. To see if you're eligible or to enroll, visit oge.com/weatherization.

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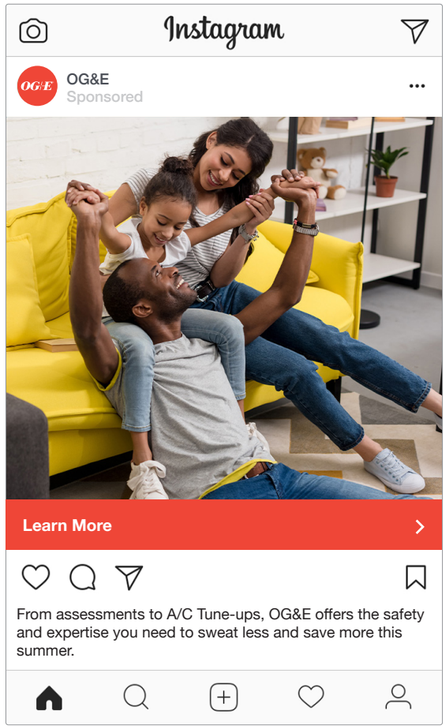

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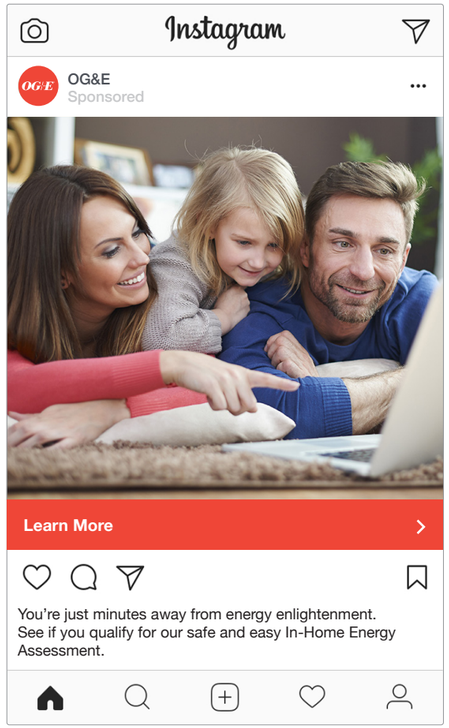

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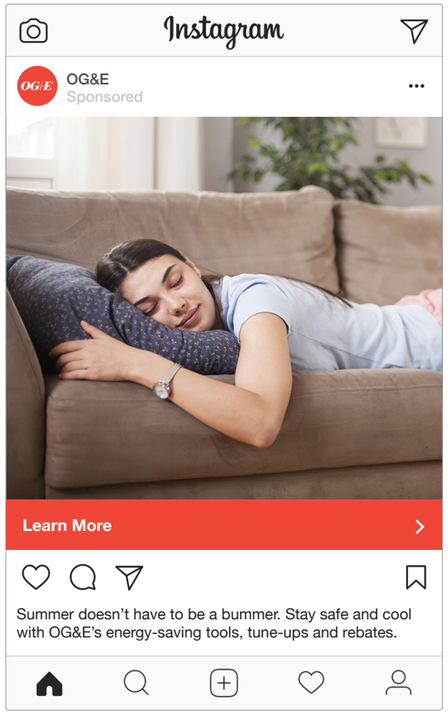

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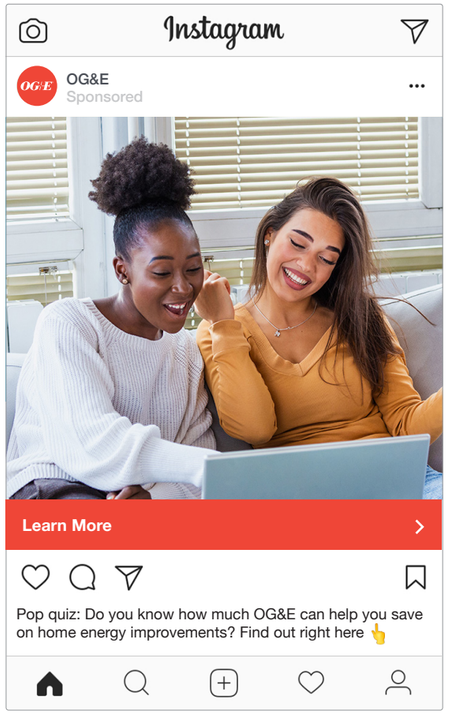

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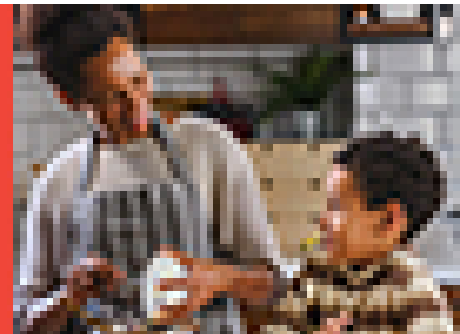

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Get your home ready for summer with a safe, easy and convenient Advanced A/C Tune-up or In-Home Energy Assessment.

Be Cool and Save

No out-of-pocket costs needed

OGE.COM/HEEP

Book Now

20 562 Comments 311 Shares

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FACEBOOK POST 3

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Sweat less and save more this summer with our safe and convenient Advanced A/C Tune-up and In-Home Energy Assessment services.

Stay Safe and Save

Book now and save all summer

OGE.COM/HEEP

Book Now

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FACEBOOK POST 4

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Stay safe and cool this summer with an Advanced A/C Tune-up or In-Home Energy Assessment—no out-of-pocket costs required.

Get Set for Summer

No out-of-pocket costs needed

OGE.COM/HEEP

Book Now

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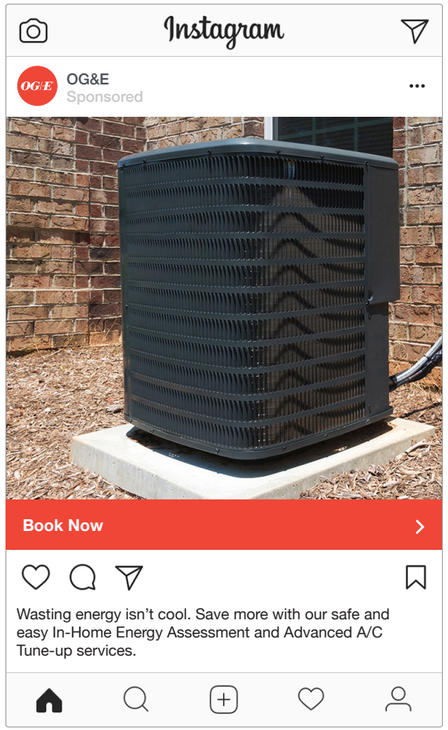
INSTAGRAM POSTS

INSTAGRAM POST 1



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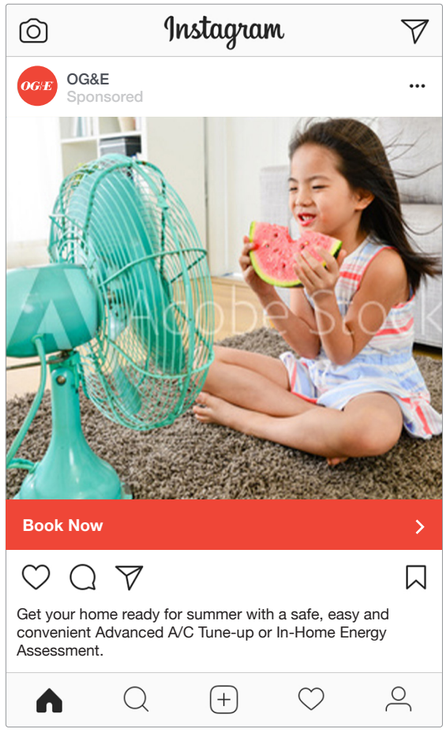

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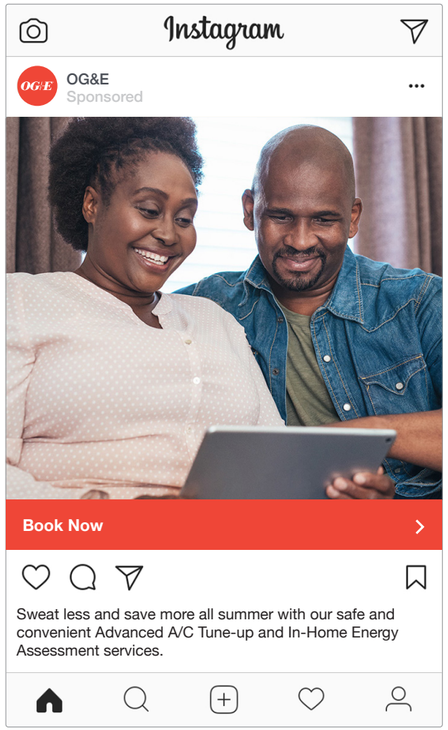
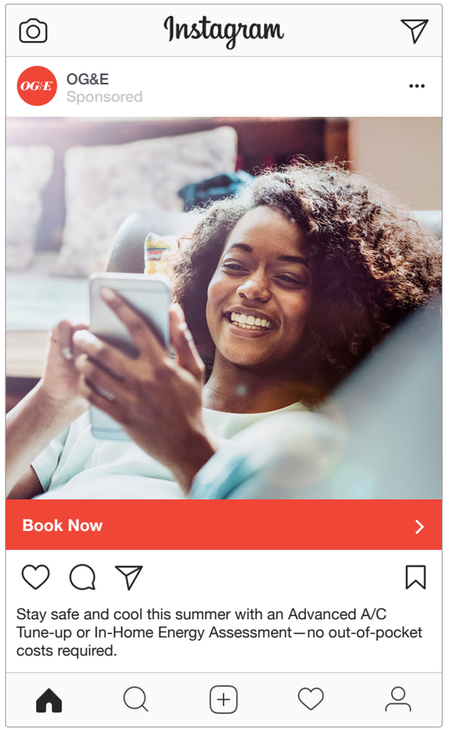


INSTAGRAM POST 4



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POSITIVE ENERGY TOGETHER®

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OG&E

YOUR HOME FOR HOME SAVINGS

A more comfortable, energy-efficient home awaits. Take our 10-question online Home Review to qualify for an In-Home Energy Assessment at no out-of-pocket cost to you.

Start Home Review

We're taking enhanced safety measures, including protective masks, gloves and shoe covers as we deliver your In-Home Energy Assessment, valued at $250.

Your assessment may include:

- An expert walk-through analysis of your home's energy efficiency
- Up to 15 LED bulbs
- Up to two advanced power strips (if needed)
- A custom Home Energy Report with recommended improvements
- Access to professional support and generous rebates

Get started

Or call 1-844-413-3065 for details.

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THE COOLEST WAY TO SAVE

Ready for the coolest summer ever?

Our Advanced A/C Tune-up can lead to lower energy costs, improved cooling performance and longer-lasting equipment—all in one safe and easy appointment. Schedule yours today at no out-of-pocket cost to you.

Schedule Now

Or call 844-882-5746.

About our Advanced A/C Tune-ups:

- In one 90-minute to two-hour appointment, a participating contractor can improve your A/C's efficiency by up to 30 percent.
- Extra precautions will be taken to ensure your safety throughout the appointment.
- Up to one pound of refrigerant will be provided at no out-of-pocket cost.
- Not all HVAC systems qualify. If more refrigerant or repairs are needed, you will be asked before being charged.

Schedule Now

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OGE

LET THE SAVINGS BEGIN

Now that you've completed your eScore™ quiz, it's time to bring home the real savings. Schedule your In-Home Energy Assessment today to get $250 worth of energy-saving products safely installed at no out-of-pocket cost to you.

Getting started is as easy as logging in to your eScore portal.

Schedule Now

Your In-Home Energy Assessment includes:

- An expert walk-through analysis of your home's energy efficiency
- Up to 15 LED bulbs
- Advanced power strips (as needed)
- A custom Home Energy Report with recommended improvements
- Access to professional support and generous rebates
- Enhanced safety measures, including protective masks, gloves and shoe covers

Start Saving

Log in to your eScore profile or call 844-882-5746 to book your assessment today.

POSITIVE ENERGY TOGETHER®

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THESE SAVINGS ARE ALL YOURS.

Whether you rent or own, you have the power to lower your energy costs. Complete a quick online Home Review to qualify for our safe and easy In-Home Energy Assessment, offered at no out-of-pocket cost to you.

Start Home Review

Conducted with your safety in mind, our in-home assessment is valued at $250 and includes:

- An expert walk-through analysis of your home's energy efficiency
- Up to 15 LED bulbs
- Advanced power strips (if needed)
- A custom Home Energy Report with recommended improvements
- Access to professional support and generous rebates
- Enhanced safety measures, including protective masks, gloves and shoe covers

Start Home Review

You may also qualify for $175 toward an A/C Tune-up—the coolest way to improve your A/C's performance, energy efficiency and longevity.

Extra precautions will be taken to ensure your safety throughout the appointment.

Or call 844-882-5746 to get started.

SAVING ENERGY AND MONEY HAS NEVER BEEN EASIER

OG&E brings you a collection of energy- and money-saving programs, at your home or at your business, all at no additional cost to you. Take advantage of the following:

- Residential Solutions Program
- Customer Rebates
- A/C Replacement & Tune-Up
- Consumer Products
- Weatherization
- Positive Energy® Home
- Multi-Family Efficiency Program
- Student Energy Education LivingWise
- Food Bank Program
- A/C Commercial Tune-Up
- Large Commercial & Industrial Solutions
- Small Business Solutions
- Schools & Governments
- Midstream
- Continuous Energy Improvement (CEI)

To learn more about these programs, visit **oge.com** or call customer service at **844-882-5746**.

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To learn more about these programs, visit
oge.com
or call
844-882-5746.

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OKLAHOMA

ENERGY EFFICIENCY PROGRAMS

Offering a variety of products and services to help your home or business save money and energy, year after year.

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COMMERCIAL ENERGY EFFICIENCY PROGRAMS (CEEP)

Energy costs can have a major impact on a business's operating expenses. That's why OG&E's Commercial Energy Efficiency Program offers financial incentives when energy efficiency measures are implemented at commercial facilities. OG&E provides easy energy assessments at no additional cost to customers to help identify and financially qualify potential energy-saving projects that could include little or no-cost solutions.

Energy-saving solutions include:

HVAC Commercial Tune-Up
The HVAC Commercial Tune-Up Program offers an enhanced tune-up to commercial customers. This tune-up provides businesses with a more efficient A/C system while saving money.

Large Commercial & Industrial (C&I) Solutions
The Large C&I Solutions Program equips businesses with energy advisors who can help identify energy-saving opportunities that will lower energy costs. A business can also receive incentives based on the energy saved by upgrades to lighting, lighting controls, building automation, HVAC equipment, chillers, ground source heat pumps, motors, air compressors, retro-commissioning lite (RCx Lite), and other new construction and retrofit projects.

Continuous Energy Improvement (CEI) Program
Under the CEI program, OG&E offers incentives for qualified commercial, industrial and school customers who partner with OG&E's consultants to help them identify and implement no/low-cost energy-saving changes.

Midstream
The Midstream Program provides commercial customers with instant rebates off the sale price of various LED lightbulbs or fixtures. Simply visit a participating lighting distributor to take advantage of the generous savings.

Small Business Solutions (SBDI)
SBDI offers facility walk-throughs and enhanced financial incentives to qualified small businesses that implement energy efficiency lighting measures. In some cases, the incentives in this program will provide 90 percent of the upgrade cost. All for no additional cost to the Small Business customer.

Schools and Governments (SAGE)
The Schools and Government Efficiency Program (SAGE) can provide incentives for LED lighting, HVAC upgrades and a select number of custom measure improvements. The program also performs facility walk-through audits to suggest energy-efficient updates.

HOME ENERGY EFFICIENCY PROGRAMS (HEEP)

Saving energy is easier than ever. OG&E's vast lineup of easy energy-saving opportunities will help homeowners lower their energy bills while increasing comfort, safety and efficiency. With so many ways to save with rebates and no out-of-pocket cost programs, you don't want to miss out.

Energy-saving solutions include:

Residential Solutions Program
OG&E's Residential Solutions Program provides quick and easy ways to save energy and money. The first step is OG&E's online eScore™ tool which provides personalized, step-by-step solutions to lower your energy costs and make your home more comfortable. Take your review today and schedule an assessment. Next is a walk-through home energy assessment from an energy advisor who will provide energy-saving value to your home worth up to $250. Take yours today and schedule an assessment or visit **oge.com/heep** to learn more.

Multi-Family Efficiency Program
OG&E's Multi-Family Efficiency Program provides various energy-saving upgrades for residential apartments and other multi-family dwellings. Upgrades are installed by OG&E's trade allies.

Customer Rebates
For homeowners looking to maximize their energy use and reduce electrical costs, OG&E offers money-saving rebates on select **ENERGY STAR® certified** door replacement, **ENERGY STAR certified** window replacement, **ENERGY STAR certified** pool pumps and attic insulation.

HVAC Replacement & Tune-Up
OG&E's A/C Replacement & Tune-Up Program offers enhanced A/C tune-ups performed by trained HVAC trade allies using proven energy-saving techniques. A tune-up can boost your A/C unit's efficiency by up to 30 percent, plus help you enjoy longer-lasting, better-working equipment, greater energy efficiency, and improved comfort and humidity control. This program also allows customers to receive instant rebates for upgrading older units with new high-efficiency units from participating trade allies.

Consumer Products
This component allows residential customers in OG&E's territory to receive instant in-store discounts from major retailers on energy-efficient products. Look for special pricing from OG&E at your local retailers.

Weatherization Program
So that everyone can enjoy energy efficiency, OG&E's Weatherization Program provides home energy efficiency upgrades for eligible customers who own or rent (landlord approval required) a single-family home, duplex or mobile home and have an annual income of $60,000 or less. This program is designed to reduce energy use, lower energy costs, increase comfort and safeguard occupants' health. Call **1-800-272-9741** to learn more.

Positive Energy Home
You only get one chance to build a home right the first time. That's why OG&E's Positive Energy® Home Program offers a high standard of energy efficiency and comfort through strict construction requirements. This program is the best option for a new home.

Student Energy Education Livingwise
The LivingWise Program provides residential energy and water efficiency education. These educational kits will be provided to fifth-grade students in OG&E's service territory. The program's proven school-based format includes take-home LivingWise Kits of energy measures coupled with creative classroom and in-home education techniques to create awareness for families to adopt new resource habits.

Food Bank Program
Understanding that every little bit of savings helps those who need it most, OG&E has partnered with Oklahoma food banks to distribute energy-efficient LEDs and educational materials to qualifying OG&E customers.

EVERY SEASON IS SAVINGS SEASON.

POSITIVE ENERGY TOGETHER®

OG&E®

Our Weatherization Program provides energy-saving upgrades to help keep your home comfy and efficient all year long—all at **no out-of-pocket cost** to you.

Available upgrades:

- Attic insulation
- Air sealing
- Duct sealing
- Window caulking
- Door weatherstripping
- LED bulbs

START SAVING.

Call **405-272-9741** (OKC Metro) or **800-272-9741** (all other areas), or visit **oge.com/weatherization**.

Customers must have a household income less than $60,000 to be eligible. Customers must live in or rent a single-family home or duplex. Rental properties are eligible for the services with the approval of the landlord.

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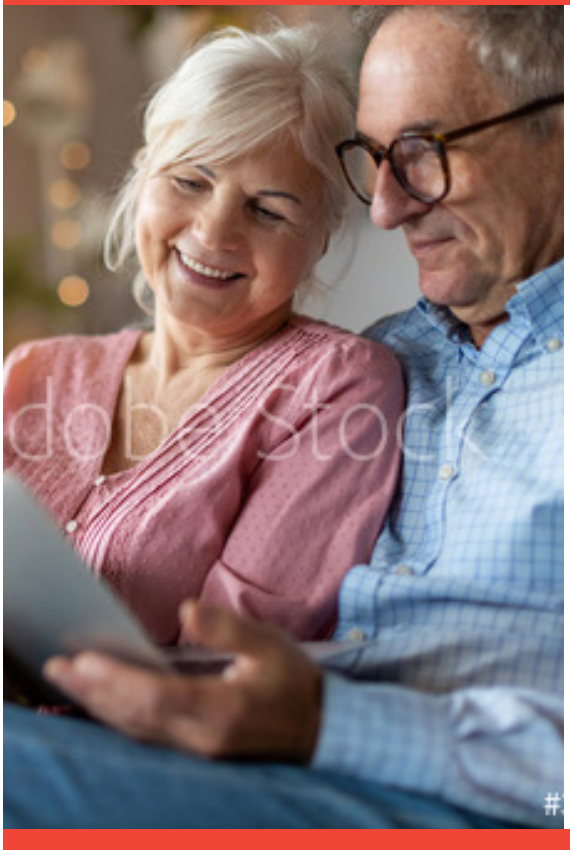

UNLEASH YOUR SAVINGS POTENTIAL.

Complete your online home review to see if you qualify for an In-Home Energy Assessment at **no out-of-pocket cost** to you. You could receive:

- An expert walk-through analysis of your home's energy use
- Up to 15 LED bulbs
- Up to 2 Advanced power strips (as needed)
- A custom Home Energy Report with recommended improvements

For another cool way to save, schedule an Advanced A/C Tune-up to boost your A/C unit's energy efficiency by up to 30 percent.

START SAVING.

Discover even more ways to save at **oge.com/heep**, or call us at **844-882-5746**.

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Available incentives

Planning an energy efficiency project? Get with the program. Our Small Business Efficiency Program offers incentives that can cover up to 90 percent of the cost of a project.

Incentive rates:

- $0.15/peak kWh reduced on all eligible measures but door gaskets
- $0.12/peak kWh reduced on refrigerator door gaskets

Eligible projects

Incentives are available for a wide variety of energy efficiency projects, including:

- LED lighting upgrades* (tube lights, bulbs, fixtures)
- Occupancy sensor installations
- LED exit sign retrofits
- Refrigerator door gaskets
- Refrigerator anti-sweat heater controls
- And more!

**LED retrofits must be either DesignLights Consortium™ approved or ENERGY STAR® certified to receive incentives.*

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Take control of your energy use—and your bottom line.

A POSITIVE ENERGY FUTURE
BUSINESS SUCCESS
OG&E EFFICIENCY PARTNER

To get started, contact a program representative by email at

oge.ok.sbdi@clearesult.com

OR CALL

405-437-4350

Products and services are provided solely by approved participating Service Providers. OG&E does not sell goods or services in its energy efficiency programs.

Big savings for your small business

OG&E offers energy-efficient solutions for small business customers.

SMALL BUSINESS EFFICIENCY PROGRAM

OKLAHOMA

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Program benefits

We'll provide everything you need to help your business achieve long-term energy savings, including:

- A no-out of pocket cost, no-obligation lighting assessment to identify energy-saving opportunities
- Recommendations and estimates for energy savings, project costs and payback periods
- Installation of approved energy-saving equipment by a local, pre-qualified contractor
- Incentives paid directly to the contractor by the program to reduce your upfront cost

It's with programs like this that OG&E is able to keep rates among the lowest in the country.

Eligibility

The program is open to any small commercial customers with a valid OG&E account meter and no more than 150 kW peak demand at any one facility.

Get started today

1. Visit oge.com/business to select a participating contractor.
2. Contact the contractor you selected and provide your customer account number to verify your eligibility.
3. The participating contractor will provide a no-cost walk-through assessment of your facility.
4. Review your energy-saving proposal and sign the customer proposal to approve the recommended measures.
5. The participating contractor will install the approved measures within 60 days of receiving the signed agreement.

Typical project scenario

To give you an idea of the potential savings available through the program, below is an example of some commonly proposed retrofits. The projected savings and costs for these retrofits are on the right.

EXISTING INTERIOR LIGHTING:

32 4 ft. 4-lamp fluorescent fixtures
16 60W incandescent bulbs
2 exit signs

INTERIOR LIGHTING RETROFIT:

32 4 ft. 36W LED fixtures
16 10W LEDs
2 LED exit signs

Incentives, actual savings and payback periods vary depending on the equipment installed, building characteristics, energy-use patterns, age of existing equipment, location and other parameters specific to the project.

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Example project by the numbers

20,671 kWh
total energy savings

2.96 kW
total peak demand savings

$3,101
estimated incentives

$1,611
net cost to customer

$4,712
estimated project cost

9.35 months
project payback

$2,067
estimated annual savings

HOME **ENERGY EFFICIENCY PROGRAM**

OG&E

Higher efficiency, lower costs

At OG&E, our goal is to help customers save energy and live more comfortably.

That's why our Home Energy Efficiency Program provides energy-saving tools, programs and incentives to all our neighbors across Oklahoma. From attic to basement, we'll help you discover which upgrades work best for your home and budget—and be there to help you every step of the way.

BRING HOME **EASY SAVINGS**

Lowering your energy consumption is now easier than ever—and it all starts with our simple-to-use online eScore™ tool. With just a few questions, eScore identifies trouble spots in your home and provides customized tips on how to improve your comfort and lower your energy costs.

Get started on the path toward a more comfortable, energy-efficient home at **oge.com/escore**.

YOUR ENERGY EFFICIENCY **TOOLBOX**

Complete your online eScore profile to see if your home could benefit from our In-Home Assessment. Valued at $250, the assessment includes all the following with no out-of-pocket costs required:

- An expert walkthrough analysis of your home's energy efficiency
- Up to 15 LED bulbs
- Advanced power strips (up to two as needed)
- A custom Home Energy Report with recommended improvements
- Access to additional services, incentives and offerings to help you manage energy costs

TUNE UP YOUR **ENERGY COSTS**

A cooler, more efficient summer starts with an OG&E A/C Tune-up.

Schedule yours today to boost your A/C unit's efficiency by up to 30 percent. Valued at $175, the tune-up requires no out-of-pocket costs from qualifying customers.*

Benefits:

- Longer-lasting, better-working equipment
- Great energy efficiency
- Improved comfort and humidity control
- Access to incentives for a high-efficiency replacement, if needed

*Additional charges may apply.

SPECIAL PRICING
from OG&E on select ENERGY STAR® certified products.
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EVEN MORE **WAYS TO SAVE**

Want to become a more energy-conscious consumer? OG&E rebates and incentives let you pay less for the technology that saves you more**.

Attic Insulation
Depending on your current insulation level, you could qualify for up to $500 toward attic insulation improvements.

Windows
We offer a $50 rebate for each professionally installed ENERGY STAR® certified window (limit 7).

Doors
Get $100 back for each sliding or French door you replace with an ENERGY STAR certified model (limit 2).

Pool Pumps
ENERGY STAR certified multi-speed (≥ 1 horsepower) and variable-speed (≥ 0.5 hp) pool pumps qualify for a $300 rebate.

Instant Incentives
Look for "Special Pricing from OG&E" signs at your local retailer for special deals on energy-efficient products.

**Incentive funds are limited. Please call 844-882-5746 to confirm fund availability and schedule work.

For more ways OG&E can help you manage your energy costs, visit oge.com/escore or contact us at 844-882-5746.

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Mayor eficiencia, menores costos

En OG&E, nos esforzamos en ayudar a los clientes a ahorrar energía y vivir más cómodamente.

Es por eso que nuestro Programa de Energía Eficiente del Hogar proporciona herramientas, programas e incentivos de ahorros de energía a todos nuestros vecinos en Oklahoma. Desde el ático hasta el sótano, le ayudaremos a descubrir las mejores actualizaciones para su hogar y su presupuesto, y estaremos ahí para ayudarlo en cada paso a través del camino.

IMPLEMENTE AHORROS FÁCILES EN CASA

Reducir su consumo de energía es ahora más fácil que nunca, y todo comienza con nuestra fácil de usar herramienta eScore™ en línea. Con solo algunas preguntas, eScore identifica las áreas problemáticas en su hogar y ofrece consejos personalizados sobre cómo aumentar su comodidad y reducir sus costos de energía.

Dé el primer paso en su camino hacia un hogar más cómodo y de eficiencia energética en **oge.com/escore**.

SU CAJA DE HERRAMIENTAS DE ENERGÍA EFICIENTE

Complete su perfil de eScore en línea para ver si su hogar podría beneficiarse de nuestra Evaluación En Casa. Con un valor de $250, esta evaluación incluye todo lo siguiente sin requerir costos de su bolsillo:

- Un recorrido por un experto con análisis de la eficiencia energética de su hogar
- Hasta 15 bombillas LED
- Regletas avanzadas (hasta dos según necesario)
- Un Reporte de Energía del Hogar personalizado, con mejoras recomendadas
- Acceso a servicios, incentivos y ofertas adicionales para ayudarle a manejar los costos de energía

AJUSTE SUS COSTOS DE ENERGÍA

Un verano más fresco y eficiente comienza con un Ajuste de Aire Acondicionado de OG&E.

Programe el suyo hoy para mejorar la eficiencia de su unidad de aire acondicionado por hasta 30 por ciento. Con un valor de $175, este ajuste no requiere pagos de su bolsillo por clientes que califiquen.*

Beneficios:

- Equipo más duradero que funciona mejor
- Eficiencia superior de energía
- Mayor comodidad y control de humedad
- Acceso a incentivos para un reemplazo de alta eficiencia, si es necesario

*Pueden aplicar cargos adicionales.

INCENTIVOS AL INSTANTE

Busque los rótulos de "Precios Especiales de OG&E" en su minorista local para ofertas especiales en productos de eficiencia energética.

PRECIOS ESPECIALES
de OG&E para productos selectos certificados por ENERGY STAR®

OG&E
OGE.COM

MÁS MANERAS DE AHORRAR

¿Quiere ser un consumidor más consciente del consumo de energía? Los reembolsos e incentivos de OG&E le permiten pagar menos por tecnología que le ahorra más.**

Aislamiento del ático
Dependiendo de su nivel actual de aislamiento, usted puede calificar para hasta $500 hacia mejoras del aislamiento del ático.

Ventanas
Ofrecemos un reembolso de $50 por cada ventana certificada por ENERGY STAR® instalada por un profesional (límite de 7).

Puertas
Reciba una devolución de $100 por cada puerta corrediza o francesa que reemplace con un modelo certificado por ENERGY STAR (límite de 2).

Bombas de piscina
Las bombas de piscina certificadas por ENERGY STAR de múltiples velocidades (≥ 1 caballo de potencia) y de velocidad variable (≥ 0.5 caballos de potencia) son elegibles para un reembolso de $300.

Incentivos al instante
Busque los rótulos de "Precios Especiales de OG&E" en su minorista local para ofertas especiales en productos de eficiencia energética.

**Los fondos para incentivos son limitados. Llame al 844-822-5746 para confirmar la disponibilidad de fondos y para programar el trabajo.

Para otras maneras en que OG&E le puede ayudar a manejar sus costos de energía, visite oge.com/arheep o llámenos al 844-413-3065.

ENERGÍA POSITIVA JUNTOS®

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LOWER ***YOUR COSTS,*** *INCREASE* ***YOUR COMFORT***

OG&E®

We Energize Life

OKLAHOMA

Increase the comfort of your home and make your energy bill more manageable at no additional cost with the OG&E Weatherization Program.

Our trained crews have worked to improve the homes of more than 50,000 customers over the years and they're not stopping now! Valued at approximately $2,500, the OG&E Weatherization Program covers a wide range of improvements that may include but are not limited to:

- Adding insulation to the attic
- Duct sealing
- Caulking windows to eliminate air leakage and drafts
- Weatherstripping around doors
- Installing energy-saving LED light bulbs
- Sealing air leaks throughout the home
- Other thermal improvements

This program is available to eligible OG&E Oklahoma residential customers who meet the following criteria:

- Household income of $60,000 or less a year
- Own or rent* a single-family home, duplex or mobile home

Spots are limited so if you or someone you know could benefit from home weatherization improvements at no additional cost, don't wait!

Visit **oge.com/weatherization** to see if you're eligible and to enroll in OG&E's Weatherization Program. You can also contact our call center at 800-272-9741 from 8 a.m. to 5 p.m., Monday through Friday.

*Landlord approval required

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OG&E® WEATHERIZATION PROGRAM

*REDUZCA SUS **COSTOS**, AUMENTE SU **COMODIDAD***

OG&E®
Energía para la Vida

OKLAHOMA

Aumente la comodidad de su hogar y tenga un mayor manejo de su factura de energía sin ningún costo adicional con el Programa de Climatización de OG&E.

Nuestro personal capacitado ha trabajado para mejorar los hogares de más de 50,000 clientes a través de los años, ¡y no piensan detenerse ahora! Con un valor aproximado de $2,500, el Programa de Climatización de OG&E cubre una amplia variedad de mejoras, las cuales pueden incluir, pero no limitarse a:

- Añadir aislamiento al ático
- Sellado de ductos
- Sellado de ventanas para eliminar fugas y corrientes de aire
- Colocación de burletes (cintas protectoras) alrededor de las puertas
- Instalación de focos LED ahorradores de energía
- Sellado de fugas de aire a través del hogar
- Otras mejoras térmicas

Este programa está disponible para los clientes residenciales de OG&E en Oklahoma quienes cumplan con los siguientes requisitos*:

- Ingreso familiar de $60,000 o menos al año
- Ser propietario o rentar* una casa unifamiliar, dúplex o casa móvil

La disponibilidad es limitada, por lo que si usted o alguien que conoce puede beneficiarse de mejoras de climatización del hogar sin costo adicional, ¡no espere más!

Visite **oge.com/weatherization** para ver si usted es elegible y para inscribirse en el Programa de Climatización de OG&E. También puede contactar a nuestro Centro de Atención al Cliente llamando al 800-272-9741 de 8 a.m. a 5 p.m., de Lunes a Viernes.

* Se requiere la aprobación del propietario

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OG&E® PROGRAMA DE CLIMATIZACIÓN

OG&E CURRENTS

BRIGHT IDEAS ON ENERGY USE NOV 2020

Three good reasons to go paperless

Be an environmental steward

It saves trees. Less paper, more trees. It's that simple. It's also less greenhouse gases, less wastewater to produce paper and less gas to mail payments. By choosing to go paperless, you are creating a smaller carbon footprint, which helps protect our environment.

Safe, secure & convenient

With OG&E Paperless Billing, your bill is emailed directly to your inbox instead of your mailbox. Pay it then and there with no additional cost to you and with your preferred payment method, too. And your information is mobile – take it anywhere.

Save together

You'll save time, storage space and money! OG&E saves money, too, since there's no paper, printing or mailing, which helps *keep your bills below the national average.*

SIGN UP online at **oge.com** or by calling customer service at **800-272-9741**.

OG&E We Energize Life

Every year, OG&E raises money for United Way and its partner agencies across our service area, both in Oklahoma and Arkansas.
TOGETHER, WE ARE MAKING COMMUNITIES BRIGHTER.

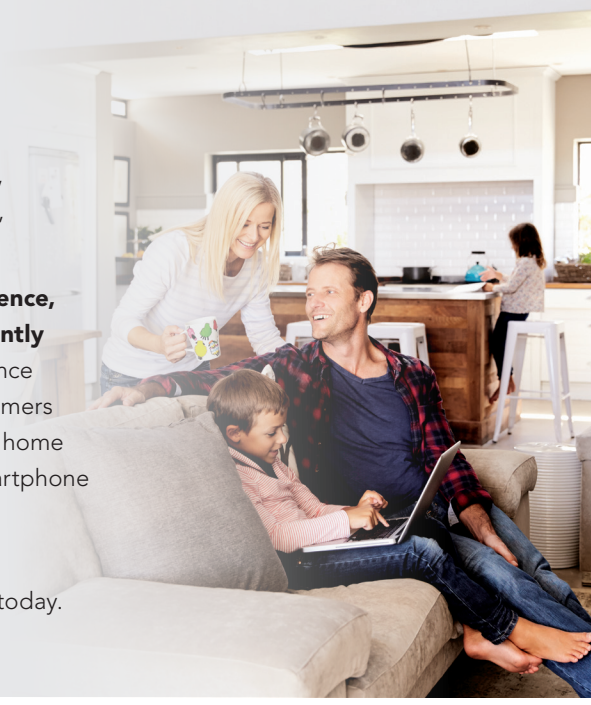
HOLIDAY LIGHTS IN **DOWNTOWN OKC**

Experience OKC's must-see Holiday Lights at the Myriad Gardens beginning **November 25 – January 4**. Take in the beautiful views along a safely distanced stroll through a lit-up wonderland right in the heart of the city.

For more information, visit **oklahomacitybotanicalgardens.com**.

We wish you a Merry & Bright holiday season!

SAVINGS TO BE DISCOVERED



See where you could be saving with our **In-Home Energy Assessment**. Valued at $250, but at no additional cost to you, this assessment includes:

- An expert analysis of your home's energy use
- Up to 15 LED bulbs
- Advanced power strips (as needed)
- A custom Home Energy Report with recommended improvements
- Enhanced safety measures, including protective masks, gloves and shoe covers

For your safety and convenience, this assessment is also currently offered virtually. With guidance from an OG&E assessor, customers perform a walk-through of the home via live video chat on their smartphone or tablet.

Visit **oge.com/heep** or call **844-882-5746** to get started today.

HOLIDAY **SAFETY**

We want you to have a safe and happy holiday season. Below are a few safety tips to follow when decorating your home this year:

- Use only indoor and outdoor lights that have the UL (safety approved) label.
- Inspect lights before putting them up. It's time to buy new lights if the strands are frayed, cracked or broken.
- Don't overload outlets or extension cords.
- Keep all decorations a safe distance from heat sources such as space heaters and fireplaces.
- Unplug lights before leaving home or going to sleep.
- Keep outlets covered and breakable decorations out of reach of children.

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GIVE YOUR HOME SOME EXTRA LOVE.

POSITIVE ENERGY TOGETHER®

With no out-of-pocket cost required, an In-Home Energy Assessment just might be the smartest way to save this year.

Valued at over $250, your assessment includes:

- An expert walk-through analysis of your home's energy use
- Up to 15 LED bulbs
- Advanced power strips (as needed)
- A custom Home Energy Report with recommended improvements

Call **844-882-5746** or visit **oge.com/escore** to schedule your assessment today.

OG&E®

WE'RE HERE TO HELP YOU SAVE ENERGY.

POSITIVE ENERGY TOGETHER®

OG&E®

Simply put, our goal is to help customers like you save energy.

From our eScore™ energy management tool to electric vehicle initiatives, we offer a variety of programs, technology and incentives to help manage your energy use and costs.

See them all at **oge.com**.

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GIVE YOUR HOME SOME EXTRA LOVE.

POSITIVE ENERGY TOGETHER®

With no out-of-pocket cost required, an In-Home Energy Assessment just might be the smartest way to save this summer.

Conducted with your safety in mind, our in-home assessment is valued at $250 and includes:

- An expert walk-through analysis of your home's energy use
- Up to 15 LED bulbs
- Advanced power strips (as needed)
- A custom Home Energy Report with recommended improvements
- Enhanced safety measures including safety mask, gloves and shoe covers

Call **844-882-5746** or visit **oge.com/escore** to schedule your assessment today.

OG&E®

LivingWise® Program Contents

Each program includes the following materials:

Student Materials

- *Student Guide*
- *Student Workbook*
- *LivingWise Kit (shown below)*
- *Parent Letter/Pledge Form*
- *Student Survey Form*
- *Certificate of Achievement*
- *Unlimited Website Access*
- *Toll-Free HELP Line*
- *"OG&E" Wristband*

Teacher Materials

- *Teacher Book*
- *Step-by-Step Program Checklist*
- *Five-day Teaching Unit Plan*
- *State Education Standard Correlation Chart*
- *Electricity, Water and Natural Gas Posters for classroom*
- *Teacher Survey Form*
- *Unlimited Website Access*
- *Toll-Free HELP line*
- *Self-Addressed Postage-Paid Envelope*

LivingWise Kit*

- *High-Efficiency Showerhead*
- *Two LED Light Bulbs*
- *Kitchen Faucet Aerator*
- *Bathroom Faucet Aerator*
- *Digital Thermometer*
- *LED Night Light*
- *Flow Rate Test Bag*
- *Parent/Guardian Program Evaluation*
- *Quick Start Guide*
- *Installation Instruction Booklet*
- *Spanish Translated Materials*

*Actual kit items may vary.

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Hurry and enroll today - spots are filling up fast!

We know you are busy so we've made enrolling a snap. Choose the ONE option that works best for you!

- **Fax this completed form to 1-800-544-8051**
- **Call toll free 1-888-438-9473**
- **Email the information requested below to info@getwise.org**
- **Enroll online at www.getwise.org/enroll**

LIVINGWISE®
PROGRAM

A SPECIAL $50.00 MINI GRANT FOR YOUR CLASSROOM

$50.00

when 80% of the completed Surveys are submitted by February 1, 2021

YES! Please enroll me in the FREE LivingWise® Program!
I have verified that the contact information below is correct.

Contact Name:_____

School Name:_____

City:_____ State:_____ Zip Code:_____

School Phone:_____ Fax:_____

Email:_____

Phone (alternative):_____ Grade Level: 5th

What month would you like to use the materials? (Circle one)

# of students:_____ **Sept** **Oct** **Nov** **Dec**

I would like to be contacted via : (circle all that apply)

School phone Alternative phone Fax Email

Please enroll the following additional teachers to participate in the FREE Program. These teachers will also receive a $50.00 Mini Grant once they have submitted at least 80% of the completed classroom Surveys by February 1, 2021.

Name_____ # of Students_____

Name_____ # of Students_____

Name_____ # of Students_____

Three reasons to enroll your classroom in LivingWise today!

1. Each student receives a **FREE** LivingWise kit that contains educational materials and water efficient products that can be installed in the students' homes! For your convenience we have enclosed a flier that describes the products.

2. Each participating teacher will receive a $50.00 Mini Grant when returning 80% of their students' completed Surveys by February 1, 2021.

3. Each teacher receives a **FREE** LivingWise® kit to take home and use too!

SUPPORTS STATE ACADEMIC STANDARDS

How do Teachers Benefit?

- NOTHING TO ADD - the program is meant as an enhancement to your current curriculum.
- The rigorous curriculum provided by this program adheres to the academic standards set for: ELA, Math, Next Generation Science, Technology, and College and Career Readiness.
- Program comes complete with a teacher manual and FREE LivingWise kits for each student.
- Implementation time is minimal and the time frame is flexible – you set the pace!
- Encourages PARENTS to be directly involved in their child's education.
- Teaches students how they can help their FAMILIES save electricity, natural gas, and water.
- The FREE kits and exciting projects engage students, making learning more fun!
- Builds partnerships with the community and creates support for schools.

P: 1-888-438-9473
F: 1-800-544-8051
www.getwise.org/enroll

LIVINGWISE®
PROGRAM

OGE®

POSITIVE ENERGY TOGETHER®
www.oge.com

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DON'T LET TIME RUN OUT

Simply return 80% of your completed surveys by February 1, 2021, and you'll receive a **$50.00** Mini Grant for your classroom!

And don't forget to give a wristband reward to your students when they return their completed surveys to you!

Offer open only to teachers participating in the program. Certain restrictions may apply. Good while supplies last. Offer ends February 1, 2021. 80% return rate of completed participant survey forms required for eligibility. For more information call 1-888-GET-WISE or contact us online at www.getwise.org.

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OKLAHOMA ACADEMIC STANDARDS*
GRADE 5

LANGUAGE ARTS	
1: SPEAKING AND LISTENING - STUDENTS WILL SPEAK AND LISTEN IN A VARIETY OF SITUATIONS INCLUDING READING/WRITING.	
Reading-Students will develop and apply effective communication skills through speaking and active listening.	
5.1.R.2	Students will ask and answer questions to seek help, get information, or clarify about information presented orally through text or other media to confirm understanding.
5.1.R.3	Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.
2: READING AND WRITING PROCESS - STUDENTS WILL USE A VARIETY OF RECURSIVE READING AND WRITING PROCESSES.	
Reading-Students will read and comprehend increasingly complex literary and informational texts.	
5.2.R.2	Students will compare and contrast details in literary and nonfiction/informational texts to distinguish genres.
5.2.R.3	Students will begin to paraphrase main ideas with supporting details in a text.
3: CRITICAL READING AND WRITING - STUDENTS WILL APPLY CRITICAL THINKING SKILLS TO READING AND WRITING.	
Reading-Students will comprehend, interpret, evaluate, and respond to a variety of complex texts of all literary and informational genres from a variety of historical, cultural, ethnic, and global perspectives.	
5.3.R.1	Students will determine an author's stated or implied purpose and draw conclusions to evaluate how well the author's purpose was achieved.
5.3.R.2	Students will determine the point of view and describe how it affects grade-level literary and/or informational text.
5.3.R.5	Students will distinguish fact from opinion in non-fiction text and investigate facts.
5.3.R.6	Students will distinguish the structures of texts and content by making inferences about texts and use textual evidence to support understanding.
5.3.R.7	Students will compare and contrast texts and ideas within and between texts.
Writing-Students will write for varied purposes and audiences in all modes.	
5.3.W.3	Students will clearly state an opinion supported with facts and details.

**State Academic Standards derived from multiple, independent sources exhibit the most current information available to date.*

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OKLAHOMA ACADEMIC STANDARDS*
GRADE 5

LANGUAGE ARTS	
4: VOCABULARY - STUDENTS WILL EXPAND THEIR WORKING VOCABULARIES TO EFFECTIVELY COMMUNICATE AND UNDERSTAND TEXTS.	
Reading-Students will expand academic, grade-level vocabularies through reading, word study, and discussion.	
5.4.R.1	Students will increase knowledge of academic, domain-appropriate, grade-level vocabulary to infer meaning of grade-level text.
5.4.R.2	Students will use word parts (e.g., affixes, Greek and Latin roots, stems) to define new words and determine the meaning of new words.
5.4.R.3	Students will use context clues to determine or clarify the meaning of words or distinguish among multiple-meaning words.
5.4.R.5	Students will use a dictionary, glossary, or a thesaurus to determine or clarify the meanings, syllabication, pronunciation, synonyms, and parts of speech of words.
Writing-Students will apply knowledge of vocabularies to communicate by using descriptive, academic, and domain-appropriate abstract and concrete words in their writing.	
5.4.W.1	Students will use domain-appropriate vocabulary to communicate ideas in writing.
5.4.W.2	Students will select appropriate language to create a specific effect according to purpose in writing.
6: RESEARCH-STUDENTS WILL ENGAGE IN INQUIRY TO ACQUIRE, REFINE, AND SHARE KNOWLEDGE.	
Reading-Students will comprehend, evaluate, and synthesize resources to acquire and refine knowledge.	
5.6.R.1	Students will use their own research questions to find information about a specific topic.
5.6.R.3	Students will determine the relevance and reliability of the information gathered.
Writing-Students will summarize and paraphrase, integrate evidence, and cite sources to create reports, projects, papers, texts, and presentations for multiple purposes.	
5.6.W.4	Students will summarize and present information in a report.

**State Academic Standards derived from multiple, independent sources exhibit the most current information available to date.*

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OKLAHOMA ACADEMIC STANDARDS*
GRADE 5

MATHEMATICS	
NUMBER & OPERATIONS	
5.N.1	Divide multi-digit numbers and solve real-world and mathematical problems using arithmetic.
5.N.1.1	Estimate solutions to division problems to assess the reasonableness of results.
5.N.1.2	Divide multi-digit numbers, by one- and two-digit divisors, using efficient procedures, based on knowledge of place value, including standard algorithms.
5.N.1.3	Recognize that quotients can be represented in a variety of ways, including a whole number with a remainder, a fraction or mixed number, or a decimal and consider the context in which a problem is situated to select and interpret the most useful form of the quotient for the solution.
5.N.1.4	Solve real-world and mathematical problems requiring addition, subtraction, multiplication, and division of multi-digit whole numbers. Use various strategies, including the inverse relationships between operations, the use of technology, and the context of the problem to assess the reasonableness of results.
5.N.2	Read, write, represent, and compare fractions and decimals; recognize and write equivalent fractions; convert between fractions and decimals; use fractions and decimals in real-world and mathematical situations.
5.N.2.2	Read and write decimals using place value to describe decimal numbers including fractional numbers as small as thousandths and whole numbers as large as millions.
5.N.2.3	Compare and order fractions and decimals, including mixed numbers and fractions less than one, and locate on a number line.
ALGEBRAIC REASONING & ALGEBRA	
5.A.1	Describe and graph patterns of change created through numerical patterns.
5.A.1.2	Use a rule or table to represent ordered pairs of whole numbers and graph these on a coordinate plane, identifying the origin and axes in relation to the coordinates.
GEOMETRY & MEASUREMENT	
5.GM.2	Understand how the volume of rectangular prisms and surface area of shapes with polygonal faces are determined by the dimensions of the object and that shapes with varying dimensions can have equivalent values of surface area or volume.
5.GM.2.1	Recognize that the volume of rectangular prisms can be determined by the number of cubes (n) and by the product of the dimensions of the prism ($a \times b \times c = n$). Know that rectangular prisms of different dimensions (p, q, and r) can have the same volume if $a \times b \times c = p \times q \times r = n$.
DATA & PROBABILITY	
5.D.1	Display and analyze data to find the range and measures of central tendency (mean, median, and mode).
5.D.1.2	Create and analyze line and double-bar graphs with whole numbers, fractions, and decimals increments.

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OKLAHOMA ACADEMIC STANDARDS*
GRADE 5

SCIENCE	
PHYSICAL SCIENCE	
Matter and Its Interactions	
5-PS1-1	Develop a model to describe that matter is made of particles too small to be seen.
5-PS1-2	Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.
5-PS1-4	Conduct an investigation to determine whether the mixing of two or more substances results in new substances.
Motion and Stability: Forces and Interactions	
5-PS2-1	Support an argument that the gravitational force exerted by the Earth is directed down.
LIFE SCIENCE	
From Molecules to Organisms: Structure and Processes	
5-LS1-1	Support an argument that plants get the materials they need for growth chiefly from air and water.
5-LS2-1	Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
Ecosystems: Interactions, Energy, and Dynamics	
5-LS2-2	Use models to explain factors that upset the stability of local ecosystems.
EARTH AND SPACE SCIENCE	
Earth's Systems	
5-ESS2-1	Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
5-ESS2-2	Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.
Earth and Human Activity	
5-ESS3-1	Obtain and combine information about ways individual communities use science ideas to protect the earth's resources and environment.

**State Academic Standards derived from multiple, independent sources exhibit the most current information available to date.*

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TEACHER SURVEY

Your feedback is greatly appreciated.

Program brought to you by:

OG&E®

Date: _____

School: _____

Teacher name: _____

E-mail: _____

Number of Student Survey Forms returned: _____

Teacher Signature: _____

Please assess the LivingWise® Program by filling out this *Teacher Survey Form*. Upon completion, return this survey, your Student Survey Forms, student thank-you notes, and a letter from you to **Oklahoma Gas & Electric** in the postage-paid return envelope provided.

PLEASE FILL IN THE CIRCLE THAT BEST DESCRIBES YOUR OPINION:

1. Did you install any of the products from your kit?

❍ Yes ❍ No

2. The products in the kit were easy for students to use.

❍ Strongly Agree ❍ Agree ❍ Disagree ❍ Strongly Disagree

3. Did you use the curriculum materials to teach in class?

❍ Yes ❍ No

4. Students indicated that their parents supported the program.

❍ Yes ❍ No

5. Would you conduct this program again?

❍ Yes ❍ No

6. Would you recommend this program to other colleagues?

❍ Yes ❍ No

7. Did you distribute the student surveys to your students?

❍ Yes ❍ No

8. What did students like best about the program? Explain.

9. What did you like best about the program? Explain.

10. What would you change about the program? Explain.

GET YOUR $50.00 MINI GRANT!

Return the following by February 1, 2021

- 80% of Student Survey Forms
- This Survey Form
- Student thank-you notes
- A letter from you

By submitting this survey I hereby waive any fee or other compensation from Franklin Energy for the use of said quotation in any republication, reprint, transcription, electronic medium, or recording of the article containing said quotations.
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OG&E®

WELCOME

Thank you for choosing to participate! The LivingWise Program will help your students and their families learn the importance of natural resources and immediately lower their utility bills. **Oklahoma Gas & Electric** has fully paid for and provided this program for your class.

Program materials are developed by teachers just like you. Materials include:

- **TEACHER MATERIALS.** The *Teacher Book* has been designed to include a Five-day Teaching Unit Plan, chapters, lessons, hands-on classroom activities and teaching ideas.
- **STUDENT MATERIALS.** The *Student Guide* has been redesigned to include easy-to-use chapters and lessons, more visual aids, new charts and graphs, vocabulary exercises, engagement exercises, and "think and apply" discussion topics.
- **PARENT MATERIALS.** The introduction letter to parents and the kit contain information specifically designed to engage parents. Materials reinforce the concepts taught and will effectively help parents become an active participant in their child's education.
- **SUPPORT OF MORE STATE STANDARDS.** The materials support state and academic standards in science and math as well as language arts.

To ensure program success and your eligibility for a Mini Grant, please do the following:

- **HAVE YOUR STUDENTS INSTALL ALL OF THE PRODUCTS IN THE KIT.** Installation of all of the products is essential for learning how to conserve at home. The more products that are installed, the higher probability that the program will be available in future years.
- **IMPLEMENT THE PROGRAM.** Most teachers find that they can implement the program in two weeks or less. Find a time to fully implement the program so that students and their families have the best opportunity to save natural resources and money on the utility bill.
- **RETURN PROGRAM RESULTS.** Make sure that each student completes a Student Survey Form and thank-you note. Return the Survey Forms, thank-you notes, the Teacher Survey Form (located on the reverse side of this letter) and a letter from you in the postage-paid envelope provided.

Questions? Call 1-888-GET-WISE or visit www.getwise.org.

PARENTS

OG/E®
POSITIVE ENERGY TOGETHER®

CONGRATULATIONS!

Your child's class has been selected to participate in the exciting LivingWise Program. The program is designed to teach your child the value of water and energy and help you save money on your utility bills. This program is being provided by **Oklahoma Gas & Electric** at NO COST to you, your child's school or the school district.

The average U.S. household pays at least $2,200 per year in utility bills and can reduce these costs with just a few simple changes. Your child will be given a kit which includes FREE high quality energy and water saving products that utilize the latest efficiency technology. This kit is valued at over $50 and will provide you with the ability to make these changes.

To participate, please do the following:

- Have your child talk to you about the ways they would like to save energy and water and complete the Pledge Form located on the next page.
- Install all of the kit items. You and your child can do most of the activities in less than 15 minutes. If you need additional help installing the kit items, visit www.getwise.org to view installation videos or call 1-888-GET-WISE.
- Work with your child to answer all of the survey questions in the Student Workbook.

The LivingWise Program will be an easy and fun experience for your entire family. Not only will it allow your child the chance to be a leader in your home and community, but also your family will immediately benefit from lower utility bills. Thank you for your participation.

LET'S GET STARTED!

QUESTIONS? • 1-888-GET-WISE • www.getwise.org

2468, 2469

PADRES

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POSITIVE ENERGY TOGETHER®

¡FELICITACIONES!

La clase de su hijo ha sido seleccionada para participar en el fascinante Programa LivingWise. El programa está diseñado para enseñarle a su hijo el valor del agua y de la energía y para ayudarle a usted a ahorrar dinero en sus facturas de servicios públicos. Este programa lo provee **Oklahoma Gas & Electric** SIN COSTO para usted, la escuela de su hijo ni el distrito escolar.

La vivienda promedio estadounidense paga por la mínima $2,200 por año en facturas de servicios públicos y puede reducir estos costos simplemente con algunos cambios sencillos. A su hijo se le dará un kit LivingWise que incluye productos GRATUITOS de alta calidad para el ahorro de agua y energía que utilizan la tecnología de ahorro más moderna. Este kit tiene un valor de más de $50 y le dará a usted la habilidad de implementar estos cambios.

Para participar, por favor haga lo siguiente:

- Haga que su hijo hable con usted sobre las formas en las que le gustaría ahorrar agua y energía y complete el Formulario de Compromiso ubicado en la próxima página.
- Instale todos los artículos del kit. Usted y su hijo pueden hacer la mayoría de las actividades en menos de 15 minutos. Si necesita ayuda adicional con la instalación de los artículos del kit, visite www.getwise.org para ver videos de instalación o llame al 1-888-GET-WISE.
- Trabaje con su hijo para responder todas las preguntas de la encuesta en el Libro de Trabajo del Estudiante.

El Programa LivingWise será una experiencia sencilla y divertida para toda su familia. No sólo le permitirá a su hijo la posibilidad de ser un líder en su hogar y en su comunidad, sino que también su familia se beneficiará inmediatamente por las facturas más bajas de los servicios públicos. Gracias por su participación.

PREGUNTAS? • 1-888-GET-WISE • www.getwise.org

ESTUDIANTES

FORMULARIO DE COMPROMISO

Nombre:	Fecha:
Escuela:	Docente:

Comprometerse a ahorrar energía y agua es un paso importante para conservar nuestros recursos naturales y le ahorrará dinero a su familia en las facturas de servicios públicos. A medida que atraviesa por el Programa, aprenderá por qué es importante ahorrar energía y agua. El Programa le enseñará formas sencillas de ahorrar energía, agua y dinero. Asumir el Compromiso muestra que usted quiere ahorrar más energía y agua para reducir las facturas de los servicios públicos de su familia.

ASUMIR EL COMPROMISO

Le hemos ayudado a escribir su primer compromiso. Todo lo que tiene que hacer para completar el primer compromiso es instalar los artículos de su kit. Ahora, escriba dos compromisos más que describan cómo ahorrará energía y agua en el hogar. Recuerde, un compromiso es una promesa.

1. **Me comprometo** a hacer mi parte instalando todos los artículos de mi kit para ahorrar energía y agua así como para reducir las facturas de servicios públicos de mi familia.
2. _____
3. _____

FIRMAR EL COMPROMISO

He escrito y revisado mis anteriores compromisos y al firmar este formulario, prometo usar la energía y el agua de manera más eficiente en casa.

_____ _____

Firma del Estudiante *Firma del Padre*

Estos kits son posibles gracias a:

OG&E®

Developed by:

FRANKLIN ENERGY

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www.franklinenergy.com • (888) 438-9473
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STUDENTS

PLEDGE FORM

Name:	Date:
School:	Teacher:

Pledging to save energy and water is an important step in conserving our natural resources and will save your family money on utility bills. As you go through the Program, you will learn why it is important to conserve energy and water. The Program will teach you simple ways to save energy, water, and money. Taking the Pledge shows that you want to be more energy and water efficient to reduce your family's utility bills.

TAKE THE PLEDGE

We have helped you out by writing your first pledge. All you have to do to complete the first pledge is install the items from your kit. Now, write two more pledges describing how you will be more energy and water efficient at home. Remember, a pledge is a *promise*.

1. **I pledge** to do my part by installing all of the items in my kit to save energy and water as well as reduce my family's utility bills.
2. _____
3. _____

SIGN THE PLEDGE

I have written and reviewed my pledges above and by signing this form, I promise to use energy and water more efficiently at home.

_____ _____

Student Signature *Parent Signature*

These kits are made possible by:

OG&E®

Developed by:

FRANKLIN ENERGY

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POSITIVE
ENERGY
TOGETHER®

OGE®
OGE.COM

CERTIFICATE OF ACHIEVEMENT

Awarded to

_____

for making a difference in your community
by successfully completing the LivingWise® Program.

Diane Sumner

Diane Sumner, Ed.D., Director of Education

Developed by:

FRANKLIN ENERGY

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7.3 Franklin LivingWise™ Report

OG&E OKLAHOMA LIVINGWISE® PROGRAM

PROGRAM SUMMARY REPORT

2020

SUBMITTED BY:

AM Conservation Group

OG&E Oklahoma LivingWise© Program Summary Report 2020

Made possible by:

OG&E®

We Energize Life

Submitted by:

AM Conservation Group

May 2021

"Students really liked learning ways to conserve resources."

Amanda Williams, Teacher
Byng Elementary School

Table of Contents

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"Students loved getting the box of household items to help save energy + conserve water."

Amanda Stearns, Teacher
Wilson Elementary School

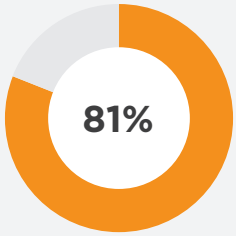
Executive Summary

AM Conservation Group is pleased to present this Program Summary Report to OG&E, which summarizes the 2020 OG&E LivingWise® Program. The program was implemented in the OG&E service area in the state of Oklahoma by 16,425 teachers, students, and their families.

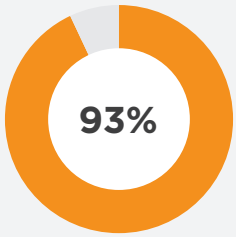
The following pages provide an overview of the program and materials, outline of program implementation, introduction to the program team, description of program enhancements, impact of the program, and summary of results from the home activities. In addition to this information, evaluations, letters, and comments are provided for a glimpse into actual participant feedback. Lastly, projected savings from the individual measures found within the LivingWise Kit are also included.

Participant Satisfaction

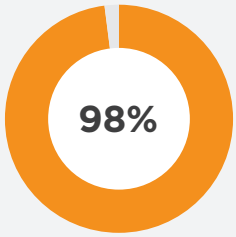
A successful program excites and engages participants. Students, parents, and teachers are asked to evaluate the program and provide personal comments. A sample of the feedback is given in the margin. ›



Teachers who indicated that they installed products from the kit.



Teachers who indicated that the products in the kit were easy for students to use.



Teachers who indicated they would conduct this Program again.

A summary of responses can be found in Appendix D.

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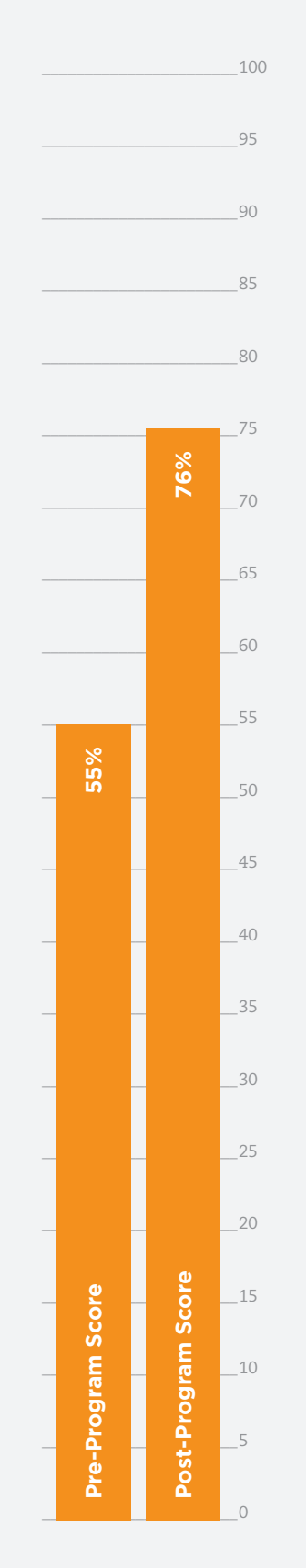


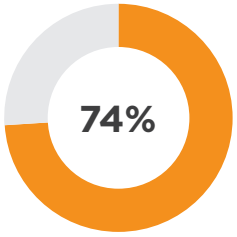
Knowledge Gained

Identical tests were administered to the students prior to the program and again upon program completion to measure knowledge gained. Scores and subject knowledge improved from **55%** to **76%**.

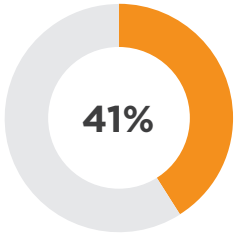
Data Obtained

Home surveys were taken by students and their families, which collected household demographic and consumption data along with program participation information.

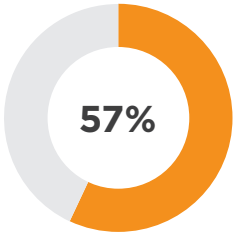
A summary of responses can be found in Appendix B.



Students who reported that their family homes were owned.



Students who reported that their water was heated by electricity.

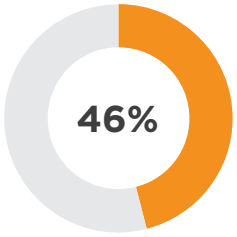


Students who reported that their main source of heating is electricity.

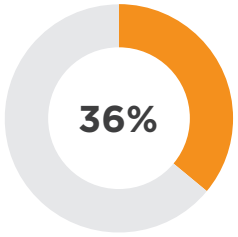
Measures Installed

Students completed take-home activities as part of the program and reported on the kit measures they installed in their homes.

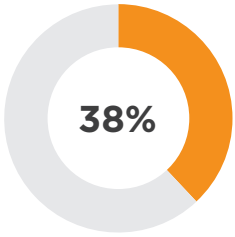
A summary of responses can be found in Appendix B.



Students who reported they installed the High-Efficiency Showerhead.



Students who reported they installed the Bathroom Faucet Aerator.



reported they installed the Kitchen Faucet Aerator.

Energy and Water Savings Results

In addition to educating students and their parents, a primary program goal is to generate cost-effective energy and water savings. Student home surveys not only provided the data used in the savings projections, but also reinforced the learning benefits.

Projected Resource Savings

A list of assumptions and formulas used for these calculations can be found in Appendix A.

PROJECTED ANNUAL SAVINGS	
1,752,383	kWh of electricity saved
201	kW Demand Reduction
28,612,350	gallons of water saved

PROJECTED ANNUAL SAVINGS PER HOME	
106.69	kWh of electricity saved
0.01224	kW Demand Reduction
1,742	gallons of water saved

PROJECTED LIFETIME SAVINGS	
16,468,333	kWh of electricity saved
286,123,500	gallons of water saved

PROJECTED LIFETIME SAVINGS PER HOME	
1,003	kWh of electricity saved
17,420	gallons of water saved

©AM Conservation Group

"AM Conservation Group utilizes an extensive network of educators for program feedback. This feedback ensures that educational components meet the changing needs of educators, keep information relevant to students, and provide increased energy literacy for program participants."

Program Overview

The OG&E LivingWise® Program, a school-based energy efficiency education program, is designed to generate immediate and long-term resource savings by bringing interactive, real-world education home to students and their families. The 2020 program was taught in 5th grade throughout the OG&E service area.

The OG&E LivingWise Program team identifies and enrolls students and teachers within the designated service area. The program physically begins with classroom discussions using a Student Guide that provides the foundations of using energy and water efficiently. It is followed by hands-on, creative, problem-solving activities led by the classroom teacher.

All program materials support state and national academic standards to allow the program to fit easily into a teacher's existing curriculum and requirements. The participating classroom teachers follow the Teacher Book and lesson plan. Information is given to guide lessons throughout the program in order to satisfy each student's individual needs, whether they are visual, auditory, or kinesthetic learners.

The LivingWise Kit and Student Workbook comprise the take-home portion of the program. Students receive a kit containing high-efficiency measures they use to install within their homes. With the help of their parents/guardians, students install the kit measures and complete a home survey. The act of installing and monitoring new energy efficiency devices in their homes allows students to put their learning into practice. Here, participants and their parents/guardians realize actual water and energy savings within their home, benefitting two generations.

A critical element of AM Conservation Group program design is the use of new knowledge through reporting. At the end of the program, the OG&E LivingWise program team tabulates all participant responses—including home survey information, teacher responses, student letters, and parent feedback—and generates this Program Summary Report.

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"For more than 27 years, AM Conservation Group has designed and implemented Measure-Based Education® programs. The programs inspire change in household energy and water use habits while delivering significant and measurable resource savings."

Program Materials

Each participant in the OG&E LivingWise® Program receives classroom materials and energy efficiency kits containing high-efficiency measures to perform the program's take-home activities. Program materials for students, parents/guardians, and teachers are outlined below.

Each Student & Teacher Receives

Student Guide

Student Workbook

Parent Letter/Pledge Form*

Student Survey Form

Certificate of Achievement

LivingWise Kit Containing:

- High-Efficiency Showerhead
- Two LED Light Bulbs
- Kitchen Faucet Aerator
- Bathroom Faucet Aerator
- Digital Thermometer*
- Rumble LED Night Light
- Flow Rate Test Bag
- Illustrated Instruction Booklet
- Quick Start Guide
- Parent/Guardian Program Evaluation

OG&E Wristband

Program Website Access at Getwise.org

Toll-Free HELP Line

Each Teacher/Classroom Receives

Teacher Book

Step-by-Step Program Checklist

Lesson Plans

Oklahoma State and National Academic Standards Chart

Teacher Survey Form

Pre/Post Student Survey Answer Keys

Electricity, Water, and Natural Gas Posters

Self-Addressed Postage-Paid Envelope

** Materials / Installation Instructions provided in English and Spanish*

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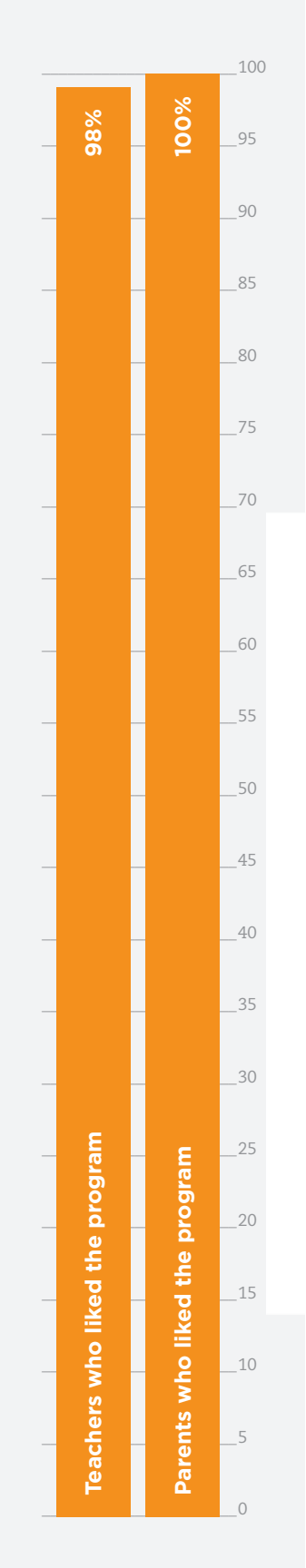
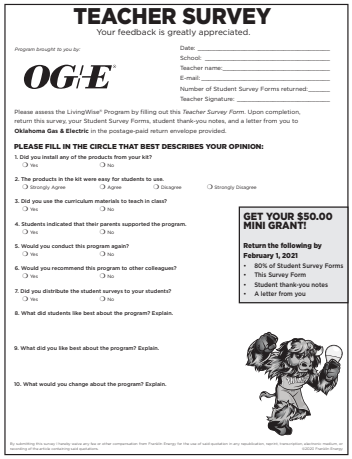


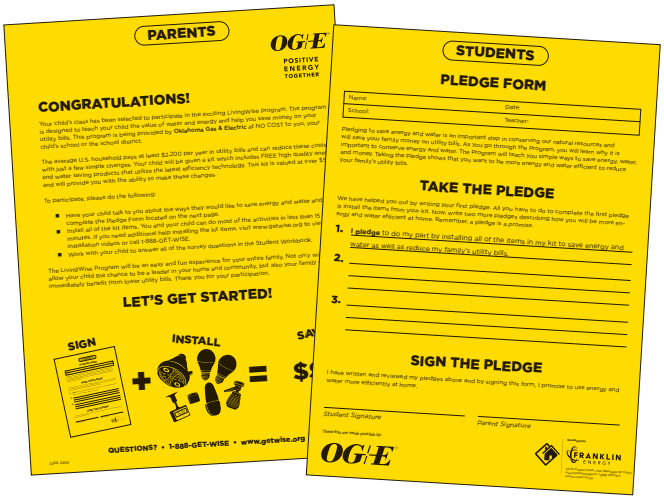
Custom Branding

In addition to the kit, the Teacher Survey Form and Parent Letter/ Pledge Form, Student Guide, Student Workbook, Teacher Book, and Certificate of Achievement also feature OG&E branding.

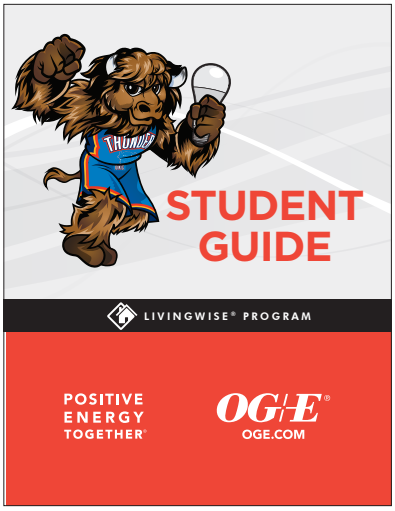
Program Materials



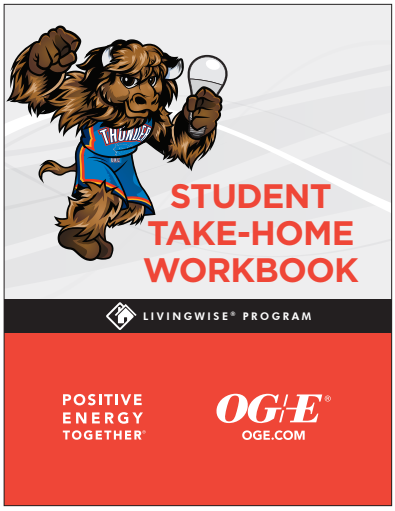
Teacher Survey Form



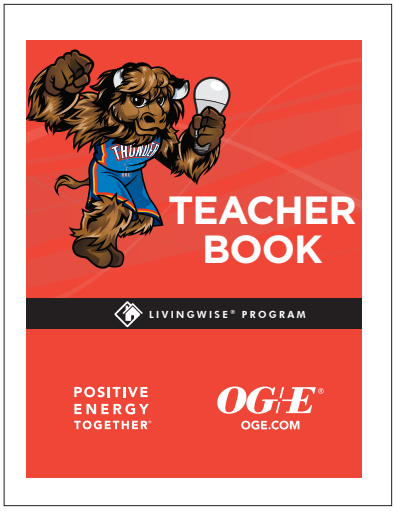
Parent Letter/Pledge Form



Student Guide



Student Workbook



Teacher Book

Certificate of Achievement

Kit Box

©AM Conservation Group

"My students loved learning how to save energy at home and receiving the kits."

Shannon Hodgins, Teacher
Northwood Elementary School

Program Implementation

The 2020 OG&E LivingWise® Program followed this comprehensive implementation schedule:

1. Identification of Oklahoma state and national academic standards & benchmarks
2. Curriculum development and refinement (completed annually)
3. Curriculum correlation to Oklahoma state and national academic standards & benchmarks
4. Materials modification to incorporate OG&E branding
5. Incentive program development
6. Teacher/school identification—with OG&E approval
7. Teacher outreach and program introduction
8. Teachers enrolled in the program individually
9. Implementation dates scheduled with teachers
10. Program material delivered to coincide with desired implementation date
11. Delivery confirmation
12. Periodic contact to ensure implementation and teacher satisfaction
13. Program completion incentive offered
14. Results collection
15. Program completion incentive delivered to qualifying teachers
16. Thank you cards sent to participating teachers
17. Data analysis
18. Program Summary Report generated and distributed

Participating teachers are free to implement the program to coincide with their lesson plans and class schedules. Appendix C provides a comprehensive list of classrooms in grade 5 that participated during the 2020 calendar year.

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AM Conservation Group has been in the business of designing and implementing energy and water efficiency programs for nearly three decades. Throughout this time we've built an expert team of industry professionals that deliver a seamless program to achieve your goals.

We designed the OG&E LivingWise® Program in our program center from the ground up. Working in conjunction with OG&E, we identified goals, desired outcomes of the program, and specific materials' customization. The result is a stimulating program that delivers significant and measurable resource savings. The OG&E LivingWise Program features a proven blend of innovative education, comprehensive implementation services, and hands-on activities to put efficiency knowledge to work in homes throughout the OG&E service territory.

The OG&E LivingWise Program is a reflection of true teamwork. On behalf of the entire implementation team at AM Conservation Group, We would like to thank you for the opportunity to design and implement the OG&E LivingWise Program. It has been a pleasure working with you. We look forward to many more years of program success.

Sincerely,

Lee Moran
Program Manager, PMP®, CEM®

Rodney Shelton
Senior Director, Business Development

Program Team

Program Team

The success of the OG&E LivingWise® Program is owed to a cross-functional implementation team chosen specifically to meet the goals of the program. We incorporated both a PMP® certified Program Manager and a CEM® designated energy analyst to ensure the program hits key milestones and delivers results. These thought leaders are supported by an integral mix of specialists working in unity to accomplish your program objectives. The OG&E LivingWise Program implementation team consisted of the following:

Outreach

Our outreach team is the face of the OG&E LivingWise Program, introducing teachers to the program, and providing support throughout implementation to guarantee the program's success in the classroom. This group builds relationships and keeps teachers engaged in program execution year after year.

Graphic Design and Marketing

Expertly-designed kits and program materials are a result of our Graphic Design and Marketing teams. This group provides brand alignment and marketing strategies to ensure program branding is within guidelines. Additionally, this team facilitates copy and art direction and works with education to develop end-user activities.

Education

Led by a Ph.D. educator having both classroom and administration leadership experience, this team is responsible for the development of educational content as well as classroom energy literacy and engagement. The group also ensures the program's content is aligned with Oklahoma state expectations in science, math, and language as well as the rigorous expectations of STEM (Science, Technology, Engineering, and Math).

Information Technology

We leave IT strategy and cyber security in the hands of our experts. This team built and manages the integrated systems responsible for seamlessly blending operations, driving automation, and maximizing participation in the OG&E LivingWise Program. This group provides the managed data services and software in support of outreach, enrollment, order processing, fulfillment, data collection and reporting.

Warehouse and Logistics

Last but not least, our warehouse and logistics teams guarantee OG&E LivingWise program materials reach the classroom on-time and without errors. This group provides printing, purchasing, production, quality assurance & control, warehousing and shipping for all program materials. Additionally, this team ensures that all materials are consistent with orders and confirms delivery.

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"Upon completion of the program, participating families are asked to complete a home survey to assess their resource use, verify product installation, provide demographic information, and measure participation rates."

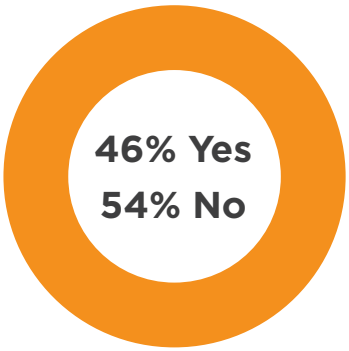
Program Impact

The OG&E LivingWise® Program has had a significant impact within the community. As illustrated below, the program successfully educated participants about energy and water efficiency while generating resource savings through the installation of efficiency measures in homes. Home survey information was collected to track projected savings and provide household consumption and demographic data. Program evaluations and comments were collected from teachers, students, and parents.

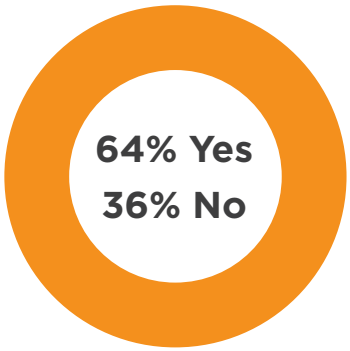
A. Home Survey

Upon completion of the program, participating families are asked to complete a home survey to assess their resource use, verify product installation, provide demographic information, and measure participation rates. A few samples of questions asked are below while a complete summary of all responses is included in the appendices.

Did your family install the showerhead?	**Yes - 46%**
Did your family install the first LED light bulb?	**Yes - 64%**



Students who indicated they installed showerhead.



Students who indicated they installed the first LED light bulb.

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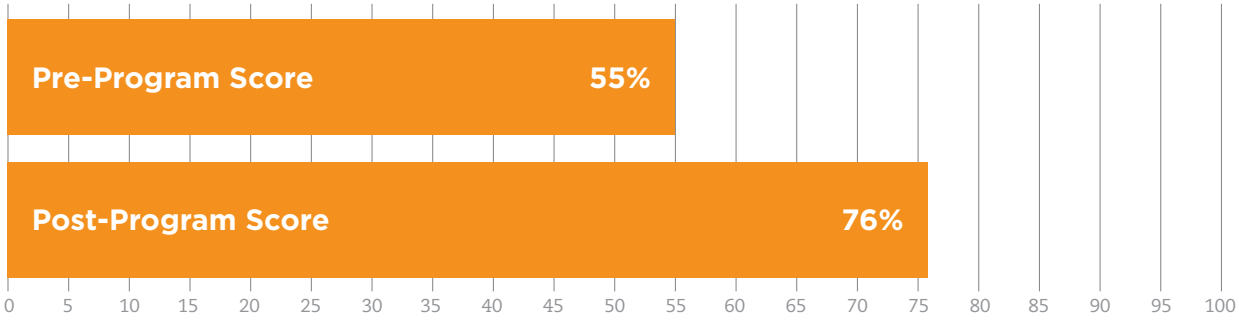
B. Pre-Program and Post-Program Tests

Students were asked to complete a 10-question test before the program was introduced and then again after it was completed to determine the knowledge gained through the program. The average student answered **5.5** questions correctly prior to being involved in the program and then improved to answer **7.6** questions correctly following participation.

Scores improved from 55% to 76%.



C. Home Activities

As part of the program, parents and students installed resource efficiency measures in their homes. They also measured the pre-existing devices to calculate savings that they generated. Using the family habits collected from the home survey as the basis for this calculation, 16,425 households are expected to save the following resource totals. Savings from these actions and new behaviors will continue for many years to come.

Projected Resource Savings

A list of assumptions and formulas used for these calculations can be found in Appendix A.

	Annual	Lifetime	
Number of Participants:	**16,425**		
Projected reduction from Showerhead retrofit:	**946,737**	**9,466,771**	kWh
Product Life: 10 years	**22,880,025**	**228,800,250**	gallons
Projected reduction from Bathroom Aerator retrofit:	**138,463**	**1,385,447**	kWh
Product Life: 10 years	**3,514,950**	**35,149,500**	gallons
Projected reduction from Kitchen Aerator retrofit:	**87,381**	**874,090**	kWh
Product Life: 10 years	**2,217,375**	**22,173,750**	gallons
Projected reduction from first LED Lightbulb retrofit:	**289,901**	**2,371,012.50**	kWh
Product Life: 19 years			
Projected reduction from second LED Lightbulb retrofit:	**289,901**	**2,371,012.50**	kWh
Product Life: 19 years			
TOTAL PROGRAM SAVINGS:	**1,752,383**	**16,468,333**	kWh
	28,612,350	**286,123,500**	gallons
TOTAL PROGRAM SAVINGS PER HOUSEHOLD:	**106.69**	**1,003**	kWh
	1,742	**17,420**	gallons
TOTAL PROGRAM kW DEMAND REDUCTION:			
Showerhead:	**9.03**		
Bathroom Faucet Aerator:	**98.39**		
Kitchen Faucet Aerator:	**14.45**		
First LED Light Bulb:	**39.58**		
Second LED Light Bulb:	**39.58**		
Total:	**201.04**		
TOTAL PROGRAM DEMAND REDUCTION PER HOUSEHOLD:	**0.01224**		

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D. Teacher Program Evaluation

Program improvements are based on participant feedback received. One of the types of feedback obtained is from participating teachers via a Teacher Program Evaluation Form. They are asked to evaluate relevant aspects of the program and each response is reviewed for pertinent information. The following is feedback from the Teacher Program Evaluation for the OG&E LivingWise Program.

Teacher Response

(A summary of responses can be found in Appendix D)

98% of participating teachers indicated they would conduct the program again given the opportunity.

100% of participating teachers indicated they would recommend the program to their colleagues.

What did students like best about the program?

"They loved getting free gifts."
Tammy Stokes, Piedmont Intermediate

"They always like the kits the most."
David Adair, Pleasant Grove Elementary School

"That they received a box of cool stuff."
Elise Horn, Ward Elementary School East

"They really did like the box full of goodies."
Neil Workman, Saint Joseph Catholic School

"They always are excited to get the kit.... especially the rumble nightlight."
Becky Henderson, Byng Elementary School

"Students really liked learning ways to conserve resources."
Amanda Williams, Byng Elementary School

What would you change about the program?

"Not sure If I would change anything. It was very easy program to use. :)"
Tammy Stokes, Piedmont Intermediate

"Change nothing!"
David Adair, Pleasant Grove Elementary School

"I would change the time of year."
Elise Horn, Ward Elementary School East

Teacher Response

(A summary of responses can be found in Appendix D)

What did you like best about the program? Explain.

"It helped me to show the student how we can be more energy efficient & save."
Tammy Stokes, Piedmont Intermediate

"The program is easy to use, and the kids can understand easily."
David Adair, Pleasant Grove Elementary School

"The curriculum was thought out."
Elise Horn, Ward Elementary School East

"I like the charts that I got to hang in my room."
Neil Workman, Saint Joseph Catholic School

"As a science teacher this program curriculum is spot on for my class."
Becky Henderson, Byng Elementary School

"I liked that it is easy to use and teach in the classroom."
Donna Radford, Sasakwa Elementary School

"Curriculum aligns with Science standards."
Becky Henderson, Byng Elementary School

"I was glad to have a book for each student. It made it much easier to teach the curriculum."
Amanda Williams, Byng Elementary School

"It is a great resource that teaches energy that is engaging for students."
Melanie Williams, Oak Hall Episcopal School

"The activities within the book. Information about different science careers."
Amanda Stearns, Wilson Elementary School

"I loved that the kids get ti be the experts w their families they feel so proud."
Stephanie Mouse, Highland Park Elementary School

"It makes the students aware of conserving energy."
Tamara Woodring, Highland Park Elementary School

"Teaching about types of energy and how to save and conserve."
Joy Baker, Sacred Heart Catholic School

"The same and how well organized and a great job you all did to educate us."
Burt McLain, Liberty Mounds Elementary School

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E. Parent/Guardian Program Evaluation

Parent involvement with program activities and their children is of paramount interest to both utilities and teachers in the program. When parents take an active role in their child's education it helps the schools and strengthens the educational process considerably. When students successfully engage their families in retrofit, installation, and home energy efficiency projects, efficiency messages are powerfully delivered to two generations in the same household. The program is a catalyst for this family interaction, which is demonstrated by feedback from Parent/Guardian Program Evaluations in each program. The following is feedback from the Parent/Guardian Program Evaluations for the OG&E LivingWise Program.

Parent Response

(A summary of responses can be found in Appendix E)

100% of participating parents indicated that the program was easy to use.

100% of participating parents indicated they would continue to use the kit items after the completion of the program.

100% of participating parents indicated they would like to see this program continued in local schools.

As a parent, which aspect of the program did you like best?

"We enjoyed reading and doing the program together. I read the instructions and he performed them. We just moved into the new house, so it was neat to see how efficient it is."
Jodie Hudson, Kiefer Middle School

"Offering devices to lower cost and making the student aware how it impacts energy costs."
Haley Roberts, Kipp Reach College Preparatory

"I like the clever way of involving my child in household maintenance and awareness."
Daniel Taylor, Liberty Mounds Elementary School

"Teaching about energy and water conservation."
Ronda MccMomgh, Mannford Upper Elementary School

"Hands on learning not just for my child but myself as well."
Linda + Patrick Henson, Meeker Elementary School

"Encouragement."
Dunivah, Morrison Elementary School

"All of the information for the kids to read about energy that the electricity produces."
Taylor sumpler, Morrison Elementary School

"I liked how you save."
Matthew Nimesheim, Roland Upper Elementary School

Parent Response

(A summary of responses can be found in Appendix E)

Are there any comments you would like to express to your child's program sponsor?

"Thank you for providing this experience for my child."
Jodie Hudson, Kiefer Middle School

"I appreciate the brand awareness. A really nice program."
Haley Roberts, Kipp Reach College Preparatory

"The kit is well thought out and well put together. I'm impressed."
Daniel Taylor, Liberty Mounds Elementary School

"Thank you."
Ronda MccMomgh, Mannford Upper Elementary School

"I want to thank you for providing such amazing information to the children as well as gifts for the house to try out."
Taylor sumpler, Morrison Elementary School

"Thank you for the encouragement you show for the saving of water and energy to families. I appreciate that."
Terri lelatkins, Roland Upper Elementary School

"Thank you for all the generous kit. Our son helped install the items with his dad. It was a great way to teach him about conserving energy and our home benefited as well! Thank you!"
Nesha Olney, Thomas Middle School

"Thank you for investing in children early in good lessons that will benefit them and our communities throughout their lives."
Holly Gerard, Victory Life Academy

"This is wonderful program! Thank you!"
Ryan and Melissa Shaw, Willard Grade Center

"Thank you! Our family loved this!"
Lori and Kevin Barnes, Northmoor Elementary School

"No very wonderful way to teach & share the cost of life & ways to save."
Christian & Lorane Jernigan, Union Elementary School

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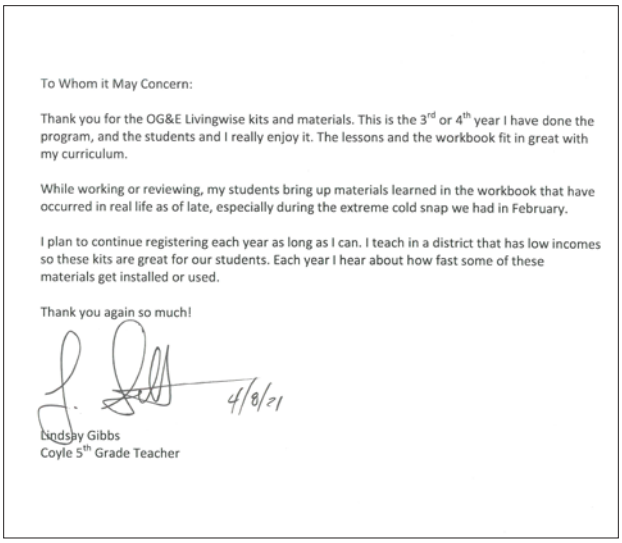
F. Teacher Letters

(A summary of responses can be found in Appendix F)



To Whom it May Concern:

Thank you for the OG&E Livingwise kits and materials. This is the 3rd or 4th year I have done the program, and the students and I really enjoy it. The lessons and the workbook fit in great with my curriculum.

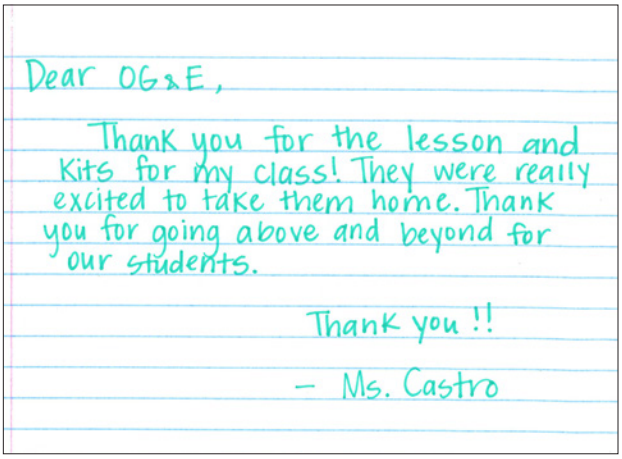
While working or reviewing, my students bring up materials learned in the workbook that have occurred in real life as of late, especially during the extreme cold snap we had in February.

I plan to continue registering each year as long as I can. I teach in a district that has low incomes so these kits are great for our students. Each year I hear about how fast some of these materials get installed or used.

Thank you again so much!

4/8/21

Lindsay Gibbs
Coyle 5th Grade Teacher

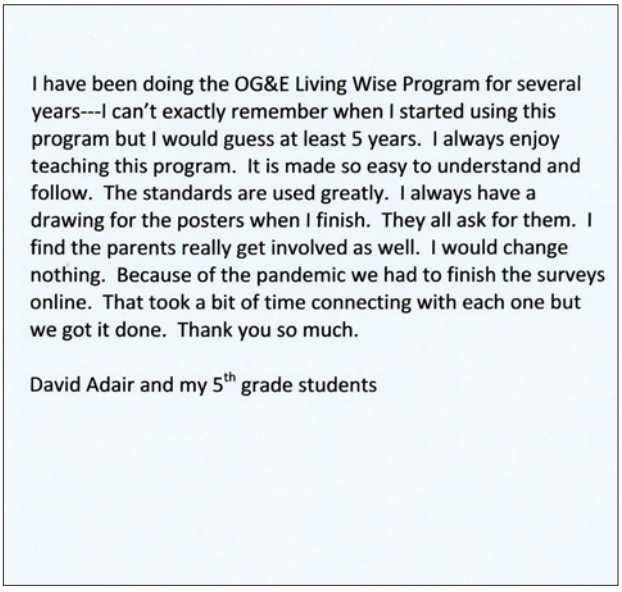


Dear OG&E,

Thank you for the lesson and kits for my class! They were really excited to take them home. Thank you for going above and beyond for our students.

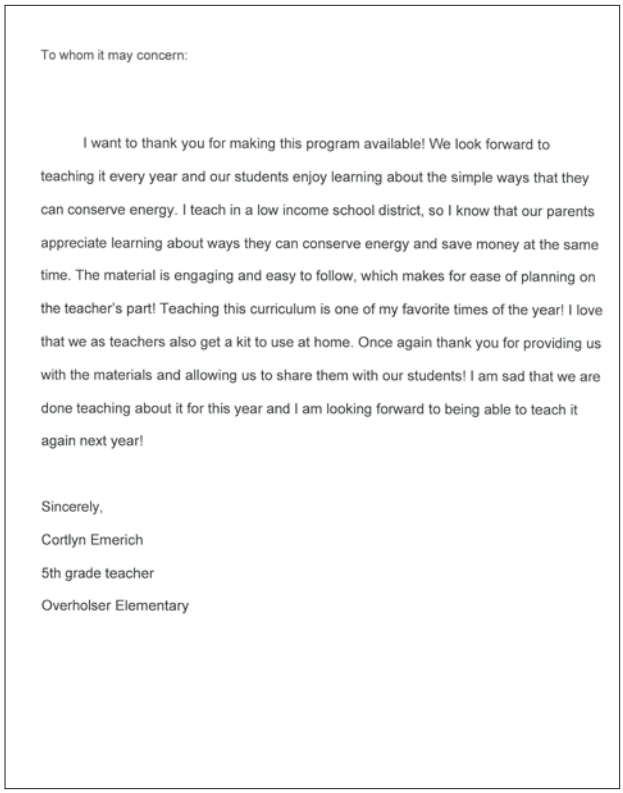
Thank you !!

– Ms. Castro



I have been doing the OG&E Living Wise Program for several years---I can't exactly remember when I started using this program but I would guess at least 5 years. I always enjoy teaching this program. It is made so easy to understand and follow. The standards are used greatly. I always have a drawing for the posters when I finish. They all ask for them. I find the parents really get involved as well. I would change nothing. Because of the pandemic we had to finish the surveys online. That took a bit of time connecting with each one but we got it done. Thank you so much.

David Adair and my 5th grade students



To whom it may concern:

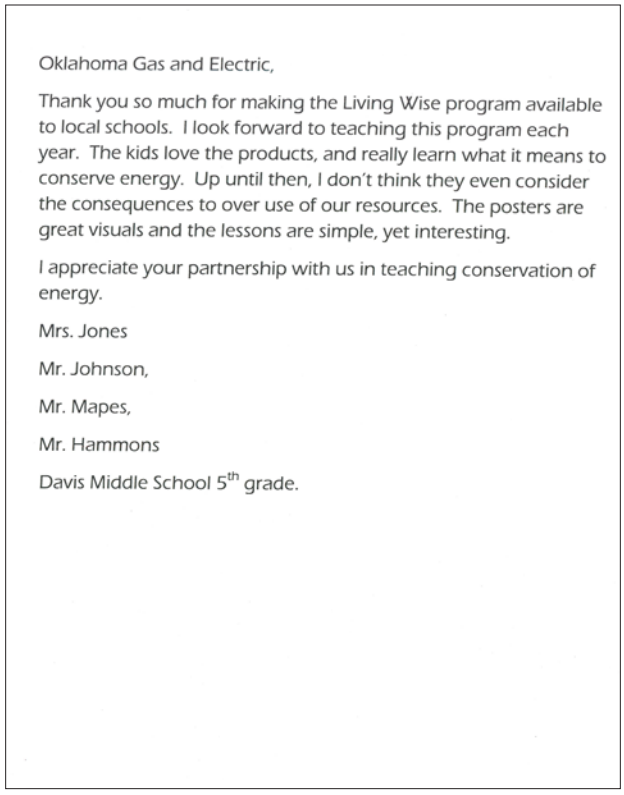
I want to thank you for making this program available! We look forward to teaching it every year and our students enjoy learning about the simple ways that they can conserve energy. I teach in a low income school district, so I know that our parents appreciate learning about ways they can conserve energy and save money at the same time. The material is engaging and easy to follow, which makes for ease of planning on the teacher's part! Teaching this curriculum is one of my favorite times of the year! I love that we as teachers also get a kit to use at home. Once again thank you for providing us with the materials and allowing us to share them with our students! I am sad that we are done teaching about it for this year and I am looking forward to being able to teach it again next year!

Sincerely,

Cortlyn Emerich

5th grade teacher

Overholser Elementary



Oklahoma Gas and Electric,

Thank you so much for making the Living Wise program available to local schools. I look forward to teaching this program each year. The kids love the products, and really learn what it means to conserve energy. Up until then, I don't think they even consider the consequences to over use of our resources. The posters are great visuals and the lessons are simple, yet interesting.

I appreciate your partnership with us in teaching conservation of energy.

Mrs. Jones

Mr. Johnson,

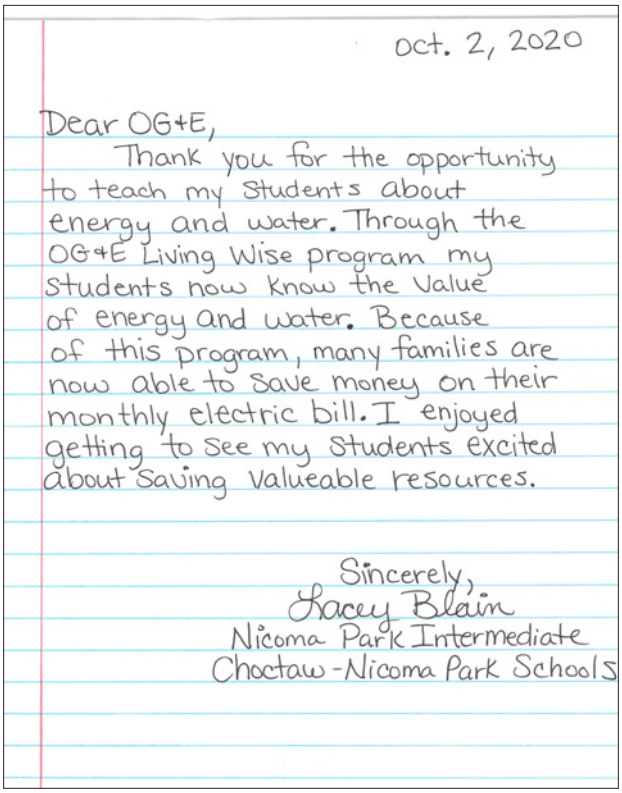
Mr. Mapes,

Mr. Hammons

Davis Middle School 5th grade.

Teacher Letters

(A summary of responses can be found in Appendix F)

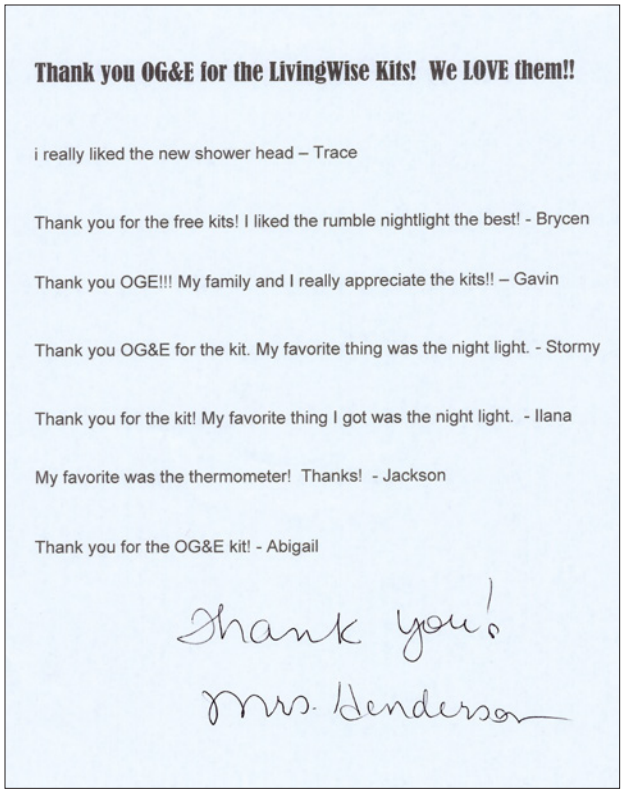


Oct. 2, 2020

Dear OG+E,

Thank you for the opportunity to teach my students about energy and water. Through the OG+E Living Wise program my students now know the value of energy and water. Because of this program, many families are now able to save money on their monthly electric bill. I enjoyed getting to see my students excited about saving valueable resources.

Sincerely,
Lacey Blain
Nicoma Park Intermediate
Choctaw-Nicoma Park Schools



Thank you OG&E for the LivingWise Kits! We LOVE them!!

i really liked the new shower head – Trace

Thank you for the free kits! I liked the rumble nightlight the best! - Brycen

Thank you OGE!!! My family and I really appreciate the kits!! – Gavin

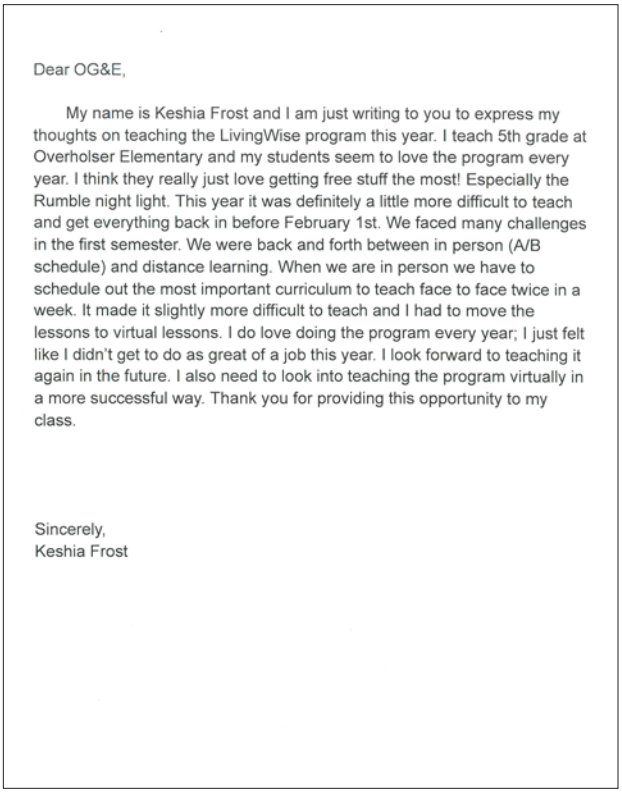
Thank you OG&E for the kit. My favorite thing was the night light. - Stormy

Thank you for the kit! My favorite thing I got was the night light. - Ilana

My favorite was the thermometer! Thanks! - Jackson

Thank you for the OG&E kit! - Abigail

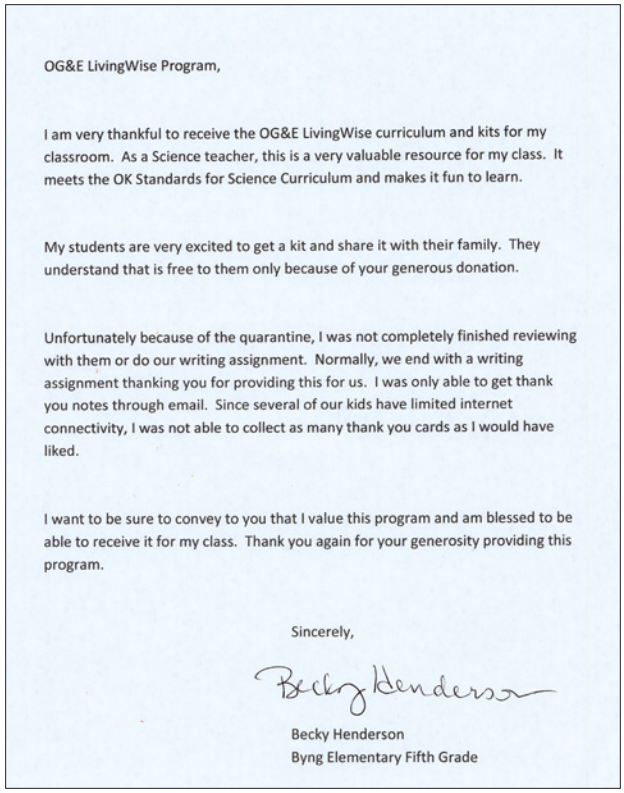
Thank you!
Mrs. Henderson



Dear OG&E,

My name is Keshia Frost and I am just writing to you to express my thoughts on teaching the LivingWise program this year. I teach 5th grade at Overholser Elementary and my students seem to love the program every year. I think they really just love getting free stuff the most! Especially the Rumble night light. This year it was definitely a little more difficult to teach and get everything back in before February 1st. We faced many challenges in the first semester. We were back and forth between in person (A/B schedule) and distance learning. When we are in person we have to schedule out the most important curriculum to teach face to face twice in a week. It made it slightly more difficult to teach and I had to move the lessons to virtual lessons. I do love doing the program every year; I just felt like I didn't get to do as great of a job this year. I look forward to teaching it again in the future. I also need to look into teaching the program virtually in a more successful way. Thank you for providing this opportunity to my class.

Sincerely,
Keshia Frost



OG&E LivingWise Program,

I am very thankful to receive the OG&E LivingWise curriculum and kits for my classroom. As a Science teacher, this is a very valuable resource for my class. It meets the OK Standards for Science Curriculum and makes it fun to learn.

My students are very excited to get a kit and share it with their family. They understand that is free to them only because of your generous donation.

Unfortunately because of the quarantine, I was not completely finished reviewing with them or do our writing assignment. Normally, we end with a writing assignment thanking you for providing this for us. I was only able to get thank you notes through email. Since several of our kids have limited internet connectivity, I was not able to collect as many thank you cards as I would have liked.

I want to be sure to convey to you that I value this program and am blessed to be able to receive it for my class. Thank you again for your generosity providing this program.

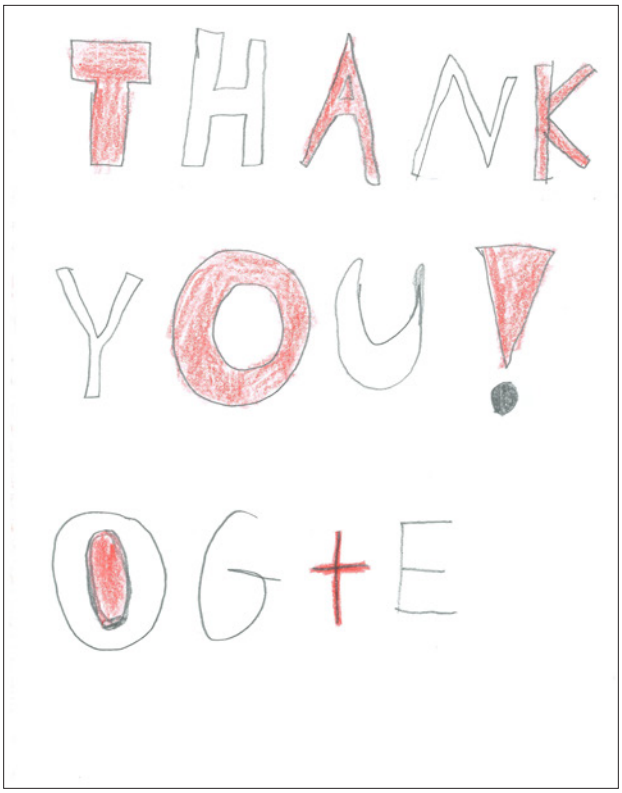
Sincerely,

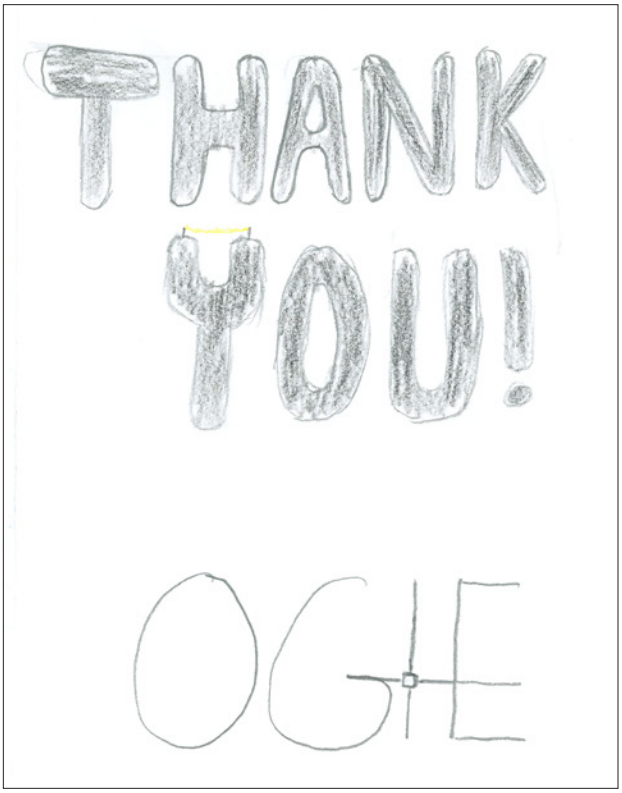
Becky Henderson

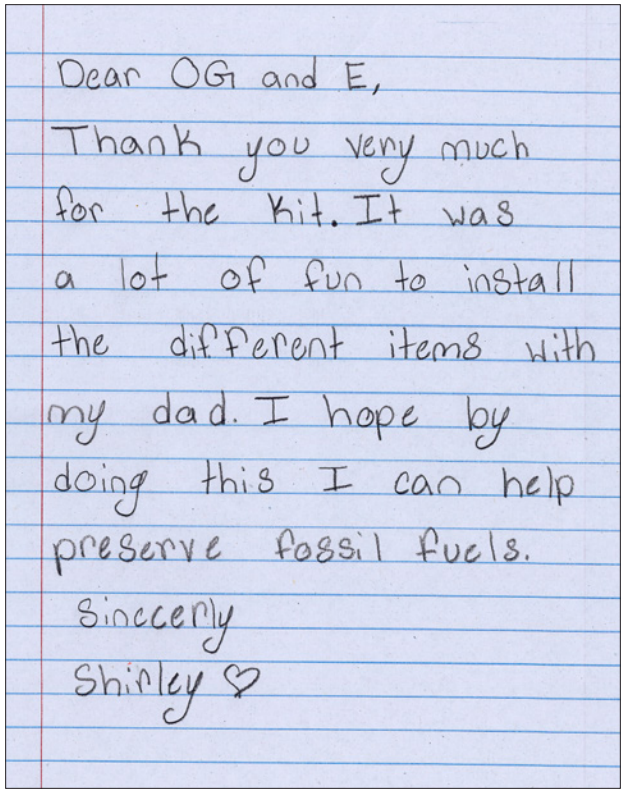
Becky Henderson
Byng Elementary Fifth Grade

G. Student Letters

(A summary of responses can be found in Appendix F)

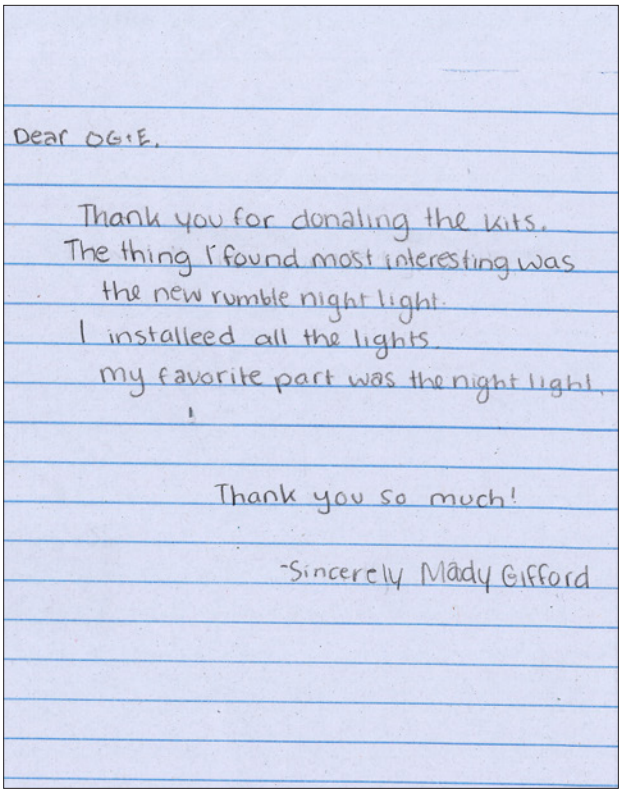






Student Letters

(A summary of responses can be found in Appendix F)

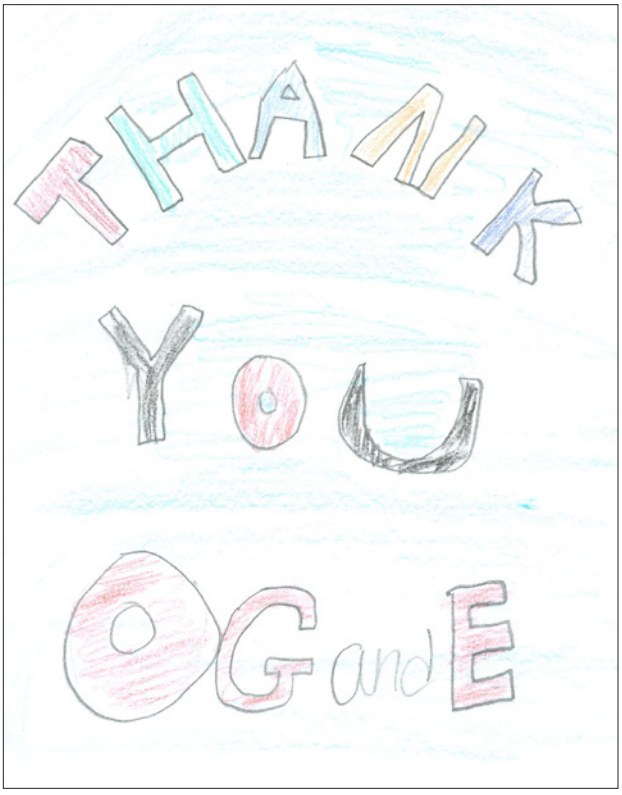


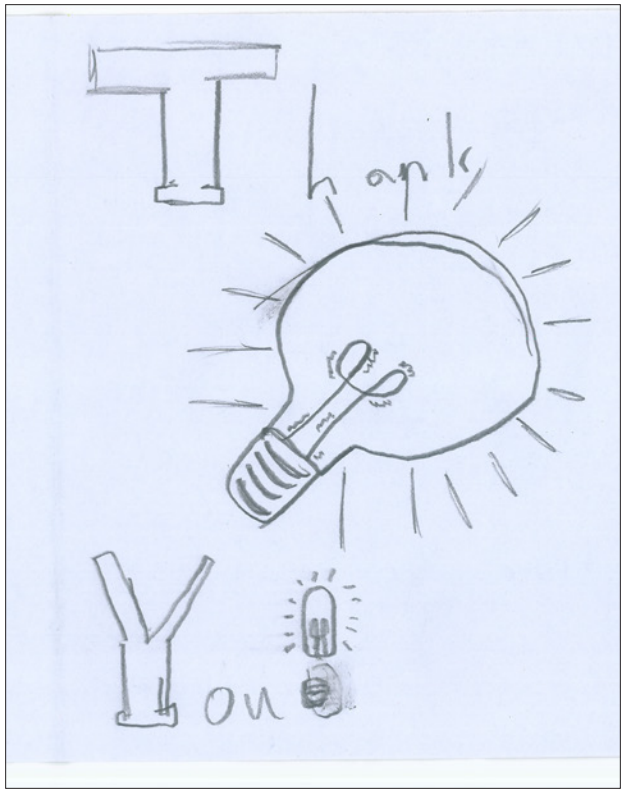
Dear OG+E,

Thank you for donating the kits. The thing I found most interesting was the new rumble night light. I installeed all the lights. my favorite part was the night light.

Thank you so much!

-Sincerely Mady Gifford





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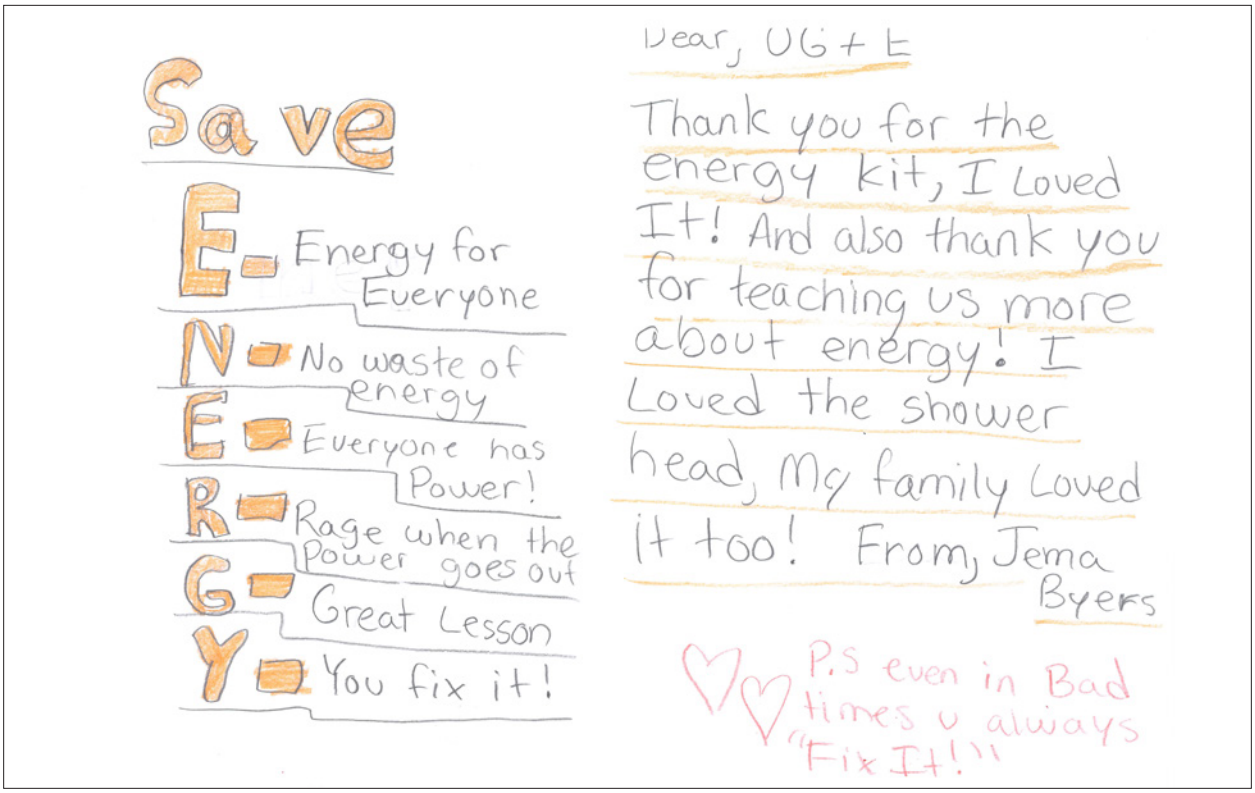
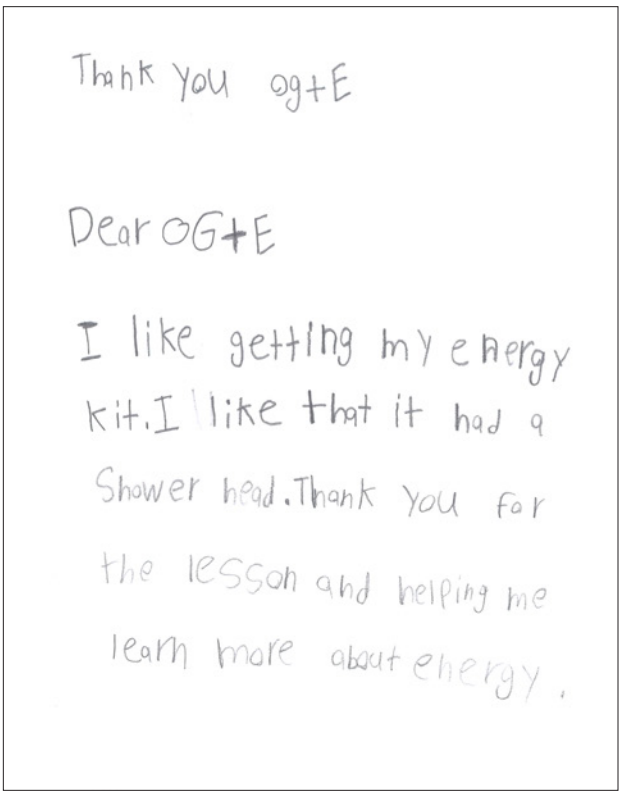
Student Letters

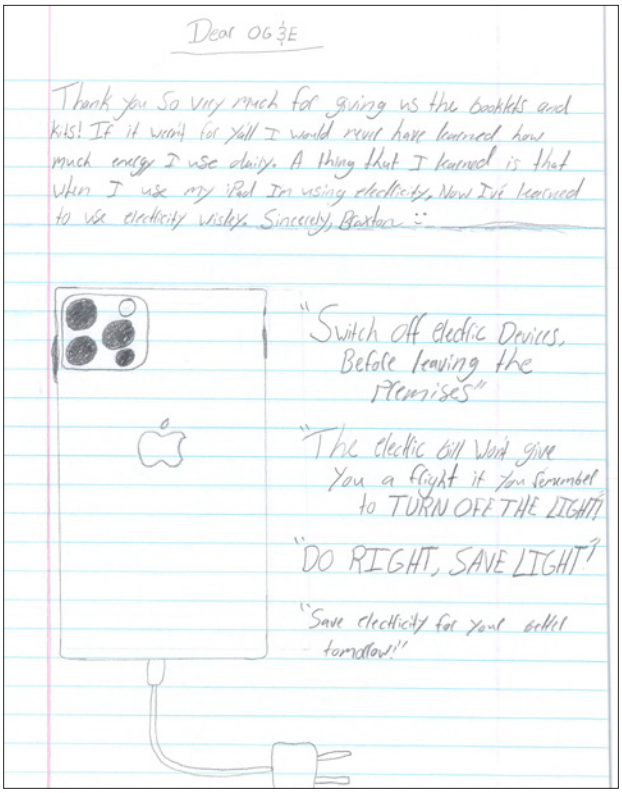
(A summary of responses can be found in Appendix F)





Student Letters

(A summary of responses can be found in Appendix F)



Dear OG&E

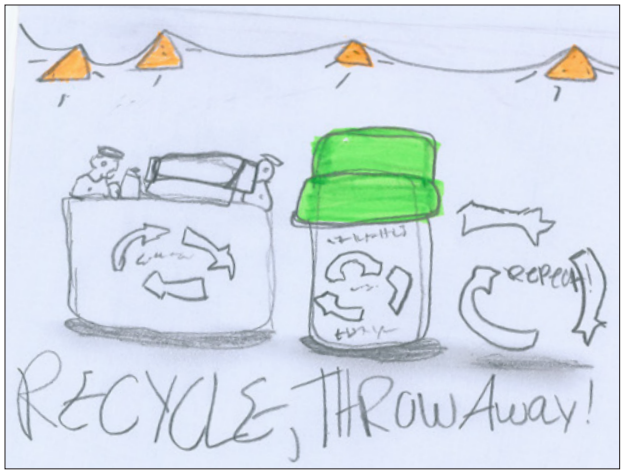
Thank you So very much for giving us the booklets and kits! If it wasn't for yall I would never have learned how much energy I use daily. A thing that I learned is that when I use my iPad I'm using electricity. Now I've learned to use electricity wisely. Sincerely, Braxton

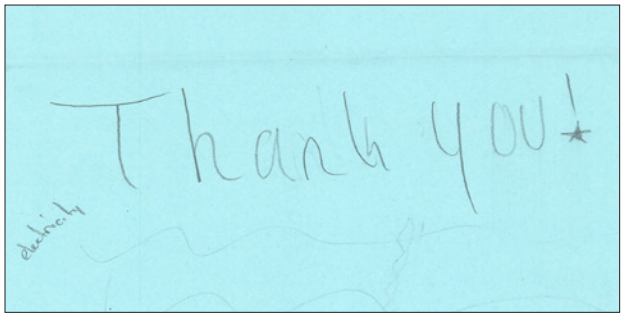
"Switch off electric Devices, Before leaving the Premises"

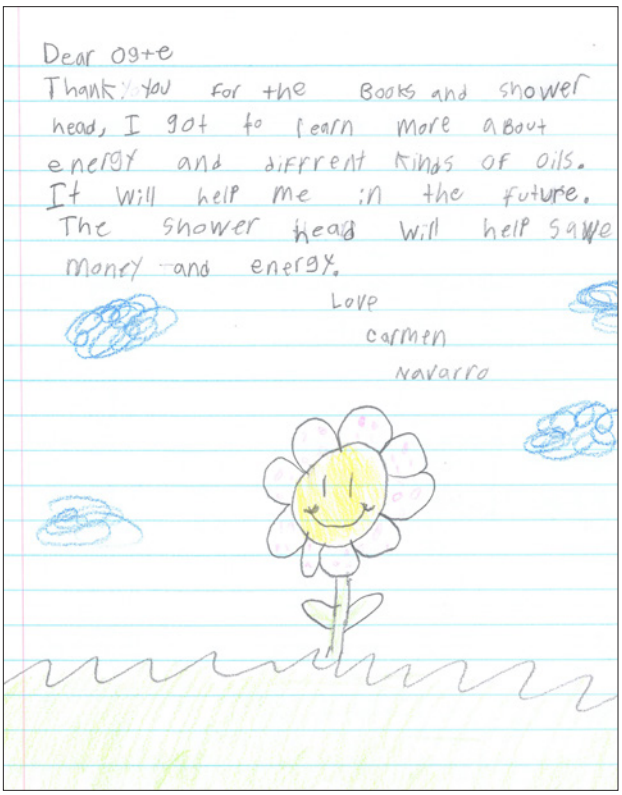
"The electric bill Would give You a fright if you forgot to TURN OFF THE LIGHT!"

"DO RIGHT, SAVE LIGHT"

"Save electricity for your future tomorrow!"







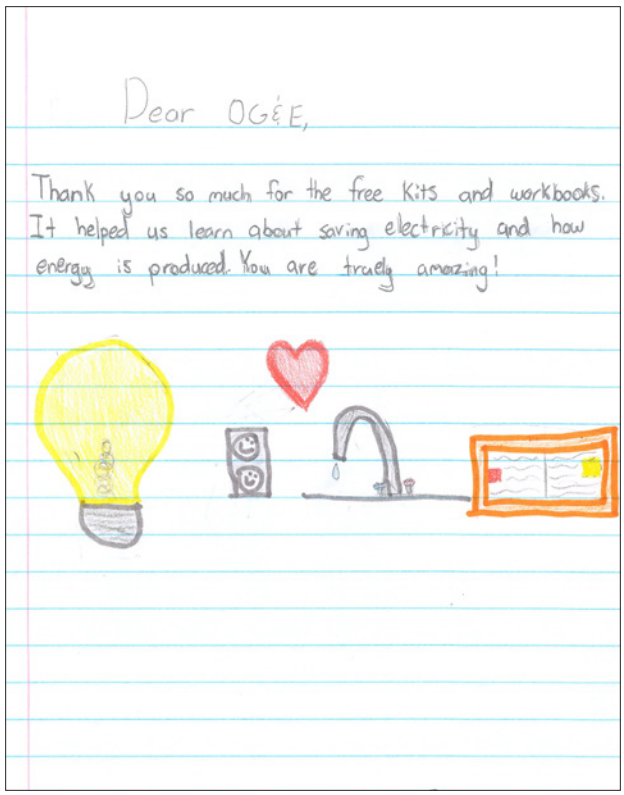
Dear OG&E

Thank you for the Books and shower head, I got to learn more about energy and different kinds of oils. It will help me in the future. The shower head will help save money and energy.

Love

Carmen

Navarro



Dear OG&E,

Thank you so much for the free kits and workbooks. It helped us learn about saving electricity and how energy is produced. You are truely amazing!

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Appendices

Appendix A

Appendix B

Appendix C

Appendix D

Appendix E

Appendix F

Appendix G

Projected Savings from Showerhead Retrofit

Showerhead retrofit inputs and assumptions:

Number of Participants:	**16,425**	[1]
Deemed kWh Savings per Participant:	**57.64**	kWh[2]
Deemed kW Savings per Participant:	**0.00055**	kW[2]
Deemed Water Gallon Savings per Participant:	**1,393**	gallons[2]
Estimated Useful Life	**10.00**	years[2]

Projected Energy Savings:

Showerhead retrofit projects an **annual** reduction of:	**946,737**	kWh[3]
Showerhead retrofit projects a **lifetime** reduction of:	**9,466,771**	kWh[4]

Projected Demand Reduction Savings:

Showerhead retrofit projects an **annual** reduction of:	**9.03**	kW[5]

Projected Water Savings:

Showerhead retrofit projects an **annual** reduction of:	**22,880,025**	gallons[6]
Showerhead retrofit projects a **lifetime** reduction of:	**228,800,250**	gallons[7]

1 Reported by Participants

2 2020 ADM EMV - Per Unit Savings from Dylan Hill email dated 03/29/2021

3 Deemed kWh X Participants

4 Deemed kWh X Participants X EUL

5 Deemed kW X Participants

6 Deemed gallons X Participants

7 Deemed gallons X Participants X EUL

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Projected Savings from Kitchen Faucet Aerator Retrofit

Kitchen Faucet Aerator retrofit inputs and assumptions:

Number of Participants:	**16,425**	[1]
Deemed kWh Savings per Participant:	**5.32**	kWh[2]
Deemed kW Savings per Participant:	**0.00088**	kW[2]
Deemed Water Gallon Savings per Participant:	**135**	gallons[2]
Estimated Useful Life	**10.00**	years[2]

Projected Energy Savings:

Kitchen faucet aerator retrofit projects an **annual** reduction of:	**87,381**	kWh[3]
Kitchen faucet aerator retrofit projects a **lifetime** reduction of:	**874,090**	kWh[4]
Projected Demand Reduction Savings:		
Kitchen faucet aerator retrofit projects an **annual** reduction of:	**14.45**	kW[5]

Projected Water Savings:

Kitchen faucet aerator retrofit projects an **annual** reduction of:	**2,217,375**	gallons[6]
Kitchen faucet aerator retrofit projects a **lifetime** reduction of:	**22,173,750**	gallons[7]

1 Reported by Participants

2 2020 ADM EMV - Per Unit Savings from Dylan Hill email dated 03/29/2021

3 Deemed kWh X Participants

4 Deemed kWh X Participants X EUL

5 Deemed kW X Participants

6 Deemed gallons X Participants

7 Deemed gallons X Participants X EUL

Projected Savings from Bathroom Faucet Aerator Retrofit

Bathroom Faucet Aerator retrofit inputs and assumptions:

Number of Participants:	**16,425**	[1]
Deemed kWh Savings per Participant:	**8.43**	kWh[2]
Deemed kW Savings per Participant:	**0.00599**	kW[2]
Deemed Water Gallon Savings per Participant:	**214**	gallons[2]
Estimated Useful Life	**10.00**	years[2]

Projected Energy Savings:

Bathroom faucet aerator retrofit projects an **annual** reduction of:	**138,463**	kWh[3]
Bathroom faucet aerator retrofit projects a **lifetime** reduction of:	**1,385,447**	kWh[4]
Projected Demand Reduction Savings:		
Bathroom faucet aerator retrofit projects an **annual** reduction of:	**98.39**	kW[5]

Projected Water Savings:

Bathroom faucet aerator retrofit projects an **annual** reduction of:	**3,514,950**	gallons[6]
Bathroom faucet aerator retrofit projects a **lifetime** reduction of:	**35,149,500**	gallons[7]

1 Reported by Participants

2 2020 ADM EMV - Per Unit Savings from Dylan Hill email dated 03/29/2021

3 Deemed kWh X Participants

4 Deemed kWh X Participants X EUL

5 Deemed kW X Participants

6 Deemed gallons X Participants

7 Deemed gallons X Participants X EUL

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Projected Savings from 1st LED Light Bulb Retrofit

First LED Light Bulb retrofit inputs and assumptions:

Number of Participants:	**16,425**	[1]
Deemed kWh Savings per Participant:	**17.65**	kWh[2]
Deemed kW Savings per Participant:	**0.00241**	kW[2]
Estimated Useful Life (Tier 1 is 3 years and Tier 2 is 16 years)	**19.00**	years[2]

Projected Energy Savings:

First LED light bulb retrofit projects an **annual** reduction of:	**289,901**	kWh[3]
First LED light bulb retrofit projects a **lifetime** reduction of:	**2,371,012.50**	kWh[4]

Projected Demand Reduction Savings:

First LED light bulb retrofit projects an **annual** reduction of:	**39.58**	kW[5]

1 Reported by Participants

2 2020 ADM EMV - Per Unit Savings from Dylan Hill email dated 03/29/2021

3 Deemed kWh X Participants

4 Deemed kWh X Participants X EUL

5 Deemed kW X Participants

Projected Savings from 2nd LED Light Bulb Retrofit

Second LED Light Bulb retrofit inputs and assumptions:

Number of Participants:	**16,425**	[1]
Deemed kWh Savings per Participant:	**17.65**	kWh[2]
Deemed kW Savings per Participant:	**0.00241**	kW[2]
Estimated Useful Life (Tier 1 is 3 years and Tier 2 is 16 years)	**19.00**	years[2]

Projected Energy Savings:

Second LED light bulb retrofit projects an **annual** reduction of:	**289,901**	kWh[3]
Second LED light bulb retrofit projects a **lifetime** reduction of:	**2,371,012.50**	kWh[4]
Projected Demand Reduction Savings:		
Second LED light bulb retrofit projects an **annual** reduction of:	**39.58**	kW[5]

1 Reported by Participants

2 2020 ADM EMV - Per Unit Savings from Dylan Hill email dated 03/29/2021

3 Deemed kWh X Participants

4 Deemed kWh X Participants X EUL

5 Deemed kW X Participants

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Home Check-Up

1 How many people live in your home (including you)?	
1	1%
2	3%
3	17%
4	27%
5	27%
6	14%
7+	12%
2 How is your water heated?	
Natural Gas	41%
Electricty	41%
Propane	18%
3 Does your home have a dishwasher?	
Yes	78%
No	22%
4 How many half bathrooms are in your home?	
0	68%
1	26%
2	4%
3	2%
4+	1%
5 How many full bathrooms are in your home?	
1	29%
2	55%
3	13%
4	2%
5+	2%
6 Which fuel is used as the main source of energy to heat your home?	
Natural Gas	26%
Electricity	57%
Heating Oil	1%
Wood	2%
Propane	11%
Other	3%

Due to rounding of numbers, percentages may not add up to 100%

Home Check-Up

(continued)

7	What type of air conditioning unit do you have?	
	Central Air Conditioner	75%
	Evaporative Cooler	3%
	Room Unit	17%
	Don't Have One	4%
8	What type of home do you live in?	
	Single Family home	89%
	Multi-Family Home/Apartment Building	11%
9	Was your home built before 1992?	
	Yes	49%
	No	51%
10	Is your home owned or rented?	
	Owned	74%
	Rented	26%

Due to rounding of numbers, percentages may not add up to 100%

©AM Conservation Group

Home Activities

1	Did your family install the new High-Efficiency Showerhead?	
	Yes	46%
	No	54%
2	Did your family install the new Bathroom Faucet Aerator?	
	Yes	36%
	No	64%
3	Did your family install the new Kitchen Faucet Aerator?	
	Yes	38%
	No	62%
4	Did your family install the first 9-watt LED Light Bulb?	
	Yes	64%
	No	36%
5	Did your family install the second 9-watt LED Light Bulb?	
	Yes	54%
	No	46%
6	Did your family install the LED Night Light?	
	Yes	75%
	No	25%
7	Did your family raise the temperature on your refrigerator?	
	Yes	29%
	No	71%
8	How much did your family turn down the thermostat in winter for heating?	
	1 - 2 Degrees	17%
	3 - 4 Degrees	16%
	5+ Degrees	10%
	Didn't Adjust Thermostat	56%

Due to rounding of numbers, percentages may not add up to 100%

Home Activities

(continued)

9	How much did your family turn up the thermostat in summer for cooling?	
	1 - 2 Degrees	18%
	3 - 4 Degrees	17%
	5+ Degrees	8%
	Didn't Adjust Thermostat	56%
10	Did your family lower your water heater settings?	
	Yes	21%
	No	79%
11	Did you work with your family on this program?	
	Yes	62%
	No	38%
12	Did your family change the way they use energy?	
	Yes	58%
	No	42%
13	How would you rate the LivingWise Program?	
	Great	45%
	Pretty Good	33%
	Okay	20%
	Not so Good	3%

Due to rounding of numbers, percentages may not add up to 100%

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Participant List

SCHOOL NAME	TEACHER	T	S
Achille Elementary School	Toby Isenberg	1	20
Achille Elementary School	Toby Isenberg	1	16
Adams Elementary School	Gena Ratcliff	1	25
Adams Elementary School	Cameron Liner	1	25
Adams Elementary School	Zoe Nolan	1	25
Adams Elementary School	Sara Alrumaizan	1	25
Adams Elementary School	Deseray Spence	1	29
Adams Elementary School	Tammy Millis	1	25
Adams Elementary School	Cameron Liner	1	17
Adams Elementary School	Rebecca Yeaman	1	17
Adams Elementary School	Madison Morrow	1	17
Adams Elementary School	Kaylee Woods	1	17
Antioch Christian Academy	Christopher Roberts	1	6
Apollo Elementary School	Kaci North	1	25
Apollo Elementary School	Deya Adams	1	25
Apollo Elementary School	Caitlyn Havlik	1	25
Apple Creek Elementary School	Laura Lewis	1	45
Banner Elementary School	Christina Sharp	1	34
Banner Elementary School	Marcie Goad	1	15
Banner Elementary School	Sheryl Hoyle	1	15
Barnes Elementary School	Cynthia Prescott	1	55
Beggs Middle School	Pam Norris	1	70
Belfonte Elementary School	Bobbie Jo Real	1	52
Belle Isle Middle School	Elizabeth Maples	1	62
Belle Isle Middle School	Susan Hastings	1	62
Bethel Elementary School	Makisha Tucker	1	24
Bethel Elementary School	Haylee Winsett	1	24
Bethel Elementary School	Jennifer Sumpter	1	25
Bethel Elementary School	Kari Nunneley	1	25
Bethel Elementary School	Makisha Tucker	1	17
Bethel Elementary School	Haylee Winsett	1	16
Bethel Elementary School	Jennifer Sumpter	1	16
Bethel Elementary School	Kari Nunneley	1	16
Bishop John Carroll School	Jennifer Herndon	1	25
Bokoshe Elementary School	Angela Rosa	1	24
Braggs Elementary School	Scott Belcher	1	15
Briarwood Elementary School	Jennifer Osborne	1	97
Briarwood Elementary School	Jennifer Osborne	1	65
Bristow Adventist School	Abbigail Banks	1	3
Bryant Elementary School	Erin Stutzman	1	65
Byng Elementary School	Becky Henderson	1	20
Byng Elementary School	Tracy Allison	1	20
Byng Elementary School	Amanda Williams	1	18
Byng Elementary School	Becky Henderson	1	20
Byng Elementary School	Tracy Allison	1	20
Byng Elementary School	Amanda Williams	1	18
Caddo Elementary School	Kara Doyle	1	36
Calera Elementary School	Shannon West	1	60
Calera Elementary School	Shannon West	1	55
Cameron Elementary School	Michelle Earls	1	25
Canton Elementary School	Peggy Dowell	1	32
Canton Elementary School	Kim Nault	1	30
Central Elementary School	Christine Clay	1	25
Central Elementary School	Shawna Jackson	1	25

Note: "T" represents number of teachers and "S" represents number of students

Participant List

(continued)

SCHOOL NAME	TEACHER	T	S
Central Elementary School	Kathy Hughes	1	25
Central Elementary School	Addyson Weast	1	25
Central Elementary School	Cassidy Malm	1	25
Central Oak Elementary School	Kristen Dean	1	42
Central Oak Elementary School	Caitlyn Anderson	1	21
Central Oak Elementary School	Jodi Travis	1	20
Charles Evans Elementary School	Missy Ross	1	80
Charles Evans Elementary School	Missy Ross	1	78
Checotah Intermediate School	LaDonna Utley	1	97
Cherokee Elementary School	Tanarra Gandy	1	30
Cherokee Elementary School	Filisha Church	1	30
Cherokee Elementary School	Jeanne Lewis	1	26
Chisholm Elementary School	Rebecca Powell	1	24
Chisholm Elementary School	Lisa Earl	1	22
Chisholm Elementary School	Tammie Wall	1	22
Chisholm Elementary School	Sara Dow	1	22
Choctaw Elementary School	Cayci Rhoads	1	15
Choctaw Elementary School	Lindsay Hartman	1	15
Cimarron Montessori School	Julie Yarbrough	1	6
Classen SAS Middle School	Candice Bond	1	50
Classen SAS Middle School	Curtis Marshall	1	50
Classen SAS Middle School	Candi McKinney	1	50
Classen SAS Middle School	Lauren Yount	1	50
Cleveland Bailey Elementary School	Rene O'Hagan	1	15
Cleveland Bailey Elementary School	Rhonda Rodriquez	1	15
Collins Elementary School	Mandy Rosenberger	1	152
Collins Elementary School	Shandee Allen	1	20
Collins Elementary School	Lindsey Mayberry	1	40
Collins Elementary School	Ashley McGovran	1	40
Coolidge Elementary School	Alexxis Farmer	1	25
Coolidge Elementary School	Rebecca Leming	1	25
Coronado Heights Elementary School	Marlene Lee	1	26
Coronado Heights Elementary School	Ronda Boston	1	26
Coronado Heights Elementary School	Elizabeth Birdwell	1	25
Coronado Heights Elementary School	Dawn Dilley	1	70
Country Estates Elementary School	Keven Brewster	1	75
Country Estates Elementary School	Brooke Guthery	1	1
Country Estates Elementary School	Keven Brewster	1	85
Coyle Elementary School	Lindsay Gibbs	1	23
Creek Elementary School	Margaret Ragsdale	1	30
Creek Elementary School	Linda Falleur	1	30
Cross Timbers Elementary School	Kelsey Ledford	1	20
Cross Timbers Elementary School	Ashlee Hunter	1	20
Cross Timbers Elementary School	Lisa Jones	1	20
Cross Timbers Elementary School	Kenney Fowler	1	20
Cross Timbers Elementary School	Amy Carlile	1	20
Cross Timbers Elementary School	Payton Worley	1	20
Cross Timbers Elementary School	Ashley Renken	1	20
Crutcho Elementary School	James Williams	1	38
Darlington Elementary School	Pam Garner	1	18
Darlington Elementary School	Pam Garner	1	24
Davis Middle School	Daleen Jones	1	20
Davis Middle School	Dustin Hammons	1	20
Davis Middle School	Jeff Mapes	1	20

Note: "T" represents number of teachers and "S" represents number of students

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Participant List

(continued)

SCHOOL NAME	TEACHER	T	S
Davis Middle School	Randy Johnson	1	20
Del City Elementary School	Maryam White	1	50
Del City Elementary School	Loni Briggs	1	50
Del City Elementary School	Loni Briggs	1	50
Dickson Upper Elementary School	Emile Winchester	1	95
Drummond Elementary School	Karie Moorehead	1	30
Drummond Elementary School	Karie Moorehead	1	30
Durant Intermediate School	Alecia Jarvis	1	150
Durant Intermediate School	Susan Hall	1	150
Earl Harris Elementary School	Youmi Carroll	1	29
Earl Harris Elementary School	Nancy Summers	1	29
Earl Harris Elementary School	Karla White	1	29
Earl Harris Elementary School	Heather Digiantomasso	1	29
Earlsboro Elementary School	Britni Sisco	1	23
Earlywine Elementary School	Luann Gilbert	1	18
Earlywine Elementary School	Sherry Honeyman	1	18
Earlywine Elementary School	Shyan Stallings	1	18
Eisenhower Elementary School	Mikella Stanton	1	25
Eisenhower Elementary School	Carly Williamson	1	25
Eisenhower Elementary School	Miranda Steward	1	25
Eisenhower Elementary School	Angela Reed	1	25
Epic Charter Schools	Jillian Bolding	1	2
Epperly Heights Elementary School	Suzanna Bennett	1	24
Epperly Heights Elementary School	Pamela Allison	1	22
Epperly Heights Elementary School	Yaleli Carreno	1	22
Epperly Heights Elementary School	Lauren Hernandez	1	23
Epperly Heights Elementary School	Veronica Gray	1	22
Epperly Heights Elementary School	Lauren Hernandez	1	25
Epperly Heights Elementary School	Veronica Gray	1	25
Epperly Heights Elementary School	Valerie Minor	1	25
Epperly Heights Elementary School	Elnora Miller	1	25
Eufaula Elementary School	Erin Bridges	1	105
Eufaula Elementary School	Shalynn Johnston	1	100
Eufaula Elementary School	Brandi Bohannon	1	17
Eufaula Elementary School	Kristi Davis	1	17
Eufaula Elementary School	Lyndsey Skaggs	1	16
Eufaula Elementary School	B Swboni	1	16
Family of Faith Christian School	Sharon Phillips	1	14
First Lutheran School	Shelly Schatte	1	20
First Lutheran School	Jennelle Hanson	1	60
Garfield Elementary School	Matthew Nicolin	1	22
Garfield Elementary School	Valerie Francisco	1	22
Garfield Elementary School	Kaitlin Streber	1	23
Greenville Elementary School	Tambre Sanders	1	14
Grove Elementary School	Heather Harper	1	85
Guthrie Upper Elementary School	Stacey Johnston	1	85
Guthrie Upper Elementary School	Angela Bandy	1	90
Harris-Jobe Elementary School	Richard Henson	1	11
Harvest Hills Christian School	Debbie Ridley	1	12
Healdton Elementary School	Tara Watkins	1	22
Healdton Elementary School	Natasha Inselman	1	21
Healdton Elementary School	Tara Watkins	1	12
Healdton Elementary School	Natasha Inselman	1	12

Note: "T" represents number of teachers and "S" represents number of students

Participant List

(continued)

SCHOOL NAME	TEACHER	T	S
Heavener Elementary School	Lacey Dyer	1	20
Heavener Elementary School	Melissa Baker	1	15
Heavener Elementary School	Shelly Brown	1	19
Heavener Elementary School	Lacey Dyer	1	20
Heavener Elementary School	Melissa Baker	1	21
Heavener Elementary School	Shelly Brown	1	4
Hennessey Elementary School	Janell Riddle	1	18
Hennessey Elementary School	Kaylena Grellner	1	20
Hennessey Elementary School	Kathi Reilly	1	19
Hennessey Elementary School	Chelli Rapp	1	19
Heritage Hall School	Holly Carlin	1	66
Highland Park Elementary School	Stephanie Mouse	1	21
Highland Park Elementary School	Tamara Woodring	1	21
Highland Park Elementary School	Jennifer Black	1	25
Highland Park Elementary School	Stephanie Mouse	1	20
Highland Park Elementary School	Tamara Woodring	1	20
Hilldale Elementary School	Kathy Mimms	1	125
Hilldale Elementary School	David Adair	1	24
Holmes Park Elementary School	Tara Fancher	1	25
Holmes Park Elementary School	Kaylee Romeo	1	25
Holmes Park Elementary School	Robert Demers	1	25
Holmes Park Elementary School	Lesli Whillock	1	25
Holmes Park Elementary School	Martin	1	5
Holmes Park Elementary School	Bertha Shatswell	1	110
Homer Elementary School	Calli Presley	1	61
Hoover Elementary School	Jamilyn Lewis	1	25
Horace Mann Elementary School	Krista Farris	1	25
Horace Mann Elementary School	Mallory Cheatwood	1	22
Horace Mann Elementary School	Alyssa Kelough	1	20
Houchin Elementary School	Ashley Blake	1	20
Houchin Elementary School	Stephani Clayton	1	20
Houchin Elementary School	Betsy Davidson	1	20
Howe Elementary School	Debbie Johnston	1	40
Independence Middle School	Alana VanDeventer	1	56
Independence Middle School	Lacy Snodegrass	1	28
Independence Middle School	Ashley Bangs	1	27
Independence Middle School	Misti Zerger	1	29
Independence Middle School	Tina Myers	1	26
Independence Middle School	Alana VanDeventer	1	25
Independence Middle School	Kayleen Browning	1	25
Jackson Elementary School	Kenny Danner	1	27
Jackson Elementary School	Alesia Warner	1	26
Jackson Elementary School	Kenny Danner	1	16
Jackson Elementary School	Alesia Warner	1	17
Jackson Elementary School	PJ Siharath	1	20
James Griffith Intermediate School	Donna Kraeer	1	23
James Griffith Intermediate School	Heather Carr	1	24
James Griffith Intermediate School	Shannon DeQuasie	1	23
James Griffith Intermediate School	Amanda Wilkinson	1	24
James Griffith Intermediate School	Cortney Cunningham	1	24
James Griffith Intermediate School	Christy Wamhoff	1	25
James Griffith Intermediate School	Melissa Yocum	1	23
James Griffith Intermediate School	Heather Carr	1	25

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Participant List

(continued)

SCHOOL NAME	TEACHER	T	S
James Griffith Intermediate School	Amanda Wilkinson	1	24
James L. Dennis Elementary School	Shantell Barbour	1	22
James L. Dennis Elementary School	Wes Phillips	1	22
James L. Dennis Elementary School	Allison Becker	1	22
Jefferson Elementary School	Wendell Kennedy	1	42
Jefferson Elementary School	Lesli Arnold	1	23
Jefferson Elementary School	Bryan Karinshak	1	24
Jefferson Elementary School	Matthew Blanchard	1	26
Jefferson Elementary School	Robert Lowe	1	23
Jefferson Elementary School	Wendell Kennedy	1	23
Jefferson Elementary School	Lesli Arnold	1	20
Jefferson Elementary School	Bryan Karinshak	1	19
Jefferson Elementary School	Courtney Bullen	1	18
Jefferson Elementary School	Melissa McElfresh	1	18
Jefferson Elementary School	Elizabeth Maltos	1	18
JF Kennedy Elementary School	Bri Schatz	1	15
JF Kennedy Elementary School	Bri Schatz	1	18
Jones Elementary School	Tara Freeman	1	21
Jones Elementary School	AJ Calvert	1	20
Jones Elementary School	Jordan Aman	1	21
Justice Elementary School	Carol Lloyd	1	16
Kelley Elementary School	Michelle Hughes	1	30
Kennedy Elementary School	Elnora Miller	1	23
Kennedy Elementary School	Katie Campbell	1	19
Kennedy Elementary School	Lily Blevins	1	19
Kiefer Middle School	Taylor Johnson	1	60
Kiefer Middle School	Brittany Brown	1	51
Kingsgate Elementary School	Arica Dick	1	78
Kingsgate Elementary School	Arica Dick	1	50
Kipp Reach College Preparatory	Allisyn Burleigh	1	90
Kipp Reach College Preparatory	Gjasmine McCarroll	1	90
Konawa Elementary School	Diana Wallis	1	24
Lake Park Elementary School	Jennifer Newman	1	50
Lakeview Elementary School	Rebecca Johnson	1	15
Lakeview Elementary School	Anna Morrison	1	15
Latta Middle School	Darcie Reeves	1	21
Latta Middle School	Julie Rauch	1	21
Latta Middle School	Shawna Senkel	1	22
Latta Middle School	Ailey	1	21
Latta Middle School	Shawna Senkel	1	68
Lee Elementary School	Shawna Perry	1	24
Lee Elementary School	Kim Thompson	1	24
Lee Elementary School	Amy Watson	1	24
Lee Elementary School	Kristine Porter	1	24
Liberty Academy	Jessica Pollard	1	6
Liberty Mounds Elementary School	Anita Green	1	17
Liberty Mounds Elementary School	Burt McLain	1	18
Lincoln Elementary School	Kenny Tudor	1	59
Lincoln Elementary School	Zac Robertson	1	65
Lincoln Elementary School	Emily Stein	1	26
Lincoln Elementary School	Tonya Ford	1	17
Lomega Elementary School	Angela Kerr	1	15
Lomega Elementary School	Sandy Kramer	1	22

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Participant List

(continued)

SCHOOL NAME	TEACHER	T	S
Lone Grove Intermediate School	Sarah Voreis	1	55
Lone Grove Intermediate School	Brenda Wright	1	55
Macomb Elementary School	Kelcey McAnulty	1	23
Macomb Elementary School	Sam Adams	1	12
Madison Elementary School	Brittany Arnold	1	20
Madison Elementary School	Janet Trotter	1	19
Madison Elementary School	Lindsey Grotheer	1	20
Mannford Upper Elementary School	Amanda Kyser	1	102
Mannsville Elementary School	Bret Willard	1	12
Maple Elementary School	Shana Thiel	1	17
Maysville Elementary School	Christie Puckett	1	26
McLoud Intermediate School	Shante Aubert	1	140
Meeker Elementary School	Angela Tyler	1	30
Messiah Lutheran Institute	Katrina Weber	1	12
Midwest City Elementary School	Tamara Moore	1	25
Midwest City Elementary School	Demetria Murphy	1	25
Midwest City Elementary School	Chelsea Cash	1	26
Midwest City Elementary School	Fiorella Quary	1	24
Midwest City Elementary School	Wendy Sparks	1	23
Midwest City Elementary School	Tamara Moore	1	30
Midwest City Elementary School	Demetria Murphy	1	30
Midwest City Elementary School	Chelsea Cash	1	30
Midwest City Elementary School	Fiorella Quary	1	30
Midwest City Elementary School	Wendy Sparks	1	30
Millwood Arts Academy	Kimberly Drea	1	20
Monroe Elementary School	Torrie Warren	1	45
Monroe Elementary School	Amy Skaggs	1	15
Monroe Elementary School	Stacia Paul	1	12
Monroe Elementary School	Peterson	1	13
Morrison Elementary School	Jenna Bulling	1	30
Morrison Elementary School	Danielle Gerbrecht	1	30
Mounds Middle School	Stephanie Sturman	1	40
Mounds Middle School	Kimm Smith	1	4
Muldrow Middle School	Jamie Patterson	1	105
Muldrow Middle School	Jamie Patterson	1	88
Mulhall - Orlando Elementary School	Kelli Kindschi	1	18
New Lima Elementary School	Jessica Carr	1	16
New Lima Elementary School	Jessica Carr	1	14
Nicoma Park Intermediate School	Terri Patten	1	45
Nicoma Park Intermediate School	BeeJay Precure	1	50
Nicoma Park Intermediate School	Lacey Blain	1	60
North Rock Creek Schools	Luci Copelin	1	66
North Rock Creek Schools	Theresa Clinkenbeard	1	22
North Rock Creek Schools	Michael Hobbs	1	100
Northmoor Elementary School	Melissa Craig	1	25
Northmoor Elementary School	Keri Snyder	1	25
Northmoor Elementary School	Janis Meyer	1	25
Northmoor Elementary School	Melissa Craig	1	15
Northmoor Elementary School	Keri Snyder	1	15
Northridge Elementary School	Noel Wisniewski	1	25
Northridge Elementary School	Laura Hardee	1	25
Northridge Elementary School	Laura Brothers	1	24
Northridge Elementary School	Andrew Wiggins	1	24

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Participant List

(continued)

SCHOOL NAME	TEACHER	T	S
Northwood Elementary School	Jennifer Stuteville	1	20
Northwood Elementary School	Shannon Hodgins	1	20
Northwood Elementary School	Brandon Sigman	1	30
Northwood Elementary School	Lexi Hernandez	1	17
Oak Hall Episcopal School	Melanie Williams	1	15
Oakridge Elementary School	Lisa Sebrant	1	20
Oakridge Elementary School	Dawn Hubbard	1	20
Oakridge Elementary School	Lynn Buchheit	1	20
Oakridge Elementary School	Tracy Coulson	1	20
Okay Elementary School	Andrea Collins	1	30
Okay Elementary School	Andrea Collins	1	28
Oklahoma School for the Blind	Whitney Gamble	1	5
Oktaha Elementary School	Susan Ledford	1	52
Olive Elementary School	Tony Cordell	1	40
Overholser Elementary School	Cortlyn Emerich	1	19
Overholser Elementary School	Keshia Frost	1	19
Overholser Elementary School	Natilee Benefield	1	19
Overholser Elementary School	Maria Castro	1	19
Panama Upper Elementary School	Sherri Walker	1	18
Panama Upper Elementary School	Debra Barnes	1	20
Panama Upper Elementary School	Lori Skelton	1	21
Panama Upper Elementary School	Sherri Walker	1	26
Panama Upper Elementary School	Suzie Carpenter	1	26
Pansy Kidd Middle School	Kenneth Braden	1	22
Pansy Kidd Middle School	Beverly McCutchan	1	23
Pansy Kidd Middle School	Terri Chitwood	1	22
Pansy Kidd Middle School	Christi Thompson	1	22
Pansy Kidd Middle School	Misty Collins	1	22
Pansy Kidd Middle School	Nina Blasdel	1	22
Pansy Kidd Middle School	Janie Davis	1	22
Pansy Kidd Middle School	Taylor Farley	1	22
Pansy Kidd Middle School	Susan Manlove	1	23
Paoli Elementary School	Donna Mckinney	1	20
Park Road Elementary School	Ann Taylor	1	22
Park Road Elementary School	Amanda Berry	1	23
Park Road Elementary School	Kayelee Howard	1	23
Park Road Elementary School	Angela Carroll	1	22
Park Road Elementary School	Amanda Berry	1	4
Parkview Adventist Academy	Daniel Spooner	1	13
Parkview Elementary School	Rashonda Stockard	1	20
Parkview Elementary School	Brian Muller	1	20
Parkview Elementary School	Amanda Ferris	1	20
Pershing Elementary School	Heather Morrison	1	55
Pershing Elementary School	Regina Kelley	1	20
Pershing Elementary School	Heather Morrison	1	28
Piedmont Intermediate	Tammy Stokes	1	155
Piedmont Intermediate	Rebecca Willis	1	146
Piedmont Intermediate	Robert Anderson	1	73
Pioneer - Pleasant Vale Elementary School	Debbie Whatley	1	31
Plaza Towers Elementary School	Stephanie Ellison	1	21
Plaza Towers Elementary School	Natalie Calvert-Morris	1	22
Plaza Towers Elementary School	Amanda Terrill	1	22
Pleasant Grove Elementary School	David Adair	1	30

Note: "T" represents number of teachers and "S" represents number of students

Participant List

(continued)

SCHOOL NAME	TEACHER	T	S
Pleasant Grove Elementary School	Kathy Ferguson	1	31
Prairie View Elementary School	Anna Wyant	1	24
Prairie View Elementary School	Christa Rigel	1	24
Ralph Downs Elementary School	Mary Thele	1	50
Ravia Elementary School	Diana Walters	1	10
Ridgecrest Elementary School	Kathy Gentry	1	28
Ridgecrest Elementary School	Michael Henson	1	28
Ridgecrest Elementary School	Kathy Gentry	1	16
Ridgecrest Elementary School	Michael Henson	1	17
Ringling Elementary School	Halie Griffin	1	26
Ringling Elementary School	Halie Griffin	1	25
Ringwood Elementary School	Matt Foster	1	25
Ripley Elementary School	Amber Meeks	1	22
Riverside Elementary School	Nancy Bross	1	15
Robin Hill Public School	Aryan Azizian	1	20
Robin Hill Public School	Missy McIntosh	1	21
Rock Creek Elementary School	Deborah Robnett	1	42
Roland Upper Elementary School	Melinda McKinney	1	54
Rollingwood Elementary School	Hope Shinn	1	18
Russell Babb Elementary School	Tina Curry	1	48
Sacred Heart Catholic School	Rebecca Johnson	1	20
Sacred Heart Catholic School	Joy Baker	1	3
Sadler Arts Academy	Annie Stevenson	1	21
Sadler Arts Academy	Jessica (Smith) Scott	1	21
Saint Joseph Catholic School	Neil Workman	1	12
Saint Joseph Catholic School	Colton Wood	1	4
Santa Fe Elementary School	Marissa Dooley	1	45
Santa Fe South Elementary School - Penn Avenue	Chantel Jones	1	75
Santa Fe South Elementary School - Western Hills	Alma Knutson	1	76
Sasakwa Elementary School	Donna Radford	1	13
Sasakwa Elementary School	Donna Radford	1	16
Schwartz Elementary School	Patricia Patterson	1	45
Seiling School	Anna Nelson	1	29
Shady Point School	Becky Baker	1	6
Silo Elementary School	Ryan Cordell	1	75
Silo Elementary School	Ryan Cordell	1	75
Sky Ranch Elementary School	Madison Thomas	1	95
Sky Ranch Elementary School	Madison Thomas	1	57
Soldier Creek Elementary School	Shelby Pearson	1	22
South Lake Elementary School	Jan Brim	1	88
South Rock Creek Elementary School	Rachelle Law	1	23
South Rock Creek Elementary School	Brooke Eddings	1	24
Southern Nazarene University School for Children	Andrea Guy	1	26
Spiro Upper Elementary School	Becky Cox	1	20
Spiro Upper Elementary School	Leigh Sanders	1	20
Spiro Upper Elementary School	Angela Timmons	1	20
Spiro Upper Elementary School	Angie Hammontree	1	20
Spiro Upper Elementary School	Becky Cox	1	25
Spiro Upper Elementary School	Leigh Sanders	1	25
Spiro Upper Elementary School	Angela Timmons	1	20
Springer Elementary School	Payton Taylor	1	15
Springer Elementary School	Payton Taylor	1	11
St. Eugene Catholic School	Whitney Jansen	1	26

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Participant List

(continued)

SCHOOL NAME	TEACHER	T	S
St. James The Greater Catholic School	Tony Silva	1	25
St. John Christian Heritage Academy	James Brown	1	7
St. Philip Neri Catholic School	James Bleecker	1	15
Steed Elementary School	Courtney Robbins	1	25
Steed Elementary School	Ciane Hartzell	1	25
Steed Elementary School	Alexandria Mcghee	1	25
Steed Elementary School	Ciane Hartzell	1	20
Steed Elementary School	Alexandria Mcghee	1	20
Strother Elementary School	Charity Dillon	1	17
Strother Elementary School	Lynsie Stay	1	17
Strother Elementary School	Charity Dillon	1	11
Strother Elementary School	Jenna Pollock	1	15
Sulphur Intermediate Elementary School	Kim Dixon	1	38
Sulphur Intermediate Elementary School	Jennifer Williams	1	35
Sulphur Intermediate Elementary School	Lacey Doty	1	40
Sulphur Intermediate Elementary School	Kim Dixon	1	33
Sulphur Intermediate Elementary School	Jennifer Williams	1	28
Sulphur Intermediate Elementary School	Lacey Doty	1	33
Thomas Middle School	Cara Sherry	1	20
Thomas Middle School	Nancy Giles	1	20
Thomas Middle School	Logan Proctor	1	21
Thomas Middle School	Sherry McDaniel	1	11
Tinker Elementary School	Craig Elrod	1	20
Tinker Elementary School	Kayla Wilbanks	1	13
Tinker Elementary School	Belinda Patrick	1	15
Tishomingo Middle School	Julie Garner	1	70
Tishomingo Middle School	Debbie Caskey	1	60
Tonkawa Elementary School	Fawne Pierce	1	55
Tony Goetz Elementary School	Tonya Gates	1	20
Tony Goetz Elementary School	Keri Green	1	20
Tony Goetz Elementary School	Heather McCall	1	9
Townsend Elementary School	Karen Bermudez	1	25
Townsend Elementary School	Kodie Binswanger	1	25
Townsend Elementary School	Wendy Ramsey	1	25
Union Elementary School	Melissa Smith	1	26
Union Elementary School	Lexis Sherman	1	28
Union Elementary School	Melissa Smith	1	20
Union Elementary School	Lexis Sherman	1	14
Union Elementary School	Karl King	1	20
Vanoss Elementary School	Sarah Francois	1	40
Varnum Elementary School	Brenda Shockley	1	1
Varnum Elementary School	Lauren Newman	1	4
Varnum Elementary School	Randy McCown	1	17
Vici Elementary School	Donna Peoples	1	23
Vici Elementary School	Donna Peoples	1	9
Victory Life Academy	Melissa Holder	1	11
Victory Life Academy	Melissa Holder	1	8
Wanette Elementary School	Betty Buff	1	20
Ward Elementary School East	Kristy Sisemore	1	17
Ward Elementary School East	Elise Horn	1	20
Ward Elementary School East	Kerrey Matlock	1	18
Warner Elementary School	Cindy Shry	1	48
Washington Elementary School	Lindy Brewer	1	20

Note: "T" represents number of teachers and "S" represents number of students

Participant List

(continued)

SCHOOL NAME	TEACHER	T	S
Washington Elementary School	Angel Paulk	1	20
Washington Elementary School	Kristen Byrd	1	20
Washington Elementary School	Susan Roach	1	20
Washington Elementary School	Lindy Brewer	1	18
Washington Elementary School	Angel Paulk	1	18
Washington Elementary School	Kristen Byrd	1	18
Washington Elementary School	Susan Roach	1	18
Washington Irving Elementary School	Shawna Shorb	1	50
Washington Irving Elementary School	Patricia Hill	1	25
Washington Irving Elementary School	Shawna Shorb	1	50
Wayland Bonds Elementary School	Jessica Aman	1	70
Webbers Falls Elementary School	Ali Sanders	1	27
Webbers Falls Elementary School	Rose Olson	1	21
Wellston Elementary School	Wanda Hall	1	80
Western Oaks Elementary School	Kendra Moy	1	120
Westfall Elementary School	Amy Davis	1	26
Westfall Elementary School	Chrystal Reis	1	25
Westfall Elementary School	Miranda Pherigo	1	25
Westfall Elementary School	Chrystal Reis	1	21
Westfall Elementary School	Destiny Corbin	1	21
Westfall Elementary School	Kathy Austin	1	20
Westfall Elementary School	Kristen Stein	1	21
Wewoka Elementary School	Janet Farrow	1	21
Wewoka Elementary School	Chris Taylor	1	20
White Rock Elementary School	Mallory Tully	1	10
Whitebead Elementary School	Becky Higgins	1	20
Whitebead Elementary School	Joni Hamilton	1	19
Whittier Elementary School	Richard Henson	1	19
Whittier Elementary School	Audra Long	1	19
Whittier Elementary School	Donna Zarnke	1	17
Will Rogers Elementary School	Vicki Hanlin	1	33
Will Rogers Elementary School	Leslie Rollins	1	18
Will Rogers Elementary School	Allison Mitchell-Hill	1	19
Will Rogers Elementary School	Lorrie Scott	1	19
Will Rogers Elementary School	Kelsey Tucker	1	19
Willard Grade Center	Elizabeth Cannon	0	10
Willard Grade Center	Elizabeth Cannon	1	26
Willard Grade Center	Linda Forrester	1	29
Willard Grade Center	Angela Foster	1	7
Willard Grade Center	Rhiannon Debrosky	1	70
Wilson Elementary School	Amanda Stearns	1	22
Wilson Elementary School	Nadean Melton	1	17
Wilson Elementary School	John Walker	1	19
Wilson Elementary School	Amanda Stearns	1	25
Winding Creek Elementary School	Cindy Riedl	1	26
Winding Creek Elementary School	Brandy Thetford	1	27
Winding Creek Elementary School	Jessica White	1	26
Winding Creek Elementary School	Sandra Dobbs	1	26
Winding Creek Elementary School	Megan Hunt	1	4
Woodward Christian Academy	Robert Dwinelle	1	3
	TOTALS	**528**	**15897**
	TOTAL PARTICIPANTS	**16425**	

Note: "T" represents number of teachers and "S" represents number of students

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Teacher Program Evaluation Data

1 Did you install any of the products from your kit?	
Yes	81%
No	19%
2 The products in the kit were easy for students to use.	
Strongly Agree	50%
Agree	43%
Disagree	7%
Strongly Disagree	0%
3 Did you use the curriculum materials to teach in class?	
Yes	95%
No	5%
4 Students indicated that their parents supported the program.	
Yes	90%
No	10%
5 Would you conduct this program again?	
Yes	98%
No	2%
6 Would you recommend this program to other colleagues?	
Yes	100%
No	0%
7 Did you distribute the student surveys to your students?	
Yes	100%
No	0%

Due to rounding of numbers, percentages may not add up to 100%

Teacher Comment Data

(continued from page 22)

What did students like best about the program?

"They love the kits the best!"
Tracy Allison, Byng Elementary School

"Being able to try to put something together."
James Brown, St. John Christian Heritage Academy

"They loved getting to take home the kits."
Melanie Williams, Oak Hall Episcopal School

"Students loved getting the box of household items to help save energy + conserve water."
Amanda Stearns, Wilson Elementary School

"They enjoyed gifting their families with the materials."
Stephanie Mouse, Highland Park Elementary School

"They love the nightlights."
Tamara Woodring, Highland Park Elementary School

"The materials kit. They love new things. Especially the night light."
Joy Baker, Sacred Heart Catholic School

"Hands on activities and knowledge about energy."
Burt McLain, Liberty Mounds Elementary School

"They loved examining the items in the LivingWise kit."
Ashlee Hunter, Cross Timbers Elementary School

"The students loved getting the OG+E kits."
Ashley Renken, Cross Timbers Elementary School

"They liked seeing Rumble and the Thunder support. They especially commented about the Night Light."
Luann Gilbert, Earlywine Elementary School

"The students liked the night light and that they got free things!"
Shyan Stallings, Earlywine Elementary School

"Vocabulary Scramble Kit."
Heather Carr, James Griffith Intermediate School

"My students loved learning how to save energy at home and receiving the kits."
Shannon Hodgins, Northwood Elementary School

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Teacher Comment Data

(continued)

"Students liked to learn how to save energy."
Colton Wood, Saint Joseph Catholic School

"Learning conservation techniques Rumble nightlight."
Becky Baker, Shady Point School

"They enjoyed the Rumble Nightlight."
Ciane Hartzell, Steed Elementary School

"They enjoyed the change of doing the program and activities."
Melissa Holder, Victory Life Academy

"The students enjoyed installing the kits the best."
Pam Norris, Beggs Middle School

"The students were excited to learn about conservation."
LaDonna Utley, Checotah Intermediate School

"Free Stuff and reading about things that connected to their daily life."
Ashley McGovran, Collins Elementary School

"What students liked the best about the program was the kit. They were very interested in taking them home and installing it."
Alesia Warner, Jackson Elementary School

"The students loved doing the experiments in class."
Bri Schatz, JF Kennedy Elementary School

"The students enjoyed the actual materials in the kits."
Keri Snyder, Northmoor Elementary School

"They enjoyed learning the different way they can help conserve energy themselves."
Melissa Craig, Northmoor Elementary School

"They love taking the kits home and teaching their families."
Jessica (Smith) Scott, Sadler Arts Academy

"All the products in the kit."
Linda Falleur, Creek Elementary School

"The students loved getting the box and working, hands on, with their parents."
Tambre Sanders, Greenville Elementary School

"My students liked the interactive learning by taking their kit home."
Natilee Benefield, Overholser Elementary School

Teacher Comment Data

(continued)

"What my students liked about the program was getting their kit."
Maria Castro, Overholser Elementary School

"The experiments."
Linda Forrester, Willard Grade Center

"The students really loved the activities in the workbook and the take home kit."
Kelsey Ledford, Cross Timbers Elementary School

"The puzzles in the handbook."
Sharon Phillips, Family of Faith Christian School

"The in-class labs and experiments."
Jennelle Hanson, First Lutheran School

"They liked learning about and then using things they learned about."
Cortlyn Emerich, Overholser Elementary School

"The kits full of stuff."
Keshia Frost, Overholser Elementary School

"They enjoyed the box and were excited to take them home."
Alexandria Mcghee, Steed Elementary School

"The students really enjoyed the kits. They also enjoyed the online activities."
Rhiannon Debrosky, Willard Grade Center

"Getting stuff to their homes."
Tara Freeman, Jones Elementary School

"It was a break from the norm, and they loved the labs."
Shante Aubert, McLoud Intermediate School

"Night lights and light bulbs + bracelets."
Shawna Shorb, Washington Irving Elementary School

"Every year, students like the "hands on." materials."
Karie Moorehead, Drummond Elementary School

"Variety of activities."
Nancy Summers, Earl Harris Elementary School

"They were excited about the nightlight and enjoyed the activities."
Karla White, Earl Harris Elementary School

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Teacher Comment Data

(continued)

"Getting to use things in their home."
Heather Digiantomasso, Earl Harris Elementary School

"My students liked the kit the best because they got to talk with parents and install the items."
Fawne Pierce, Tonkawa Elementary School

"Trying the materials at home."
Lindsey Mayberry, Collins Elementary School

"They were excited to get their kits and take them home to make changes."
Pam Garner, Darlington Elementary School

"Experiments & activities."
Anna Morrison, Lakeview Elementary School

What did you like best about the program?

"The easy-to-follow lesson plan."
Angela Tyler, Meeker Elementary School

"I liked having a fun and unique resource to teach the science resource."
Ashlee Hunter, Cross Timbers Elementary School

"I like that the materials match the state standards."
Ashley Renken, Cross Timbers Elementary School

"I like the versatility in the teaching plan and the ease of following it. With COVID I like that there are activities to do at home."
Luann Gilbert, Earlywine Elementary School

"The kit. The connections to the Thunder Team."
Sherry Honeyman, Earlywine Elementary School

"I liked how this program encouraged the students to think about the way they use energy."
Shyan Stallings, Earlywine Elementary School

"It reinforces our Science standards."
Heather Carr, James Griffith Intermediate School

"I enjoyed seeing the students learn about energy."
Tamara Moore, Midwest City Elementary School

"I enjoyed teaching the lessons each day, and hearing from my students how they used the materials at home."
Shannon Hodgins, Northwood Elementary School

Teacher Comment Data

(continued)

"I thought it did a good job getting students involved."
Colton Wood, Saint Joseph Catholic School

"Easy to teach Important lessons kids love kits."
Becky Baker, Shady Point School

"The 50$ mini-grant."
Ciane Hartzell, Steed Elementary School

"The program is easy to use and covered state standard material."
Melissa Holder, Victory Life Academy

"I liked that it encompasses a lot of areas on conservation."
Pam Norris, Beggs Middle School

"The topics to teach about energy and ever-changing resources."
Shannon West, Calera Elementary School

"The program helps make a connection from natural resources to our everyday life."
LaDonna Utley, Checotah Intermediate School

"Everything was included and very easy to follow."
Ashley McGovran, Collins Elementary School

"What I liked best about the program is all the resources that comes with it. The kit gives real-life tangibles the posters give great visuals, and the workbooks are easy to use."
Alesia Warner, Jackson Elementary School

"I liked how relevant it all was. It showed practical uses for conservation."
Bri Schatz, JF Kennedy Elementary School

"I love how the program is very student friendly. Nothing was too deep for the students."
Keri Snyder, Northmoor Elementary School

"I liked that the kits came with quality posters that were great visual aids."
Melissa Craig, Northmoor Elementary School

"Teacher book and study guide with lessons, visual aids, etc."
Linda Falleur, Creek Elementary School

"I like the teacher guide that accompanies the boxes and the sheets that already have the DAS standards."
Tambre Sanders, Greenville Elementary School

"I liked my students' excitement. They loved it."
Natilee Benefield, Overholser Elementary School

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Teacher Comment Data

(continued)

"What I liked about the program was that students got to see how learning goes far beyond the classroom."
Maria Castro, Overholser Elementary School

"The ease of presenting the program."
Elizabeth Cannon, Willard Grade Center

"Diagrams, pictures."
Linda Forrester, Willard Grade Center

"I love that the program applies our energy standard with a real-world application."
Kelsey Ledford, Cross Timbers Elementary School

"It gave some experiments and demonstrations to do."
Sharon Phillips, Family of Faith Christian School

"The variety of teaching tools, books, digital tools, labs activities, assessments, etc."
Jennelle Hanson, First Lutheran School

"My students loving the kits and lessons."
Cortlyn Emerich, Overholser Elementary School

"The kids excitement."
Keshia Frost, Overholser Elementary School

"I like the student guidebook."
Alexandria Mcghee, Steed Elementary School

"I appreciate the wealth of resources."
Rhiannon Debrosky, Willard Grade Center

"How we could tie everything we have learned all year into one program. Allowed me to reteach a few topics."
Shante Aubert, McLoud Intermediate School

"That you give free kits to fifth graders."
Shawna Shorb, Washington Irving Elementary School

"I enjoy seeing the kids excited."
Karie Moorehead, Drummond Elementary School

"Supported my standards."
Youmi Carroll, Earl Harris Elementary School

"Hands an activities."
Karla White, Earl Harris Elementary School

Teacher Comment Data

(continued)

"Very interactive!"
Heather Digiantomasso, Earl Harris Elementary School

"I like that the students are excited about seeing how the kits work. The website is a nice resource."
Fawne Pierce, Tonkawa Elementary School

"The resources given."
Lindsey Mayberry, Collins Elementary School

"I enjoyed doing the curriculum with the students. They were amazed at how much energy they could save."
Pam Garner, Darlington Elementary School

What would you change about the program?

"Nothing-Its great!"
Neil Workman, Saint Joseph Catholic School

"Nothing! I love this program."
Becky Henderson, Byng Elementary School

"No Covid played a role in how many of the surveys were returned."
Donna Radford, Sasakwa Elementary School

"Nothing."
Tracy Allison, Byng Elementary School

"The survey for the youth is in depth and ask questions the youth would not know."
James Brown, St. John Christian Heritage Academy

"I use this program every year! It is great the way it is."
Melanie Williams, Oak Hall Episcopal School

"Ways to make the activities digital. Since we have distance learning obstacles facing us digital access would be great."
Amanda Stearns, Wilson Elementary School

"Nothing! This is our 4th year and I look forward to working through everything with my kids each year."
Stephanie Mouse, Highland Park Elementary School

"Nothing. It was tremendous."
Burt McLain, Liberty Mounds Elementary School

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Teacher Comment Data

(continued)

"Add more activities or hands on projects include more in-depth information on some of the biggest energy resources."
Angela Tyler, Meeker Elementary School

"The program is great, and I appreciate the resources that students trust."
Ashlee Hunter, Cross Timbers Elementary School

"Some of the lessons are hard for struggling students."
Ashley Renken, Cross Timbers Elementary School

"Nothing."
Luann Gilbert, Earlywine Elementary School

"Digital resources."
Shyan Stallings, Earlywine Elementary School

"I wouldn't"t change anything."
Shannon Hodgins, Northwood Elementary School

"I would update the materials and maybe a google lesson option w/ videos on elements."
Colton Wood, Saint Joseph Catholic School

"There were some questions that the children had a hard time obtaining in the survey- an introductory video showing kit installations."
Melissa Holder, Victory Life Academy

"Possibly tie in some videos with book."
Shannon West, Calera Elementary School

"Excellent program. I don't know anyway to make it better."
LaDonna Utley, Checotah Intermediate School

"Videos to go along with lessons."
Ashley McGovran, Collins Elementary School

"One thing I would change is to combine the 2 student workbooks into 1. That would help cut back on materials."
Alesia Warner, Jackson Elementary School

"I would include more experiments. Also, some of the worksheets were very difficult for the students to complete."
Bri Schatz, JF Kennedy Elementary School

"I wouldn"t change a thing."
Keri Snyder, Northmoor Elementary School

Teacher Comment Data

(continued)

"I wouldn"t change anything."
Melissa Craig, Northmoor Elementary School

"Videos! Kid friendly to introduce each lesson."
Linda Falleur, Creek Elementary School

"I like it as is."
Tambre Sanders, Greenville Elementary School

"Nothing."
Natilee Benefield, Overholser Elementary School

"When there is not help from an adult, the student may struggle with their kit. Maybe something that they could also do independently."
Maria Castro, Overholser Elementary School

"One thing I would change would be to make lesson available for Google Classroom. We had some students quarantine during the program."
Elizabeth Cannon, Willard Grade Center

"Nothing, it's a great program. Parents just don't want to do anything at home."
Linda Forrester, Willard Grade Center

"I do not have any suggestions."
Kelsey Ledford, Cross Timbers Elementary School

"Have great speakers share about energy with students, take out some of the information-there was too much information at times and the kids got bored."
Sharon Phillips, Family of Faith Christian School

"We needed more time this year just because of the craziness of virtual/hybrid."
Keshia Frost, Overholser Elementary School

"Some online interactive resources."
Alexandria Mcghee, Steed Elementary School

"The only thing I found difficult was not having an online curriculum we had several students going in and out of quarantine that either participated for a portion or not at all."
Rhiannon Debrosky, Willard Grade Center

"Nothing I love it!"
Shawna Shorb, Washington Irving Elementary School

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Teacher Comment Data

(continued)

"I think it would be fun to include game type of activities to reinforce understanding."
Karie Moorehead, Drummond Elementary School

"More online interacted activities for online students."
Karla White, Earl Harris Elementary School

"Nothing!"
Heather Digiantomasso, Earl Harris Elementary School

"Students also liked the games and activities on the website."
Fawne Pierce, Tonkawa Elementary School

"Nothing... I love the program."
Pam Garner, Darlington Elementary School

Parent/Guardian Program Evaluation Data

1 Was the Program easy for you and your child to use?

Yes	100%
No	0%

2 Will you continue to use the Kit items after the completion of the Program?

Yes	100%
No	0%

3 Would you like to see this Program continued in local schools?

Yes	100%
No	0%

Due to rounding of numbers, percentages may not add up to 100%

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Parent/Guardian Comment Data

(continued from page 24)

As a parent, which aspect of the program did you like best?

"Faucet Aerators and Shower head."
Terri lelatkins, Roland Upper Elementary School

"Showerhead."
Jesse Gonzalez, Sacred Heart Catholic School

"It taught our son about conserving energy."
Nesha Olney, Thomas Middle School

"It was interesting to learn about the various new energy efficient options available. Our children are now more aware of making efficient choices."
Holly Gerard, Victory Life Academy

"See the savings."
Rebecca Bennett, Wellston Elementary School

"This program teaches kids how important it is to be energy efficient."
Ryan and Melissa Shaw, Willard Grade Center

"Great way to raise awareness that little changes a makes a difference."
Michelle Carr, Jackson Elementary School

"I like the light bulbs."
John Self, Latta Middle School

"Working together as a team while teaching your child how to conserve."
Lori and Kevin Barnes, Northmoor Elementary School

"Many savings tips and the shower head."
Teniesha Colungo, Springer Elementary School

"The time getting to spend with my child to educate and teacher about cost expenses."
Christian & Lorane Jernigan, Union Elementary School

Teacher Letters

(continued from page 26)

January 18, 2021

Dear LivingWise,

We did not receive the opportunity to participate in the program last year due to the COVID-19 restrictions, which was disappointing.

When I was initially responding to the invitation to participate this school-year, we had 120 students in our 5th-grade classes. Due to ongoing safety concerns, our enrollment dropped at Christmas to a mere 80 students.

It has been challenging to engage students virtually and connect the school with the home when we only have our students twice per week. This program was the shot in the arm we all needed. The kids were so excited when we introduced this program and all the activities that came with it. It was a hit, and I am genuinely grateful for the support you have given during these unprecedented times.

Sincerely,

Kendra Moy

Kendra Moy
5th Grade Teacher
Western Oaks Elementary School

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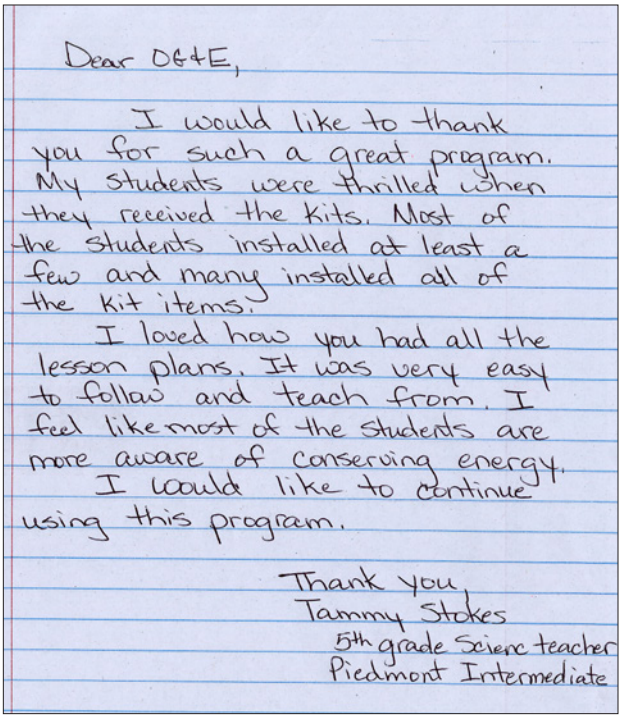
Teacher Letters

(continued)



Dear O&E,

I would like to thank you for such a great program. My students were thrilled when they received the kits. Most of the students installed at least a few and many installed all of the kit items.

I loved how you had all the lesson plans. It was very easy to follow and teach from. I feel like most of the students are more aware of conserving energy.

I would like to continue using this program.

Thank you,
Tammy Stokes
5th grade Science teacher
Piedmont Intermediate

Dear Living-Wise Program, Jan. 1, 2021

Thank you for providing this program! I have taught it for 3 years now and the information taught is invaluable. The students learn so much pertinent information. I love teaching them how THEY can contribute to energy conservation. All the students enjoy taking their kits home and showing their family all the items they can install that will help their household save money and energy. I hope you can continue providing this program for years to come as it is very beneficial.

Sincerely,

Keri Snyder

Keri Snyder
5th grade
Northmoor Elementary

Northwood Elementary School
Seminole Public Schools

Phone: 405-382-5800
Fax: 405-382-8658

P. O. Box 1031
1001 Carson Drive
Seminole, OK 74868

Dear Oklahoma Gas & Electric,

Thank you so much for providing this wonderful program for our students. My students enjoyed learning from the lessons each day. Each day during the lessons that we completed, my students learned new information about energy and water conservation. They loved receiving the kits, and having their family help them conserve energy at home by using the materials. They also loved receiving a bracelet for returning the surveys. I was impressed by how fast I received the materials and kits for my students. In addition, everything was so well organized which made it very easy to teach the lessons each day. I look forward to implementing this program again during the next school year.

Thank you,

Shannon Hodgins

Shannon Hodgins
5th Grade Teacher
Seminole Public Schools

Teacher Letters

(continued)

Office of the Principal

MOORE Public Schools
LEARNING FOR LIFE
EARLYWINE ELEMENTARY
12800 South May Avenue • Oklahoma City, OK 73170
405.735.4150 • Fax 405.692.5659

Luann Gilbert
November 30, 2020

Tahnee Ramirez
OG&E Living Wise Program Coordinator

Dear Ms. Ramirez and OG&E Affiliates,

Thank you for providing the Living Wise Program to schools. It has been a beneficial tool in extending the educational curriculum of our 5th grade students at Earlywine, especially during the uncertain times in which we currently find ourselves. The content within the program enables the students to make education personal and take an assessment of their energy choices and decisions. It also helps them to gain a broader scope of the environmental issues that impact our society and are likely to be of greater concern to them in the future. It also encourages them to think outside of their egocentric nature and to consider the needs of other people. With additional time being spent at home considering our current health crisis, it has provided families with an opportunity to assess their energy usage and make changes as needed. I believe they enjoy learning some of the official vocabulary used in the energy industry. The suggestions of possible ways to save money for their families seems to be particularly intriguing to many of my students. One family mentioned how surprised they were at savings that could result from minor changes after conducting experiments in the workbook. They have all spoken of ways they are at least more aware of their energy consumption, and many have made changes in their behavior. It certainly seems a success if they are more energy conscious. Some have made bigger changes than others, but hopefully every little bit will contribute to the greater good of all. I am grateful for the part you are playing in this effort.

Sincerely,

Luann Gilbert

Luann Gilbert

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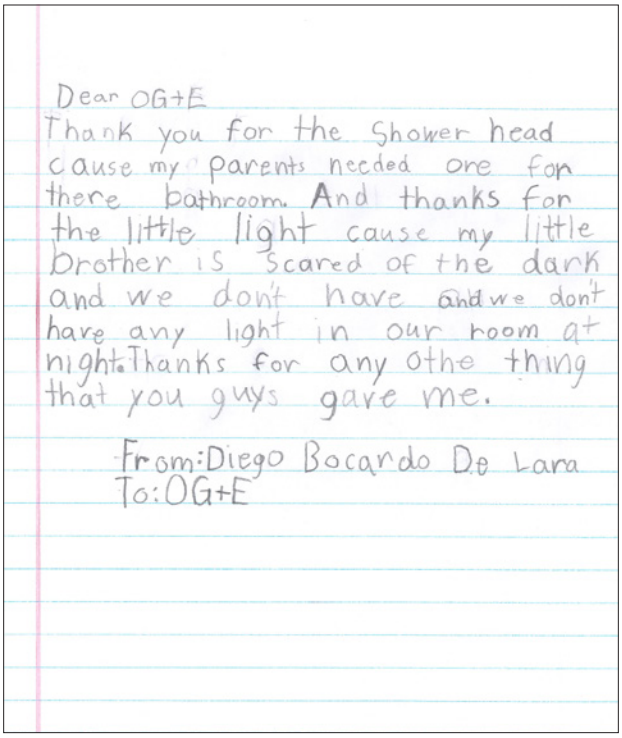
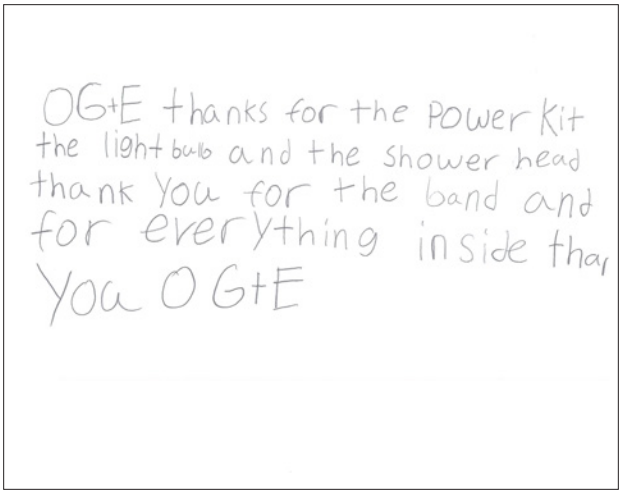
Student Letters

(continued from page 28)

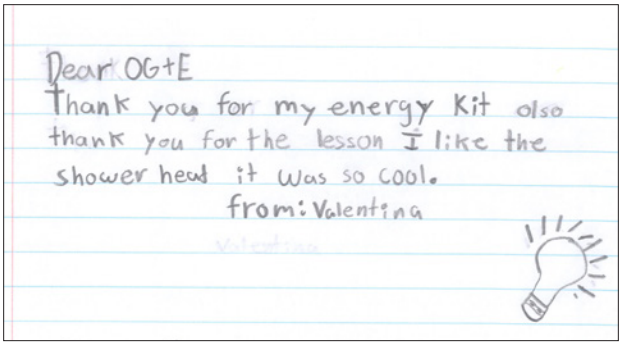


Dear OG+E
Thank you for the shower head cause my parents needed one for there bathroom. And thanks for the little light cause my little brother is scared of the dark and we dont have and we dont have any light in our room at night. Thanks for any othe thing that you guys gave me.

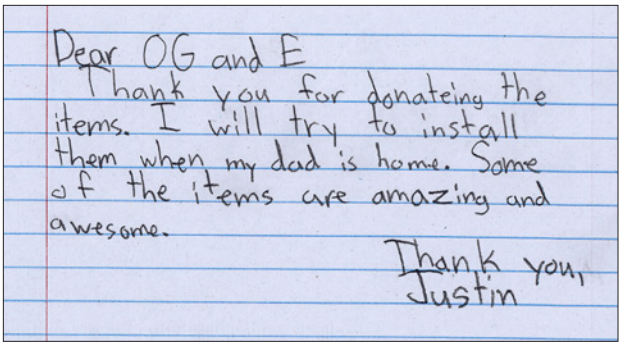
From: Diego Bocardo De Lara
To: OG+E



OG+E thanks for the Power Kit the light bulb and the shower head thank you for the band and for everything inside that you OG+E

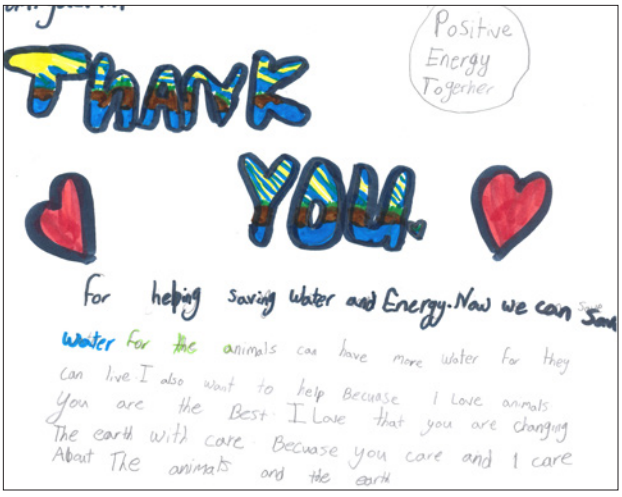


Dear OG+E
Thank you for my energy Kit also thank you for the lesson I like the shower head it was so cool.
from: Valentina



Dear OG and E
Thank you for donateing the items. I will try to install them when my dad is home. Some of the items are amazing and awesome.

Thank you,
Justin



Student Letters

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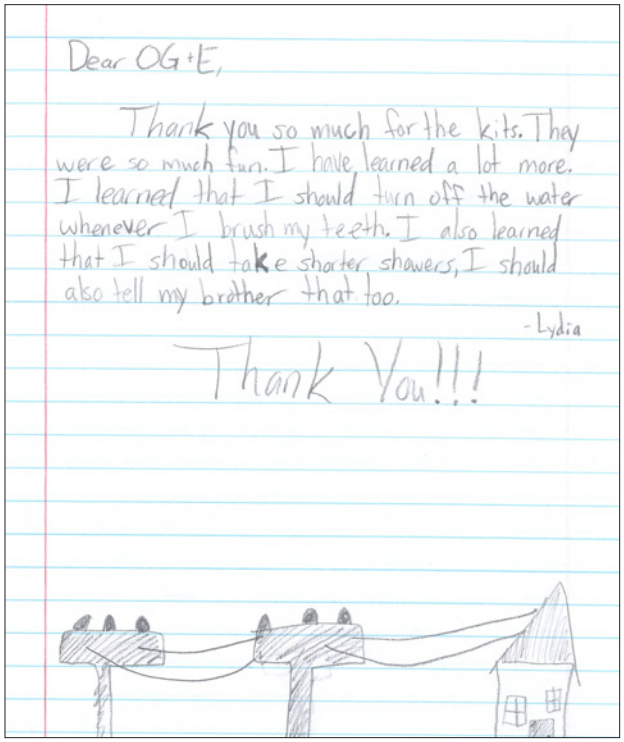
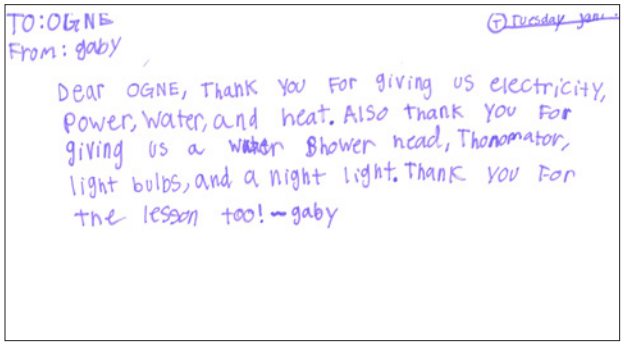


Dear OG+E,

Thank you so much for the kits. They were so much fun. I have learned a lot more. I learned that I should turn off the water whenever I brush my teeth. I also learned that I should take shorter showers, I should also tell my brother that too.

-Lydia

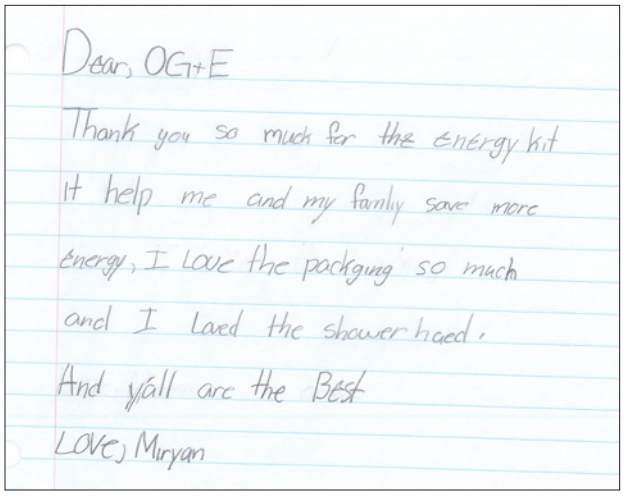
Thank You!!!



TO: OGNE
From: gaby

Tuesday

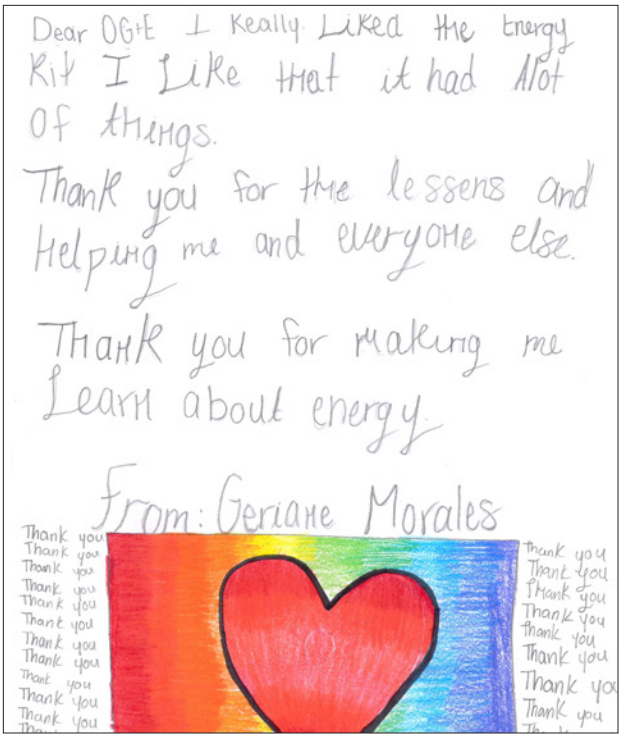
Dear OGNE, Thank you for giving us electricity, power, water, and heat. Also thank you for giving us a water Shower head, Thonomator, light bulbs, and a night light. Thank you for the lesson too! -gaby



Dear, OG+E

Thank you so much for the energy kit it help me and my family save more energy, I Love the packging so much and I Laed the shower haed, And yall are the Best

LOVE, Miryan



Dear OG+E I Really Liked the Energy Kit I Like that it had Alot of things.

Thank you for the lessens and Helping me and everyone else.

Thank you for making me Learn about energy.

From: Geriane Morales

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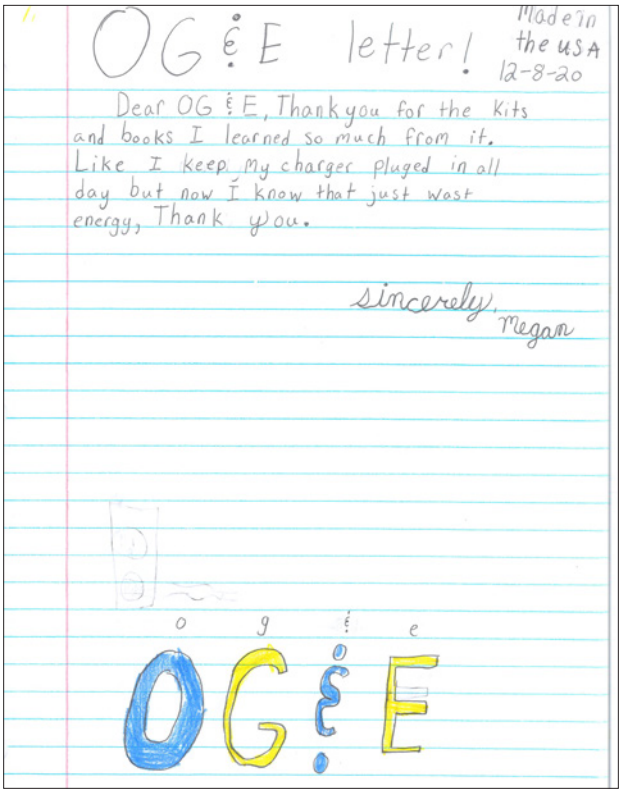
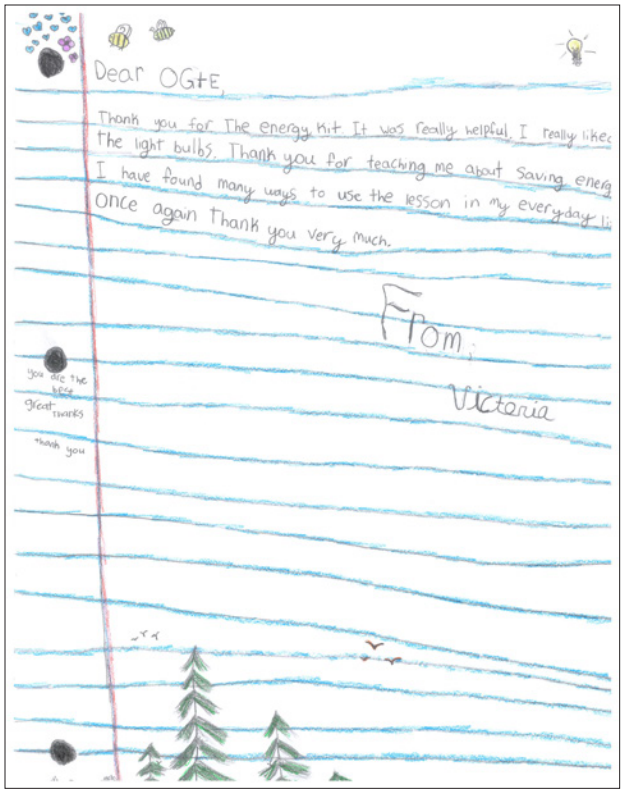
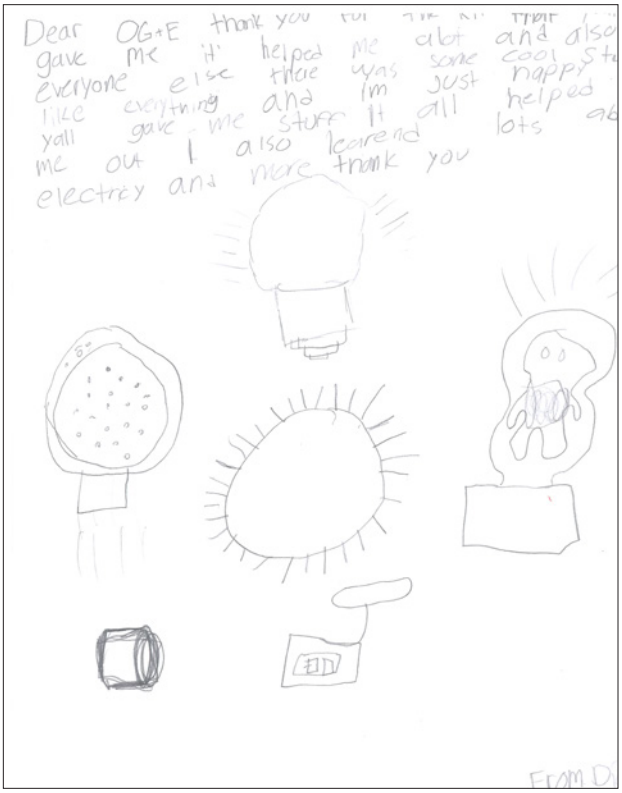
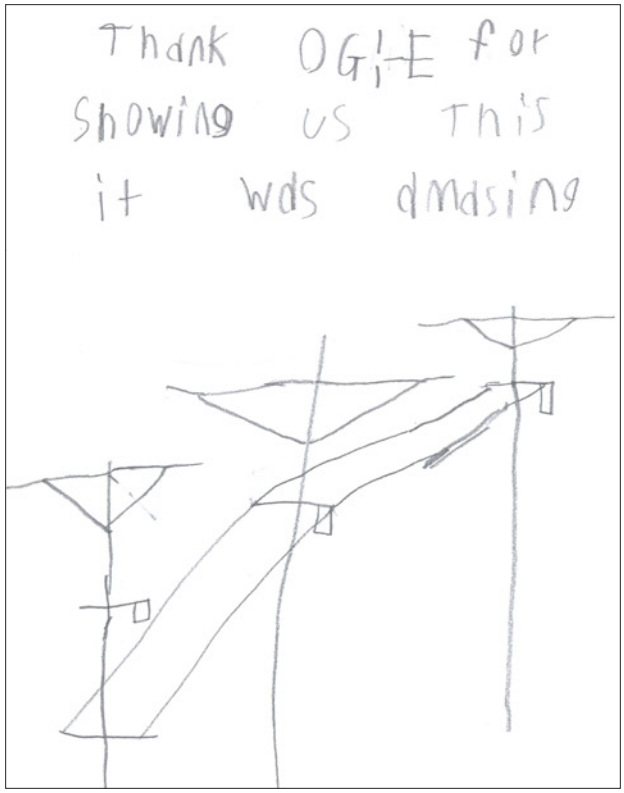
Student Letters

(continued)









Student Letters

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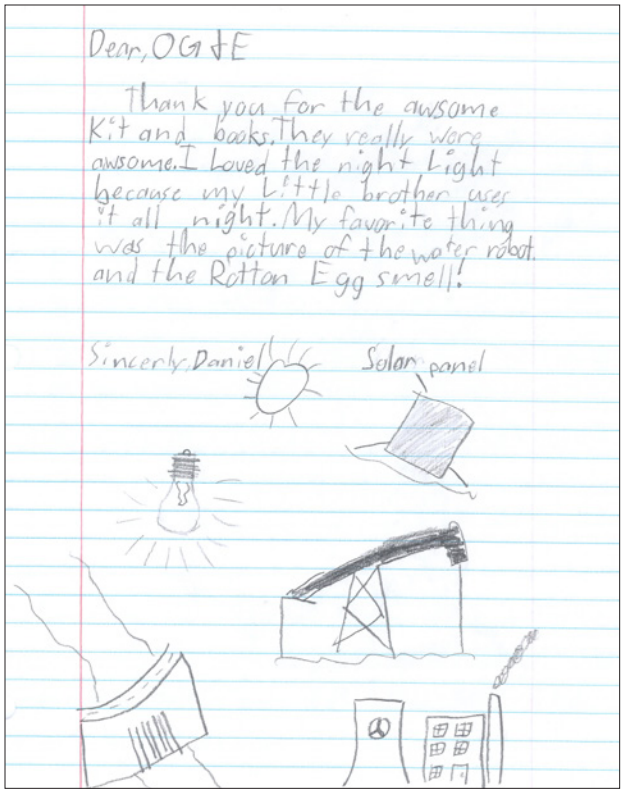

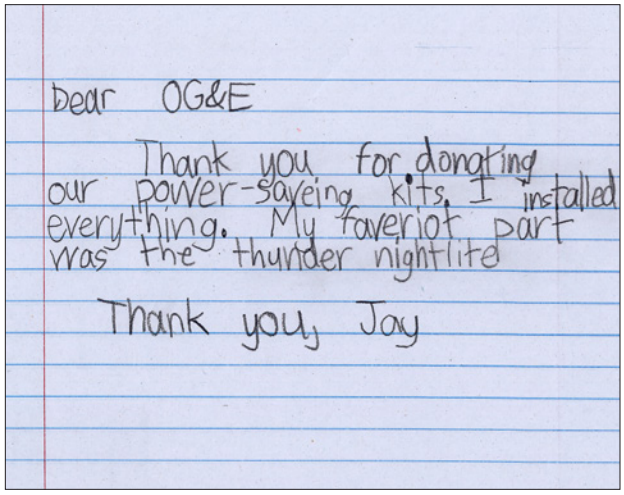

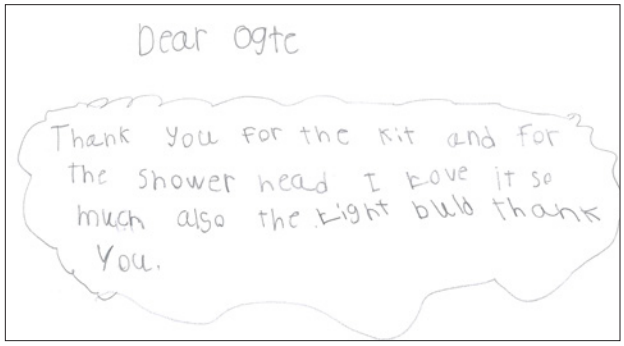

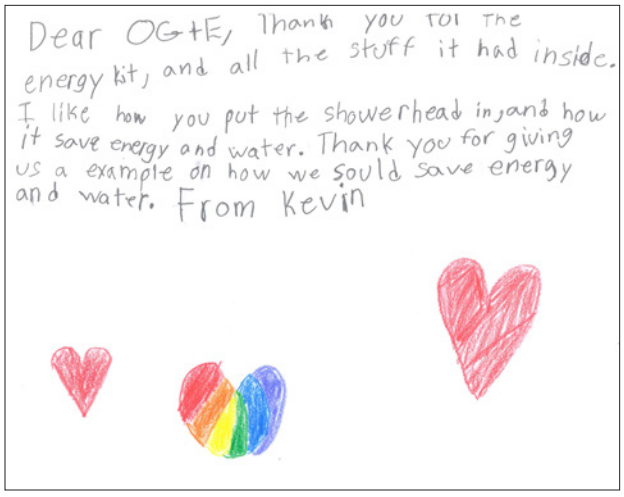

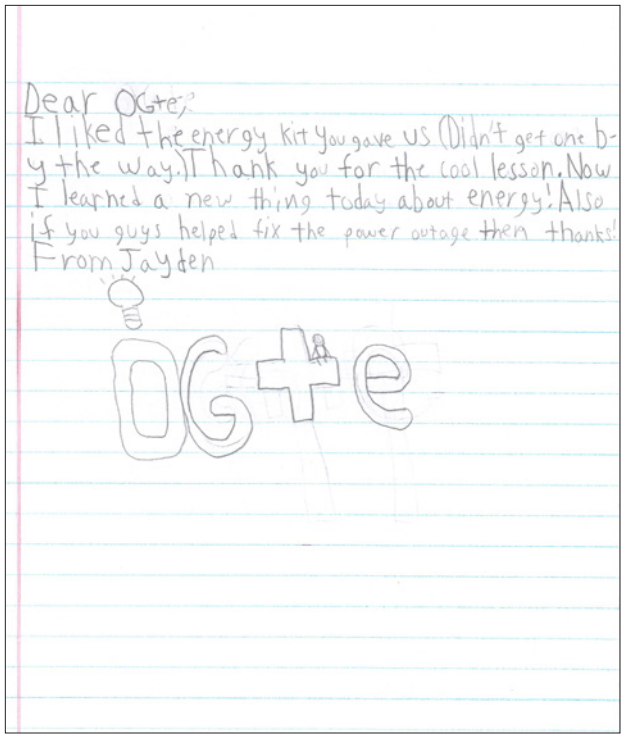

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7.4 Water and Emissions Methodology

Methodology to estimate a consistent, output-based emissions and fresh water savings rate from OG&E's operations

Background:

In an annual report, OG&E represents Demand Program emissions and water savings for The Oklahoma Corporation Commission. The following estimation methodology is used to maintain a consistent and reliable representation of this basis. Importantly, this methodology allows water and emissions to be compared on an equal footing due to the inclusion of only parameters under OG&E's direct operational control. For the Demand Program, an estimate is needed for: fresh water use, and emissions of nitrogen oxides (NO_x), sulfur dioxide (SO_2) & carbon dioxide-equivalents (CO_2e).

Assumptions:

1. Fresh water use and emission rates are derived from all power plants owned and operated by OG&E, including wind, solar, and fossil-fueled (natural gas and coal).
2. OG&E has direct control (i.e., is the operator) over these facilities and direct access to their water use, emissions, and power generation information.
3. Purchased power (from any source or state) is not part of this methodology as the associated water use and emissions are not accounted for by OG&E in regulatory programs or permits.
4. Renewable Emissions Credits (RECs) are not part of this calculation as they only pertain to CO_2e emissions and wind and solar generation, not part of any regulatory program, not certified and would be inconsistent with other environmental benefit estimations i.e., water conservation.

Calculation:

Fresh water use is based on the amount of water lost due to evaporation in the power generation process. Usage data is obtained from quality assured measurement systems which provide information for reporting to the Oklahoma Water Resources Board (OWRB) regarding water use governed by facility water rights permits. Water usage data for Frontier Power Plant is not reported to OWRB because this facility purchases water from the City of Oklahoma City. Frontier water use data is metered as it comes into the facility and when it leaves the facility. Emissions data is obtained from the Continuous Emissions Monitors (CEMs) Data Acquisition Handling System (DAHS) that is quality assured and consistent with information available from the Clean Air Markets Division (CAMD) of the Environmental Protection Agency (EPA). Generation data (gross megawatt hours (MWhs)), are derived from the sum of the gross output from OG&E-operated fossil-fueled generating units and the gross output of OG&E-owned renewable generation. The gross generation for fossil-fueled units is obtained from the same CEMS system as the emission data. Total gross generation from the McClain Power Plant is not required by the EPA CEMS reporting program referenced above, therefore, it is obtained from OG&E's Generating Availability Data System (GADS) database, a North American Electric Reliability Corporation (NERC)-developed database. GADS is a mandatory industry program for conventional generating units that are 20 MW and larger and windfarms with a total installed capacity of 75MW or greater. Currently, solar generation is not part of the NERC mandatory reporting requirements, therefore, solar MWh data is obtained from reliable, accurate OG&E sources other than GADS.

The output-based water use and emission rates are derived by dividing measured fresh water use, and emissions of NO_x, SO_2, and CO_2e from OG&E-operated fossil-fueled facilities by *gross* power generation (MWhs) from OG&E-operated fossil-fueled and OG&E owned renewable generation facilities.

Each of these factors is multiplied by the energy savings in MWh during the Demand Program period resulting in gallons of fresh water and mass (pounds or short tons) of emissions avoided by the OG&E-owned generating fleet over the duration.