2021 ANNUAL REPORT FOR ENERGY EFFICIENCY PROGRAMS
PROGRAM YEAR 2020

NMPRC EFFICIENT USE OF ENERGY RULE 17.7.2 NMAC

JULY 15, 2021

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Section I. Executive Summary

Introduction

El Paso Electric Company ("EPE") submits its annual report on the performance of EPE's Energy Efficiency Programs for calendar year 2020 ("2020 Programs"). This Annual Report for Energy Efficiency Programs ("Annual Report") covers the program period from January 1, 2020, through December 31, 2020, and relies on the statewide independent evaluator's report, *Evaluation of the 2020 El Paso Electric Energy Efficiency Programs* ("M&V Report") prepared by Evergreen Economics ("Evergreen"). The M&V Report is included as Attachment A. The programs evaluated in this Annual Report were approved by the New Mexico Public Regulation Commission ("NMPRC" or "Commission") as part of EPE's 2019-2021 Energy Efficiency and Load Management Plan ("EE/LM Plan") in accordance with 17.7.2.8(A) NMAC. See Final Order Adopting Recommended Decision in Case No. 18-00116-UT (March 6, 2019) ("Final Order"). In addition, El Paso Electric Company moved the Commission to modify its EE/LM Plan by approving a new Residential Load Management Program in Case No. 18-00116-UT. See Order Granting EPE's Motion to Modify It's EE/LM Plan by Approving a New Residential Load Management Program (July 22, 2020).

Summary of Results

The following 2020 Programs are included in this Annual Report:

- LivingWise® Program
- Residential Comprehensive Program
- Residential Lighting Program
- ENERGY STAR® New Homes Program
- Residential Load Management Program
- NM EnergySaver (Low Income) Program
- Commercial Comprehensive Program
- SCORE Plus Program
- Commercial Load Management Program

Results are based upon the M&V Report by Evergreen.

The following is a short summary of the overall results[1]:

- EPE's 2020 EE/LM Portfolio achieved cost effectiveness of 1.50[2] as measured by the Utility Cost Test ("UCT"). The majority of the 2020 Programs were cost effective.
- The total annual net energy savings were 16,117,987 kilowatt-hours ("kWh") at the customer meter.
- The total 2020 Programs expenditures were $5,150,027.
- The total amount collected through Rate No. 17 - Efficient Use of Energy Recovery Factor ("EUERF") was $4,857,630.

[1] Totals in tables may not tie due to rounding.
[2] A UCT of greater than or equal to one indicates the cost effectiveness of the energy efficiency portfolio or program.

Table 1 shows the total number of participants or units, the verified annual demand and energy savings, the lifetime energy savings, and the total program costs for the 2020 Programs.

Table 1 - 2020 Results Summary

Program	Participants or Units	Annual Savings (kW)	Annual Savings (kWh)	Lifetime Savings (kWh)	Total Program Expenses
Educational					
LivingWise Program	871	5	105,322	1,362,587	$ 33,274
Residential					
Residential Comprehensive Program	1,223	1,105	1,913,979	28,950,282	$ 795,071
Residential Lighting Program	212,407	783	4,640,516	92,810,318	$ 515,554
ENERGY STAR New Homes Program	394	220	444,283	9,385,641	$ 429,019
Residential Load Management	761	409	240,190	2,401,900	$ 227,762
Low Income					
NM EnergySaver Program	1,652	948	2,089,257	31,941,808	$ 944,686
Commercial					
Commercial Comprehensive Program	263	306	2,349,207	36,888,719	$ 582,385
SCORE Plus Program	91	620	4,316,475	55,345,420	$ 1,414,896
Commercial Load Management	7	1,215	18,757	18,757	$ 207,380
TOTAL	**217,669**	**5,611**	**16,117,987**	**259,105,431**	**$ 5,150,027**

*Total Program Expenses include EPE's internal administration costs of $227,942 recovered through base rates, therefore those costs are not recovered in Rate No. 17 - EUERF.

Table 2 presents the 2020 Benefit-Cost Analysis by Program based on the net present value ("NPV") of the 2020 Programs' benefits, expenses, and the program and portfolio UCT ratios. In accordance with the New Mexico Efficient Use of Energy Act ("EUEA") NMSA 1978 Section 62-17-5, EPE's portfolio of programs meets the UCT cost-effectiveness standard.

Table 2 - 2020 Benefit-Cost Analysis by Program

Program	NPV of Benefits (a)	NPV of Expenses (b)	UCT (a ÷ b)
Educational			
LivingWise Program	$ 21,210	$ 33,274	0.64
Residential			
Residential Comprehensive Program	$ 1,538,118	$ 795,071	1.93
Residential Lighting Program	$ 1,928,317	$ 515,554	3.74
ENERGY STAR New Homes Program	$ 379,996	$ 429,019	0.89
Residential Load Management	$ 75,031	$ 227,762	0.33
Low Income			
NM EnergySaver Program	$ 1,672,749	$ 944,686	1.77
Commercial			
Commercial Comprehensive Program	$ 748,491	$ 577,491	1.30
SCORE Plus Program	$ 1,215,194	$ 1,418,896	0.86
Commercial Load Management Program	$ 131,043	$ 208,274	0.63
PORTFOLIO UCT	**$ 7,710,149**	**$ 5,150,027**	**1.50**

2020 Cumulative Program Goals

Table 3 provides the annual and cumulative energy savings achieved from 2008 through 2020. The EUEA required that EPE achieve cumulative savings of 65,815,596 kWh by 2014, which was equal to five percent (5%) of EPE's 2005 retail sales, and 105,304,953 kWh by 2020, which was equal to eight percent (8%) of EPE's 2005 retail sales. By the end of 2020, EPE had achieved a total cumulative savings of 163,517,159 kWh. This exceeds the 2020 statutory goal by about 55 percent.

The 2020 cumulative savings includes all annual savings for program years 2008 through 2020, less the expired 2008 and 2009 kWh savings. The 2009 kWh savings were removed once they expired in 2020.

Table 3 - 2020 Cumulative Energy Savings

Year	Portfolio EUL	Annual kWh Savings	Annual Expired Portfolio kWh	Cumulative kWh Savings	EUEA Goal
2008	7	**855,912**		855,912	
2009	11	4,667,928		5,523,840	
2010	13	5,169,908		10,693,748	
2011	13	14,728,590		25,422,338	
2012	13	13,537,655		38,959,993	
2013	11	12,832,995		51,792,988	
2014	13	20,692,228		72,485,216	65,815,596
2015	13	15,729,342		88,214,558	
2008 Expired			(855,912)	87,358,646	
2016	13	18,213,422		105,572,068	
2017	14	12,729,242		118,301,310	
2018	14	17,216,718		135,518,028	
2019	16	16,549,072		152,067,100	
2020	16	16,117,987		168,185,087	105,304,953
2009 Expired			(4,667,928)	163,517,159	

Section II. Program Descriptions

Educational Program

LivingWise Program

The LivingWise® Program is an educational program that teaches fifth grade students to use energy more efficiently in their homes. The program is available at no cost to the teacher, school district or to the students and serves as an effective community outreach program to improve energy efficiency awareness. The program identifies and enrolls students and teachers and provides them with a LivingWise® kit that contains energy and water saving devices and educational materials. Students install the devices in their home, and with the help of their parents, complete a home energy audit report. EPE contracted with AM Conservation Group to implement and manage this program. AM Conservation Group identified and enrolled teachers for the 2020 fall semester and EPE distributed 871 kits that achieved a net savings of 105,322 kWh.

Residential Programs

Residential Comprehensive Program

The Residential Comprehensive Program offers rebates for building envelope and weatherization measures to include air infiltration, duct sealing, ceiling and floor insulation, solar screens, evaporative coolers, refrigerated air conditioners, heat pumps, HVAC Tune-Ups, as well as ENERGY STAR® cool roofs, windows, smart thermostats, and pool pumps. The rebates are paid directly to the customer, or upon customer approval, can be paid to the contractors that perform the installation. EPE contracted with Frontier Energy to administer the rebate process. EPE promoted this program through various outreach methods including radio and newspaper advertising, bill inserts, and targeted outreach to contractors that install these measures. In 2020, a total of 1,223 rebates were processed with a net savings of 1,913,979 kWh.

Residential Lighting Program

The Residential Lighting Program provides incentives in the form of markdowns at retail locations. The program encourages customers to replace their existing inefficient light bulbs with more energy efficient Light Emitting Diodes ("LED") lighting. EPE contracted with CLEAResult Consulting to provide outreach and administration for this program. A total of 31 retail locations participated in this program. EPE promoted the Residential Lighting Program through radio and newspaper advertising, social media, and point-of-purchase displays in stores. Ten free LED events were also held at Doña Ana Community Colleges, food pantries, churches, and the Salvation Army. Additional free LEDs were distributed at 19 elementary and middle schools throughout Las Cruces.

As part of the Commission's Final Order, on page 5, paragraph 13, EPE was directed to:

- review annually the cost effectiveness of the Residential Lighting program, employing the UCT. This annual review must compare the cost effectiveness of the total program, including CFL and halogen lighting, to LED lighting alone within the program. The results of this review must be included in EPE's annual energy efficiency report.

As part of the Commission Order in the Motion to Modify[3] EPE filed a compliance report on August 7, 2020 that stated EPE conducted the review and determined that 100% of the lighting products distributed through the Residential Lighting Program in 2020 were LEDs. Therefore, there is no difference between the cost effectiveness of the total program and the cost effectiveness of LED lighting alone. This is still true today. A total of 212,407 bulbs were sold and distributed through this program, with a net savings of 4,640,516 kWh.

ENERGY STAR® New Homes Program

The ENERGY STAR® New Homes Program provides incentives for homebuilders to construct energy efficient homes that exceed current 2009 International Energy Conservation Code ("IECC") standards. EPE offered homebuilders two incentive paths depending on which best fits their needs. The Performance Path provides tiered incentive levels for new homes that exceed the 2009 IECC building code goals by ten percent. The Prescriptive Path provides incentives for measures that exceed building code requirements. The installation of a combination of measures includes ENERGY STAR® lighting, refrigerators, radiant barriers, insulation, and refrigerated air conditioning. EPE contracted with ICF to implement and manage this program. EPE also collaborates with PNM on the New Homes Program that is administered by our common implementer, ICF. EPE promoted this program through various informational training sessions for homebuilders and real estate agents in the area throughout the year. EPE provided yard signs for homes in the Performance Path, advertising that their homes were more energy efficient than other homes in the area. EPE targeted its marketing efforts through the Las Cruces Home Builders Association and its trade magazine. In 2020, 394 homes participated in this program and had a net savings of 444,283 kWh.

Residential Load Management Program

The Residential Load Management Program provides incentives to participating residential customers that provide voluntary load curtailment during the peak demand season of June 1 through September 30. EPE has the capability of remotely adjusting participating customers' internet-enabled smart thermostats during load management events to relieve peak load. Customers receive a $25 incentive for the purchase and enrollment of a new internet enabled smart thermostat or for registering an existing qualifying unit. Customers may also receive an additional $50 rebate for the purchase and enrollment of a new internet enabled smart thermostat through EPE's online microsite. EPE promoted this program through outreach utilizing print, radio and newspaper advertising. EPE and Uplight also targeted customers through online advertisements, direct email, and social media. The new program was approved July 22, 2020. There were 761 units that participated in the partial load management season with a net savings of 240,190 kWh and 409 kW. Projected savings for 2021 are 404,207 kWh and 1,288 kW. The reduction in 2021 savings are due to a decrease in deemed savings from the recent Technical Resource Manual update.

The times and durations of the residential load curtailment events are shown in Table 4.

[3] Case No. 18-00116-UT Order Granting El Paso Electric Company's Motion to Modify Its EE/LM Plan by Approving a New Residential Load Management Program

Table 4 - Residential Load Management Events

Event Date	Start Time	End Time	Duration (Hr)
8/6/2020	3:00 PM	5:00 PM	2.0
8/11/2020	3:00 PM	5:00 PM	2.0
8/12/2020	3:00 PM	5:00 PM	2.0
8/13/2020	3:00 PM	5:00 PM	2.0
8/19/2020	3:00 PM	5:00 PM	2.0
8/20/2020	3:00 PM	5:00 PM	2.0
9/3/2020	3:00 PM	5:00 PM	2.0
9/24/2020	3:00 PM	5:00 PM	2.0
8 Events in 2020			**16.0**

Low Income Program

New Mexico EnergySaver Program

The New Mexico EnergySaver Program offers income-qualified customers a variety of energy efficiency measures at no cost. Qualification for the Program is based on an annual household income at or below 200 percent of the federal poverty guidelines. Frontier Energy administered and tracked the results of this program, and EnergyWorks identified customers and implemented the direct installs. Homes with refrigerated air conditioning qualified for LEDs, attic insulation, air infiltration, duct sealing, advanced power strips and smart thermostats. Homes with evaporative coolers qualified for LEDs, advanced power strips and installation of a high-efficiency evaporative cooler replacement. In 2020, EPE continued to expand our efforts to help low-income customers by installing 362 evaporative coolers. Of those homes eligible for an evaporative cooler upgrade that had natural gas heat, ceiling insulation was also added. Homes with electric water heaters also qualified for low flow kitchen and bathroom faucet aerators, low-flow showerheads, and water heater pipe and tank insulation. Advanced power strips, smart thermostats and evaporative cooler upgrades, water heater pipe and tank insulation were measures added in 2019. EnergyWorks collaborated with a variety of community organizations, church groups, and low-income service providers, and continued to combine energy efficiency services with New Mexico Gas Company and Zia Natural Gas Company when possible to provide customers a more comprehensive energy efficiency service approach. EPE promoted this program through outreach utilizing referrals, door-to-door marketing, and radio and newspaper advertising. EPE and EnergyWorks also targeted customers with ability to pay issues through community educational events at EPE payment centers.

The Final Order in Case No. 18-00116-UT directed EPE and its Measurement & Verification ("M&V") Evaluator to:

- devise more comprehensive and meaningful measures of the program's effectiveness and to include such measures in EPE's next annual report and thereafter.

The results are shown in Table 5.

Table 5 - 2020 NM EnergySaver Program Summary

	Home Count	Measure Count	Unit Count *	Expected Gross kW Savings**	Expected Gross kWh Savings**
Building Envelope (Evap. Coolers, Insulation, Air Infiltration, Duct Efficiency)		607	15,971	931	1,892,026
Water Heating (Low Flow Showerheads, Aerators, Pipe Wrap, Water Heater Jackets)		583	1,517	8	123,465
LED Lighting		418	6,752	9	65,558
Small Energy Devices (Advanced Power Strips, Smart Thermostats)		44	44	0	8,208
Total	**567**	**1,652**	**24,284**	**948**	**2,089,257**

* Multiple units per home. Measure count provided for # of LEDs, faucet aerators, showerheads, etc. Ceiling insulation count = sq. ft. insulated, pipe wrap count = total feet of pipe wrapped.
** Reference the M&V Report in Attachment A.

This program had 1,652 participants and had a net savings of 2,089,257 kWh.

Commercial Programs

Commercial Comprehensive Program

The Commercial Comprehensive Program provides energy efficiency incentives and rebates for commercial customers whose annual average of monthly peak demand is up to and including 100 kilowatts ("kW"). Incentives and rebates are offered for lighting, lighting controls, heating, ventilation, and air conditioning ("HVAC"), HVAC controls, and more. EPE contracted with Frontier Energy to implement the program, administer the incentive and rebate process, and track the results of the program. EPE and Frontier Energy identified possible energy efficiency measures by conducting walk-through audits. EPE advertised the Commercial Comprehensive Program through print, digital, and radio campaigns, and business events. To further promote this program, EPE and Frontier Energy reached out to electrical and HVAC contractors and distributors, and property managers. A High Performance HVAC Tune-Up training session was offered to interested HVAC contractors.

As part of the Commission's Final Order in Case No. 18-00116-UT, on page 6, paragraph 14, EPE was directed to:

- undertake annual reviews in this program as well, including (1) comparison of the cost-effectiveness of LED lighting versus CFL and halogen lighting; (2) participation rates for each type of light in the program; and (3) savings for each type of light actually achieved. The results of this review must be included in EPE's annual energy efficiency report.

As part of the Commission Order in the Motion to Modify[4] EPE filed a compliance report on August 7, 2020 that stated EPE conducted the review and determined that 100% of the lighting products distributed through the Commercial Comprehensive Program in 2020 were LEDs or controls for LED fixtures. Therefore, there is no difference between the cost effectiveness of the total program and the cost effectiveness of LED lighting alone.
Table 6 shows the participation rates for each type of light in the program below.

[4] Case No. 18-00116-UT Order Granting El Paso Electric Company's Motion to Modify Its EE/LM Plan by Approving a New Residential Load Management Program

Table 6 - 2020 Commercial Comprehensive Lighting Participation Rates

Fixture Type	Expected Gross kWh Savings*	%
Halogen	-	0.0%
High Intensity Discharge (HID)	-	0.0%
Integrated-ballast CFL Lamps	-	0.0%
Integrated-ballast CCFL Lamps	-	0.0%
Modular CFL and CCFL Fixtures	-	0.0%
Integrated-ballast LED Lamps	538,747	15.0%
Light Emitting Diode (LED)	2,254,828	83.8%
Linear Fluorescent	-	0.0%
Lighting Controls	20,812	1.2%
Total	**2,814,387**	**100.0%**

* Expected Gross kWh savings are only for the lighting and controls components of the Program.

The Commercial Comprehensive Program had 263 participants and had a net savings of 2,349,207 kWh.

SCORE Plus Program

The SCORE Plus Program offers customer incentives, technical support, and outreach services to commercial customers with an annual average of monthly peak demand greater than 100 kW, as well as schools and government facilities, regardless of their average demand. This program offers incentives for a range of energy efficiency measures including lighting, lighting controls, HVAC upgrades, HVAC controls, and more, as well as custom projects. EPE contracted with CLEAResult to actively recruit eligible customers and to identify energy efficiency improvements that could be made to their facilities. CLEAResult also assisted customers in the program application process. EPE promoted this program through direct customer and contractor contact. A High-Performance HVAC Tune-Up training was offered to interested HVAC contractors. In 2020, a total of 91 projects had net energy and demand savings of 4,316,475 kWh through various energy efficiency measures.

Commercial Load Management Program

The Commercial Load Management Program provides incentives to participating commercial customers that provide voluntary load curtailment during the peak demand season of June 1 through September 30. Incentives are based on verified demand savings that customers achieve for participating in load management events called by EPE. EPE contracted with Trane US ("Trane") to actively recruit eligible customers and provide a detailed evaluation of building operations to estimate optimal load shedding options, installation and integration of controls as needed, enabling real-time energy use monitoring. Trane calculates and verifies demand savings and dispenses incentive payments. The 2020 load management season had two participants with seven sites that had net savings of 18,757 kWh and a total demand reduction of 1,215 kW. In late 2020, the Commercial Load Management Program acquired a third participant for a total contracted amount projected for 2021 of 46,880 kWh and 2,930 kW.

The times and durations of the load curtailment events are shown in Table 7 below.

Table 7 - Commercial Load Management Events

Event Date	Start Time	End Time	Duration (Hr)
6/12/2020	3:00 PM	5:00 PM	2.0
7/10/2020	3:00 PM	5:00 PM	2.0
7/15/2020	3:00 PM	5:00 PM	2.0
8/12/2020	3:00 PM	5:00 PM	2.0
8/13/2020	3:00 PM	5:00 PM	2.0
8/19/2020	3:00 PM	5:00 PM	2.0
9/24/2020	3:00 PM	5:00 PM	2.0
7 Events in 2020			**14.0**

Effect of COVID-19 on Programs

The COVID-19 pandemic had a detrimental effect on EPE's energy efficiency programs. The implementers and contractors were limited due to mandated business closures and quarantines. In time, the program implementers and contractors developed strategies and procedures for safe inspections and audits, some utilizing apps and cameras on smart phones to conduct virtual inspections.

The LivingWise program was negatively affected by the COVID-19 pandemic due to school closures, mandatory quarantines, and virtual learning. Ultimately, the LivingWise implementer provided the program materials to students and teachers digitally. The LivingWise kits were shipped to the teachers' schools where the students would pick them up along with their other school materials.

The EnergySaver program had great success during 2020 due to the outreach the EnergySaver contractor and EPE staff conducted at EPE payment centers in Las Cruces and Anthony during the last quarter of 2019. The contractor was able to schedule many customers during these outreach events, then the customer's 'word-of-mouth' exceedingly propelled this program within their neighborhoods.

Section III. Energy Efficiency Rule Reporting Requirements

Section III of the Annual Report provides program information to comply with the EUEA as required by the NMPRC Energy Efficiency Rule 17.7.2.14.

Documentation of Program Expenditures

Table 8 shows the 2020 expenses by program. The Commission approved EPE's 2020 Program budget in accordance with 17.7.2.8(A) NMAC. All 2020 Program expenses were tracked through a unique work order number. Likewise, all revenue collected through EPE's EUERF was booked to a separate work order number. The total 2020 program expenses were $5,150,027 of the approved $5,113,646 budget or about 100.7 percent of the budget.

Table 8 - 2020 Program Expenditures

Programs	Administration*	Marketing and R&D	M&V	Customer Incentives	Total Program Expenses
Educational					
LivingWise Program	$ 2,993	$ 1,354	$ 9,000	$ 19,928	$ 33,274
Residential					
Residential Comprehensive Program	$ 208,014	$ 38,563	$ 15,106	$ 533,388	$ 795,071
Residential Lighting Program	$ 173,411	$ 957	$ -	$ 341,185	$ 515,554
ENERGY STAR New Homes Program	$ 165,797	$ 429	$ 11,000	$ 251,793	$ 429,019
Residential Load Management	$ 111,594	$ 71,468	$ 15,000	$ 29,700	$ 227,762
Low Income					
NM EnergySaver Program	$ 147,187	$ 18,720	$ -	$ 778,779	$ 944,686
Commercial					
Commercial Comprehensive	$ 200,525	$ 4,160	$ 15,106	$ 357,699	$ 577,491
SCORE Plus Program	$ 603,287	$ 2,575	$ 19,106	$ 793,928	$ 1,418,896
Commercial Load Management	$ 138,408	$ 66	$ 20,000	$ 49,800	$ 208,274
TOTAL	**$ 1,751,215**	**$ 138,294**	**$ 104,318**	**$ 3,156,200**	**$ 5,150,027**

*Administration includes EPE's internal administration costs of $227,942 recovered through base rates, therefore those costs are not recovered in Rate No. 17 - EUERF.

Table 9 shows the breakdown of customer incentives by rate class.

Table 9 - Customer Incentives by Rate Class

Program	Residential NMRT01	Small Commercial NMRT03	General Service NMRT04	City and County NMRT07	NMRT08	Large Power NMRT09	Total Participant Incentives
Educational							
LivingWise Program	$ 19,928	$ -	$ -	$ -	$ -	$ -	$ 19,928
Residential							
Residential Comprehensive Program	$ 533,388	$ -	$ -	$ -	$ -	$ -	$ 533,388
Residential Lighting Program	$ 341,185	$ -	$ -	$ -	$ -	$ -	$ 341,185
ENERGY STAR New Homes Program	$ 251,793	$ -	$ -	$ -	$ -	$ -	$ 251,793
Residential Load Management	$ 29,700	$ -	$ -	$ -	$ -	$ -	$ 29,700
Low Income							
NM EnergySaver Program	$ 778,779	$ -	$ -	$ -	$ -	$ -	$ 778,779
Commercial							
Commercial Comprehensive	$ -	$ 206,808	$ 150,891	$ -	$ -	$ -	$ 357,699
SCORE Plus Program	$ -	$ 319	$ 398,030	$ 171,879	$ 895	$ 222,805	$ 793,928
Commercial Load Management	$ -	$ 39,800	$ -	$ 10,000	$ -	$ -	$ 49,800
TOTAL	**$ 1,954,773**	**$ 246,927**	**$ 548,922**	**$ 181,879**	**$ 895**	**$ 222,805**	**$ 3,156,200**

EPE did not make any adjustments to expenditures in plan year 2020. Table 10 shows the budgeted amounts, the program expenditures, and the variances for each program during 2020. The variances in individual program costs from the budgeted amounts were primarily due to customer participation being lower or higher than projected.

Table 10 - Budget Variances

Program	2020 Approved Budget	2020 Actual Expenses	Variance %
Educational			
LivingWise Program	$ 76,021	33,274	-56%
Residential			
Residential Comprehensive Program	$ 862,164	795,071	-8%
Residential Lighting Program	$ 483,180	515,554	7%
ENERGY STAR New Homes Program	$ 446,895	429,019	-4%
Residential Load Management	$ 350,000	227,762	-35%
Low Income			
NM EnergySaver Program	$ 537,717	944,686	76%
Commercial			
Commercial Comprehensive Program	$ 455,000	577,491	27%
SCORE Plus Program	$ 1,520,458	1,418,896	-7%
Commercial Load Management Program	$ 382,212	208,274	-46%
TOTAL	**$ 5,113,646**	**$ 5,150,027**	**1%**

Estimated and Actual Customer Participation and Savings Levels

Table 11 presents the estimated and actual customer participation levels, annual energy savings, and annual peak demand savings for each program.

Table 11 - Estimated vs. Actual

Program	Estimated Participants or Units	Actual Participants or Units	Estimated Savings (kWh)	Actual Savings (kWh)	Estimated Savings (kW)	Actual Savings (kW)
Educational						
LivingWise Program	3,050	871	863,634	105,322	10	5
Residential Comprehensive Program	1,371	1,223	1,667,151	1,913,979	965	1,105
Residential Lighting Program	131,751	212,407	2,446,380	4,640,516	154	783
ENERGY STAR New Homes Program	300	394	587,895	444,283	285	220
Residential Load Management	4,500	761	826,143	240,190	4,262	409
NM EnergySaver Program	42,657	1,652	1,790,927	2,089,257	239	948
Commercial Comprehensive Program	149	263	1,959,834	2,349,207	358	306
SCORE Plus Program	171	91	5,295,592	4,316,475	1,250	620
Commercial Load Management	15	7	40,903	18,757	4,083	1,215
TOTAL	**183,964**	**217,669**	**15,478,459**	**16,117,987**	**11,606**	**5,611**

Estimated and Actual Costs (Expenses) and Avoided Costs (Benefits)

Table 12 presents the net present value of estimated and actual monetary expenses and benefits for each program.

Table 12 - Estimated and Actual Costs (Expenses) and Avoided Costs (Benefits)

	Estimated NPV of Monetary Costs	Actual NPV of Monetary Costs	Estimated NPV of Monetary Benefits	Actual NPV of Monetary Benefits
Educational				
LivingWise Program	$ 76,021	$ 33,274	$ 93,009	$ 21,210
Residential				
Residential Comprehensive Program	$ 862,164	$ 795,071	$ 1,221,475	$ 1,538,118
Residential Lighting Program	$ 483,180	$ 515,554	$ 628,163	$ 1,928,317
ENERGY STAR New Homes Program	$ 446,895	$ 429,019	$ 454,937	$ 379,996
Residential Load Management	$ 350,000	$ 227,762	$ 507,745	$ 75,031
Low Income				
NM EnergySaver Program	$ 537,717	$ 944,686	$ 587,222	$ 1,672,749
Commercial				
Commercial Comprehensive Program	$ 455,000	$ 577,491	$ 609,440	$ 748,491
SCORE Plus Program	$ 1,520,458	$ 1,418,896	$ 2,031,310	$ 1,215,194
Commercial Load Management	$ 382,212	$ 208,274	$ 403,354	$ 131,043
TOTAL	**$ 5,113,646**	**$ 5,150,027**	**$ 6,536,654**	**$ 7,710,149**

Cost Effectiveness Evaluation

Table 13 presents the UCT for each program for 2020. The UCT of the total portfolio of programs was 1.50. A UCT of greater than one indicates the cost effectiveness of the energy efficiency portfolio or program. UCTs are based on NMPRC Case No. 18-00116-UT weighted average cost of capital and avoided costs. EPE's 2020 total portfolio of programs passed cost effectiveness.

Table 13 - Cost Effectiveness by Program

Program	UCT
Educational	
LivingWise Program	0.64
Residential	
Residential Comprehensive Program	1.93
Residential Lighting Program	3.74
ENERGY STAR New Homes Program	0.89
Residential Load Management	0.33
Low Income	
NM EnergySaver Program	1.77
Commercial	
Commercial Comprehensive Program	1.30
SCORE Plus Program	0.86
Commercial Load Management	0.63
PORTFOLIO UCT	**1.50**

Self-Directed Program Participation

EPE did not receive any applications for customer self-directed programs in 2020.

Independent Measurement and Verification Report

The statewide independent evaluator, Evergreen, was selected by the NMPRC. EPE contracted with Evergreen to conduct the independent evaluation of its 2020 Programs. The M&V Report is included as Attachment A to this report and includes:

- Documentation of expenses at both the individual and total portfolio program levels;
- Measured and verified energy and demand savings;
- Cost-effectiveness of all 2020 Programs;
- Deemed savings and other assumptions used by Evergreen; and,
- Description of the M&V process used by Evergreen.

Program Expenditures Not Covered in the Independent M&V Report

All program-related expenditures are included in the M&V Report.

Annual Economic Benefits by Program

Table 14 presents the annual and lifetime energy savings, estimated useful life ("EUL"), and annual economic benefits for the 2020 Programs. The average EUL is calculated by dividing the total lifetime energy savings by the annual energy savings, resulting in an average estimate of how long measures will continue to provide savings.

Table 14 - Annual Economic Benefits

Program	Annual Energy Savings (kWh)	Lifetime Energy Savings (kWh)	Estimated Useful Life	Annual Benefits
Educational				
LivingWise Program	105,322	1,362,587	13	$ 1,639
Residential				
Residential Comprehensive Program	1,913,979	28,950,282	15	$ 101,689
Residential Lighting Program	4,640,516	92,810,318	20	$ 96,416
ENERGY STAR New Homes Program	444,283	9,385,641	21	$ 17,988
Residential Load Management	240,190	2,401,900	10	$ 7,503
Low Income				
NM EnergySaver Program	2,089,257	31,941,808	15	$ 109,412
Commercial				
Commercial Comprehensive Program	2,349,207	36,888,719	16	$ 47,667
SCORE Plus Program	4,316,475	55,345,420	13	$ 94,775
Commercial Load Management	18,757	18,757	1	$ 131,043
TOTAL	**16,117,987**	**259,105,431**		**$ 608,131**

Non-Energy Benefits

Table 15 shows the estimated emissions savings, and Table 16 shows the estimated water savings associated with the 2020 Programs. The annual and lifetime avoided emissions are determined by multiplying the emission rates times the annual and lifetime megawatt-hours ("MWh") saved. The water savings are determined by multiplying EPE's average portfolio water consumption per MWh times the annual and lifetime energy savings.

Table 15 - Emissions Savings

Emission Type	Avoided Electric Emmision Rate (lbs/MWh)	Annual Avoided Emissions (tons)	Lifetime Avoided Emissions (tons)
SO_2	0.0051	0.04	0.66
NO_X	0.92	7.44	119.56
CO_2	1,153	9,290	149,339
Particles	0.0868	0.70	11.25

Table 16 - Water Savings

Water Impact	EPE Portfolio Water Consumption (gal/MWh)	Annual Water Saved (gal)	Lifetime Water Saved (gal)
Water Saved	532.0	8,575,215	137,851,260

Tariff Reconciliation

Table 17 presents the calculation for EPE's 2020 tariff reconciliation based on the 2020 program expenditures plus the approved 2020 utility incentive, less EPE's internal administration costs, and less the cost recovery through EPE's EUERF from January through December 2020. The costs recovered through the EUERF are therefore not recovered through EPE's base rates.

EPE's 2020 utility incentive is based on its costs and satisfactory performance of measures and programs. Utilizing the sliding scale utility incentive approved by the Final Order (7.1 percent for verified annual savings of at least 12 gigawatt-hours ("GWh") with an adder incentive of 0.075 percent for each 1.0 GWh of additional energy savings, up to a maximum of 7.6657 percent), EPE earned a profit incentive of 7.4 percent for its verified annual energy savings of 16.12 GWh.

Table 17 - Energy Efficiency Historical (Underage)/Overage Recovery

Description	Total Program Expenses	7.4% Utility Incentive	Internal Admin Costs Recovered Through Base Rates	EUERF Recovery	(Underage)/ Overage
Beg. Bal. (PY2017-2019)					$ 456,443
2020 Energy Efficiency Activity	$ 5,150,027	$ 381,102	$ 227,942	$ 4,857,630	$ 902,001
Ending Balance					**$ 902,001**

EPE's beginning balance originated from an overage of $456,443 due to activities from Program Years 2017 to 2019, with carrying charges for Program Years 2018 and 2019. This overage is the result of. The total program expenses ($5,150,027 + $381,102 utility incentive = $5,531,129) exceeded the revenues collected ($227,942 + $4,857,630 = $5,085,572) in 2020, resulting in a cumulative overage amount of $902,001.

Table 18 presents the month-by-month reconciliation of EPE's tariff reconciliation.

Table 18 - EPE Tariff Reconciliation

Month	Total Program Expenses	7.4% Utility Incentive	Internal Admin Costs Recovered Through Base Rates	EUERF Recovery	(Underage)/ Overage of Expenses
Beg. Bal. (PY2017-2019)					456,443
Jan 2020	$ 56,658	$ 4,193	$ 18,995	$ 366,869	131,430
Feb 2020	$ 138,845	$ 10,275	$ 18,995	$ 323,504	(61,950)
Mar 2020	$ 342,620	$ 25,354	$ 18,995	$ 284,669	2,361
Apr 2020	$ 401,522	$ 29,713	$ 18,995	$ 271,483	143,117
May 2020	$ 290,544	$ 21,500	$ 18,995	$ 328,709	107,458
Jun 2020	$ 252,452	$ 18,681	$ 18,995	$ 442,644	(83,049)
Jul 2020	$ 467,327	$ 34,582	$ 18,995	$ 672,186	(272,320)
Aug 2020	$ 235,527	$ 17,429	$ 18,995	$ 639,493	(677,853)
Sep 2020	$ 364,361	$ 26,963	$ 18,995	$ 540,059	(845,583)
Oct 2020	$ 453,069	$ 33,527	$ 18,995	$ 450,197	(828,178)
Nov 2020	$ 541,645	$ 40,082	$ 18,995	$ 252,395	(517,842)
Dec 2020	$ 1,605,456	$ 118,804	$ 18,997	$ 285,420	902,001
Total	**$ 5,150,027**	**$ 381,102**	**$ 227,942**	**$ 4,857,630**	

Estimated Program Expenditures Expected in 2021

Table 19 shows estimated program expenditures for 2021. EPE's Program Year 2021 budget, approved in NMPRC Case No. 18-00116-UT on August 7, 2020, is $5,113,646.

Table 19 - Estimated Program Expenditures Expected in 2021

2021 Program	Budget
Educational	
LivingWise Program	$ 84,665
Residential	
Residential Comprehensive Program	$ 881,641
Residential Lighting Program	$ 482,586
ENERGY STAR New Homes Program	$ 450,816
Residential Load Management	$ 350,000
Low Income	
NM EnergySaver Program	$ 537,215
Commercial	
Commercial Comprehensive Program	$ 464,685
SCORE Plus Program	$ 1,475,758
Commercial Load Management	$ 386,279
TOTAL	**$ 5,113,646**

EVERGREEN ECONOMICS

Evaluation of the 2020 El Paso Electric Energy Efficiency Programs

Final Report

May 21, 2021

Demand Side Analytics
DATA DRIVEN RESEARCH AND INSIGHTS

ECOMETRIC

RESEARCH & POLLING INC

Table of Contents

Executive Summary

This report presents the independent evaluation results for the El Paso Electric (EPE) energy efficiency programs for program year 2020 (PY2020).

The EPE programs and evaluation requirements were first established in 2005 by the New Mexico legislature's passage of the 2005 Efficient Use of Energy Act (EUEA).[1] The EUEA requires public utilities in New Mexico, in collaboration with other parties, to develop cost-effective programs that reduce energy demand and consumption. Utilities are required to submit their proposed portfolio of programs to the New Mexico Public Regulation Commission (NMPRC) for approval. As a part of its approval process, the NMPRC must find that the program portfolio is cost effective based on the Utility Cost Test (UCT).

An additional requirement of the EUEA is that each program must be evaluated at least once every three years. As part of the evaluation requirement, EPE must submit to the NMPRC a comprehensive evaluation report prepared by an independent program evaluator. As part of the reporting process, the evaluator must measure and verify energy and demand savings, determine program cost effectiveness, assess how well the programs are being implemented, and provide recommendations for program improvements as needed. The Evergreen evaluation team consisted of the following firms:

- **Evergreen Economics** was the prime contractor and managed all evaluation tasks and deliverables;
- **EcoMetric** provided engineering capabilities and led the review of EPE's savings estimates;
- **Demand Side Analytics** conducted the impact evaluation of the Commercial Load Management program; and
- **Research & Polling** fielded all the phone surveys.

For PY2020, the following EPE programs were evaluated:

- Commercial Comprehensive

[1] NMSA §§ 62-17-1 *et seq* (SB 644). Per the New Mexico Public Regulation Commission Rule Pursuant to the requirements of the EUEA, the NMPRC issued its most recent *Energy Efficiency Rule* (*17.7.2 NMAC*) effective September 26, 2017, that sets forth the NMPRC's policy and requirements for energy efficiency and load management programs. This Rule can be found online at http://164.64.110.134/parts/title17/17.007.0002.html

- SCORE Plus
- Residential Comprehensive
- LivingWise®
- Energy Star New Homes
- Residential Load Management
- Commercial Load Management

For each of the evaluated programs, the evaluation team estimated realized gross and net impacts (kWh and kW) and calculated program cost effectiveness using the UCT. Brief process evaluations were also conducted for the Commercial Comprehensive and Residential Comprehensive programs.

A summary of the analysis methods for each of the PY2020 programs being evaluated is included below.

Commercial Comprehensive. The measures eligible for the Commercial Comprehensive program are generally prescriptive in nature, and as such the evaluation included a deemed savings review, phone survey verification, and project desk reviews. The deemed savings review focused on verifying that the appropriate savings values were applied based on the equipment installed and per the referenced source of savings, whether that is the New Mexico TRM or another source. The phone survey was used to verify that program-rebated measures are still installed and functional as well as gather information to calculate a free ridership rate. Finally, desk reviews were used to examine the savings assumptions and calculations specific to each project that was included in the review sample.

SCORE Plus. The SCORE Plus program evaluation approach is similar to the Commercial Comprehensive program and included desk reviews for a representative sample of projects. Due to low levels of participation and some issues with contact information, the planned phone interviews could not be completed for PY2020, and the free ridership rate used for PY2019 was also applied to PY2020.

Residential Comprehensive. This is a prescriptive program serving EPE's residential customers and offers the following measures: insulation, duct sealing, air infiltration, solar screens, evaporative coolers, refrigerated air conditioning, and variable speed pool pumps. The impact evaluation included a review of deemed savings values and a participant phone survey. The participant survey was also used for the process evaluation.

Energy Star New Homes. This program provides incentives to homebuilders to construct homes that exceed energy code. There are three paths offered by the program: the High

Performance Homes path, which encourages a whole home approach to reach at least 10 percent above code; the Energy Star path, which is similar to High Performance Homes but also meets Energy Star requirements; and the Prescriptive path, which provides incentives for individual equipment upgrades. The impact evaluation included desk reviews for High Performance Homes and Energy Star projects, a deemed savings review for Prescriptive projects, and builder interviews to estimate net impacts.

LivingWise®. This program provides educational information and kits of energy saving measures to fifth grade students. Measures included in the kit are prescriptive in nature and include LED bulbs, faucet aerators, and low flow showerheads. As a program with prescriptive measure savings, the evaluation of this program consisted of a deemed savings review of the measures distributed in the kits, with an installation rate determined from a survey of participating students.

Commercial Load Management. The Commercial Load Management program allows participating customers to provide on-call, voluntary curtailment of electric consumption during peak demand periods in return for incentives. The impacts from this program were determined based on a review of the savings calculation algorithm that was agreed to by the program implementer.

Residential Load Management. This program provides incentives to residential customers that allow EPE the ability to remotely adjust participating customers' internet-enabled smart thermostats during load management events. The impacts from this program were calculated by comparing the actual energy use with estimated baseline usage during the load control events. Additional energy impacts were achieved through the sale of smart thermostats through this program.

Table 1 summarizes the PY2020 evaluation methods.

Table 1: Summary of PY2020 Evaluation Methods by Program

Program	Deemed Savings Review	Phone Survey / Interviews	Engineering Desk Reviews	Billing Regression	Validation of Settlement Claims
Commercial Comprehensive	◆	◆	◆		
SCORE Plus	◆	◆	◆		
Residential Comprehensive	◆	◆	◆		
Energy Star New Homes	◆	◆	◆		
LivingWise®	◆				

Commercial Load Management		◆
Residential Load Management	◆	

The results of the PY2020 impact evaluation are shown in Table 2 (kWh) and Table 3 (kW), with the programs evaluated in 2020 highlighted in blue.

Table 2: PY2020 Savings Summary – kWh

Program	# of Projects	Expected Gross kWh Savings	Engineering Adjustment Factor	Realized Gross kWh Savings	NTG Ratio	Realized Net kWh Savings
Residential Lighting (LED)	212,407	6,926,144	1.0000	6,926,144	0.6700	4,640,516
LivingWise®	871	105,322	1.0000	105,322	1.0000	105,322
Energy Star New Homes	394	605,901	0.9999	605,868	0.7333	444,283
NM EnergySaver	1,652	2,089,257	1.0000	2,089,257	1.0000	2,089,257
Residential Comprehensive	1,223	3,005,646	1.0000	3,005,646	0.6368	1,913,979
Residential Load Management	761	245,727	0.9775	240,190	1.0000	240,190
SCORE Plus	91	6,305,771	1.0229	6,450,202	0.6692	4,316,475
Commercial Comprehensive	263	2,864,571	0.9988	2,861,066	0.8211	2,349,207
Commercial Load Management	7	17,556	1.0684	18,757	1.0000	18,757
Total	**217,669**	**22,165,894**		**22,302,452**		**16,117,987**

Table 3: PY2020 Savings Summary – kW

Program	# of Projects	Expected Gross kW Savings	Engineering Adjustment Factor	Realized Gross kW Savings	NTG Ratio	Realized Net kW Savings
Residential Lighting (LED)	212,407	1,168	1.0000	1,168	0.6700	783
LivingWise®	871	5	1.0000	5	1.0000	5
Energy Star New Homes	394	284	1.0567	301	0.7333	220
NM EnergySaver	1,652	948	1.0000	948	1.0000	948
Residential Comprehensive	1,223	1,735	1.0000	1,735	0.6368	1,105
Residential Load Management	761	346	1.1821	409	1.0000	409
SCORE Plus	91	919	1.0085	926	0.6692	620
Commercial Comprehensive	263	373	0.9996	373	0.8211	306
Commercial Load Management	7	1,254	0.9689	1,215	1.0000	1,215
Total	**217,669**	**7,032**		**7,080**		**5,611**

Using net realized savings from this evaluation and cost information provided by EPE, the evaluation team calculated the ratio of benefits to costs for each of EPE's programs and for the portfolio overall. The evaluation team calculated cost effectiveness using the UCT, which compares the benefits and costs to the utility or program administrator implementing the program.[2] The evaluation team conducted this test in a manner consistent with the California Energy Efficiency Policy Manual.[3] The results of the UCT

[2] The Utility Cost Test is sometimes referred to as the Program Administrator Cost Test, or PACT.
[3] California Public Utilities Commission. 2013. *California Energy Efficiency Policy Manual – Version 5*. http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy_-_Electricity_and_Natural_Gas/EEPolicyManualV5forPDF.pdf

are shown below in Table 4. The portfolio overall was found to be cost effective with a UCT ratio of 1.50.

Table 4: PY2020 Cost Effectiveness

Program	Utility Cost Test (UCT)
Commercial Comprehensive	1.30
SCORE Plus	0.86
LED	3.74
Residential Comprehensive	1.93
ENERGY STAR New Homes	0.89
NM EnergySaver	1.77
LivingWise®	0.64
Commercial Load Management	0.63
Residential Load Management	0.33
Overall Portfolio	**1.50**

The process evaluation activities included phone surveys with Commercial Comprehensive and Residential Comprehensive participants and interviews with home builders. Based on the data collection and analysis conducted for this evaluation, the evaluation team found that, overall, EPE is operating programs that are resulting in energy and demand savings and satisfied participants. In terms of cost effectiveness, the UCT test was used and found that seven of the nine programs were cost effective.

1 Evaluation Methods

The analysis methods used for the evaluated PY2020 programs are summarized as follows:

Commercial Comprehensive. The measures eligible for the Commercial Comprehensive program are generally prescriptive in nature, and as such the evaluation included a deemed savings review, phone survey verification, and project desk reviews. The deemed savings review focused on verifying that the appropriate savings values were applied based on the equipment installed and per the referenced source of savings, whether that is the New Mexico TRM or another source. The phone survey was used to verify that program-rebated measures are still installed and functional as well as gather information to calculate a free ridership rate. Finally, desk reviews were used to examine the savings assumptions and calculations specific to each project that was included in the review sample.

SCORE Plus. The SCORE Plus program evaluation approach is similar to the Commercial Comprehensive program and included desk reviews for a representative sample of projects. Due to low levels of participation and some issues with contact information, the planned phone interviews could not be completed for PY2020, and the free ridership rate used for PY2019 was also applied to PY2020.

Residential Comprehensive. This is a prescriptive program serving EPE's residential customers and offers the following measures: insulation, duct sealing, air infiltration, solar screens, evaporative coolers, refrigerated air conditioning, and variable speed pool pumps. The impact evaluation included a review of deemed savings values and a participant phone survey. The participant survey was also used for the process evaluation of this program.

Energy Star New Homes. This program provides incentives to homebuilders to construct homes that exceed energy code. There are three paths offered by the program: the High Performance Homes path, which encourages a whole home approach to reach at least 10 percent above code; the Energy Star path, which is similar to High Performance Homes but also meets Energy Start requirements; and the Prescriptive path, which provides incentives for individual equipment upgrades. The impact evaluation included desk reviews for High Performance Homes and Energy Star projects, a deemed savings review for Prescriptive projects, and builder interviews to estimate net impacts.

LivingWise®. This program provides educational information and kits of energy saving measures to fifth grade students. Measures included in the kit are prescriptive in nature and include LED bulbs, faucet aerators, and low flow showerheads. As a program with prescriptive measure savings, the evaluation of this program consisted of a deemed

savings review of the measures distributed in the kits, with an installation rate determined from a survey of participating students.

Commercial Load Management. The Commercial Load Management program allows participating customers to provide on-call, voluntary curtailment of electric consumption during peak demand periods in return for incentives. The impacts from this program were determined based on a review of the savings calculation algorithm that was agreed to by the program implementer.

Residential Load Management. This program provides incentives to residential customers for enrolling existing qualifying internet-enabled smart thermostat or for the purchase and enrollment of a new internet-enabled smart thermostat that allow EPE the ability to remotely adjust participating customers' internet-enabled smart thermostats during load management events. The impacts from this program were calculated by comparing the actual energy use with estimated baseline usage during the load control events. With new thermostat installations also treated as an energy efficiency measure with annual kWh savings over the life of the device. Additional energy savings were achieved through the sale of smart thermostats through the program that were not enrolled in load management.

Additional detail on each of these evaluation methods is included in the remainder of this chapter.

1.1 Phone Surveys

Phone surveys were fielded in March 2021 for participants in the Commercial Comprehensive and Residential Comprehensive programs. Interviews were attempted for SCORE Plus program participants, but due to the small sample available at the time with limited contact information, we were only able to complete one interview for PY2020. Interviews were also attempted for participating new home builders, and these interview results were combined with the information collected from similar builder interviews completed in PY2018. Note that the builder interviews were conducted on a statewide basis (not just EPE territory), since many builders operate throughout the state and the new homes program incentives are similar across utilities.

The phone surveys and interviews ranged from 15 to 20 minutes in length and covered the following topics:

- Verification of measures included in EPE's program tracking database;
- Satisfaction with the program experience;
- Survey responses for use in the free ridership calculations;

- Participation drivers and barriers; and
- Customer characteristics.

Secondary interviews were also conducted by engineers if additional information was needed for the individual project desk reviews.

The original goal was to complete 130 phone surveys across the two programs (30 for Commercial Comprehensive program participants, and 100 for Residential Comprehensive participants). Table 5 shows the distribution of completed surveys.

Table 5: EPE Phone Survey and Interview Summary

Program	Customers with Valid Contact Info	Target # of Completes	Completed Surveys
Commercial Comprehensive Participants	43	30	23
Residential Comprehensive Participants	882	100	101
Total	**925**	**130**	**124**

The final survey instruments for the Commercial Comprehensive and Residential Comprehensive programs are included in Appendix A and Appendix B.

1.2 Engineering Desk Reviews and Deemed Savings Review

To verify gross savings estimates, the evaluation team conducted engineering desk reviews for a sample of the projects in the Commercial Comprehensive, SCORE Plus, and Energy Star New Homes programs. The goal of the desk reviews was to verify equipment installation, operational parameters, and estimated savings. A review of the deemed savings values was also completed for those programs measures that used prescriptive savings values. For PY2020, the deemed savings review was completed for the Residential Comprehensive and LivingWise® programs, as well as for the prescriptive measures (e.g., lighting) included in the other programs.

Both prescriptive and custom projects received desk reviews that included the following:

- Review of project description, documentation, specifications, and tracking system data;
- Confirmation of installation using invoices and post-installation reports; and

- Review of post-installation reports detailing differences between installed equipment and documentation, and subsequent adjustments made by the program implementer.

For those programs and projects that used deemed savings values, the review process included the following:

- Review of measures available in the New Mexico TRM and the Texas TRM to determine the most appropriate algorithms that apply to the installed measures;
- Recreation of savings calculations using TRM algorithms and inputs as documented by submitted specifications, invoices, and post-installation inspection reports; and
- Review of New Mexico TRM algorithms to identify candidates for future updates and improvements.

1.3 Load Management Impact Estimation

For the Commercial Load Management program, as part of the PY2018 evaluation, the Evergreen team worked closely with EPE and Trane to reach agreement on the mechanics of the demand response performance calculation mechanism. This calculation centers on the baseline, or estimate of what load would have been in the participating facilities on event days if demand response had not been called. The settlement calculations called for a "high 8-of-10" baseline with a capped, symmetric day-of adjustment. Only non-event, non-holiday weekdays were eligible to be baseline days. For each two-hour event window, the method for the settlement calculations was as follows:

1. Select the last ten non-event, non-holiday weekdays.
2. Select the eight days (out of ten) with the highest average load during the event window, using the 15-minute interval load data (on case by case 30-minute interval load data).
3. For each 15-minute interval, calculate the average load of the eight selected baseline days. This is known as the "raw baseline."

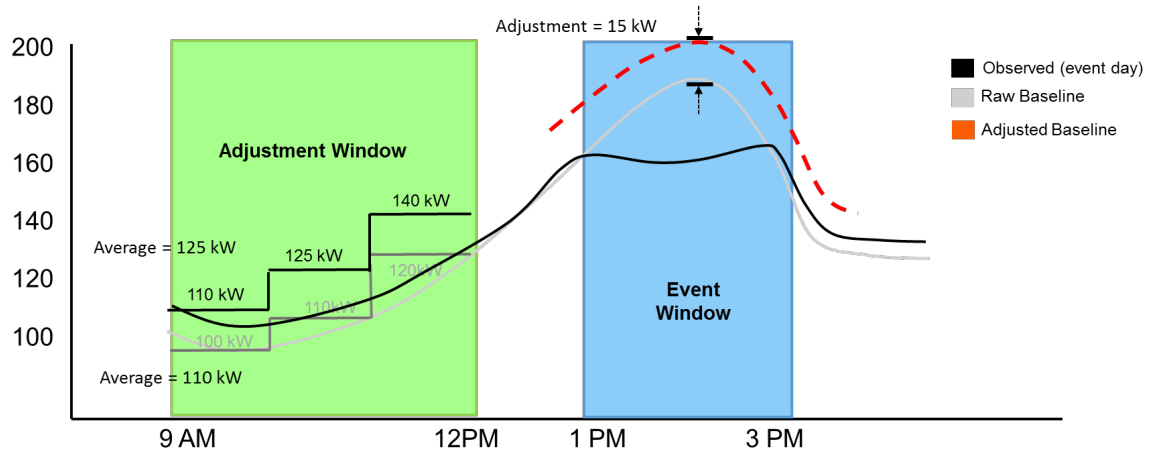
After the raw baseline was calculated, a day-of "Adjustment Factor" was calculated and applied to the raw baseline to create the "Adjusted Baseline," as follows:

- Designate the three hours prior to the event, excluding the hour immediately prior to the event, as the "Adjustment Window."
- Calculate the average observed load on the event day during the Adjustment Window (single value).

- Calculate the average load of the three baseline days during the Adjustment Window (single value).
- For each interval in the event window, add/subtract an Adjustment Factor to/from the raw baseline to calculate the Adjusted Baseline. The Adjustment Factor (single value) is defined as the difference of the average observed load and the average load of baseline days, capped at +/- 20 percent of the corresponding baseline average load.

A hypothetical sample calculation is illustrated in Figure 1. In this example, the adjusted baseline is 15 kW higher than the raw baseline during the event window, because the actual average observed load during the adjustment window was 15 kW higher on the event day (125 kW) compared to the baseline days (110 kW).

Figure 1: Illustration of Adjusted Baseline Calculation



For the Residential Load Management program, the impact analysis utilized a blended evaluation approach that employs both difference-in-difference calculation, using the randomly assigned control group devices, and within-subjects regression analysis.

The analysis uses hourly smart thermostat runtime data provided by the three participating device manufacturers – Nest, Emerson, and ecobee. In the analysis, two baselines are estimated.

1. The first employs difference-in-difference regression to estimate the runtime without demand response in each event hour. The method utilizes the experimental design and controls for existing differences between the treatment and control groups on each event day. For a given event day, the non-event days are used as the "pre-treatment" data for the randomized treatment and control customers.

2. The second baseline is estimated using within-subjects regression. For each event day and hour, the non-event day data for each of the devices in the daily experimental group is used to predict the runtime without demand response at the device level. The average predicted runtime across all experimental devices on each event day is used as the baseline.

Both methods provide an estimate of average baseline runtime per experimental device, in the absence of the demand response intervention, for a given event day and hour. The two estimates are then blended by using a simple average to provide a final runtime estimate.

The raw runtime impacts are then estimated by subtracting the actual runtime from the blended baseline runtime estimate in each event hour, where runtime is expressed as the percentage of the hour that the HVAC system is running. The cooling runtime impacts are then converted to cooling load impacts, using the connected load assumptions in the New Mexico TRM, shown in Equation 1.

Equation 1: New Mexico TRM Smart Thermostat Connected Load

$$HVAC\ Capacity\ (kW) = \frac{Capacity_{cool}}{1000\frac{W}{kW}} x \frac{1}{SEER\ x\ Eff_{duct}} = \frac{36{,}000\ Btu/h}{1000\frac{W}{kW}} x \frac{1}{13\frac{Btu}{Wh} x 0.8} = 3.4615\ kW$$

For each event hour, the reduction in cooling runtime per hour is multiplied by the estimated HVAC system capacity. This represents the demand impact per treatment device per hour, which is averaged across the two event hours to provide the impact per DR device for each event. This number is then used to provide a picture of the overall program impact delivered, as well as load reduction capability.

Additional details on the impact methods and results for the Commercial Load Management and the Residential Load Management programs are provided in Appendix D and Appendix E.

1.4 Net Impact Analysis

1.4.1 Self-Report Approach

The evaluation team estimated net impacts for most programs using the self-report approach. This method uses responses to a series of carefully constructed survey questions to learn what participants would have done in the absence of the utility's program. The goal is to ask enough questions to paint an adequate picture of the influence of the program activities (rebates and other program assistance) within the confines of what can reasonably be asked during a phone survey.

With the self-report approach, specific questions that are explored include the following:

- What were the circumstances under which the customer decided to implement the project (i.e., new construction, retrofit/early replacement, replace-on-burnout)?
- To what extent did the program accelerate installation of high efficiency measures?
- What were the primary influences on the customer's decision to purchase and install the high efficiency equipment?
- How important was the program rebate on the decision to choose high efficiency equipment?
- How would the project have changed if the rebate had not been available (e.g., would less efficient equipment have been installed, would the project have been delayed)?
- Were there other program or utility interactions that affected the decision to choose high efficiency equipment (e.g., was there an energy audit done, has the customer participated before, is there an established relationship with a utility account representative, was the installation contractor trained by the program)?

The method used for estimating free ridership (and ultimately the net-to-gross [NTG] ratio) using the self-report approach is based on the 2017 Illinois Statewide TRM.[4] For the EPE programs, questions regarding free ridership were divided into several primary components:

- A ***Program Component*** series of questions that asked about the influence of specific program activities (rebate, customer account rep, contractor recommendations, other assistance offered) on the decision to install energy efficient equipment;
- A ***Program Influence*** question, where the respondent was asked directly to provide a rating of how influential the overall program was on their decision to install high efficiency equipment, and
- A ***No-Program Component*** series of questions, based on the participant's intention to carry out the energy-efficient project without program funds or due to influences outside of the program.

Each component was assessed using survey responses that rated the influence of various factors on the respondent's equipment choice. Since opposing biases potentially affect the main components, the No-Program Component typically indicates higher free ridership than the Program Component/Influence questions. Therefore, combining these opposing

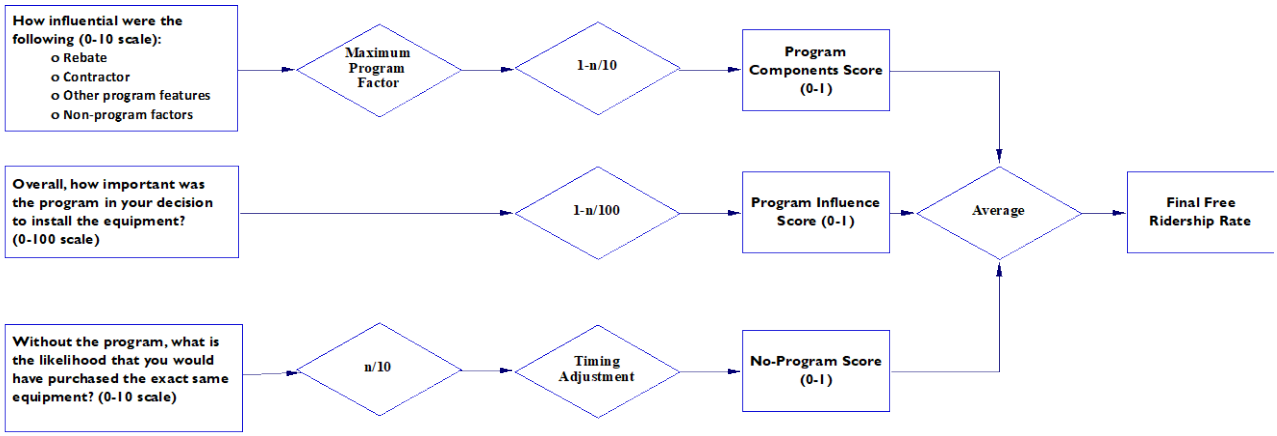
[4] The full Illinois TRM can be found at http://www.ilsag.info/il_trm_version_6.html

influences helps mitigate the potential biases. This framework also relies on multiple questions that are crosschecked with other questions for consistency. This prevents any single survey question from having an excessive influence on the overall free ridership score.

Figure 2 provides a simplified version of the scoring algorithm. Note that the more detailed chart and description reflects what was done in the participant phone surveys. For the builder interviews, the free ridership questions were more streamlined but still addressed what would have been done in absence of the program and the influence the program is having on building practices.

In some cases, multiple questions were asked to assess the levels of efficiency and purchase timing in absence of the program. For each of the scoring components, the question responses were scored so that they were consistent and resulted in values between 0 and 1. Once this was accomplished, the three question components were averaged to obtain the final free ridership score.

Figure 2: Self-Report Free Ridership Scoring Algorithm



Source: Adapted by Evergreen Economics from the 2017 Illinois TRM.

More detail on each of the three question tracks is provided below.

Program Component Questions

The ***Program Component*** battery of questions was designed to capture the influence of the program on the equipment choice. These questions were also designed to be as comprehensive as possible so that all possible channels through which the program is attempting to reach the customer were included.

The type of questions included in the Program Component question battery included the following:

- How influential were the following on your decision to purchase your energy efficient equipment?
    - Rebate amount
    - Contractor recommendation
    - Utility advertising/promotions
    - Technical assistance from the utility (e.g., energy audit)
    - Recommendation from utility customer representative (or program implementer)
    - Previous participation in a utility efficiency program

As shown at the top of Figure 2, the question with the highest value response (i.e., the program factor that had the greatest influence on the decision to install a high efficiency measure) was the one that was used in the scoring algorithm as the Program Component score.

Program Influence Question

A separate ***Program Influence*** question asked the respondent directly to rate the combined influence of the various program activities on their decision to install energy efficient equipment. This question allowed the respondent to consider the program as a whole and incorporated other forms of assistance (if applicable) in addition to the rebate. Respondents were also asked about potential non-program factors (condition of existing equipment, corporate policies, maintenance schedule, etc.) to put the program in context with other potential influences.

The Program Influence question also provided a consistency check so that the stated importance of various program factors could be compared across questions. If there appeared to be inconsistent answers across questions (rebate was listed as very important in response to one question but not important in response to a different question, for example), then the interviewer asked follow-up questions to confirm responses. The verbatim responses were recorded and were reviewed by the evaluation team as an additional check on the free ridership results.

No-Program Component Questions

A separate battery of ***No-Program Component*** questions was designed to understand what the customer might have done if the EPE rebate program had not been available. With these questions, we attempted to measure how much of the decision to purchase the energy efficient equipment was due to factors that were unrelated to the rebate program or other forms of assistance offered by EPE.

The types of questions asked for the No-Program Component included the following:

- If the program had not existed, would you have
    - Purchased the exact same equipment?
    - Chosen the same energy efficiency level?
    - Delayed your equipment purchase?
- Did you become aware of the utility rebate program before or after you chose your energy efficient equipment?

The question regarding the timing of awareness of the rebate was used in conjunction with the importance rating the respondent provided in response to the earlier questions. If the respondent had already selected the high efficiency equipment prior to learning about the rebate **and** said that the rebate was the most important factor, then a downward adjustment was made on the influence of the rebate in calculating the Program Component score.

The responses from the No-Program Component questions were analyzed and combined with a timing adjustment to calculate the No-Program score, as shown in Figure 2. The timing adjustment was made based on whether or not the respondent would have delayed their equipment purchase if the rebate had not been available. If the purchase would have been delayed by one year or more, then the No-Program score was set to zero, thereby minimizing the level of free ridership for this algorithm component only.

Free Ridership and NTG Calculation

The values from the Program Component score, the Program Influence score, and the No-Program score were averaged in the final free ridership calculation; the averaging helped reduce potential biases from any particular set of responses. The fact that each component relied on multiple questions (instead of a single question) also reduced the risk of response bias. As discussed above, additional survey questions were asked about the relative importance of the program and non-program factors. These responses were used as a consistency check, which further minimized potential bias.

Once the self-report algorithm was used to calculate free ridership, the total NTG ratio was calculated using the following formula:

$$Net\text{-}to\text{-}Gross\ Ratio = (1 - Free\ Ridership\ Rate)$$

1.5 Gross and Net Realized Savings Calculations

The final step in the impact evaluation process is to calculate the realized gross and net savings, based on the program-level analysis described above. The **Gross Realized Savings** are calculated by taking the original *ex ante* savings values from the participant

tracking databases and adjusting them using an **Installation Adjustment** factor (based on the count of installed measures verified through the phone surveys) and an **Engineering Adjustment** factor (based on the engineering analysis, desk reviews, etc.):

$$\text{Gross Realized Savings} = (\textit{Ex Ante}\ \text{Savings})*(\text{Installation Adjustment})*(\text{Engineering Adjustment Factor})$$

Net Realized Savings are then determined by multiplying the **Gross Realized Savings** by the net-to-gross ratio:

$$\text{Net Realized Savings} = (\text{Net-to-Gross Ratio})*(\text{Gross Realized Savings})$$

1.6 Cost Effectiveness

The cost effectiveness of EPE's programs was tested using the Utility Cost Test (UCT). In the UCT, the benefits of a program are considered to be the present value of the net energy saved, and the costs are the present value of the program's administrative costs plus incentives paid to customers. In order to perform the cost effectiveness analysis, the evaluation team requested the following from EPE:

- Avoided cost of energy (costs per kWh over a 20+ year time horizon);
- Avoided cost of capacity (estimated cost of adding a kW/year of generation, transmission, and distribution to the system);
- Avoided cost of CO2 (estimated monetary cost of CO2 per kWh generated);
- Avoided transmission and distribution costs;
- Discount rate;
- Line loss factor;
- Any assumed non-energy benefits; and
- Administrative costs (all non-incentive expenditures associated with program delivery).

In response to this data request, EPE provided its annual average avoided costs, discount rate, line loss factors, and program costs. EPE does not explicitly quantify separate avoided costs of CO2 emissions or transmission and distribution, instead including these factors in the avoided costs of energy and capacity.

For all programs, the evaluation team took the energy savings and effective useful life values from the final PY2020 tracking data submitted by EPE. The evaluation team reviewed the effective useful life values and compared them to the values contained in the New Mexico TRM to confirm that the values assumed by EPE were reasonable. The final

cost-effectiveness analysis uses net verified impacts, which take into account NTG ratios and engineering adjustment factors.

Additionally, Section 17.7.2.9.B(4) of the New Mexico Energy Efficiency Rule allows utilities to claim utility system economic benefits for low income programs equal to 20 percent of the calculated energy benefits. The evaluation team applied this 20 percent benefit adder to the benefits calculated for EPE's NM EnergySaver program.

2 Impact Evaluation Results

The results of the PY2020 impact evaluation are shown in Table 6 (kWh) and Table 7 (kW), with the programs evaluated in 2020 highlighted in blue.

As noted previously, each program is required to be evaluated a minimum of once every three years. For 2020, the evaluated programs covered 59 percent of the total *ex ante* kWh savings and 70 percent of the total *ex ante* kW savings.

Table 6: PY2020 Savings Summary - kWh

Program	# of Projects	Expected Gross kWh Savings	Engineering Adjustment Factor	Realized Gross kWh Savings	NTG Ratio	Realized Net kWh Savings
Residential Lighting (LED)	212,407	6,926,144	1.0000	6,926,144	0.6700	4,640,516
LivingWise®	871	105,322	1.0000	105,322	1.0000	105,322
Energy Star New Homes	394	605,901	0.9999	605,868	0.7333	444,283
NM EnergySaver	1,652	2,089,257	1.0000	2,089,257	1.0000	2,089,257
Residential Comprehensive	1,223	3,005,646	1.0000	3,005,646	0.6368	1,913,979
Residential Load Management	761	245,727	0.9775	240,190	1.0000	240,190
SCORE Plus	91	6,305,771	1.0229	6,450,202	0.6692	4,316,475
Commercial Comprehensive	263	2,864,571	0.9988	2,861,066	0.8211	2,349,207
Commercial Load Management	7	17,556	1.0684	18,757	1.0000	18,757
Total	**217,669**	**22,165,894**		**22,302,452**		**16,117,987**

Table 7: PY2020 Savings Summary - kW

Program	# of Projects	Expected Gross kW Savings	Engineering Adjustment Factor	Realized Gross kW Savings	NTG Ratio	Realized Net kW Savings
Residential Lighting (LED)	212,407	1,168	1.0000	1,168	0.6700	783
LivingWise®	871	5	1.0000	5	1.0000	5
Energy Star New Homes	394	284	1.0567	301	0.7333	220
NM EnergySaver	1,652	948	1.0000	948	1.0000	948
Residential Comprehensive	1,223	1,735	1.0000	1,735	0.6368	1,105
Residential Load Management	761	346	1.1821	409	1.0000	409
SCORE Plus	91	919	1.0085	926	0.6692	620
Commercial Comprehensive	263	373	0.9996	373	0.8211	306
Commercial Load Management	7	1,254	0.9689	1,215	1.0000	1,215
Total	**217,669**	**7,032**		**7,080**		**5,611**

Details on the individual program impacts are summarized below, with additional details on the analysis methods and results for some programs included as appendices where noted.

2.1 Commercial Comprehensive, SCORE Plus, Residential Comprehensive, Energy Star New Homes, and LivingWise® Programs

2.1.1 Gross Impacts

The *ex ante* PY2020 gross savings are summarized in Table 8 for the Commercial Comprehensive and SCORE Plus programs. In total, the Commercial Comprehensive program accounted for 13 percent of the *ex ante* energy impacts in EPE's overall portfolio,

while the SCORE Plus program accounted for 28 percent and Residential Comprehensive accounted for 14 percent of expected energy impacts.

Table 8: PY2020 Gross Savings Summary

Program	# of Projects	Expected Gross kWh Savings	Expected Gross kW Savings
Commercial Comprehensive	263	2,864,571	373
SCORE Plus	91	6,305,771	919
Residential Comprehensive	1,223	3,005,646	1,735
Energy Star New Homes	394	605,901	284
LivingWise®	871	105,322	5

The majority of the gross impact evaluation activities were devoted to engineering desk reviews of a sample of projects. For the desk reviews, separate samples were drawn for the Commercial Comprehensive, SCORE Plus, and Energy Star New Homes programs. For each program, the sample was stratified to cover a range of different measure types so that no single measure (often lighting) would dominate the desk reviews. The sample was also stratified based on total energy savings within each measure group. Overall, the sampling strategy ensured that a mix of projects in terms of both project size and measure type would be included in the desk reviews.

The final sample designs are shown in Table 9 through Table 11, with the relative precision ranging from 90/2 to 90/1 across programs.

Table 9: Commercial Comprehensive Desk Review Sample

Measure Group	Stratum	Count	Average kWh	Total kWh Savings	% of Savings	Final Sample
Lighting	Certainty	1	653,278	653,278	22.8%	1
Lighting	1	9	81,278	731,500	25.5%	5
Lighting	2	22	35,922	790,294	27.6%	5
Lighting	3	69	9,265	639,315	22.3%	5
Other	Certainty	3	8,102	24,305	<1%	3
Other	1	22	1,176	25,879	<1%	3
Total		**126**		**2,864,571**	**100%**	**22**

Table 10: SCORE Plus Desk Review Sample

Measure Group	Stratum	Count	Average kWh	Total kWh Savings	% of Savings	Final Sample
Lighting	Certainty	1	1,317,011	1,317,011	20.9%	1
Lighting	1	3	290,569	871,708	13.8%	2
Lighting	2	28	70,284	1,967,938	31.2%	8
Other	Certainty	2	333,225	666,450	10.6%	2
Other	1	16	92,667	1,482,664	23.5%	6
Total		**50**		**6,305,771**	**100%**	**19**

Table 11: Energy Star New Homes Desk Review Sample

Measure Group	Stratum	Count	Average kWh	Total kWh Savings	% of Savings	Final Sample
Energy Star Certified	1	27	3,317	89,567	23.9%	2
Energy Star Certified	2	42	2,116	88,867	23.7%	2
High Performance Homes	1	23	4,207	96,763	25.8%	3
High Performance Homes	2	37	2,679	99,133	26.5%	3
Total		**129**		**374,330**	**100%**	**10**

As discussed in the *Evaluation Methods* chapter, the results of the desk reviews were used to calculate an engineering adjustment factor (realization rate), which was then used to determine gross realized savings for these programs.

For those programs or projects that utilized deemed savings values, these calculations were reviewed to ensure that they conform to the New Mexico TRM or some other reliable source. For PY2020, the deemed savings review involved commercial lighting measures, Residential Comprehensive program measures, homes that followed the prescriptive path in the New Homes program, and the school kits measures for the LivingWise® program.

For these programs, the evaluation team found measures that existed in both the New Mexico and Texas TRMs. In the cases where EPE calculated savings using the Texas TRM, the evaluation team reviewed both savings sources and deferred to the New Mexico TRM if the Texas TRM did not offer more accuracy. Other incentivized measures existed only in the Texas TRM. The evaluation team reviewed the algorithms from the Texas TRM for accuracy and adjusted calculations as necessary to verify savings estimates.

EPE has developed Excel-based calculators to estimate savings for lighting and HVAC projects. The factors and assumptions used in these calculators were reviewed by the evaluation team and compared to the New Mexico TRM. The evaluation team reviewed any calculator assumptions that deviated from the New Mexico TRM to determine if the calculator value was reasonable in comparison to the available TRM values. The evaluation team did not modify calculator values, which deviated from the New Mexico TRM but appeared consistent with the TRM values.

For the energy impacts overall, the desk reviews and deemed savings review resulted in an engineering adjustment factor of 1.0121 for the Commercial Comprehensive program, 1.0299 for the SCORE Plus program, and 0.9999 New Homes program. For the Residential Comprehensive and LivingWise® programs, there were no adjustments to savings. Similar minor adjustments were also made to the kW savings (Table 12, Table 13).

Table 12: PY2020 Gross kWh Impact Summary

Program	# of Projects	Expected Gross kWh Savings	Engineering Adjustment Factor	Realized Gross kWh Savings
Commercial Comprehensive	263	2,864,571	0.9988	2,861,066
SCORE Plus	91	6,305,771	1.0299	6,450,202
Residential Comprehensive	1,223	3,005,646	1.0000	3,005,646
Energy Star New Homes	394	605,901	0.9999	605,868

LivingWise®	871	105,322	1.0000	105,322

Table 13: PY2020 Gross kW Impact Summary

Program	# of Projects	Expected Gross kW Savings	Engineering Adjustment Factor	Realized Gross kW Savings
Commercial Comprehensive	263	373	0.9996	373
SCORE Plus	91	919	1.0085	926
Residential Comprehensive	1,223	1,735	1.0000	1,735
Energy Star New Homes	394	284	1.0567	301
LivingWise®	871	5	1.0000	5

For the projects that received engineering desk reviews, the evaluation team made very few adjustments to the original savings values; this is evidenced by the engineering adjustment factors all having values close to 1.0.

For a few projects, adjustments were made to savings for the following reasons:

- The evaluation team increased the kWh and kW savings for one retrofit lighting project, which resulted in a 106 percent realization rate for kWh savings and a 104 percent realization rate for kW savings. For this project, the evaluation team attempted to replicate the *ex ante* savings number using EPE's lighting calculator and the project documentation, but were unsuccessful. The lighting calculator files were locked and did not allow for a detailed comparison of savings algorithms, and we were not able identify the specific source of the calculation discrepancy. The evaluation team was able to confirm that the deemed inputs in the *ex ante* calculator were consistent with the values in the TRM.
- The evaluation team adjusted the building type for one retrofit lighting project based on additional online research. The building type was updated from "Education – Primary" to "Education – Secondary" due to the school's website noting that grades 7 -12 are taught at the facility. This adjustment increased the energy (kWh) savings, resulting in a 128 percent realization rate. This adjustment did not impact the peak demand savings.
- For the New Homes program, the e*x ante* peak demand savings for several of the reviewed projects did not match the values listed in the program tracking data. The evaluation team verified alignment of the savings values listed in the REM/Rate

reports with the supplied program tracking data. These adjustments resulted in an overall realization rate for kW savings of 1.0592.

A summary of the individual desk review findings for each of the reviewed projects are included in Appendix F and Appendix G.

2.1.2 Net Impacts

Net impacts for the Commercial Comprehensive and Residential Comprehensive programs were developed using the self-report method described in the *Evaluation Methods* chapter and based on participant phone survey data. For the SCORE Plus program, the NTG ratio from PY2019 was applied to PY2020 as there were too few participants available to interview for PY2020. For the New Homes program, the self report responses from the statewide interviews of participating builders were used to calculate a free ridership rate and determine net impacts. For the LivingWise® program, given the nature of the school kits program (where the measures are essentially assigned as homework), a NTG ratio of 1.0 was applied.

For all these programs, the survey respondents acknowledged the assistance they received from EPE and generally enjoyed working with the program. As the expanded survey questions relating to free ridership make clear, however, the program is only one of several factors that are affecting customers' choices regarding energy efficiency. While the program is having a positive effect, factors unrelated to EPE involvement (e.g., corporate or management directives to install energy efficient equipment) are also driving these equipment choices.

Table 14 and Table 15 summarize the PY2020 net impacts calculations for the evaluated programs.

Table 14: PY2020 Net kWh Impact Summary

Program	# of Projects	Realized Gross kWh Savings	NTG Ratio	Realized Net kWh Savings
Commercial Comprehensive	263	2,861,066	0.8211	2,349,207
SCORE Plus	91	6,450,202	0.6692	4,316,475
Residential Comprehensive	1,223	3,005,646	0.6368	1,913,979
Energy Star New Homes	394	605,868	0.7333	444,283
LivingWise®	871	105,322	1.0000	105,322

Table 15: PY2020 Net kW Impact Summary

Program	# of Projects	Realized Gross kW Savings	NTG Ratio	Realized Net kW Savings
Commercial Comprehensive	263	373	0.8211	306
SCORE Plus	91	926	0.6692	620
Residential Comprehensive	1,223	1,735	0.6368	1,105
Energy Star New Homes	394	301	0.7333	220
LivingWise®	871	5	1.0000	5

2.2 Load Management Programs

2.2.1 Commercial Load Management

For the PY2020 Commercial Load Management program, the evaluation team was able to recreate most of Trane's calculations and affirms that their methodology was sound. Trane' gross reported savings are displayed in Table 16.

Table 16: Gross Reported Savings

Date	Portfolio Committed Capacity (kW)	Portfolio Load Reduction (kW)	Reduction Relative to Committed Capacity (kW)	Actual Enabled Capacity Percentage
12-Jun	1,130	1,744	614	154%
10-Jul	1,130	1,365	235	121%
15-Jul	1,130	582	-548	51%
12-Aug	1,130	1,069	-61	95%
13-Aug	1,130	1,639	509	145%
19-Aug	1,130	1,399	269	124%
24-Sep	1,130	983	-147	87%
Average	**1,130**	**1,254**	**124**	**111%**

The only instances where we were unable to replicate the Trane numbers were instances where the data were incomplete or when there were multiple, conflicting data sources. If the program were to expand to more sites, we recommend that Trane adopt a more standardized and dynamic system for the impact evaluation. If there were more sites,

performing the calculations in Excel could become cumbersome. Another option would be to calculate impacts at the end of the summer period to avoid conflicting records.

In our savings verification, we used the same "top 8-of-10" methodology as Trane in the independent evaluation. Our approach was identical to Trane's for six of the participating sites and was slightly adjusted for the remaining site. In the 2020 demand response season, EPE added one new site – the New Mexico State University (NMSU) Central Plant. During the evaluation process, we discovered that the NMSU site experienced a significant, mid-summer change in their load pattern which required a slightly altered methodology. The site typically operates thermal storage for six hours in the afternoon, from 12:00 to 6:00 PM. In the first half of the summer, a tunnel restoration project prevented the use of the thermal storage. Once the project was completed, the thermal storage was restored.

For NMSU, the two load shape groups were flagged, before and after August 13th. For each event day, baseline days were only selected from within the same load shape group. If there are not enough baseline days before an event day within the load shape group, we consider future days as potential baseline days. The only day that was impacted was August 19th, which occurred soon after the thermal storage was restored. There were only three non-holiday, non-event weekdays before the August 19th event that also used thermal storage. To ensure that the remaining potential baseline days represented the same conditions as the event, the seven eligible weekdays *after* August 19th were used to populate the ten days in the "top 8-of-10" calculations.

The gross verified savings estimates for demand savings by event and in total are summarized in Table 17. The portfolio delivered average reductions in excess of the 1,130 kW of committed capacity in three of seven events, with the average portfolio load reduction being 1,122 kW, or 8 kW (<1%) below the portfolio committed capacity.

Table 17: Gross Verified Savings

Date	Portfolio Committed Capacity (kW)	Portfolio Load Reduction (kW)	Reduction Relative to Committed Capacity (kW)	Actual Enabled Capacity Percentage
12-Jun	1,130	1,795	665	159%
10-Jul	1,130	1,329	199	118%
15-Jul	1,130	609	-521	54%
12-Aug	1,130	1,056	-74	93%
13-Aug	1,130	1,626	496	144%
19-Aug	1,130	1,126	-4	100%
24-Sep	1,130	986	-144	87%

Average	**1,130**	**1,215**	**85**	**108%**

The adjustment to the methodology for the NMSU site precluded the evaluation team from conducting the "high 8 of 10" analysis using the aggregated data across all sites, in the same way that Trane performs the calculations. Instead, site-level baseline and impact calculations were summed across the seven sites for each event. The differences between the two calculation methods were minor.

Demand response events may also yield energy savings if the demand reductions during the event window are not offset by actions like precooling or snapback, which shifts demand to intervals outside of the Event Window. The evaluation team's approach to estimating the net energy savings on DR event days is similar to the approach for estimating demand savings. Demand savings are estimated by calculating the difference between a site's actual load and its baseline load for the two hours in the Event Window only. To calculate energy savings, Evergreen measured the difference between a site's actual load and its baseline load for the daytime hours of event days from 8:00 AM to 8:00 PM.[5] By looking at the hours outside the Event Window, we account for increases in energy consumption that may occur before or after the DR event as a result of pre-cooling or other load-shifting activities.

Table 18 shows the portfolio net energy savings for each event and in total. Total energy savings across the seven events was 18,756 kWh.

Table 18: Energy Savings by Event Day

Date	Energy Savings (kWh)
12-Jun	3,854
10-Jul	2,131
15-Jul	865
12-Aug	85
13-Aug	4,813

[5] The cutoff hours of 8:00 AM and 8:00 PM were chosen based on a comparison of daily load shapes across different days and specifically the observation that load profiles tend to track each other closely until 8:00 AM, and converge again after 8:00 PM. We measure energy savings from 8:00 AM to 8:00 PM only because we would not expect the baseline and event day loads to differ outside of these time periods as a result of weather conditions or other factors.

19-Aug	2,626
24-Sep	4,456
Total	**18,756**

2.2.2 Residential Load Management Program

For the Residential Load Management program, the impact analysis uses hourly smart thermostat runtime data provided by the three participating device manufacturers to estimate two separate baselines. Both methods provide an estimate of average baseline runtime per experimental device, in the absence of the demand response intervention, for a given event day and hour. The two estimates are then blended by using a simple average to provide a final runtime estimate.

Based on this approach, the gross verified impacts by event day are summarized in Table 19.

Table 19: Demand Impacts by Event Day

Date	Impact per DR Device (kW)	Total Impact (kW)	Capability per Device (kW)	Total Capability (kW)
6-Aug	1.023	113	0.703	198
11-Aug	1.331	129	0.901	260
12-Aug	1.301	131	0.881	251
13-Aug	1.209	112	0.789	227
19-Aug	1.387	175	0.899	350
20-Aug	1.448	161	0.924	365
3-Sep	1.336	183	0.891	401
24-Sep	1.048	169	0.716	352
Average	**1.261**	**147**	**0.838**	**300**

The Total Impact refers to the actual load reduction (in kW) delivered on each event day. This number is calculated by multiplying the impact per device and the total treatment ("Demand Response") devices on each event day. Total Capability refers to load reduction capability of the program in each event hour if no operable devices had been assigned to the control group. This is calculated by multiplying the per device impact and total operable devices, which are the devices that are available to be remotely controlled by the program implementor ("Demand Response" + "Learning"). Capability per device is then

calculated as the total capability divided by all enrolled devices, in order to account for both operable and non-operable devices.

Program capability provides an estimate of the load reduction that EPE could expect if demand response was called for all enrolled customers. This is calculated by combining the capability per device with the number of customers that were enrolled in the program at the end of the summer DR season (September 30, 2020). Overall capability is presented in Table 20.

Table 20: Gross Verified Program Capability

Capability per Device (kW)	End of Season Enrollment	Program Capability (kW)
0.838	488	409

Table 21 shows the final hourly demand impacts and capability, as well as an overview of devices and temperature during each event.

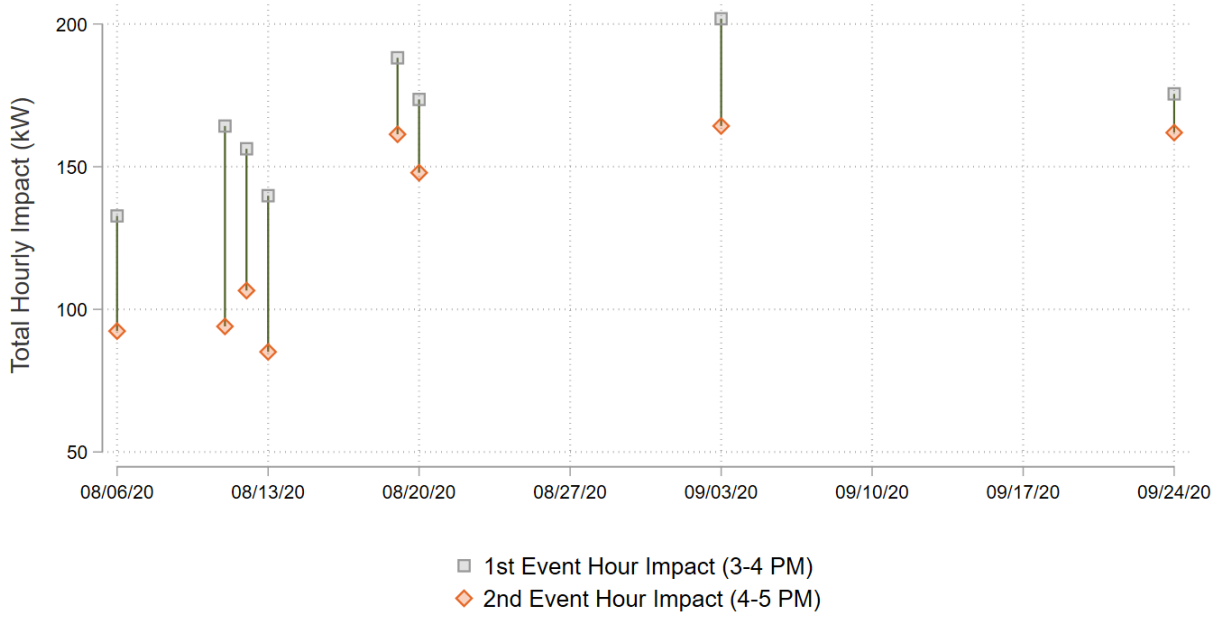
Table 21: Hourly Demand Impacts

Date	Demand Response Devices	Total Devices	Hour Ending MDT	Temp. (F)	Impact per DR Device (kW)	Total Impact (kW)	Capability per Device (kW)	Total Capability (kW)
8/6/2020	110	281	16	95	1.207	133	0.829	233
			17	95	0.840	92	0.577	162
8/11/2020	97	288	16	101	1.693	164	1.147	330
			17	100	0.969	94	0.656	189
8/12/2020	101	285	16	102	1.547	156	1.048	299
			17	101	1.055	107	0.715	204
8/13/2020	93	288	16	98	1.504	140	0.982	283
			17	98	0.915	85	0.597	172
8/19/2020	126	389	16	96	1.493	188	0.967	376
			17	96	1.281	161	0.830	323
8/20/2020	111	395	16	102	1.564	174	0.998	394
			17	101	1.332	148	0.850	336
9/3/2020	137	450	16	98	1.473	202	0.982	442

			17	98	1.199	164	0.799	360
9/24/2020	161	492	16	92	1.090	176	0.745	366
			17	91	1.006	162	0.687	338

In every event, load impacts were larger in the first hour than they were in the second hour. In calculating the event-level impacts, we used the average of the two hourly impacts. Figure 3 provides a visual of the diminishing impacts for each of the eight events.

Figure 3: Diminishing Hourly Impacts



EPE resource planners and system operators should be aware of this decay. Since the events are only two hours, it is impossible to predict if this decay would continue if the events were longer. However, if the impact on demand becomes negligible after the first few event hours, this could affect the value of the program as a demand resource.

The Residential Load Management program provides load reductions by reducing the amount of time a customer's HVAC system is running and cooling the home. If load reduction was the only program goal, program implementors would turn off the HVAC system entirely, rather than just manipulating temperature setpoints, however, customer comfort is also an important consideration. To help keep households cool throughout the event, Uplight "pre-cools" the home in the hours before the event by lowering the setpoint and then also allows the system to run more after the event to return the home to the

customer's desired temperature. As a result, the demand response treatment increase runtime and energy usage in the hours before and after the event.

This can sometimes lead to overall energy usage, even if there are significant demand savings. Figure 4 shows the estimated hourly energy impacts for each event day to illustrate the increased energy usage before and after the event and the decreased usage during the event. Negative impacts represent an increase in hourly cooling energy consumption at the device level.

Figure 4: Hourly Energy Impact by Event Day

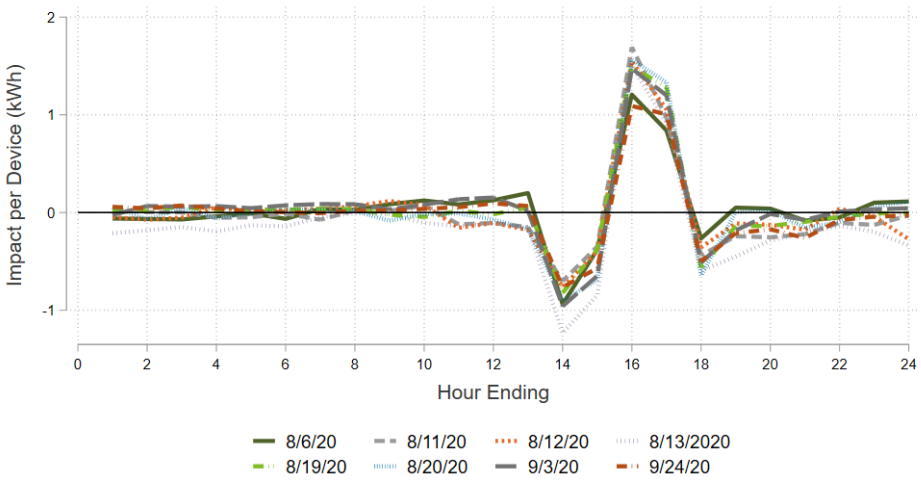


Table 22 shows the net energy impact of the demand response across each full event day. Energy impacts varied by event day, with a positive impact for five event days and negative impact for three event days. The average impact across all eight event days for the Residential Load Management program was very close to zero and not statistically significant. Our interpretation of these results is that the DR events are energy neutral in terms of savings.[6]

[6] Additional energy savings were achieved from smart thermostats that were sold through the program but not enrolled in load management. These savings have been included in the summary impact tables earlier in this report.

Table 22: Net Energy Impact by Event Day

Date	Overall Event Day Impact (kWh)
6-Aug	1.01
11-Aug	-0.22
12-Aug	0.17
13-Aug	-3.45
19-Aug	0.81
20-Aug	0.3
3-Sep	1.24
24-Sep	-0.01
Average	**-0.02**

3 Cost Effectiveness Results

The evaluation team calculated cost effectiveness using the Utility Cost Test (UCT) for each individual EPE energy efficiency program, as well as the cost effectiveness of the entire portfolio of programs.[7] The evaluation team conducted these tests in a manner consistent with the California Energy Efficiency Policy Manual.[8]

Cost effectiveness tests compare relative benefits and costs from different perspectives. The specific cost effectiveness test used in this evaluation, the UCT, compares the benefits and costs to the utility or program administrator implementing the program. The UCT explicitly accounts for the benefits and costs shown in Table 23.

Table 23: Utility Cost Test Benefits and Costs

Benefits	Costs
• Utility avoided energy-related costs • Utility avoided capacity-related costs, including generation, transmission, and distribution	• Program overhead/administrative costs • Utility incentive costs • Utility installation costs

Using net realized savings from this evaluation and cost information provided by EPE, the evaluation team calculated the ratio of benefits to costs for each of EPE's programs and for the portfolio overall. The results of the UCT are shown below in Table 24. The portfolio overall was found to have a UCT ratio of 1.50.

[7] The Utility Cost Test is sometimes referred to as the Program Administrator Cost Test, or PACT.
[8] California Public Utilities Commission. *California Energy Efficiency Policy Manual – Version 5*. 2013. http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy_-_Electricity_and_Natural_Gas/EEPolicyManualV5forPDF.pdf

Table 24: PY2020 Cost Effectiveness

Program	Utility Cost Test (UCT)
Commercial Comprehensive	1.30
SCORE Plus	0.86
LED	3.74
Residential Comprehensive	1.93
ENERGY STAR New Homes	0.89
NM EnergySaver	1.77
LivingWise®	0.64
Commercial Load Management	0.63
Residential Load Management	0.33
Overall Portfolio	**1.50**

4 Process Evaluation Results

This chapter summarizes key methods and findings from the PY2020 process evaluation of the EPE Small Business Comprehensive, SCORE Plus, and Residential Comprehensive programs. These findings, along with the findings from the impact evaluation, informed the conclusions and recommendations in the following chapter.

Throughout the analysis described here, we present the survey results as weighted percentages based on the proportion of savings represented by survey respondents relative to the total savings of all program participants.

4.1 Commercial Comprehensive Participant Surveys

As part of the evaluation, the evaluation team conducted telephone surveys with representatives from 23 participating companies that received rebates through the EPE Commercial Comprehensive program. These surveys were completed in March 2021 and ranged from 15 to 20 minutes in length.

The participant survey was designed to cover the following topics:

- Verifying the installation of measures included in the program tracking database;
- Collecting information on participants' satisfaction with the program experience;
- Survey responses for use in the free ridership calculations;
- Baseline data on energy use and/or equipment holdings;
- Participant drivers and barriers; and
- Additional process evaluation topics.

EPE provided program data on the Commercial Comprehensive participant projects, which allowed the evaluation team to select a sample for surveys. The evaluation team randomly selected and recruited program participants from the entire population of Commercial Comprehensive participants that had valid contact information.

Note that the evaluation team also attempted to conduct similar interviews with SCORE Plus participants, but we were only able to complete one interview. The evaluation team attempted to recruit an additional 12 participants.

Of the 12 participant contacts, two were contacts for a contractor rather than a customer and were therefore ineligible for the interview. Two other contact phone lines were disconnected, and calls were therefore unable to be completed. Of the eight remaining eligible and active contacts, one declined to participate, while the other seven were never

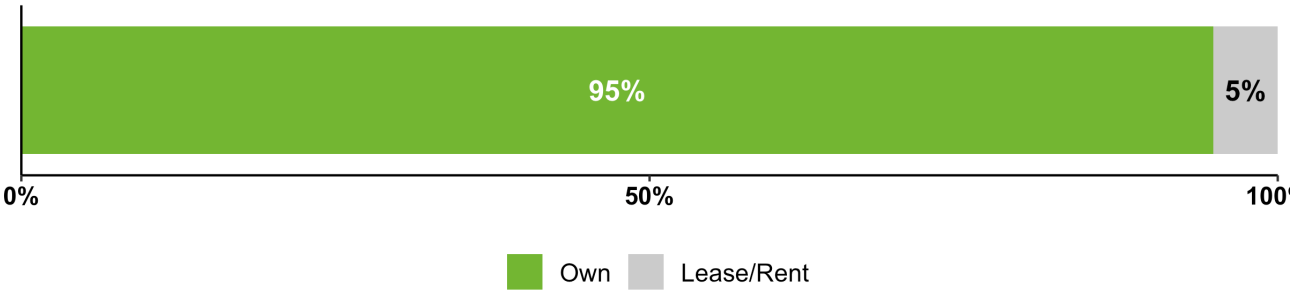
reached. The evaluation team attempted four contacts for each individual, calling at various times during the day, and left voicemails explaining the purpose of the call.

Because we were unsuccessful in reaching SCORE Plus participants, the survey results below are from the Commercial Comprehensive customers only.

4.1.1 Company Demographics

We asked the Commercial participants whether their company owns or leases the building where the project was completed. Figure 5 shows that 95 percent of participants own the building where the measure was installed compared to 5 percent of respondents who lease or rent.

Figure 5: Participant Own or Rent (n=23)



The following two figures summarize the survey respondents' building size and number of employees. Figure 6 and Figure 7 both show that the majority of participant firms are mid-sized to large-sized businesses. Twenty-eight percent of participating firms reported occupying buildings between 10,000 to 49,999 square feet, while 54 percent occupied buildings of between 50,000 and 99,999 square feet. A small portion (5%) reported occupying buildings of 100,000 square feet or greater. Additionally, 38 percent of participants reported between 50 and 90 full-time employees.

Figure 6: Participant Building Size (n=17)

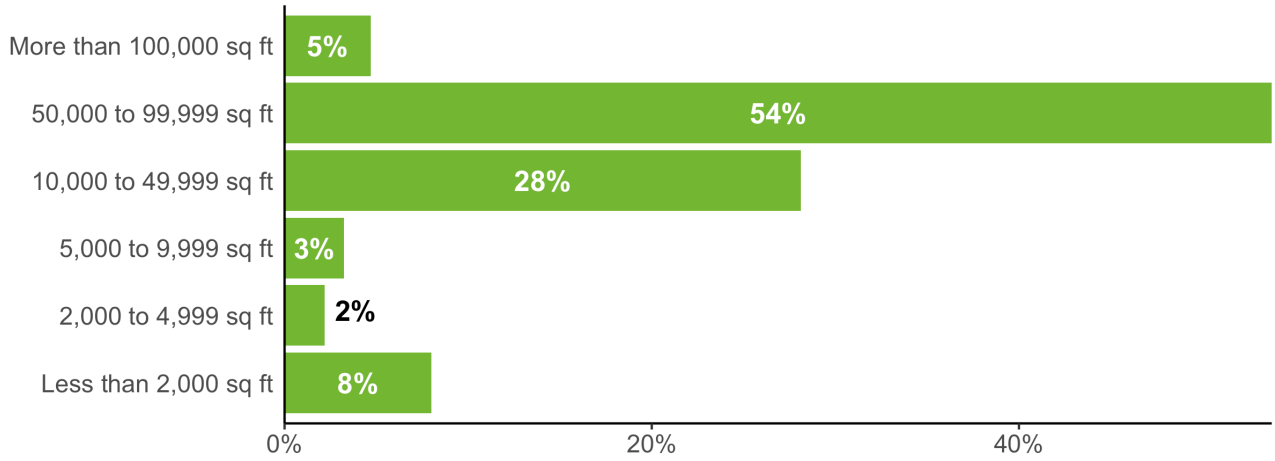
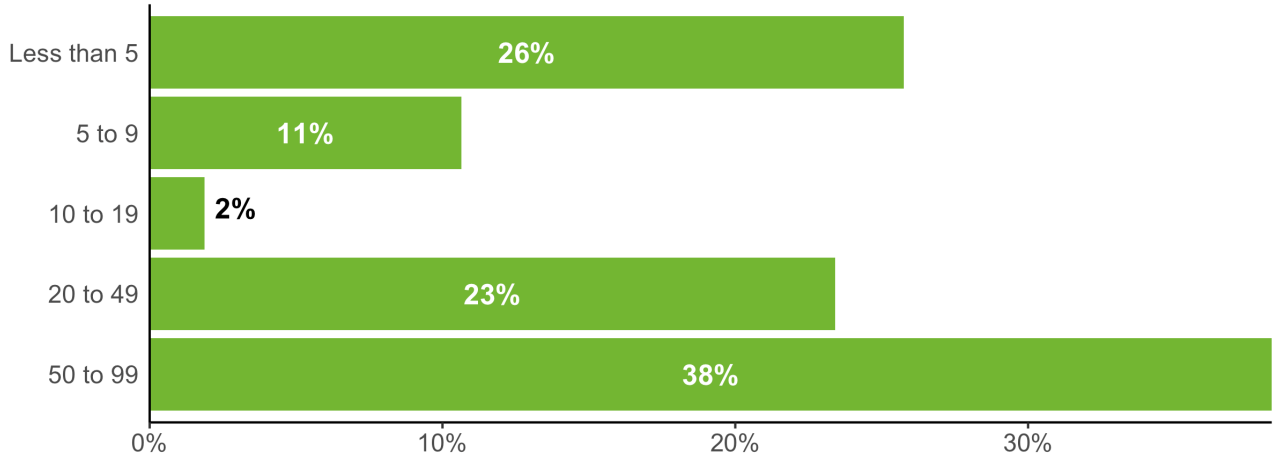
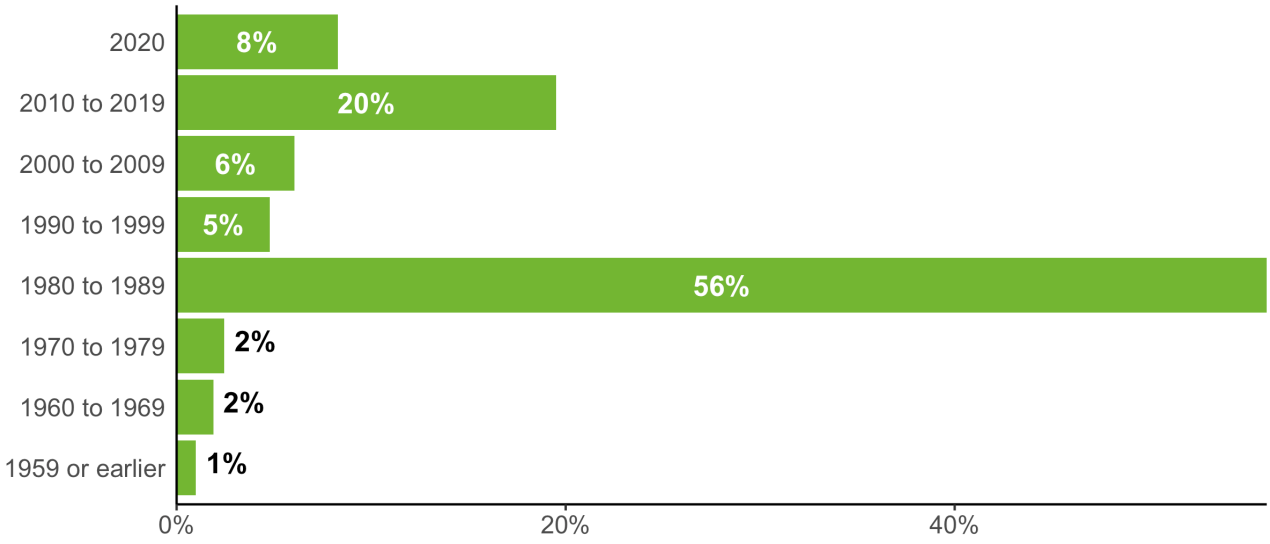


Figure 7: Participant Number of Employees (n=22)



Additionally, Figure 8 shows that there was wide range of newer and older buildings targeted in PY2020 spanning over 60 years. The majority of participants' (56%) buildings were built between 1980 and 1989, and only 5 percent of buildings were built before 1980. Thirty-four percent of participants' buildings were built during or after the year 2000. This suggests that the program is doing an adequate good job at targeting both older buildings where the potential for significant energy savings are the greatest, and newer buildings.

Figure 8: Participant Building Age (n=17)

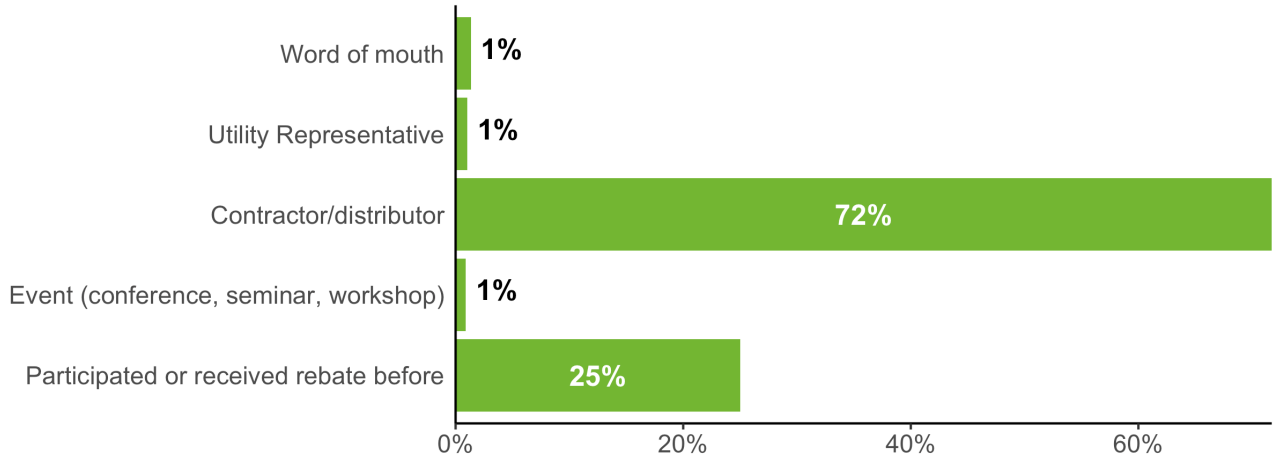


4.1.2 Sources of Awareness

Commercial Comprehensive program participants became aware of the program rebates and assistance through a variety of channels including contractors and/or distributors, word of mouth, EPE marketing and outreach, events (conferences, seminars, or workshops), and previous participation in a EPE rebate program. As shown in Figure 9, 72 percent of participants learned about the program offerings through contractors or distributors, and 25 percent of participants knew about the program through previous participation in the program or receiving the rebate before.

For the two respondents who indicated that they learned about the program through multiple sources, the evaluation team asked which source was the most useful in their decision to participate. One respondent indicated that previous participation was the most useful sources of awareness and the other indicated that a seminar was the most useful source. This indicates that beyond interactions with contractors and distributors and previous program participation , events may be a significant supplemental driver for the program.

Figure 9: Initial Source of Awareness (n=23)



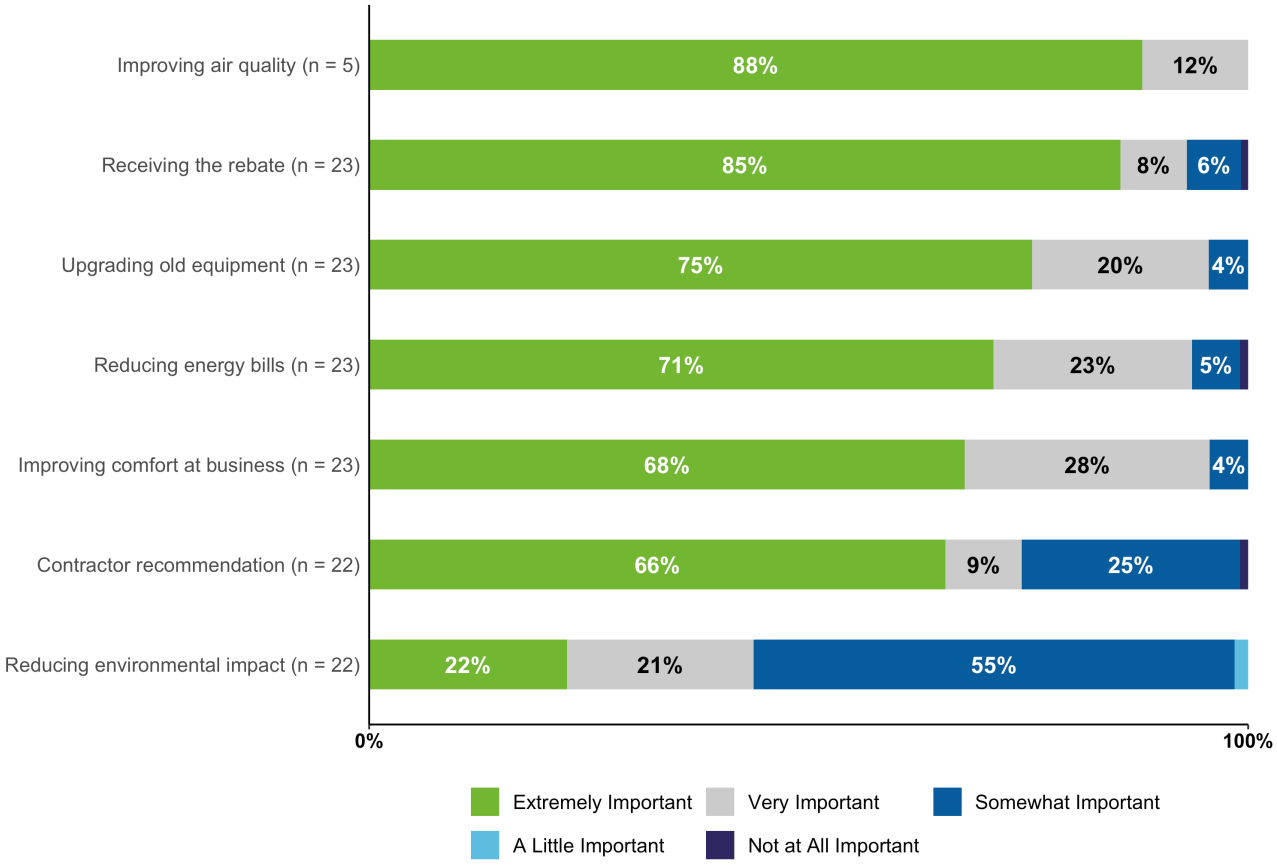
4.1.3 Motivations for Participation

Figure 10 shows the level of importance placed by respondents on a variety of factors that might be influencing customers to participate in the Commercial Comprehensive program.

Factors that participants reported as being important included receiving the rebate, upgrading old equipment, and reducing energy bills. Eighty-eight percent of respondents reported that improving air quality, was extremely important in their decision to participate in the program, however this was only asked among HVAC measure participants (n=5).

Reducing environmental impact was the least important factor in respondents' decisions to participate in the Commercial Comprehensive program, with 43 percent of respondents saying it was extremely or very important in their decision to participate. Contractor recommendations was the second least important factor in respondents' decisions to participate, with only 66 percent reporting it to be extremely important in their decision making. This finding combined with the awareness question responses above suggests that the real value of the contractors is to introduce the program to participants.

Figure 10: Motivations for Participation



In addition to motivations for participating, respondents were given a list of potential program and non-program factors that may have influenced their decision about how energy efficient their equipment would be and were then asked to rate their importance on a 0 to 10 point scale.[9] We categorized extremely important to be a score of 9 or 10, very important to be a score of 7 or 8, somewhat important to be a score of 5 or 6, a little important to be a score of 3 or 4, and not at all important to be a score of 1, 2, or 3. As shown in Figure 11, the majority of respondents rated the recommendation from a contractor, EPE marketing or informational material, and technical assistance received from EPE staff in their decision to determine how energy efficient their equipment would be. Recommendation from a vendor or distributor was the least important factor in the participants' decision to determine how energy efficient their project would be, with 72

[9] On the 0 to 10-point scale, 0 indicated 'not at all important' and 10 indicated 'extremely important'.

percent saying it was very or extremely important and 8 percent reporting that it was a somewhat important (a score of 4 or 5) or not at all important in their decision.

Figure 11: Importance of Program Factors

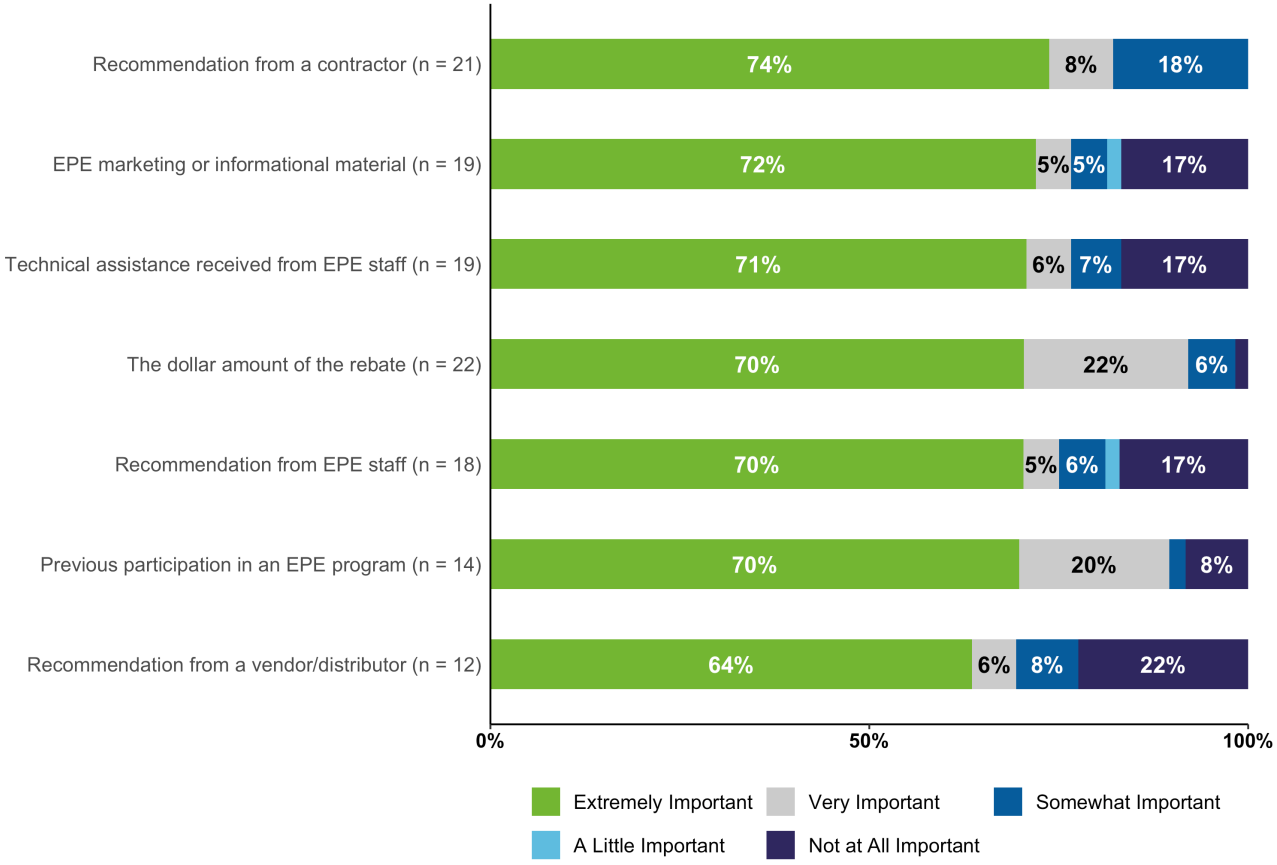
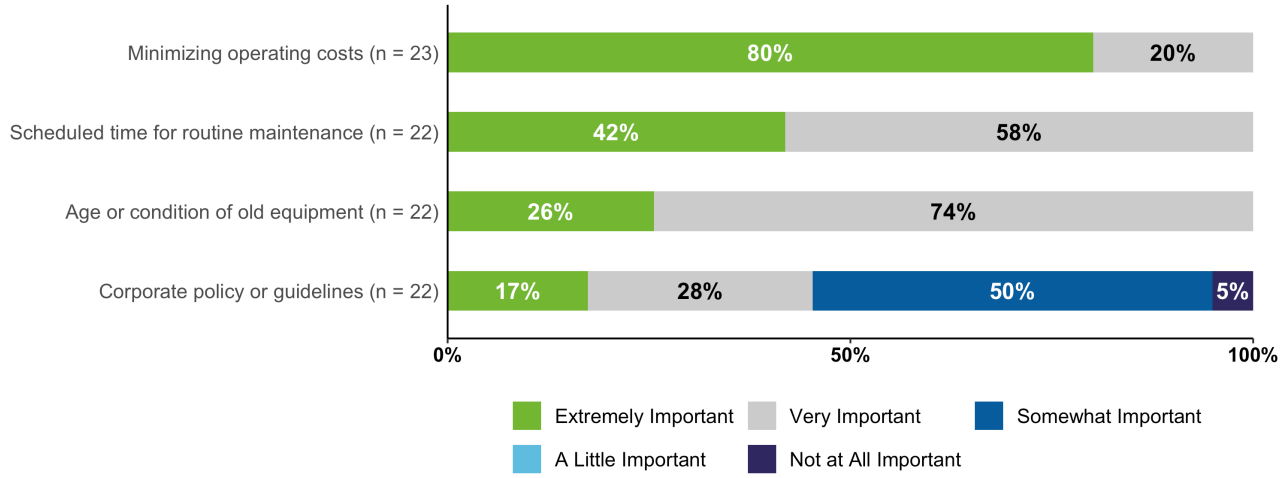


Figure 12 shows that the majority of Commercial Comprehensive participants rated minimizing operating costs, scheduled time for routine maintenance, and the age or condition of old equipment as very or extremely important on the decision to determine how energy efficient their project would be. Corporate policy or guidelines was the least influential non-program factor in the decision regarding the efficiency level of the equipment, with 17 percent of participants rating it extremely important and 5 percent rating it as not at all important.

Figure 12: Importance of Non-Program Factors



Respondents were asked if the equipment installed through the program was intended to replace existing equipment and if existing equipment was functional or in need of repairs prior to replacement. Seventy-six percent of respondents reported all equipment installed through the program replaced existing equipment (Figure 13). Only 8 percent of respondents reported that all equipment installed through the program was an addition to existing equipment. Respondents were then asked about the state of the replaced equipment as shown in Figure 14. The majority of respondents (53%) reported that the equipment replaced through the program was fully functional and in no need of repair. Only 1% reported that the replaced equipment was functional but in need of major repairs.

Figure 13: Rebated Equipment Intended to Replace Existing Equipment (n=23)

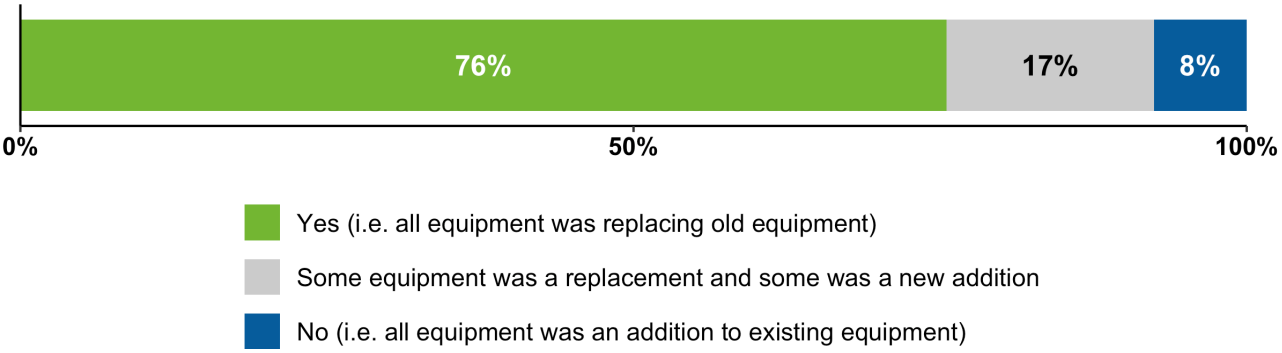
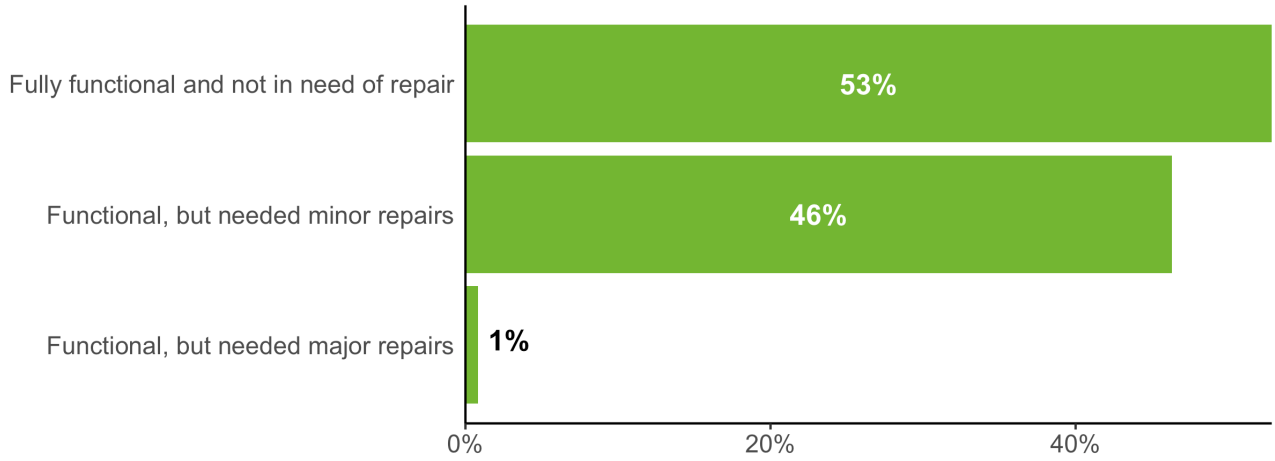
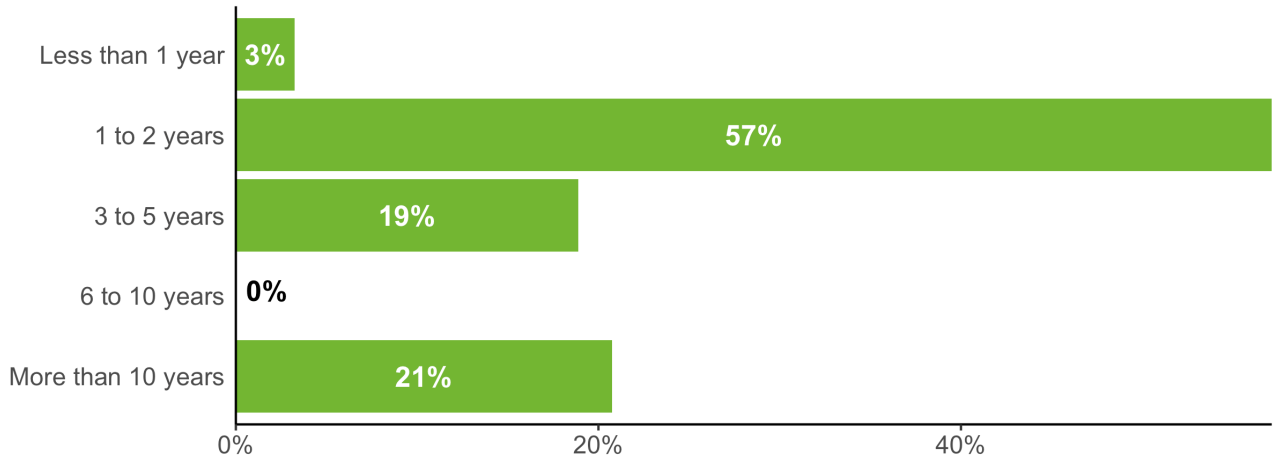


Figure 14: State of Replaced Equipment (n=21)



To allow the evaluation team to get a sense of the condition of the existing equipment, respondents were asked approximately how much longer the equipment would have lasted if it had not been replaced. Figure 15 shows that the majority of respondents (57%) believed their equipment would last 1 to 2 years more. Only 3 percent of respondents believed the replaced equipment would have lasted less than a year. Figure 15 also shows that a large portion (21%) of surveyed respondents believed that their equipment would have lasted 10 or more years. This along with the results from Figure 14 suggest that the program is doing a good job of targeting customers with functioning equipment, rather than those whose equipment is not working and would need to be replaced anyway (i.e., potential free riders).

Figure 15: Equipment Remaining Life (n=18)



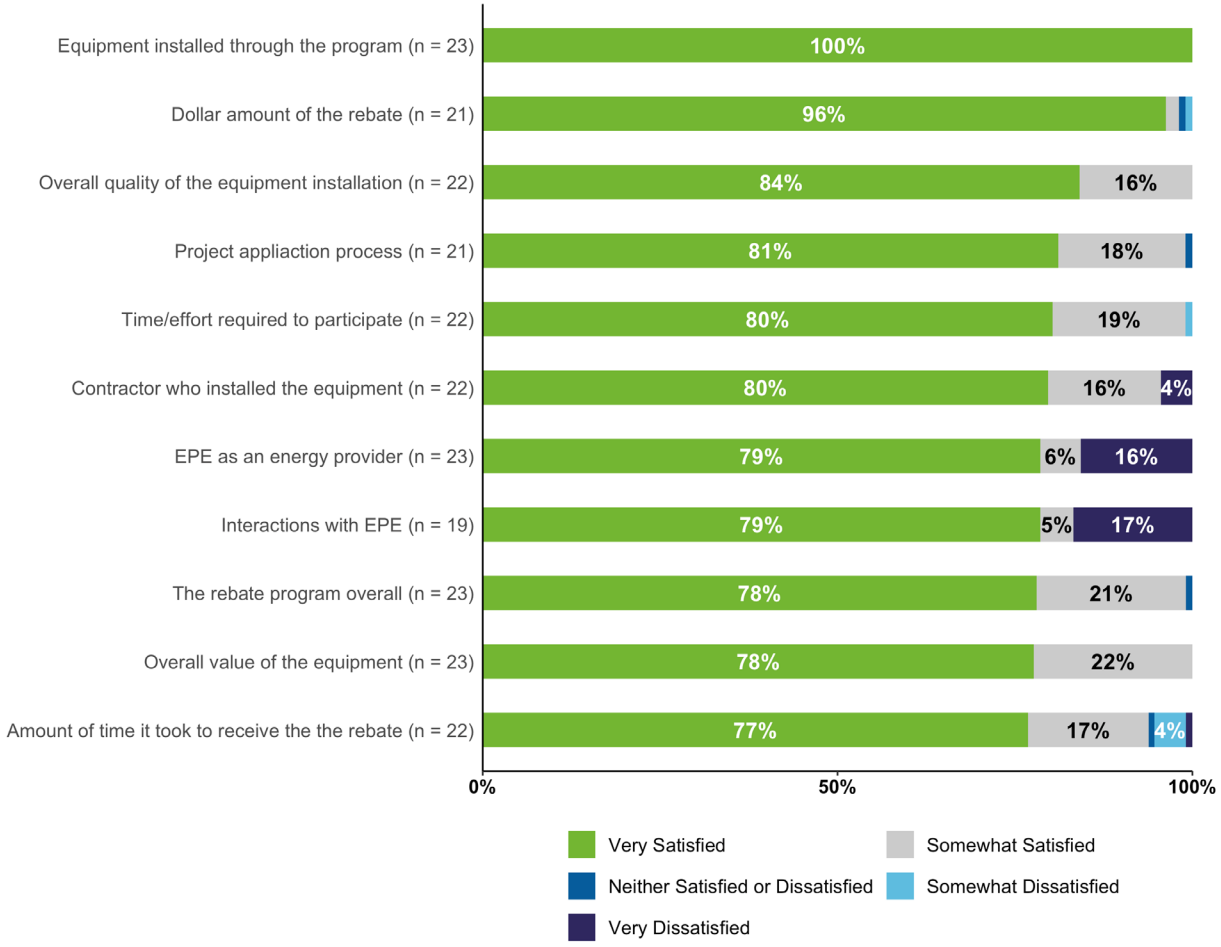
4.1.4 Participant Satisfaction

The participants evaluated their satisfaction with various components of the Commercial Comprehensive program on the following scale: very satisfied, somewhat satisfied, neither satisfied nor dissatisfied, somewhat dissatisfied, and very dissatisfied. The individual components that participants were asked to rank their satisfaction on are summarized in the chart below.

Overall, surveyed program participants expressed high levels of satisfaction with the Commercial Comprehensive program components. As shown in Figure 16, the majority of participants reported that they were "very satisfied" with all of the program components. One hundred percent reported being "very satisfied" with the equipment installed through the program, and 96 percent were "very satisfied" with the dollar amount of the rebate. Interactions with EPE and EPE as an energy provider received the lowest satisfaction rating from participants (but they were still relatively satisfied), with 17 and 16 percent respectively reporting they were "very dissatisfied".[10]

[10] The 'very dissatisfied' ratings came from a single survey respondent, who had issues with the assistance they received from the engineers involved with the program. This project associated with this respondent had a large amount of energy savings, and when the survey responses were weighted by savings the result was a weighted response frequency of 16 to 17 percent for these two questions.

Figure 16: Participant Program Satisfaction



4.2 Residential Comprehensive Participant Surveys

As part of the evaluation, the evaluation team conducted telephone surveys with 101 residential customers that received rebates through the EPE Residential Comprehensive program. These surveys were completed in March of 2021 and ranged from 15 to 20 minutes in length.

EPE provided program data on the Residential Comprehensive participant projects, which allowed the evaluation team to select a sample for interviews. The evaluation team randomly selected and recruited program participants from the entire population of Residential Comprehensive participants that had valid contact information.

The following subchapters include data covering demographics, sources of program awareness, motivations for participation, and program satisfaction among survey participants.

4.2.1 Participant Demographics

We asked survey respondents a number of questions about the characteristics of their home and household, including whether they own or rent, the size of their home, the number of people in the household, and age of their home. The large majority of survey respondents (99%) reported owning their home. Respondents were then asked to estimate the size of their homes where the projects took place, with 57 percent residing in homes less than 2,000 square feet, followed by homes between 2,000 and 2,999 square feet (Figure 17). Additionally, the majority (61%) of respondents have two or three full-time residents living in the home where the project was completed (Figure 18).

Figure 17: Residential Comprehensive Participant Home Size (n=101)

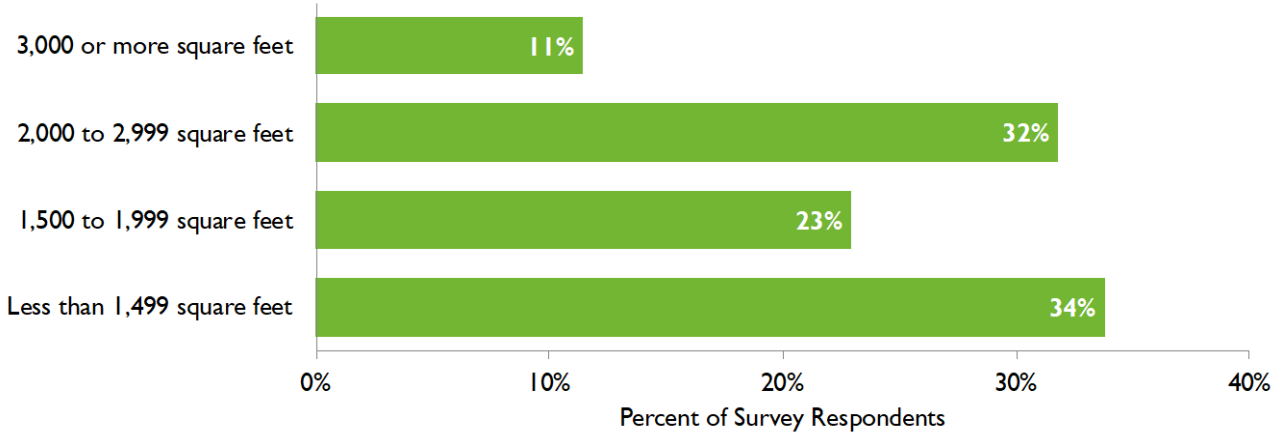
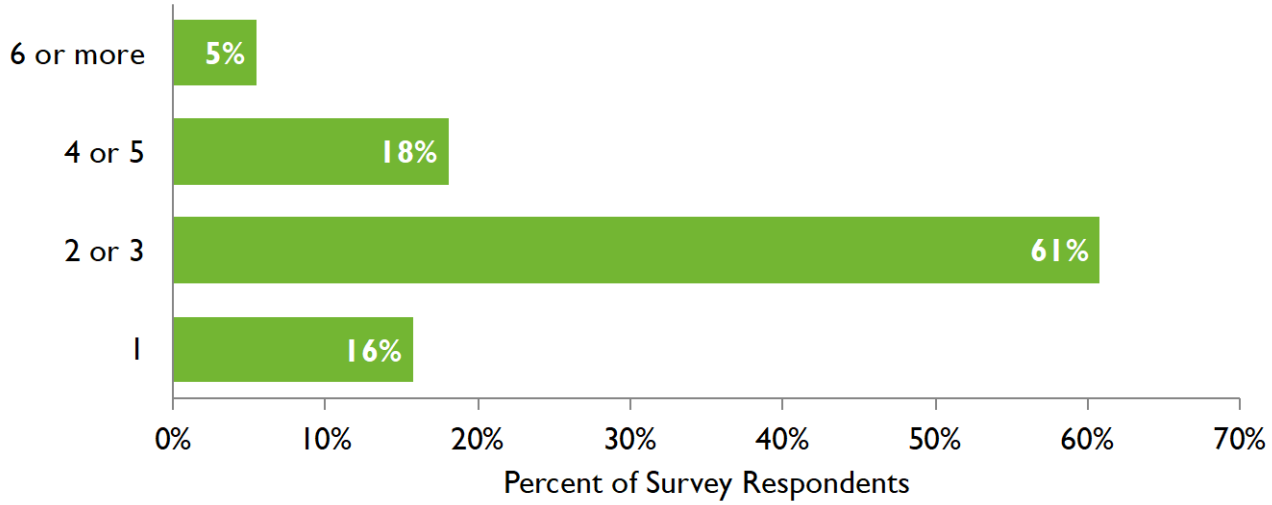
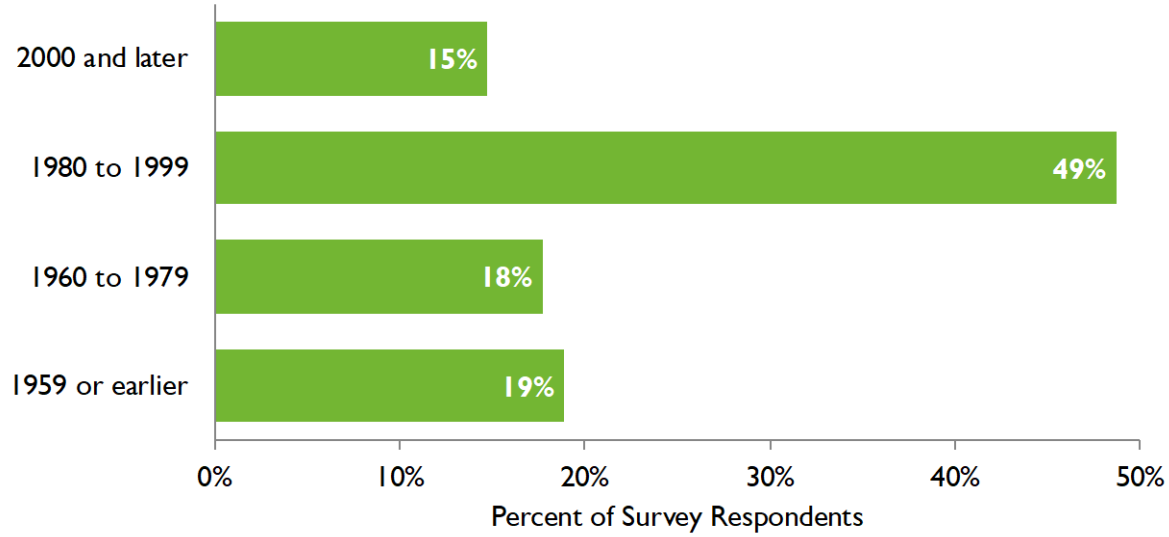


Figure 18: Residential Comprehensive Participant Household Size (n=101)



The program has continued to do a good job targeting older homes where the potential for significant energy savings is the greatest with 49 percent of respondents reporting that their homes were built sometime between 1980 and 1999, followed by thirty-seven percent of respondent homes being built sometime before 1979 (Figure 19).

Figure 19: Residential Comprehensive Home Vintage (n=101)

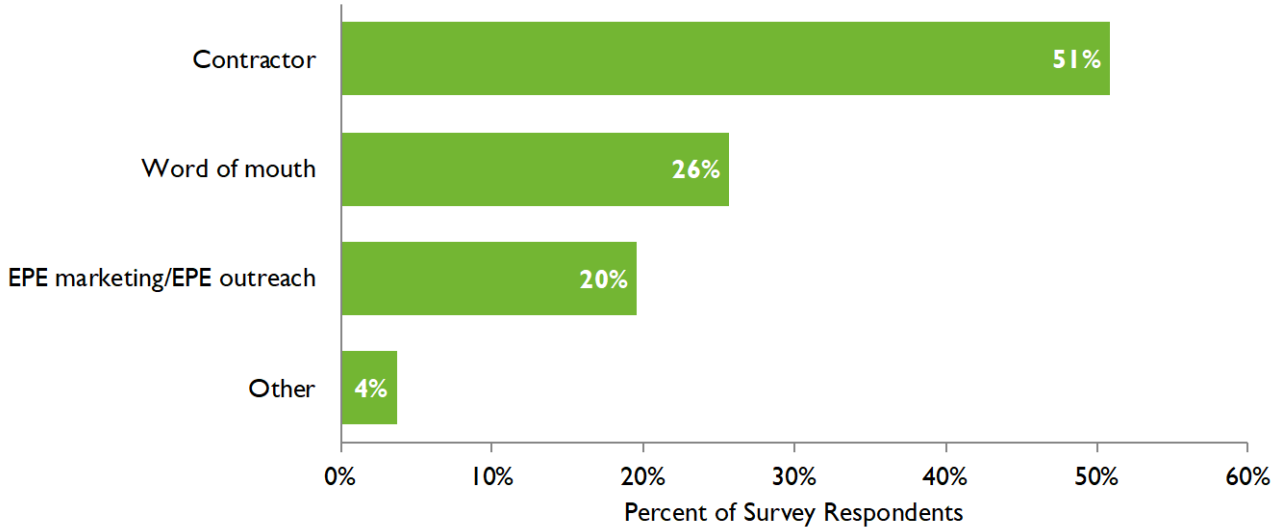


4.2.2 Sources of Awareness

Participants became aware of the program assistance through a variety of channels including the contractor who installed the equipment, word of mouth, and EPE

marketing/EPE outreach. As shown in Figure 20, contractors were the most common (51%) source of awareness reported by participants, followed by word of mouth (26%).

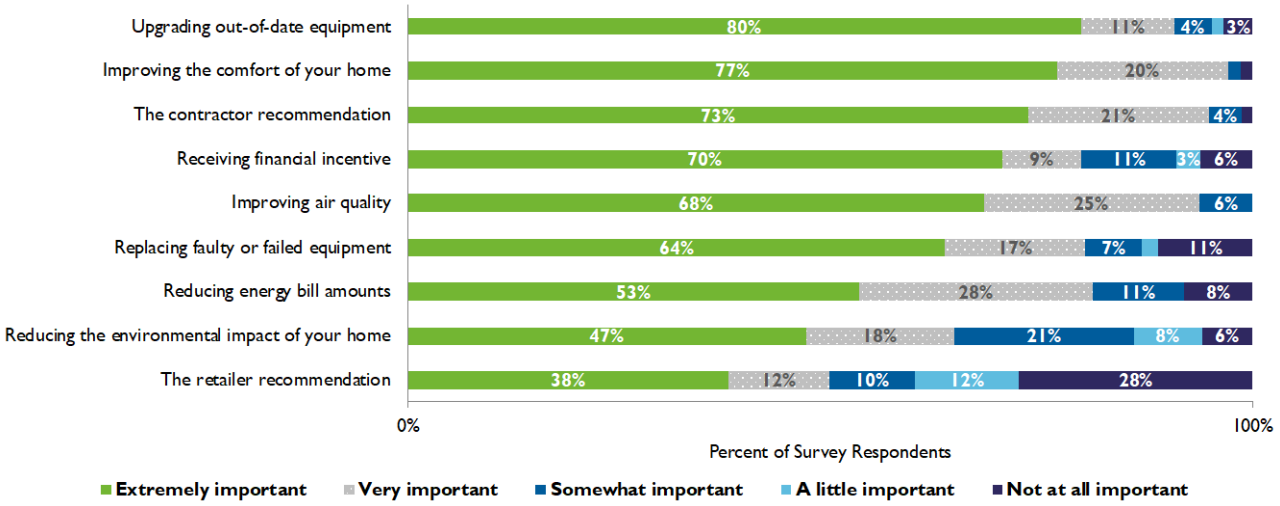
Figure 20: Residential Comprehensive Participants Initial Source of Awareness (n=79)



4.2.3 Motivations for Participation

To get a sense of how important various program and non-program factors were on participants' decisions to participate in the program, respondents were asked to rate how important a variety of factors were that might have been important in their decision to participate. Figure 21 summarizes the level of importance placed on these factors. Consistent with the results from the PY2018 Residential Comprehensive survey, upgrading out-of-date equipment was the most important factor for participants, with 80 percent of respondents reporting it as "extremely important" in their decision to participate, followed by improving the comfort of their home (77%).

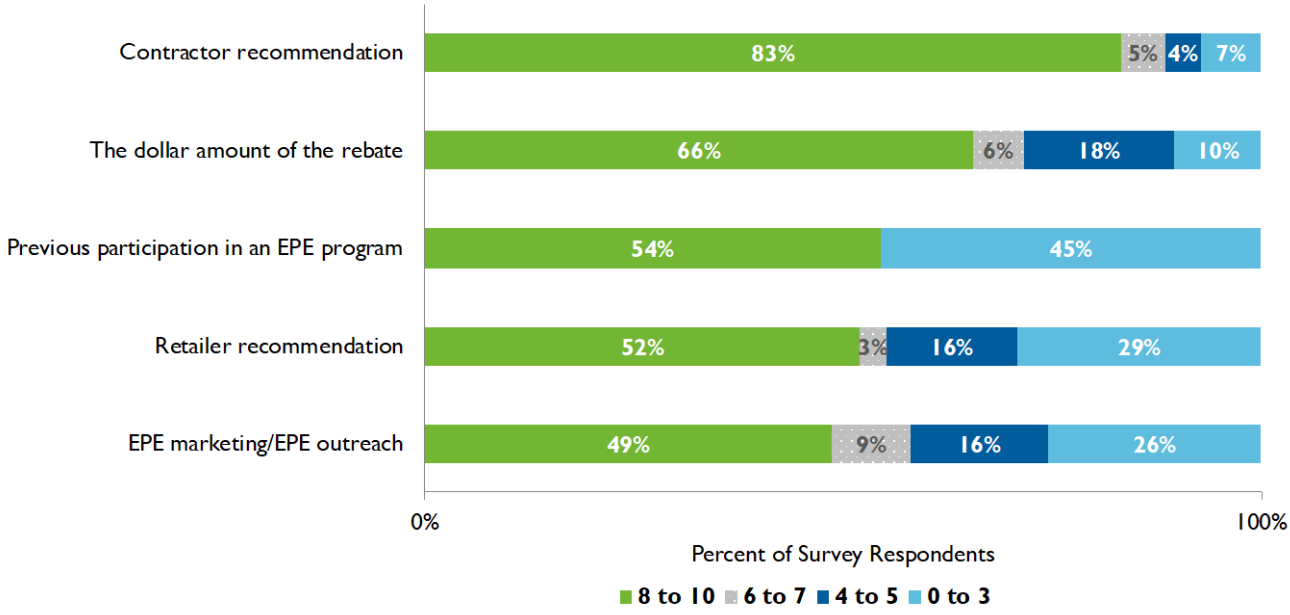
Figure 21: Residential Comprehensive Motivations for Participation (n=101)



In addition to motivations for participating, survey respondents were given a list of program factors that may have potentially influenced their decision to make the upgrade that they did through the Residential Comprehensive program and were then asked to rate the influence of those factors on a 0 to 10-point scale.[11] Figure 22 shows that the majority of respondents reported all but one program factor as extremely influential in their decisions to make the upgrade. The contractor recommendation was the most influential, with 83 percent of respondents reporting it as extremely influential (rating of 8 to 10). A slight majority of respondents (54%) reported that previous participation in an EPE program was influential in their decision to make the upgrade, indicating that they were satisfied with their prior participation experience and had established a level of trust with the program.

[11] On the 0 to 10-point scale, 0 indicated 'not at all influential' and 10 indicated 'extremely influential'.

Figure 22: Residential Comprehensive Influence of Program Factors (n=101)



4.2.4 Participant Satisfaction

The participants evaluated their satisfaction with various components of the Residential Comprehensive program on the following scale: very satisfied, somewhat satisfied, neither satisfied nor dissatisfied, somewhat dissatisfied, and very dissatisfied. The individual program components that respondents were asked to rank their satisfaction with included:

- EPE as an energy provider
- The rebate program overall
- The equipment rebated through the program
- The contractor who installed the equipment
- The time it took to receive the rebate
- The dollar amount of the rebate
- Interactions with EPE
- The overall value of the equipment for the price they paid

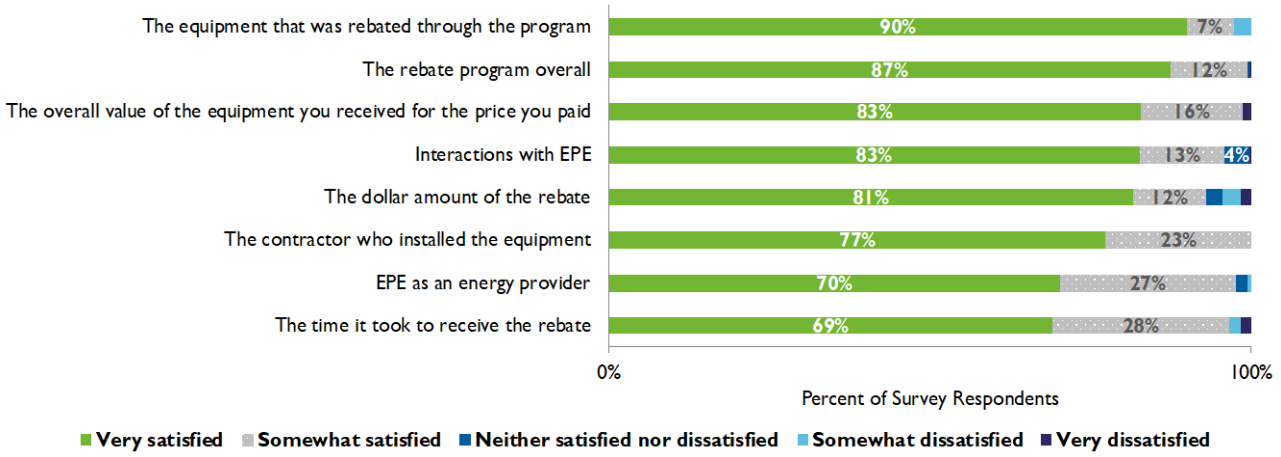
Figure 23 summarizes the satisfaction levels of the Residential Comprehensive program survey respondents.

Overall, surveyed program participants expressed high levels of satisfaction with the Residential Comprehensive program. As shown in Figure 23 and consistent with the results of the PY2018 Residential Comprehensive survey, respondents expressed high

levels of satisfaction across each individual component, with the majority reporting being very satisfied. The equipment that was rebated through the program (90%) and the rebate program overall (87%) received the high satisfaction ratings among respondents. A small percentage of respondents reported lower satisfaction ratings, primarily with the amount of time it took to receive the rebate and the equipment rebated through the program.

Some of the justifications provided for the low satisfaction ratings with the amount of time it took to receive the rebate and the equipment that was rebated through the program were that "it took a long time to receive the rebate and it wasn't easy to figure out who to talk to [at EPE]" and "the new equipment is only 50 percent as good as my old Mastercool unit. I am unable to see the water level at the bottom of the reservoir because it's a black plastic pan."

Figure 23: Residential Comprehensive Program Satisfaction (n=101)



4.3 Energy Star New Homes Builder Interviews

The evaluation team conducted telephone interviews with builders who participated in the Energy Star New Homes program. Due to the low response rate for PY2020, the evaluation team combined the results from the evaluation of the PY2018 New Homes builder interviews for the purpose of this analysis. Between PY2018 and PY2020, the evaluation team conducted a total of 17 interviews with participating home builders across the three New Mexico utilities that offer a New Homes program: PNM, El Paso Electric, and New Mexico Gas Company. A copy of the builder interview guide is included in Appendix C.

The interviews focused on the following topics:

- Project context and background;
- Role and influence of the EPE ENERGY STAR New Homes program; and

- Program satisfaction.

Participants were categorized into three groups based on the number of projects completed in PY2020: lightly active (1 to 12 projects), moderately active (13 to 100 projects), and highly active (more than 100 projects). The evaluation team interviewed nine moderately active firms and seven lightly active firms, and one highly active firm. While respondents had varying levels of interaction with the Energy Star New Homes program directly, all 17 were familiar with the eligible projects and played a significant role in their business's participation in the program.

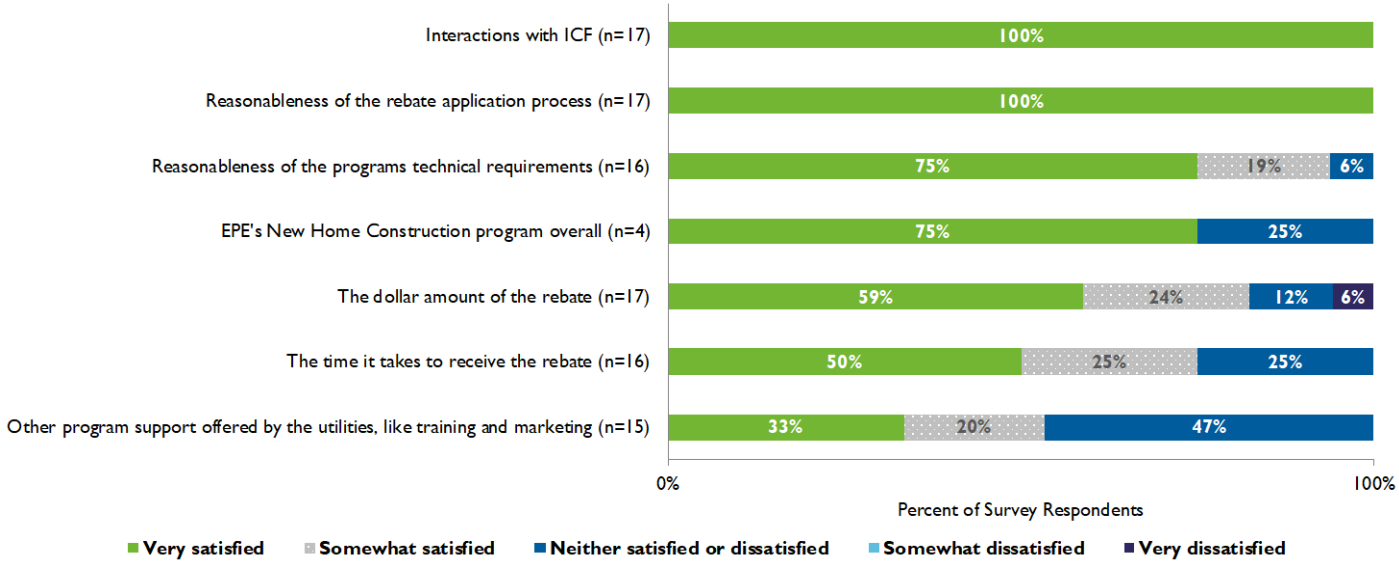
4.4 Program Satisfaction

Energy Star New Homes interviewees were asked a series of questions to quantify their level of satisfaction with various components of the program using a 1 to 5-point scale, with 1 indicating very dissatisfied and 5 indicating very satisfied.

Consistent with the results of the PY2018 Energy Star New Homes program builder interviews, satisfaction with the program in PY2020 was high overall. As shown in Figure 24, all 17 interviewees reported being "very satisfied" with their interactions with ICF and the reasonableness of the rebate application process. Other program support offered by the utilities, like training and marketing received the lowest satisfaction rating but one respondent noted that it's mainly a product of COVID-19, there weren't too many opportunities to take advantage of trainings in PY2020.

Further, respondents were mostly satisfied with the reasonableness of the program technical requirements but one of the highly active firms brought up a concern, stating "we have [the firm] heard whisperings that the program requirements are going to continue to creep up. We understand that they will increase each year but there is talks [internally] that they are getting to be too high. If they continue to increase the requirements at this rate, my company will not be able to continue to use it if we can't justify the extra costs to get to the new efficiency level."

Figure 24: Energy Star New Homes Program Builder Satisfaction



At the end of the interview the evaluation team asked what else, if anything, would you like to say about the Energy Star New Homes program. Two interviewees opted to provide additional thoughts and feedback, including:

- "The program is great, and I've invested my life and career into building homes and this program helps me see my buildings through from the beginning to the end."
- "The program has been extremely helpful in my ability to build homes the way I do. The only thing I would say negative is that my point-of-contact for the program seems to change every year which makes it difficult to get questions answered. I feel like I need to go to the top in order to get most questions answered."

5 Conclusions and Recommendations

The general evaluation conclusions are presented below, along with recommendations for program improvement where appropriate.

5.1 Commercial Comprehensive Program

Impact evaluation activities for the Commercial Comprehensive program included engineering desk reviews for a sample of projects. Based on these desk reviews, an engineering adjustment factor of 1.021 was found for kWh savings, and 1.099 was found for kW savings. The fact that engineering adjustments are close to 1.0 indicates that the evaluation was generally in agreement with the original *ex ante* savings values and few adjustments were needed. The NTG ratio was 0.8211 based on the survey responses, and this result is consistent with prior years and with values used for similar programs at other utilities.

The process evaluation consisted of a phone survey with 2020 program participants. Most participants were building owners, with over half of the buildings from the 1980's and therefore more likely to have older equipment that might need replacing. Most participants (72%) learned about the program through a contractor, with prior program participation also an important source of awareness (25%). Similarly, the vast majority (82%) rated their contractor as either an extremely important or very important in their decision to install energy efficient equipment. These responses indicate that EPE is doing a good job in leveraging a network of contractors to drive program participation. The dollar value of the rebate was also listed as being either extremely important (70%) or very important (22%) in their equipment choice decision. Participants also report generally very high satisfaction levels with all program elements.

Recommendations for Commercial Comprehensive program are based on areas where savings adjustments were made based on the project desk reviews:

- Adjustments were made to 12 retrofit lighting projects, with the changes ranging from an increase of 4,151 kWh to a decrease of 2,228 kWh in the *ex post* savings values. We attempted to replicate the original *ex ante* savings values from the project documentation and lighting calculator, but the calculator file was locked and therefore a detailed comparison was not possible. The evaluation team was able to confirm that the deemed inputs in the lighting calculator were consistent with the values in the TRM, however.
    - **Recommendation**: Provide unlocked versions of the original lighting calculators to allow for detailed comparisons when the *ex post* savings do not match the *ex ante* savings.

5.2 SCORE Plus Program

Impact evaluation activities for the SCORE Plus program included engineering desk reviews for a sample of projects. Based on these desk reviews, an engineering adjustment factor of 1.0337 was found for kWh savings, and 1.0230 was found for kW savings. We were unable to complete a significant number of interviews with the PY2020 participants, and consequently the PY2019 NTG ratio of 0.6692 was applied.

Conclusions and recommendations resulting from the evaluation include the following:

- As with the Commercial Comprehensive program, there were several SCORE Plus projects involving lighting retrofit projects where savings were adjusted based on the desk reviews. The adjustments resulted in a 106 percent realization rate for the energy savings and a 104 percent realization rate for the peak demand savings. These projects utilized the lighting calculator, but the file was locked and therefore we were unable to make a detailed comparison between the *ex ante* and *ex post* savings calculations to pinpoint the source of the discrepancy. The evaluation team was able to confirm that the deemed inputs in the *ex ante* calculator were consistent with the values in the TRM.
    - **Recommendation**: Provide unlocked versions of the lighting calculators to allow for detailed comparisons when the *ex post* savings do not match the *ex ante* savings.
- The evaluation team adjusted the building type for one retrofit lighting project based on additional online research. The building type was updated from Education – Primary to Education – Secondary due to the school's website noting that grades 7 -12 are taught at the facility. This adjustment increased the energy (kWh) savings, resulting in a 128 percent realization rate. This adjustment did not impact the peak demand savings.
    - **Recommendation**: Ensure the appropriate education building type is selected based on the grade levels taught at the facility.
- For several of the projects, the participant contact information was the project contractor and not the building owner. In other cases, the phone number had been disconnected. This made conducting the phone interviews difficult and further reduced the small sample available.
    - **Recommendation:** Ensure that full and current contact information of the building owner is recorded in the program tracking data.

5.3 Residential Comprehensive

For the Residential Comprehensive program, gross impacts were determined based on a review of the deemed savings values used for the various measures rebated through the

program. In all cases, the *ex ante* savings values either matched those in the New Mexico TRM, or else were based on other reliable source (e.g.., the Texas TRM) or were based on otherwise reasonable values and calculation procedures. As a consequence, no savings adjustments were made to the original *ex ante* savings values. Net impacts were based on a phone survey of participants and resulted in a NTG ratio of 0.6368, which is consistent with prior years and similar programs at other utilities.

The process evaluation involved phone surveys with a sample of participants, and the key findings followed a similar pattern as the Commercial Comprehensive program. For the residential customers, most owned homes that were built before 2000 (85%), with the 1980-2000 period being the most common (49%). Contractors were the most common source of program awareness (51%), which indicates that the program has an effective network of contractors to market the program. As for factors driving participation, upgrading older equipment was the most important factor for participants, with 80 percent of respondents reporting it as extremely important in their decision to participate, followed by improving the comfort of their home (77%). Of the program factors driving participation, contractor recommendation was most important (83 percent rating 8 or higher), but prior EPE program participation was also listed as being very influential by over half of the survey respondents. Finally, participants reported very high levels of satisfaction with all aspects of the program.

5.4 Energy Star New Homes Program

Impact evaluation activities for the Energy Star New Homes program included engineering desk reviews for a sample of projects. Based on these desk reviews, an engineering adjustment factor of 0.9999 was calculated for kWh impacts and 1.0592 for kW savings. Net impacts were determined through statewide interviews with participating builders (combined results from PY2018 and PY2020) that yielded a NTG ratio of 0.7333. Builders were generally satisfied with the program, although one builder working with EPE found that the program contact changed frequently, which resulted in some confusion as to who they should call when they had questions.

One recommendation is offered for this program based on the desk reviews:

- The e*x ante* peak demand savings for several of the projects did not match the values listed in the program tracking data. The evaluation team was able to match the savings values listed in the REM/Rate reports with the supplied program tracking data, however.
    - **Recommendation:** Ensure alignment of savings values listed in the project tracking data and the savings listed in the project files.

5.5 LivingWise®

The savings review for the deemed savings confirmed the original savings numbers. We have no recommendations for program changes at this time.

5.6 Commercial Load Management

The portfolio delivered average reductions in excess of the 380 kW of committed capacity in six of eight events, with the average portfolio load reduction being 489 kW, or 109 kW (29%) greater than the portfolio committed capacity. Moreover, each of the six individual sites delivered load reductions that were on average at or above their individual committed capacity. Other than one instance, the evaluation team was able to exactly replicate the load reductions calculated by the program implementer. This discrepancy resulted in the calculated average delivered load reduction being 3 kW higher than Trane's original calculation (489 kW versus 486 kW).

5.7 Residential Load Management

The impact evaluation resulted in estimates of 409 kW program capacity, or 0.838 kW per device enrolled in the program. The kW impacts did tend to decrease after the first hour of the event period, however.

We have one recommendation for this program moving forward:

- The Residential Load Management program achieves substantial impacts per device, however, the overall capability would increase significantly if more devices were operable. In particular, Emerson and ecobee have operability issues that should be investigated.
    - **Recommendation:** We recommend several tests for 2021
        - A "no learning" event where all available devices are dispatched
        - A four-hour event. It would be useful to understand what program performance might look like during a system emergency when dispatch for more than two hour is needed. EPE has noted that they have chosen not to call four-hour events, but this option is available in case of emergencies.

Evaluation of the 2020 El Paso Electric Energy Efficiency Programs

FINAL Report - Appendices

May 24, 2021

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Appendix A: Small Commercial Comprehensive Participant Survey Instrument

QA. *(Once correct respondent is reached.)* **Hello, my name is** *(your name)* **from Research & Polling, Inc. I am calling on behalf of EL PASO ELECTRIC. I'm calling because our records show that you recently completed an energy efficiency project where you installed** *lighting/ (measure 1)* **at your business located at** *(site address)* **and received a rebate through the EL PASO ELECTRIC** *(rebate program)***. I'd like to ask a short set of questions about your experience with the** *(rebate program)* **program. Your time will help us improve this program for other customers like you. Are you the best person to talk to about the/these energy efficiency upgrade(s) and energy use at your firm?**

Yes 1
No..... 2
Never installed 3

Q1-M1. (A 1) Our records show in 2020 your business got a rebate through EL PASO ELECTRIC for installing *lighting/ (measure 1)***. Are you familiar with this project?**

Yes 1
No 2
Never installed 3
Don't know 4

Q1a-M1. Our records show it was installed at *(site address)* **in** *(site city)***. Is that correct?**

Yes 1
No 2
Never installed 3

Q1b-M1. Where was lighting/ *(measure 1)* **installed?** *(Among those who installed measure 1 at a different location than EL PASO ELECTRIC's records.)*

[Data Processing Use Only] Q2-M1. (A 1a) Is there someone else at your company who would know about buying the *lighting/ (measure 1)***?**

Yes, transfer and go to intro 1
Yes, no transfer 2

Q3-M1. (A 2) Thinking about the lighting/ *(measure 1)* **for which you received a rebate, is the** *lighting/ (measure 1)* **still installed in your facility?**

Yes 1
No 2
Prefer not to answer 3
Don't know 4

Q4a-M1. (A 3) Was the lighting/ *(measure 1)* **removed?** *(Among those who do not currently have measure 1 installed at their facility.)*

Yes, it was removed .. 01
No 02
Prefer not to answer . 03
Don't know 99

Q4b-M1. (A 3) Was the lighting/ *(measure 1)* **never installed?** *(Among those who do not currently have measure 1 installed at their facility.)*

Yes, never installed ... 01
Prefer not to answer . 02
Don't know 99

Q5-M1. (A 3a) Why was the lighting/ *(measure 1)* **removed/never installed?** *(Among those who do not currently have measure 1 installed at their facility or never installed measure 1.)*

Q6-M1. (A 4) Is the lighting/ *(measure 1)* **still functioning as intended?** *(Among those who currently have measure 1 installed.)*

Yes 1
No 2
Prefer not to answer 3
Don't know 4

Q7-M1. (A 5) Did your firm use a contractor to install the lighting/ *(measure 1)* **or did internal staff do the work?**

Contractor 01
Internal Staff 02
Prefer not to answer . 03
..... 04
..... 05
Don't know 99

Q8-M1. (A 6) Why did your firm choose to use internal staff instead of a contractor? *(Among those who had internal staff install measure 1.)*

Prefer not to answer 98
Don't know 99

Q1-M2. (A 1) Our records show in 2020 your business got a rebate through EL PASO ELECTRIC for installing a *(measure 2)***. Do you remember this?** *(Among those who received rebates for more than one measure.)*

Yes 1
No 2
Never installed 3
Don't know 4

Q1a-M2. Our records show *(measure 2)* **was installed at** *(site address)* **in (***site city)***. Is that correct?** *(Among those who received rebates for more than one measure.)*

Yes 1
No 2
Never installed 3
Don't know 4

Q1b-M2. Where was *(measure 2)* **installed?** *(Among those who received rebates for more than one measure and installed measure 2 at a different location than EL PASO ELECTRIC's records.)*

Q3-M2. (A 2) Thinking about the *(measure 2)* **for which you received a rebate, is the** *(measure 2)* **still installed in your facility?** *(Among those who received rebates for more than one measure.)*

Yes 1
No 2
Prefer not to answer 3
Don't know 4

Q4a-M2. (A 3) Was the *(measure 2)* **removed?** *(Among those who received rebates for more than one measure and currently do not have measure 2 installed at their facility.)*

Yes, it was removed .. 01
No 02
Prefer not to answer . 03
Don't know 99

Q4b-M2. (A 3) Was the *(measure 2)* **never installed?** *(Among those who received rebates for more than one measure and currently do not have measure 2 installed at their facility.)*

Yes, never installed ... 01
Prefer not to answer . 02
Don't know 99

Q5-M2. (A3a) Why was the *(measure 2)* **removed/never installed?** *(Among those who received rebates for more than one measure and currently do not have measure 2 installed at their facility or never installed measure 2.)*

Q6-M2. (A 4) Is the *(measure 2)* **still functioning as intended?** *(Among those who received rebates for more than one measure and have measure 2 installed.)*

Yes 1
No 2
Prefer not to answer 3
Don't know 4

Q7-M2. (A 5) Did your firm use a contractor to install the *(measure 2)* **or did internal staff do the work?** *(Among those who received rebates for more than one measure and have measure 2 installed.)*

Contractor 01
Internal Staff 02
Prefer not to answer . 03
Don't know 99

Q8-M2. (A 6) Why did your firm choose to use internal staff instead of a contractor? *(Among those who received rebates for more than one measure and had internal staff install measure 2.)*

Prefer not to answer 98
Don't know 99

Q9-M2. (A 7) Were your *lighting/ (measure 1)* **and** *(measure 2)* **installed/purchased together as a single project or were these done separately?** *(Among those who received rebates for two measures.)*

Together as one project 1
Separately 2
Prefer not to answer 3
Don't know 4

Q10. (B 1) How did your company FIRST learn about the program?

Word of mouth (business associate, co-worker)	01
Utility program staff	02
Utility website	03
Utility bill insert	04
Utility representative	05
Utility advertising	06
Email from utility	07
Contractor/distributor	08
Building audit or assessment	09
Television Advertisement - Mass Media	10
Other mass media	11
Event (conference, seminar, workshop)	12
Online search, web links	13
Participated or received rebate before	14
Retailer	15
No way in particular	98
Don't know	99

Q11. (B 2) What other sources did your company use to gather information about the program? ... Were there any others?

Word of mouth (business associate, co-worker)	01
Utility program staff	02
Utility website	03
Utility bill insert	04
Utility representative	05
Utility advertising	06
Email from utility	07
Contractor/distributor	08
Building audit or assessment	09
Television Advertisement - Mass Media	10
Other mass media	11
Event (conference, seminar, workshop)	12
Online search, web links	13
Participated or received rebate before	14
None	98
Don't know	99

Q12. (B 3) Of all the sources you mentioned, which did you find most useful in helping you decide to participate in the program? *(Among those who mentioned additional sources used to gather information.)*

None in particular	97
Prefer not to answer	98
Don't know	99

[Data Processing Use Only] POLLER NOTE: Was Measure Installed?

Yes ... 1
No ... 2

Q13a. (C 1) Did the equipment that your firm installed replace existing equipment?

Yes (i.e. all equipment was replacing old equipment) 1
Some equipment was a replacement, and some was a new addition 2
No (i.e. all equipment was an addition to existing equipment) 3
Prefer not to answer 4
Don't know 5

Q13b. (C 1) Is the equipment that your firm purchased intended to replace existing equipment? *(Among those who did not install the measure.)*

Yes (i.e. all equipment is replacing old equipment) 1
Some equipment is a replacement, and some was a new addition 2
No (i.e. all equipment is an addition to existing equipment) 3
Prefer not to answer 4
Don't know 5

Q14a. (C 2) Was the replaced equipment ... *(Among those who installed the measure and some or all new equipment was replacing old equipment.)*

Fully functional and not in need of repair 1
Functional, but needed minor repairs? ... 2
Functional, but needed major repairs? ... 3
Not functional? 4
Prefer not to answer 5
Don’t know 6

Q14b. (C 2) Is the equipment you intend to replace ... *(Among those who did not install the measure.)*

Fully functional and not in need of repair 1
Functional, but needs minor repairs? 2
Functional, but needs major repairs? 3
Not functional? 4
Prefer not to answer 5
Don't know 6

Q15a. (C 3a) About how old, in years, was the equipment prior to replacement? *(Among those who installed the measure, and some or all new equipment was replacing old equipment, and the replaced equipment was functional.)*

Number of years _____

Q15b. (C 3b) About how old, in years, is the equipment you are replacing? *(Among those who did not install the measure, some or all new equipment was replacing old equipment, and the replaced equipment was functional.)*

Number of years _____

Q16. (C 4) How much longer (in years) do you think your old equipment would have lasted if you had not replaced it? *(Among those who installed the measure, and some or all new equipment was replacing old equipment, and the replaced equipment was functional.)*

Less than a year 1
1 - 2 years 2
3 - 5 years 3
6 - 10 years 4
More than 10 years . 5
Prefer not to answer 6
Don't know 7

Q17. (C 5a) Next I will read a list of reasons your firm may have considered when you decided to conduct your project. For each one, please tell me if it was *not at all important*, a *little important*, *somewhat important*, *very important* or *extremely important*. ***How important was reducing environmental impact of the business on your decision to conduct your project?***

1 - Not Important at All . 1
2 - A Little Important 2
3 - Somewhat Important 3
4 - Very Important 4
5 - Extremely Important 5
Don't Know/Won't Say .. 6

Q18. (C 5b) ***How important was upgrading out-of-date equipment on your decision to conduct your project?***

1 - Not Important at All . 1
2 - A Little Important 2
3 - Somewhat Important 3
4 - Very Important 4
5 - Extremely Important 5
Don't Know/Won't Say .. 6

Q19. (C 5c) ***How important was improving comfort at the business on your decision to conduct your project?***

1 - Not Important at All . 1
2 - A Little Important 2
3 - Somewhat Important 3
4 - Very Important 4
5 - Extremely Important 5
Don't Know/Won't Say .. 6

[Data Processing Use Only] POLLER NOTE: Was HVAC Measure Installed?

Yes ... 1
No ... 2

Q20. (C 5d) ***How important was improving air quality on your decision to conduct your project?*** *(Among those who installed HVAC measure.)*

1 - Not Important at All . 1
2 - A Little Important 2
3 - Somewhat Important 3
4 - Very Important 4
5 - Extremely Important 5
Don't Know/Won't Say .. 6

Q21. (C 5e) ***How important was receiving the rebate on your decision to conduct your project?*** *(Among those who did not use direct install.)*

1 - Not Important at All . 1
2 - A Little Important 2
3 - Somewhat Important 3
4 - Very Important 4
5 - Extremely Important 5
Don't Know/Won't Say .. 6

Q22. (C 5f) ***How important was reducing energy bill amounts on your decision to conduct your project?***

1 - Not Important at All . 1
2 - A Little Important 2
3 - Somewhat Important 3
4 - Very Important 4
5 - Extremely Important 5
Don't Know/Won't Say .. 6

[Data Processing Use Only] POLLER NOTE: Did respondent answer "Contractor" in Q.7?

Yes ... 1
No ... 2

Q23. (C 5g) ***How important was <u>the contractor recommendation</u> on your decision to conduct your project?*** *(Among those who used a contractor to install the measure.)*

1 - Not Important at All . 1
2 - A Little Important 2
3 - Somewhat Important 3
4 - Very Important 4
5 - Extremely Important 5
Don't Know/Won't Say .. 6

[Data Processing Use Only] POLLER NOTE: Did respondent answer "Contractor" in Q.7?

Yes ... 1
No ... 2

Q24. (D 1a) Next, I'm going to ask you to rate the importance of each of the following factors on your decision to determine how energy efficient your project would be. Please rate the importance of each of these factors in determining your project's energy efficiency level using a scale from 0 to 10, where 0 means *not at all important* and 10 means *extremely important*. Please let me know if the factor is not applicable. ***How important was <u>the contractor who performed the work</u> in determining how energy efficient your project would be?*** *(Among those who did not use direct install.)*

0 – Not important at all ... 00
1 01
2 02
3 03
4 04
5 05
6 06
7 07
8 08
9 09
10 – Extremely important 10
Don't know 97
Prefer not to answer 98
N/A 99

Q25. (D 1b) ***How important was <u>the dollar amount of the rebate</u> in determining how energy efficient your project would be?*** *(Among those who did not use direct install.)*

0 – Not important at all ... 00
1 01
2 02
3 03
4 04
5 05
6 06
7 07
8 08
9 09
10 – Extremely important 10
Don't know 97
Prefer not to answer 98
N/A 99

Q26. (D 1c) ***How important was <u>technical assistance received from EL PASO ELECTRIC staff</u> in determining how energy efficient your project would be?*** *(Among those who did not use direct install.)*

0 – Not important at all ... 00
1 01
2 02
3 03
4 04
5 05
6 06
7 07
8 08
9 09
10 – Extremely important 10
Don't know 97
Prefer not to answer 98
N/A 99

Q27. (D 1d) ***How important was <u>endorsement or recommendation by your EL PASO ELECTRIC account manager or other EL PASO ELECTRIC staff</u> in determining how energy efficient your project would be?*** *(Among those who did not use direct install.)*

0 – Not important at all ... 00
1 01
2 02
3 03
4 04
5 05
6 06

7 07
8 08
9 09
10 – Extremely important 10
Don't know 97
Prefer not to answer 98
N/A 99

Q28. (D 1e) ***How important was information from EL PASO ELECTRIC marketing or informational materials in determining how energy efficient your project would be?*** *(Among those who did not use direct install.)*

0 – Not important at all ... 00
1 01
2 02
3 03
4 04
5 05
6 06
7 07
8 08
9 09
10 – Extremely important 10
Don't know 97
Prefer not to answer 98
N/A 99

Q29. (D 1f) ***How important was previous participation in a EL PASO ELECTRIC program in determining how energy efficient your project would be?*** *(Among those who did not use direct install.)*

0 – Not important at all ... 00
1 01
2 02
3 03
4 04
5 05
6 06
7 07
8 08
9 09
10 – Extremely important 10
Don't know 97
Prefer not to answer 98
N/A 99

Q30. (D 1g) ***How important was endorsement or recommendation by a contractor in determining how energy efficient your project would be?*** *(Among those who did not use direct install.)*

0 – Not important at all ... 00
1 01
2 02
3 03
4 04
5 05
6 06
7 07
8 08
9 09
10 – Extremely important 10
Don't know 97
Prefer not to answer 98
N/A 99

Q31. (D 1h) ***How important was endorsement or recommendation by a vendor or distributor in determining how energy efficient your project would be?*** *(Among those who did not use direct install.)*

0 – Not important at all ... 00
1 01
2 02
3 03
4 04
5 05
6 06
7 07
8 08
9 09
10 – Extremely important 10
Don't know 97
Prefer not to answer 98
N/A 99

Q32. (D 1i) ***How important was endorsement or recommendation by CLEAR Result, the program implementer in determining how energy efficient your project would be?***

0 – Not important at all ... 00
1 01
2 02
3 03
4 04
5 05
6 06
7 07
8 08

9 09
10 – Extremely important 10
Don't know 97
Prefer not to answer 98
N/A 99

Q33. (D 1j) Now, I would like to read you some factors that are <u>not</u> related to the rebate program. Using the same scale from 0 to 10, where 0 means *not at all important* and 10 means *extremely important*., please rate the following non program factors' importance in determining your project's energy efficiency. ***How important was <u>the age or condition of the old equipment</u> in determining your project's energy efficiency?*** *(Among those who did not use direct install.)*

0 – Not important at all ... 00
1 01
2 02
3 03
4 04
5 05
6 06
7 07
8 08
9 09
10 – Extremely important 10
Don't know 97
Prefer not to answer 98
N/A 99

Q34. (D 1k) ***How important was <u>corporate policy or guidelines</u> in determining your project's energy efficiency?*** *(Among those who did not use direct install.)*

0 – Not important at all ... 00
1 01
2 02
3 03
4 04
5 05
6 06
7 07
8 08
9 09
10 – Extremely important 10
Don't know 97
Prefer not to answer 98
N/A 99

Q35. (D 1l) ***How important was minimizing operating cost in determining your project's energy efficiency?*** *(Among those who did not use direct install.)*

0 – Not important at all ... 00
1 01
2 02
3 03
4 04
5 05
6 06
7 07
8 08
9 09
10 – Extremely important 10
Don't know 97
Prefer not to answer 98
N/A 99

Q36. (D 1m) ***How important was scheduled time for routine maintenance in determining your project's energy efficiency?*** *(Among those who did not use direct install.)*

0 – Not important at all ... 00
1 01
2 02
3 03
4 04
5 05
6 06
7 07
8 08
9 09
10 – Extremely important 10
Don't know 97
Prefer not to answer 98
N/A 99

Q37. (D 2) Of the items I just asked you about, think of the program factors as relating to assistance provided by the utility, such as the rebate, marketing from EL PASO ELECTRIC, recommendation by a contractor and technical assistance from EL PASO ELECTRIC. I also asked you about some non-program factors, which included the age and condition of the old equipment, company policy, operating costs and routine maintenance.

If you had to divide 100% of the influence on your decision to determine how energy efficient your new equipment would be between the EL PASO ELECTRIC program and non-program factors, what percent would you give to the importance of the program factors? *(Among those who did not use direct install.)*

Percentage Program Factors ... _____%

Q38. (D 3) And what percent would you give to the importance of the non-program factors? *(Among those who did not use direct install and provided a percentage for the importance of program factors on their decision.)*

Percentage Non-Program Factors .. _____%

Q39. (D 5) Did you first learn about the *(rebate program)* **BEFORE or AFTER you decided how energy efficient your equipment would be?** *(Among those who did not use direct install.)*

Before 1
After 2
Prefer not to answer 3
Don't know 4

Q40. (D 6) Using a scale from 0 to 10, where 0 means *not at all likely* and 10 means *extremely likely*, please rate the likelihood that you would have installed the same equipment with the exact same level of energy efficiency if the *(rebate program)* **was not available.** *(Among those who did not use direct install.)*

0 - Not at all likely 00
1 01
2 02
3 03
4 04
5 05
6 06
7 07
8 08
9 09
10 - Extremely likely 10
Don't know 97
Prefer not to answer 98
N/A 99

Q41. (D 7) You just rated your likelihood to install the same equipment without any assistance from the program as a(n) *(response from Q40)* **out of 10. Earlier, when I asked you to rate the importance of each program factor on your decision, the highest rating you gave was a** *(highest rating/s from Q24-Q32)* **out of 10 for the importance of** *(re-read question wording for highest responses Q24-Q32)***. Can you briefly explain why you were likely to install the equipment without the program, but also rated the program as highly influential in your decision?** *(Among those who did not use direct install, stated that they were 08, 09, or 10 as extremely likely to install the same equipment if the rebate program was not available, and rated one or more program factors as 08, 09, or 10 on the previous list.)*

Q42. (D 8) You just rated your likelihood to install the same equipment without any assistance from the program as a(n) *(response from Q40)* **out of 10. Earlier, when I asked you to rate the importance of each program factor on your decision, the highest rating you gave was a(n)** *(lowest rating/s from Q24-Q32)* **out of 10. Can you briefly explain why you said you were not likely to install the equipment without help from the program, yet did not rate the program as highly influential in your decision?** *(Among those who did not use*

direct install, stated that they were 00, 01, or 02 as not at all likely to install the same equipment if the rebate program was not available, and rated one or more program factors as 00, 01, or 02 on the previous list.)

Q43. (D 9) If the *(rebate program)* **was not available, would you have delayed starting the project to a later date?** *(Among those who did not use direct install.)*

Yes 1
No 2
Would not have done the project at all 3
Prefer not to answer 4
Don't know 5

Q44. (D 10) Approximately how much later would you have done the project if the *(rebate program)* **was not available? Would it have been …** *(Among those who did not use direct install and stated they would have delayed starting the project if the rebate program was not available.)*

Within one year 1
Between 12 months and less than 2 years ... 2
Between 2 years and 3 years 3
Greater than 3 years 4
Would not have installed the equipment at all 5
Prefer not to answer 6
Don't know 7

Q45. (D 11) Using a scale from 0 to 10, where 0 means *not at all likely* and 10 means *extremely likely*, please rate the likelihood that you would have conducted this project within 12 months of when you actually completed this project if the *(rebate program)* **was not available.** *(Among those who did not use direct install and stated they would have delayed starting the project within one year if the rebate program was not available.)*

0 - Not at all likely 00
1 01
2 02
3 03
4 04
5 05
6 06
7 07
8 08
9 09
10 - Extremely likely 10
Don't know 97
Prefer not to answer 98
N/A 99

Q46. (D 11) Using a scale from 0 to 10, where 0 means *not at all likely* and 10 means *extremely likely*, please rate the likelihood that you would have installed the same quantity of lights if the *(rebate program)* **was not available.** *(Among those who installed lighting*

0 - Not at all likely 00
1 01
2 02
3 03
4 04
5 05
6 06
7 07
8 08
9 09
10 - Extremely likely 10
Don't know 97
Prefer not to answer 98
N/A 99

Q47. (D 12) Can you briefly explain why you were likely to install the same number of lights without the *(rebate program)* **program?** *(Among those who were likely to have installed the same quantity of lights)*

Q48. (E 1a) For each of the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **EL PASO ELECTRIC as an energy provider.**

Very Dissatisfied 1
Somewhat Dissatisfied 2
Neither Satisfied nor Dissatisfied 3
Somewhat Satisfied 4
Very Satisfied 5
Not applicable 6
Prefer not to answer 7
Don't know 8

Q49. Can you tell me why you gave that rating? *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with EL PASO ELECTRIC as an energy provider.)*

Q50. (E 1b) For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The rebate program overall.**

Very Dissatisfied 1
Somewhat Dissatisfied 2
Neither Satisfied nor Dissatisfied 3
Somewhat Satisfied 4
Very Satisfied 5
Not applicable 6

Prefer not to answer 7
Don't know 8

Q51. Can you tell me why you gave that rating? *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with the rebate program overall.)*

Q52. (E 1c) For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The equipment installed through the program.**

Very Dissatisfied 1
Somewhat Dissatisfied 2
Neither Satisfied nor Dissatisfied 3
Somewhat Satisfied 4
Very Satisfied 5
Not applicable 6
Prefer not to answer 7
Don't know 8

Q53. Can you tell me why you gave that rating? *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with the equipment installed through the program.)*

[Data Processing Use Only] POLLER NOTE: Was installation done by "Contractor" in Q.7?

Yes ... 1
No ... 2

Q54. (E 1d) For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The contractor who installed the equipment.** *(Among those who used a contractor to do the installation.)*

Very Dissatisfied 1
Somewhat Dissatisfied 2
Neither Satisfied nor Dissatisfied 3
Somewhat Satisfied 4
Very Satisfied 5
Not applicable 6
Prefer not to answer 7
Don't know 8

Q55. Can you tell me why you gave that rating? *(Among those who used a contractor to do the installation and were* Very Dissatisfied *or* Somewhat Dissatisfied *with the contractor who installed the equipment.)*

Q56. (E 1e) For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The overall quality of the equipment installation.** *(Among those who used a contractor to do the installation.)*

Very Dissatisfied 1
Somewhat Dissatisfied 2
Neither Satisfied nor Dissatisfied 3
Somewhat Satisfied 4
Very Satisfied 5
Not applicable 6
Prefer not to answer 7
Don't know 8

Q57. Can you tell me why you gave that rating? *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with the overall quality of the equipment installation.)*

Q58. (E 1f) For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The amount of time it took to receive your rebate for your equipment.** *(Among those who did not use direct install.)*

Very Dissatisfied 1
Somewhat Dissatisfied 2
Neither Satisfied nor Dissatisfied 3
Somewhat Satisfied 4
Very Satisfied 5
Not applicable 6
Prefer not to answer 7
Don't know 8

Q59. Can you tell me why you gave that rating? *(Among those who did not use direct install and were* Very Dissatisfied *or* Somewhat Dissatisfied *with the amount of time it took to receive the rebate for the equipment.)*

Q60. (E 1g) For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The dollar amount of the rebate for the equipment.** *(Among those who did not use direct install.)*

Very Dissatisfied 1
Somewhat Dissatisfied 2
Neither Satisfied nor Dissatisfied 3
Somewhat Satisfied 4
Very Satisfied 5
Not applicable 6
Prefer not to answer 7

Don't know 8

Q61. Can you tell me why you gave that rating? *(Among those who did not use direct install and were* Very Dissatisfied *or* Somewhat Dissatisfied *with the dollar amount of the rebate for the equipment.)*

Q62. (E 1h) For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **Interactions with EL PASO ELECTRIC.**

Very Dissatisfied 1
Somewhat Dissatisfied 2
Neither Satisfied nor Dissatisfied 3
Somewhat Satisfied 4
Very Satisfied 5
Not applicable 6
Prefer not to answer 7
Don't know 8

Q63. Can you tell me why you gave that rating? *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with interactions with EL PASO ELECTRIC.)*

Q64. (E 1I) For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The overall value of the equipment your company received for the price you paid.**

Very Dissatisfied 1
Somewhat Dissatisfied 2
Neither Satisfied nor Dissatisfied 3
Somewhat Satisfied 4
Very Satisfied 5
Not applicable 6
Prefer not to answer 7
Don't know 8

Q65. Can you tell me why you gave that rating? *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with the overall value of the equipment their company received for the price they paid.)*

Q66. (E 1j) For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The amount of time and effort required to participate in the program.**

Very Dissatisfied 1
Somewhat Dissatisfied 2
Neither Satisfied nor Dissatisfied 3
Somewhat Satisfied 4
Very Satisfied 5
Not applicable 6
Prefer not to answer 7
Don't know 8

Q67. Can you tell me why you gave that rating? *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with the amount of time and effort required to participate in the program.)*

Q68. (E 1k) For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The project application process.** *(Among those who did not use direct install.)*

Very Dissatisfied 1
Somewhat Dissatisfied 2
Neither Satisfied nor Dissatisfied 3
Somewhat Satisfied 4
Very Satisfied 5
Not applicable 6
Prefer not to answer 7
Don't know 8

Q69. Can you tell me why you gave that rating? *(Among those who did not use direct install and were* Very Dissatisfied *or* Somewhat Dissatisfied *with the project application process.)*

Q70. (E 2) Do you have any recommendations for improving the *(rebate program)* **program?**

No 97
Prefer not to answer 98
Don't know 99

Q71. (Gen 1) Finally, we have a few questions about your firm for classification purposes only. Do you own or lease your building where the project was completed?

Own 01
Lease/Rent 02
Prefer not to answer 03
Don't know 99

Q72. (Gen 1a) Does your firm pay your EL PASO ELECTRIC bill, or does someone else (e.g., a landlord)? *(Among those who answered that they own, lease, or rent the building where the project was completed.)*

Pay own 1
Someone else pays .. 2
Prefer not to answer 3
Don't know 4

Q73. (Gen 2) Approximately what is the total square footage of the building where the project was completed?

Less than 1,000 square feet 1
Between 1,000 and 1,999 square feet .. 2
Between 2,000 and 4,999 square feet .. 3
Between 5,000 and 9,999 square feet .. 4
Between 10,000 and 49,999 square feet 5
Between 50,000 and 99,999 square feet 6
100,000 square feet or more 7
Prefer not to answer 8
Don't know 9

Q74. (Gen 3) Approximately what year was your firm's building built?

1939 or earlier 01
1940 to 1949 02
1950 to 1959 03
1960 to 1969 04
1970 to 1979 05
1980 to 1989 06
1990 to 1999 07
2000 to 2009 08
2010 to 2019 09
2020 10
Prefer not to answer . 11
Don't know 12

Q75. (Gen 4) Approximately, how many full-time equivalent (FTE) employees does your company currently have in the state of New Mexico?

Less than 5 01
5-9 02
10-19 03
20 - 49 04
50 - 99 05
100 - 249 06
250 - 499 07

500 - 999 08
1,000 - 2,500 09
More than 2,500 . 10
Prefer not to say . 11
Don't know 12

Q76. (Gen 5) And this is my last question. How long has your company been in business?

Number of years_____

Appendix B: Residential Comprehensive Participant Survey Instrument

QA. *(Once correct respondent is reached.)* **Hello, my name is** *(your name)* **from Research & Polling, Inc. I am calling on behalf of EL PASO ELECTRIC. I'm calling because our records show that you recently completed an energy efficiency project where you installed an energy efficient** *(measure 1)* **and received a rebate from EL PASO ELECTRIC. I'd like to ask a short set of questions about your experience with this rebate program. Your time will help us improve this program for other customers like you. Are you the best person to talk to about these energy efficiency upgrades and energy use in your home?**

Yes 1
No 2
Never installed 3

Q1-M1. (A 1) Just to confirm, our records show that you received a rebate from EL PASO ELECTRIC when you installed a *(measure 1)* **at your home in 2020. Is this correct?**

Yes 1
No 2
Don't know 3

Q2-M1. (A 2) Is the *(measure 1)* **still installed?**

Yes 1
No 2
Prefer not to answer 3
Don't know 4

Q3-M1. (A 3) Was the *(measure 1)* **removed or never installed?** *(Among those who do not currently have measure 1 installed at their home.)*

Removed 01
Never installed 02
Prefer not to answer . 03
Don't know 99

Q4-M1. (A 3a) Why was the *(measure 1)* **removed/never installed?** *(Among those who do not currently have measure 1 installed at their home or never installed measure 1.)*

[Data Processing Use Only] POLLER NOTE: Was measure ever installed?

Yes ... 1
No ... 2

Q5-M1. (A 4) Is the *(measure 1)* **still functioning properly?**

Yes 1
No 2
Prefer not to answer 3
Don't know 4

Q1-M2. (A 1) Just to confirm, our records show that you received a rebate from EL PASO ELECTRIC when you installed a *(measure 2)* **at your home in 2020. Is this correct?**

Yes 1
No 2
Don't know 3

Q2-M2. (A 2) Is the *(measure 2)* **still installed?**

Yes 1
No 2
Prefer not to answer 3
Don't know 4

Q3-M2. (A 3) Was the *(measure 2)* **removed or never installed?** *(Among those who do not currently have measure 2 installed at their home.)*

Yes, it was removed .. 01
No 02
Prefer not to answer . 03
Don't know 99

Q4-M2. (A 3a) Why was the *(measure 2)* **removed/never installed?** *(Among those who do not currently have measure 2 installed at their home or never installed measure 2.)*

[Data Processing Use Only] POLLER NOTE: Was measure ever installed?

Yes ... 1
No ... 2

Q5-M2. (A 4) Is the *(measure 2)* still functioning properly?

Yes 1
No 2
Prefer not to answer 3
Don't know 4

Q6. (B 1) Did you go through a contractor to purchase the efficient equipment or did you purchase it directly from a retailer?

Used a contractor 1
Purchased at retailer 2
Prefer not to answer . 3
Don't know 4

Q7. (B 2) Did you use a contractor to install the equipment or did you do it yourself?

Contractor installed . 1
Did it myself 2
Prefer not to answer 3
Don't know 4

Q8. (C 1) How did you <u>first</u> hear about EL PASO ELECTRIC's rebates for energy efficient equipment?

Bill insert 01
EL PASO ELECTRIC website 02
Digital/web advertisement not on EPE website 03
Television advertisement 04
Radio advertisement 05
Contractor 06
Friend or family 07
Social media 08
EL PASO ELECTRIC representative 09
Prefer not to answer 98
Don't know 99

Q9. (C 2a) Next I will read a list of reasons you may have considered when you decided to make your energy efficient upgrade. For each one, please tell me if it was *not at all important*, a *little important*, *somewhat important*, *very important* or *extremely important*. ***How important was reducing environmental impact of your home on your decision to make the upgrade?***

1 - Not Important at All . 1
2 - A Little Important 2
3 - Somewhat Important 3
4 - Very Important 4
5 - Extremely Important 5
Don't Know 6
Prefer not to answer 7
N/A 8

Q10. (C 2b) ***How important was upgrading out-of-date equipment on your decision to make the upgrade?***

1 - Not Important at All . 1
2 - A Little Important 2
3 - Somewhat Important 3
4 - Very Important 4
5 - Extremely Important 5
Don't Know 6
Prefer not to answer 7
N/A 8

Q11. (C 2c) ***How important was replacing faulty or failed equipment on your decision to make the upgrade?***

1 - Not Important at All . 1
2 - A Little Important 2
3 - Somewhat Important 3
4 - Very Important 4
5 - Extremely Important 5
Don't Know 6
Prefer not to answer 7
N/A 8

[Data Processing Use Only] POLLER NOTE: Was cooling measure installed?

Yes ... 1
No ... 2

Q12. (C 2d) ***How important was improving comfort of your home on your decision to make the upgrade?*** *(Among those who installed a cooling measure)*

1 - Not Important at All . 1
2 - A Little Important 2
3 - Somewhat Important 3
4 - Very Important 4
5 - Extremely Important 5
Don't Know 6
Prefer not to answer 7
N/A 8

Q13. (C 2e) ***How important was improving air quality on your decision to make the upgrade?*** *(Among those who installed a cooling measure.)*

1 - Not Important at All . 1
2 - A Little Important 2
3 - Somewhat Important 3
4 - Very Important 4
5 - Extremely Important 5
Don't Know 6
Prefer not to answer 7
N/A 8

[Data Processing Use Only] POLLER NOTE: Was a pool pump installed?

Yes ... 1
No ... 2

Q14. (C 2f) ***How important was improving water circulation in your pool on your decision to make the upgrade?*** *(Among those who installed a pool pump measure)*

1 - Not Important at All . 1
2 - A Little Important 2
3 - Somewhat Important 3
4 - Very Important 4
5 - Extremely Important 5
Don't Know 6
Prefer not to answer 7
N/A 8

Q15. (C 2g) ***How important was receiving the financial incentive on your decision to make the upgrade?***

1 - Not Important at All . 1
2 - A Little Important 2
3 - Somewhat Important 3
4 - Very Important 4
5 - Extremely Important 5
Don't Know 6
Prefer not to answer 7
N/A 8

Q16. (C 2h) ***How important was reducing energy bill amounts on your decision to make the upgrade?***

1 - Not Important at All . 1
2 - A Little Important 2
3 - Somewhat Important 3
4 - Very Important 4
5 - Extremely Important 5
Don't Know 6
Prefer not to answer 7
N/A 8

[Data Processing Use Only] POLLER NOTE: Did respondent answer Contractor in Q.6?

Yes ... 1
No ... 2

Q17. (C 2i) ***How important was the contractor recommendation on your decision to make the upgrade?***
(Among those who used a contractor to install the measure.)

1 - Not Important at All . 1
2 - A Little Important 2
3 - Somewhat Important 3
4 - Very Important 4
5 - Extremely Important 5
Don't Know 6
Prefer not to answer 7
N/A 8

[Data Processing Use Only] POLLER NOTE: Did respondent answer Retailer in Q.6?

Yes ... 1
No ... 2

Q18. (C 2j) ***How important was <u>the retailer recommendation</u> on your decision to make the upgrade?*** *(Among those who purchased the measure at a retailer.)*

1 - Not Important at All . 1
2 - A Little Important 2
3 - Somewhat Important 3
4 - Very Important 4
5 - Extremely Important 5
Don't Know 6
Prefer not to answer 7
N/A 8

Q19. (C 3) Were there any other reasons that you installed the equipment that were more important than the ones we have mentioned?

No, none in particular 97
Prefer not to answer 98
Don't know 99

20. (D 1) Before participating in the EL PASO ELECTRIC rebate program, do you recall receiving any other rebates from EL PASO ELECTRIC for making energy efficiency upgrades at your home?

Yes 1
No 2
Prefer not to answer 3
Don't know 4

Q21. (D 2a) ***How influential was <u>the dollar amount of the rebate</u> on your decision to make the upgrade?***

0 - Not influential at all ... 00
1 01
2 02
3 03
4 04
5 05
6 06
7 07
8 08
9 09
10 - Extremely influential 10
Don't know 97
Prefer not to answer 98
N/A 99

[Data Processing Use Only] POLLER NOTE: Did respondent answer Contractor in Q.6?

Yes ... 1
No ... 2

Q22. (D 2b) ***How influential was <u>the contractor recommendation</u> on your decision to make the upgrade?*** *(Among those who used a contractor to install the measure.)*

0 - Not influential at all ... 00
1 01
2 02
3 03
4 04
5 05
6 06
7 07
8 08
9 09
10 - Extremely influential 10
Don't know 97
Prefer not to answer 98
N/A 99

[Data Processing Use Only] POLLER NOTE: Did respondent answer Retailer in Q.6?

Yes ... 1
No ... 2

Q23. (D 2c) ***How influential was <u>the retailer recommendation</u> your decision to make the upgrade?*** *(Among those who purchased the measure at a retailer.)*

0 - Not influential at all ... 00
1 01
2 02
3 03
4 04
5 05
6 06
7 07
8 08
9 09
10 - Extremely influential 10
Don't know 97
Prefer not to answer 98
N/A 99

Q24. (D 2d) ***How influential was information from EL PASO ELECTRIC marketing or informational materials on your decision to make the upgrade?***

0 - Not influential at all ... 00
1 01
2 02
3 03
4 04
5 05
6 06
7 07
8 08
9 09
10 - Extremely influential 10
Don't know 97
Prefer not to answer 98
N/A 99

Q25. (D 2e) ***How influential was previous participation in a EL PASO ELECTRIC program on your decision to make the upgrade?***

0 - Not influential at all ... 00
1 01
2 02
3 03
4 04
5 05
6 06
7 07
8 08
9 09
10 - Extremely influential 10
Don't know 97
Prefer not to answer 98
N/A 99

Q26. (D 3) Did you first learn about the EL PASO ELECTRIC rebate program BEFORE or AFTER you decided how energy efficient your equipment would be?

Before 1
After 2
Prefer not to answer 3
Don't know 4

Q27. (D 4) Now I would like you to think about the efficiency level of the equipment upgrade. Using a scale from 0 to 10, where 0 means *not at all likely* and 10 means *extremely likely*, please rate the likelihood that you would have purchased the exact same efficiency level of equipment if the EL PASO ELECTRIC rebate program was NOT available.

0 - Not at all likely 00
1 01
2 02
3 03
4 04
5 05
6 06
7 07
8 08
9 09
10 - Extremely likely 10
Don't know 97
Prefer not to answer 98
N/A 99

Q28. (D 5) Now I would like you to think about the timing of the equipment purchase. Using a scale from 0 to 10, where 0 means *not at all likely* and 10 means *extremely likely*, please rate the likelihood that you would have installed equipment, of any efficiency level, within 12 months of when you actually did if the EL PASO ELECTRIC rebate program was NOT available.

0 - Not at all likely 00
1 01
2 02
3 03
4 04
5 05
6 06
7 07
8 08
9 09
10 - Extremely likely 10
Don't know 97
Prefer not to answer 98
N/A 99

Q29. (D 6) In your own words, how would you describe the influence the EL PASO ELECTRIC rebate program had on your decision to install the new equipment?

Q30. (E 1) About how long did it take to receive your rebate after the equipment was installed?

1 week or less 1
More than a week but less than 1 month 2
About 1 month 3
Between 1 and 2 months 4
About 2 months 5
More than 2 months 6
Have not received rebate yet 7
Prefer not to answer 8
Don't know 9

Q31. (F 1a) For each of the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **EL PASO ELECTRIC as an energy provider.**

Very Dissatisfied 1
Somewhat Dissatisfied 2
Neither Satisfied nor Dissatisfied 3
Somewhat Satisfied 4
Very Satisfied 5
Not applicable 6
Prefer not to answer 7
Don't know 8

Q32. Can you tell me why you gave that rating? *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with EL PASO ELECTRIC as an energy provider.)*

Q33. (F 1b) For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The rebate program overall.**

Very Dissatisfied 1
Somewhat Dissatisfied 2
Neither Satisfied nor Dissatisfied 3
Somewhat Satisfied 4
Very Satisfied 5
Not applicable 6
Prefer not to answer 7
Don't know 8

Q34. Can you tell me why you gave that rating? *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with the rebate program overall.)*

Q35. (F 1c) For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The equipment that was rebated through the program.**

Very Dissatisfied 1
Somewhat Dissatisfied 2
Neither Satisfied nor Dissatisfied 3
Somewhat Satisfied 4
Very Satisfied 5
Not applicable 6
Prefer not to answer 7
Don't know 8

Q36. Can you tell me why you gave that rating? *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with the equipment that was rebated through the program.)*

[Data Processing Use Only] POLLER NOTE: Did respondent answer Contractor in Q.6?

Yes ... 1
No ... 2

Q37. (F 1d) For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The contractor who installed the equipment.** *(Among those who used a contractor to install the measure.)*

Very Dissatisfied 1
Somewhat Dissatisfied 2
Neither Satisfied nor Dissatisfied 3
Somewhat Satisfied 4
Very Satisfied 5
Not applicable 6
Prefer not to answer 7
Don't know 8

Q38. Can you tell me why you gave that rating? *(Among those who used a contractor to install the measure and were* Very Dissatisfied *or* Somewhat Dissatisfied *with the contractor who installed the equipment.)*

Q39. (F 1e) For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The amount of time it took to receive your rebate.**

Very Dissatisfied 1
Somewhat Dissatisfied 2
Neither Satisfied nor Dissatisfied 3
Somewhat Satisfied 4
Very Satisfied 5
Not applicable 6
Prefer not to answer 7
Don't know 8

Q40. Can you tell me why you gave that rating? *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with the amount of time it took to receive your rebate.)*

Q41. (F 1f) For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The dollar amount of the rebate.**

Very Dissatisfied 1
Somewhat Dissatisfied 2
Neither Satisfied nor Dissatisfied 3
Somewhat Satisfied 4
Very Satisfied 5
Not applicable 6
Prefer not to answer 7
Don't know 8

Q42. Can you tell me why you gave that rating? *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with the dollar amount of the rebate.)*

Q43. (F 1g) For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **Interactions with EL PASO ELECTRIC regarding this project.**

Very Dissatisfied 1
Somewhat Dissatisfied 2
Neither Satisfied nor Dissatisfied 3
Somewhat Satisfied 4
Very Satisfied 5
Not applicable 6
Prefer not to answer 7
Don't know 8

Q44. Can you tell me why you gave that rating? *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with interactions with EL PASO ELECTRIC regarding this project.)*

Q45. (F 1h) For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The overall value of the equipment you received for the price you paid.**

Very Dissatisfied 1
Somewhat Dissatisfied 2
Neither Satisfied nor Dissatisfied 3
Somewhat Satisfied 4
Very Satisfied 5
Not applicable 6
Prefer not to answer 7
Don't know 8

Q46. Can you tell me why you gave that rating? *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with the overall value of the equipment you received for the price you paid.)*

Q47. (F 2) Do you have any recommendations for improving the EL PASO ELECTRIC program?

No 97
Prefer not to answer 98
Don't know 99

Q48. (Gen 1) Finally, we have a few questions about your firm for classification purposes only. Do you own or rent your home where the equipment was installed?

Own 01
Rent 02
Prefer not to answer 03
Don't know 99

Q49. (Gen 1a) Do you pay your EL PASO ELECTRIC bill, or does someone else (e.g., a landlord)? *(Among those who answered that they own or rent the building where the project was completed.)*

Pay own 1
Someone else pays .. 2
Prefer not to answer 3
Don't know 4

Q50. (Gen2) Is your home a single-family home or part of a multifamily building with more than one unit?

Single-family home 1
More than one residence in building 2
Prefer not to answer 3
Don't know 9

Q51. (Gen2a) How many units are in the structure?

Number of units: _____

Prefer not to answer 499
Don't know..... 500

Q52. (Gen 3) Approximately what is the total square footage of your home?

Less than 1,000 square feet 1
Between 1,000 and 1,499 square feet 2
Between 1,500 and 1,999 square feet 3
Between 2,000 and 2,499 square feet 4
Between 2,500 and 2,499 square feet 5
Between 3,000 and 3,999 square feet 6
4,000 square feet or more 7
Prefer not to answer 8
Don't know 9

Q53. (Gen 4) Approximately what year was your home built?

1939 or earlier 01
1940 to 1949 02
1950 to 1959 03
1960 to 1969 04
1970 to 1979 05
1980 to 1989 06
1990 to 1999 07
2000 to 2009 08
2010 to 2019 09
2020 10
Prefer not to answer . 11
Don't know 12

Q54. (Gen 5) How many people live in your household?

Number of people: _____

Prefer not to answer 99

Q55. (Gen 6) How long have you lived in this home?

Less than 6 years 1
6 to 10 years 2
11 to 15 years 3
16 to 20 years 4
21 to 25 years 5
26 to 30 years 6
More than 30 years . 7
Prefer not to answer 8
Don't know 9

Appendix C: New Home Construction Builder Interview Guide

Introduction

Talking points for recruitment

- Evergreen Economics is conducting an evaluation of utility energy efficiency programs for the New Mexico Public Regulation Commission and the state's utilities.
- We have identified selected builders that participated in the efficiency programs in 2020 for brief telephone interviews.
- The purpose of the interviews is to help us understand decision-making on what equipment goes in homes and building envelope characteristics for participating homes you build, as well as your experiences with the program overall. Who would be the best person to talk to about these things?
- We would need about 20 minutes for the interview. [Note to interviewers: Be ready to adjust interview length and focus on high priority, high-level questions if decision-makers indicate they don't have this much time. NTG questions are the highest priority]
- Your responses will be anonymous but will be very helpful in helping the state's utilities ensure their energy efficiency programs best serve their customers.
- When would be a good time to talk?

Talking points for starting the interview

- Identify self.
- This should take about 20 minutes.
- Your responses will be anonymous, so please feel free to speak candidly.
- Do you have any questions before we begin?
- Would you feel comfortable if I record this call for note taking purposes? We will not share the recording with anyone outside our company and will not attribute anything you say back to you.

Interviewee Background

Let's begin with a couple of background questions….

A1. What is your role in your company? [INTERVIEWER INSTRUCTIONS: Listen for whether management, sales, design, construction, purchasing manager, or another role.]

A2. What is your role in making use of utility new homes incentive programs? [INTERVIEWER INSTRUCTIONS: Listen for any customer contact about specs for individual homes or interviewee involvement in setting product specifications the company presents as options.]

- How long?
- Who else?

Builder Background

B1. Do you build mostly custom, semi-custom, or spec / tract homes?

B2. How many homes a year do you build?

- How many of those are in PNM, NMGC, and EPE service territories? [INTERVIEWER INSTRUCTIONS: Ranges are okay but want to be generally consistent in how we get this.]

B3. What is the typical price range of the homes you build? Would you say they're typically?

a. Less than $200,000
b. Between $200,001 and $400,000
c. More than $400,000
d. Don't know

Program Involvement and Use

Ask about PNM

Ask what other utilities the work for

What share of homes get rebates through PNM?

C1. Which of the utility programs are you currently utilizing - do you make use of prescriptive, appliance-specific incentives or the whole-home performance-based incentives? Why?

C2. How did you get involved initially? [INTERVIEWER INSTRUCTIONS: Listen for outreach and any volunteered elements of the program that attracted them. Could also be just an internal referral.]

C3. What share of your homes in the utilities service areas would you say qualify for the utility new construction rebates?

- [If most or all:] a) How long have you been building to specs that qualify? Did you make any changes when you started using the program? What? (Probe with anything else as long as needed)
- [IF Less than most:] b) What factors ultimately drive whether you will build a given home to the qualifying standards or not? What changes do you make from your standard design so the homes will qualify?
- [IF multiple changes mentioned above:] c) Of the changes you just mentioned, which make the biggest differences in the homes' projected energy consumption?
- d) How influential would you say the program has been in spurring those changes in your home designs?
- e) For homes which don't participate in the program or are located where they don't have access to one, have the New Mexico new homes programs influenced your typical home design? How?

Program Awareness, Clarity, and Process

D1. If you were to describe the New Mexico utility new homes programs offerings to a new colleague or peer in the construction industry, how would you describe what they offer?

- [INTERVIEWER INSTRUCTIONS: Listen for prescriptive, whole-house, marketing support, training for builders. Probe on any not mentioned to ask whether they are aware of it, make use of it.]

D2. [IF work with multiple utilities:] Are the differences between the utilities' programs clear? [Probe: What isn't?]

D3. How well do the individual utilities describe their program offerings? Where do you find out about how they work?

D4. Do you have any comments about the program offerings? Is there anything missing? Anything not needed? Or anything that could be better?

D5. What does the process for participating look like? How is that working for you?

NTG Questions

[INTERVIEWER INSTRUCTIONS: Use, skip, or modify the blue text, as needed, to adjust to the interviewee context. Use text in green for builders who participate primarily in whole home offers and text in orange for builders who participate primarily in prescriptive offers. Tailor the measures listed to those the builder actually claims.]

Next, I'd like to ask you about the effect the current utility new homes programs are having on the efficiency characteristics of the homes you are building in New Mexico this year regardless of utility service area or program participation.

E1. Using a scale from 0 to 10, where 0 means not at all important and 10 means extremely important, how influential are the utility rebates on (the degree to which you build beyond energy code requirements) (on the HVAC equipment, lighting, refrigeration, and insulation you include in homes)? [REMINDER: If prescriptive, ask only about the measures the builder consistently claims on rebate applications – here and below.]

E2. And, using that same scale, how influential are the other facets of the utility programs, such as the involvement of raters, training, and marketing?

E3. Next, I'd like to ask how likely you think it is that you would be (building to the same levels beyond energy code requirements) (using the same types of HVAC equipment, lighting, refrigeration, and insulation you put in homes that qualify for the program) if the utility new homes efficiency programs had not been available when you built these homes? This time, please tell me using a 0 to 10 scale, where 0 means you would definitely not be building the way you are now and 10 means you would definitely be building the same way.

[IF E3 > 6]

E4. What is the likelihood that you would have built fewer homes (to the same level beyond code requirements) (using the same types of HVAC equipment, lighting, refrigeration, and insulation you include in homes that qualify for the program) if the utility homes efficiency program had not been available? What percentage fewer?

[IF QUALITATIVE RESPONSES IN PROGRAM INVOLVEMENT SECTION AND NTG RESPONSES ARE DIRECTIONALLY INCONSISTENT, ASK:]

E5. I'd like to make sure I'm interpreting what you are telling me correctly. I got the impression earlier that the utility programs had (a good deal of / only a little / no) impact on your building practices, and your answers to the questions I just asked make me think the utility programs have (a good deal of / only a little / no) impact. We are trying to understand just how influential the programs are in spurring the higher efficiency levels you are building to. Could you elaborate on what degree of influence they are having and why?

Program Satisfaction

Now, I'd like you to rate your satisfaction with various organizations involved with the new homes programs and with some program attributes. For each one, please tell me if you are very dissatisfied, somewhat dissatisfied, neither satisfied or dissatisfied, somewhat satisfied, very

satisfied, or have no basis for an opinion. [INTERVIEWER INSTRUCTION: Skip items that are clearly not applicable, such as utilities the builder does not work with.]

F1. PNM's new home construction program overall

- [IF RATING < somewhat satisfied] Can you tell me why you gave that rating?

F2. NMGC's new home construction program overall

- [IF RATING < somewhat satisfied] Can you tell me why you gave that rating?

F3. EPE's new home construction program overall

- [IF RATING < somewhat satisfied] Can you tell me why you gave that rating?

F4. Your interaction with ICF, the implementation contractor that runs these programs

- [IF RATING < somewhat satisfied] Can you tell me why you gave that rating?

F5. The reasonableness of the programs' technical requirements, such as rebated efficiency levels, and installation and inspection requirements

- [IF RATING < somewhat satisfied] Can you tell me why you gave that rating?

F6. The reasonableness of the rebate application process

- [IF RATING < somewhat satisfied] Can you tell me why you gave that rating?

F7. The amount of rebate offered

- [IF RATING < somewhat satisfied] Can you tell me why you gave that rating?

F8. How long it takes to receive the rebates

- [IF RATING < somewhat satisfied] Can you tell me why you gave that rating?

F9. Other program support offered by the utilities, like training and marketing

- [IF RATING < somewhat satisfied] Can you tell me why you gave that rating?

Closing

G1. What else could New Mexico's utilities do to support greater energy efficiency in new homes?

G2. Is there anything else you would like to comment on?

Appendix D: Commercial Load Management Detailed Methods and Findings

Background

El Paso Electric (EPE) operates a Commercial Load Management demand response (DR) program for seven schools in its service territory, including three middle schools, three high schools, and one university. The program compensates participants for reducing electric load upon dispatch during periods of high system load. For summer 2020, the portfolio committed capacity was 1,130 kW. Individual participant committed capacities ranged from 20 kW to 750 kW.

During the summer 2020 demand response season, EPE and the program implementer (Trane) called seven demand response events, all of which lasted two hours from 3:00-5:00 PM Mountain Daylight Time (MDT). These events are summarized in Table 1.

Table 1: 2020 Event Summary

Date	Weekday	Start Time (MDT)	End Time (MDT)	Max Temp in Interval (°F)
12-Jun	Friday	3:00 PM	5:00 PM	95
10-Jul	Friday	3:00 PM	5:00 PM	108
15-Jul	Wednesday	3:00 PM	5:00 PM	104
12-Aug	Wednesday	3:00 PM	5:00 PM	106
13-Aug	Thursday	3:00 PM	5:00 PM	106
19-Aug	Wednesday	3:00 PM	5:00 PM	99
24-Sep	Thursday	3:00 PM	5:00 PM	95

As the statewide evaluator for New Mexico, Evergreen Economics was asked to verify the savings calculated by Trane for purposes of settlement with the participating customers and perform an independent evaluation of program performance. This work will also be the basis for verified program savings for the 2020 El Paso Electric evaluation report due mid-2021.

Validation of Settlement Claims

Methodology

In 2018, Evergreen worked closely with EPE and Trane to reach agreement on the mechanics of the DR performance calculation mechanism. This calculation centers on the baseline or estimate of what load would have been in the participating facilities on event days if DR had not been called. The settlement calculations called for a "high 8-of-10" baseline with a capped, symmetric day-of adjustment. Only non-event, non-holiday weekdays were eligible to be baseline days. For each two-hour Event Window, the method was as follows:

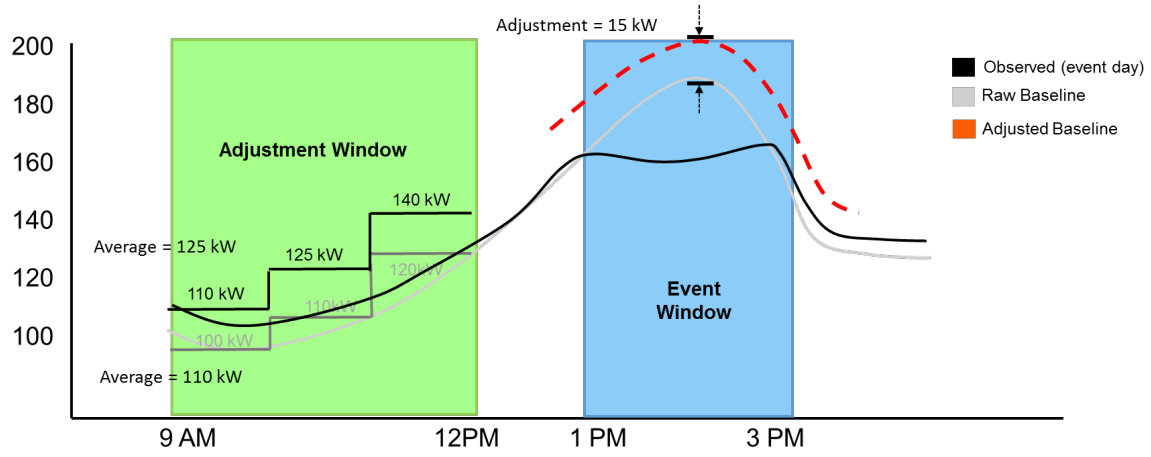
- Select the last ten non-event, non-holiday weekdays
- Select the eight days (out of ten) with the highest average load during the Event Window, using the 15-minute interval load data
- For each 15-minute interval, calculate the average load of the eight selected baseline days. This is known as the "Raw Baseline."

After the Raw Baseline was calculated, a day-of "Adjustment Factor" was calculated and applied to the Raw Baseline to create the "Adjusted Baseline," as follows:

- Designate the three hours prior to the event, excluding the hour immediately prior to the event, as the "Adjustment Window"
- Calculate the average observed load on the event day during the Adjustment Window (single value)
- Calculate the average load of the three baseline days during the Adjustment Window (single value)
- The Adjustment Factor (single value) is defined as the difference of the average observed load and the average load of baseline days, capped at +/- 20% of the corresponding baseline average load
- For each interval in the event window, add/subtract the Adjustment Factor to/from the Raw Baseline to calculate the Adjusted Baseline

A sample calculation is illustrated in Figure 1. In this example, the Adjusted Baseline is 15 kW higher than the Raw Baseline during the event window, because the actual average observed load during the Adjustment Window was 15 kW higher on the event day (125 kW) compared to the baseline days (110 kW).

Figure 1: Illustration of Adjusted Baseline Calculation



Results

Evergreen was able to recreate most of Trane's calculations and affirms that their methodology was sound. Trane' gross reported savings are displayed in Table 2.

Table 2: Gross Reported Savings

Date	Portfolio Committed Capacity (kW)	Portfolio Load Reduction (kW)	Reduction Relative to Committed Capacity (kW)	Actual Enabled Capacity Percentage
12-Jun	1,130	1,744	614	154%
10-Jul	1,130	1,365	235	121%
15-Jul	1,130	582	-548	51%
12-Aug	1,130	1,069	-61	95%
13-Aug	1,130	1,639	509	145%
19-Aug	1,130	1,399	269	124%
24-Sep	1,130	983	-147	87%
Average	**1,130**	**1,254**	**124**	**111%**

The only instances where Evergreen was unable to replicate the Trane numbers were instances where the data was incomplete or when there were multiple, conflicting data sources. If the program were to expand to more sites, Evergreen recommends that Trane adopts a more standardized and dynamic system for the impact evaluation. If there were more sites, performing

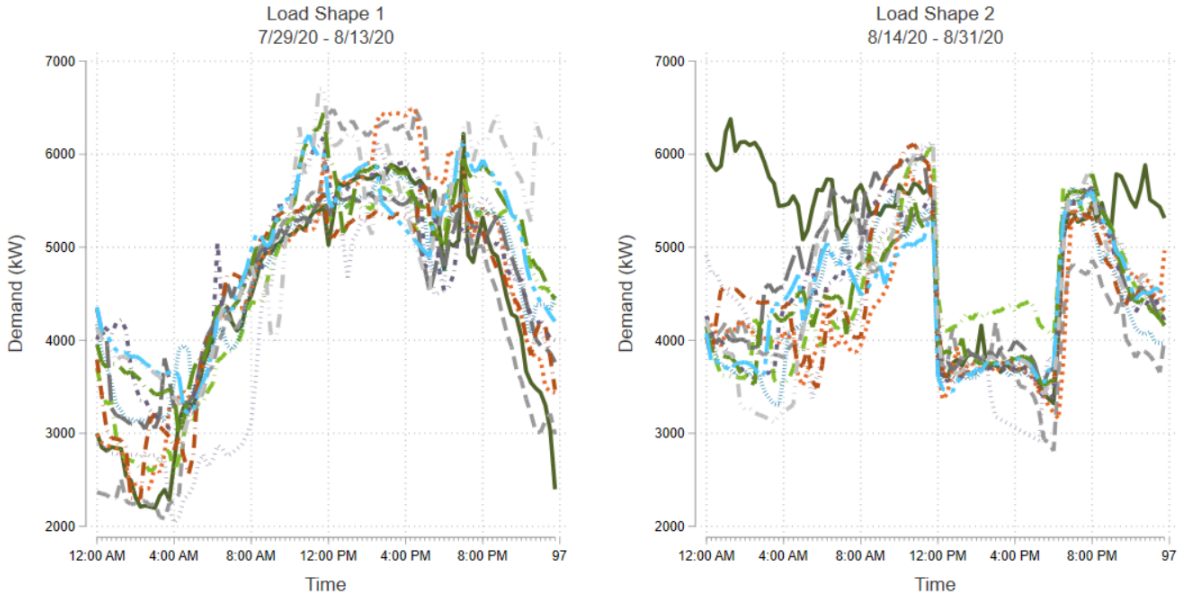
the calculations in Excel could become cumbersome. Another option would be to calculate impacts at the end of the summer period to avoid conflicting records.

Independent Evaluation

Methodology

Evergreen used the same "top 8-of-10" methodology as Trane in the independent evaluation. Our approach was identical to Trane's for six of the participating sites and was slightly adjusted for the remaining site. In the 2020 demand response season, EPE added one new site – New Mexico State University's Central Plant. During the evaluation process, Evergreen discovered that the NMSU site experienced a significant, mid-summer change in their load pattern which required a slightly altered methodology. The site typically operates thermal storage for six hours in the afternoon, from 12:00 to 6:00 PM. In the first half of the summer, a tunnel restoration project prevented the use of the thermal storage. Once the project was completed, the thermal storage was restored. The shift occurred in mid-August, resulting in two distinct load profiles, as shown in Figure 2.

Figure 2: NMSU Load Shape Change



For NMSU, the two load shape groups were flagged, before and after August 13th. For each event day, baseline days were only selected from within the same load shape group. If there are not enough baseline days before an event day within the load shape group, we consider future days as potential baseline days. The only day that was impacted was August 19th, which occurred soon after the thermal storage was restored. There were only three non-holiday, non-event weekdays before the August 19th event that also used thermal storage. To ensure that the remaining

potential baseline days represented the same conditions as the event, the seven eligible weekdays *after* August 19th were used to populate the ten days in the "top 8-of-10" calculations.

Results

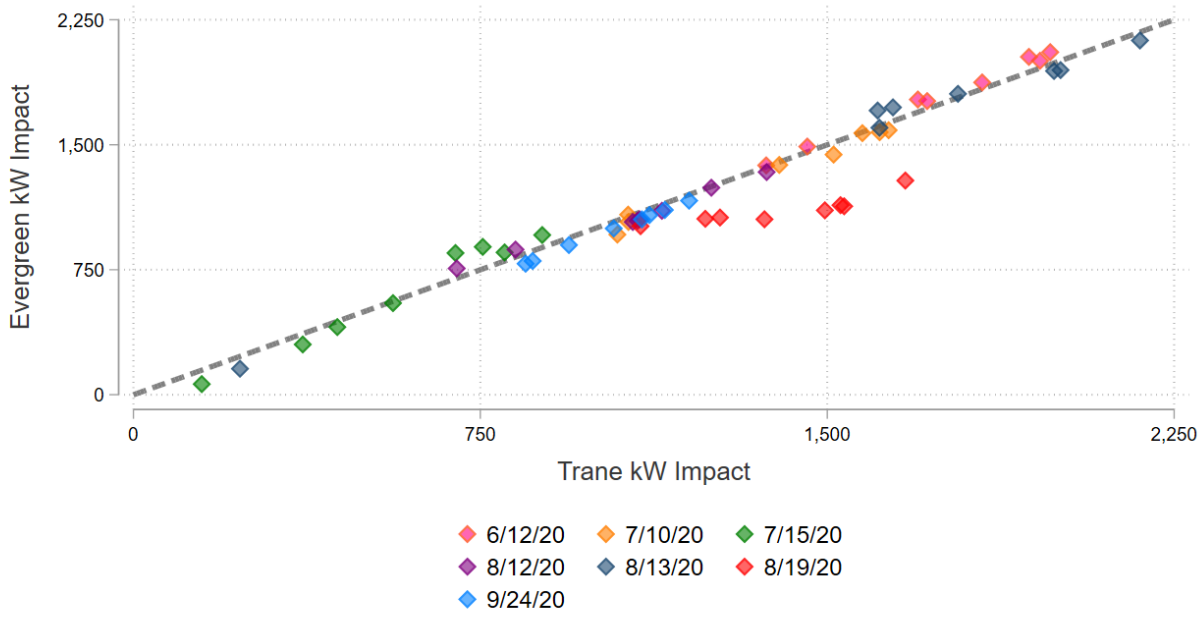
Evergreen's gross verified savings estimates for demand savings by event and in total are summarized in Table 3. The portfolio delivered average reductions in excess of the 1,130 kW of committed capacity in three of seven events, with the average portfolio load reduction being 1,215 kW, or 85 kW (>8%) above the portfolio committed capacity.

Table 3: Gross Verified Savings

Date	Portfolio Committed Capacity (kW)	Portfolio Load Reduction (kW)	Reduction Relative to Committed Capacity (kW)	Actual Enabled Capacity Percentage
12-Jun	1,130	1,795	665	159%
10-Jul	1,130	1,329	199	118%
15-Jul	1,130	609	-521	54%
12-Aug	1,130	1,056	-74	93%
13-Aug	1,130	1,626	496	144%
19-Aug	1,130	1,126	-4	100%
24-Sep	1,130	986	-144	87%
Average	**1,130**	**1,215**	**85**	**108%**

The adjustment to the methodology for the NMSU site precluded Evergreen from conducting the "high 8 of 10" analysis using the aggregated data across all sites, in the same way that Trane performs the calculations. Instead, site-level baseline and impact calculations were summed across the seven sites for each event. The differences between the two calculation methods were minor. Figure 3 shows a comparison of Trane's portfolio level impacts and Evergreen's calculated impacts for each 15-minute interval. The different color markers indicate different event days and the dashed line represents the scenario where Trane and Evergreen's estimates are exactly the same. The only day that deviates significantly from the line is August 19th, 2020, which is the day that was affected by the load shape shift at NMSU. The differences in the estimates on that day are caused by the selection of different baseline days.

Figure 3: Portfolio Impacts Comparison



Detailed Results

Energy Savings

Demand response events may also yield energy savings if the demand reductions during the event window are not offset by actions like precooling or snapback, which shifts demand to intervals outside of the Event Window. Evergreen's approach to estimating the net energy savings on DR event days is similar to the approach for estimating demand savings. Demand savings are estimated by calculating the difference between a site's actual load and its baseline load for the two hours in the Event Window only. To calculate energy savings, Evergreen measured the difference between a site's actual load and its baseline load for the daytime hours of event days from 8:00 AM to 8:00 PM.[1] By looking at the hours outside the Event Window, we account for increases in energy consumption that may occur before or after the DR event as a result of pre-cooling or other load-shifting activities.

Table 4 shows the portfolio net energy savings for each event and in total. Total energy savings across the seven events was 18,756 kWh.

[1] The cutoff hours of 8:00 AM and 8:00 PM were chosen based on a comparison of daily load shapes across different days and specifically the observation that load profiles tend to track each other closely until 8:00 AM and converge again after 8:00 PM. We measure energy savings from 8:00 AM to 8:00 PM only because we would not expect the baseline and event day loads to differ outside of these time periods as a result of weather conditions or other factors.

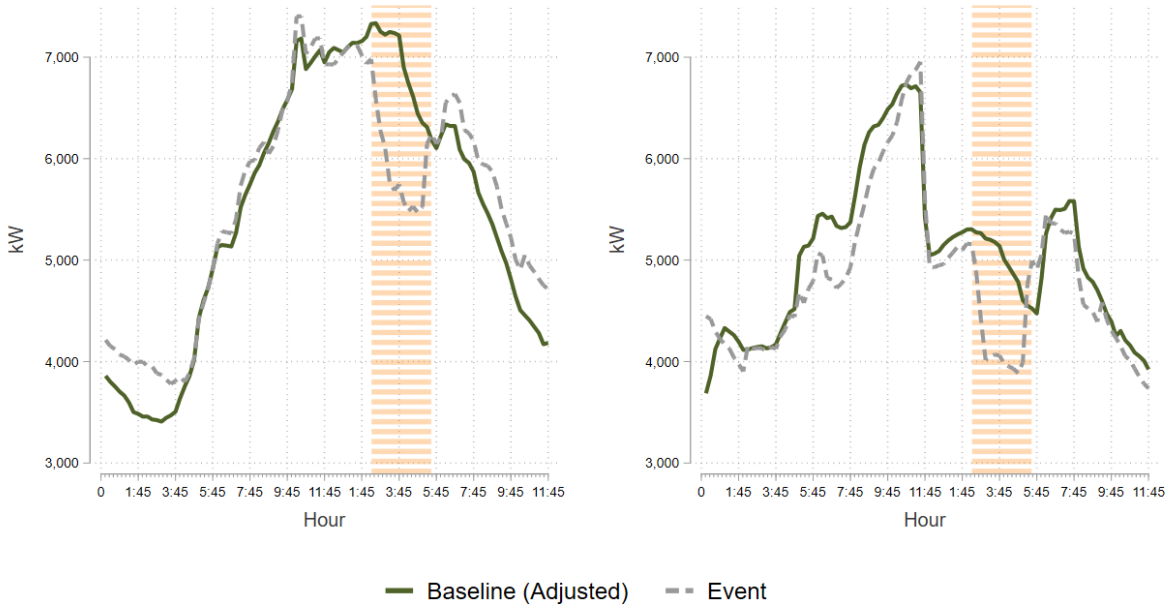
Table 4: Energy Savings by Event Day

Date	Energy Savings (kWh)
12-Jun	3,854
10-Jul	2,131
15-Jul	865
12-Aug	85
13-Aug	4,813
19-Aug	2,626
24-Sep	4,456
Total	**18,756**

Baseline and Event Load Visualization

Figure 4 shows the average event-day and baseline-day site loads for all events across the two load shape groups (before and after 8/13/2020). In both groups, there is a clear reduction in load during the event window from 3:00-5:00 PM. In the second panel, the drop is still very clear, even though the loads were already reduced by thermal storage operation at the NMSU site.

Figure 4: Average Baseline and Event Loads for Events



Duration of Load Reductions

While settlement is based on the average load reduction across each two-hour event window, the minimum or first-interval load reduction may also be of interest, depending on the DR use case. Figure 5 shows how the magnitude of kW savings varies depending on which metric is used – average, minimum, and first-interval value. The average reduction, shown in green, corresponds to the values presented in Table 1 in the Summary of Findings.

Figure 5: Average, Minimum, and First-Interval Load Reduction by Event

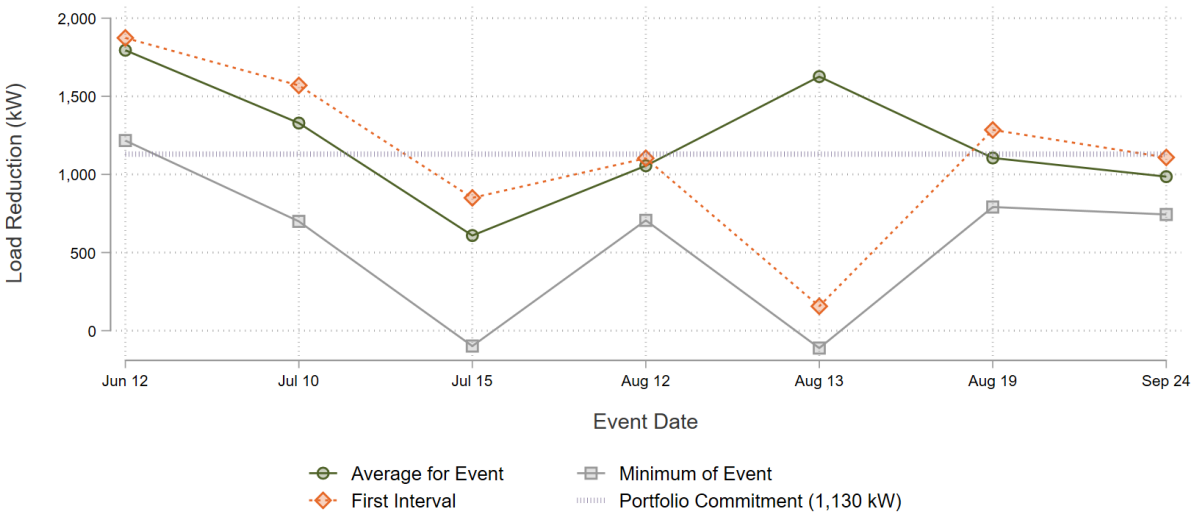


Figure 6 and Figure 7 provide more detail as to how load reductions changed between the beginning and end of each event. Figure 6 shows how load reductions vary by interval across different sites. On average, the delivered load reductions decrease over time, and the largest declines over the interval are seen among sites with the highest load reductions as a fraction of the baseline.

Figure 6: Load Reduction by 15-Minute Interval and School (Average of all Events)

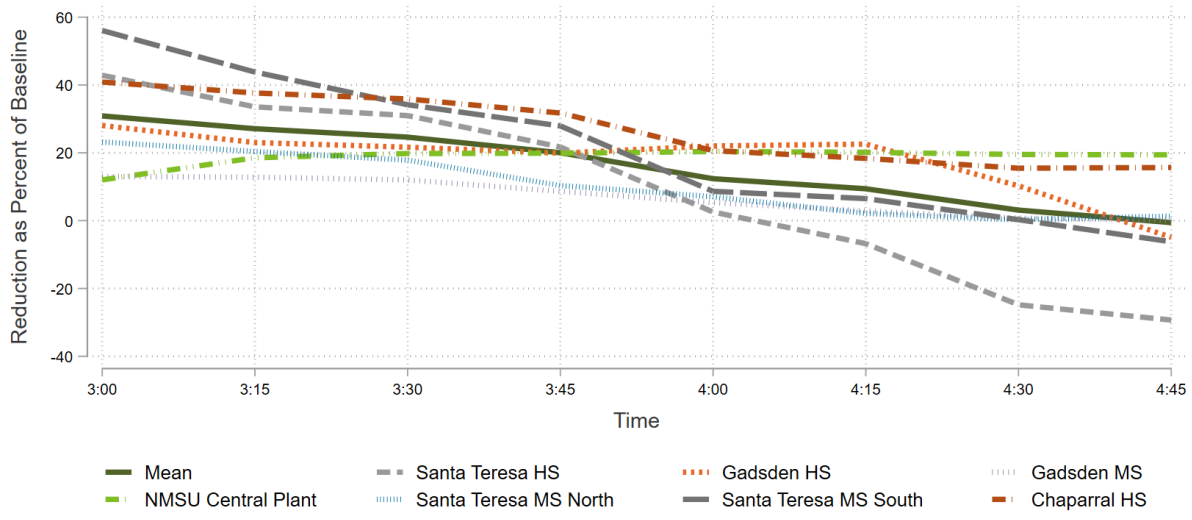
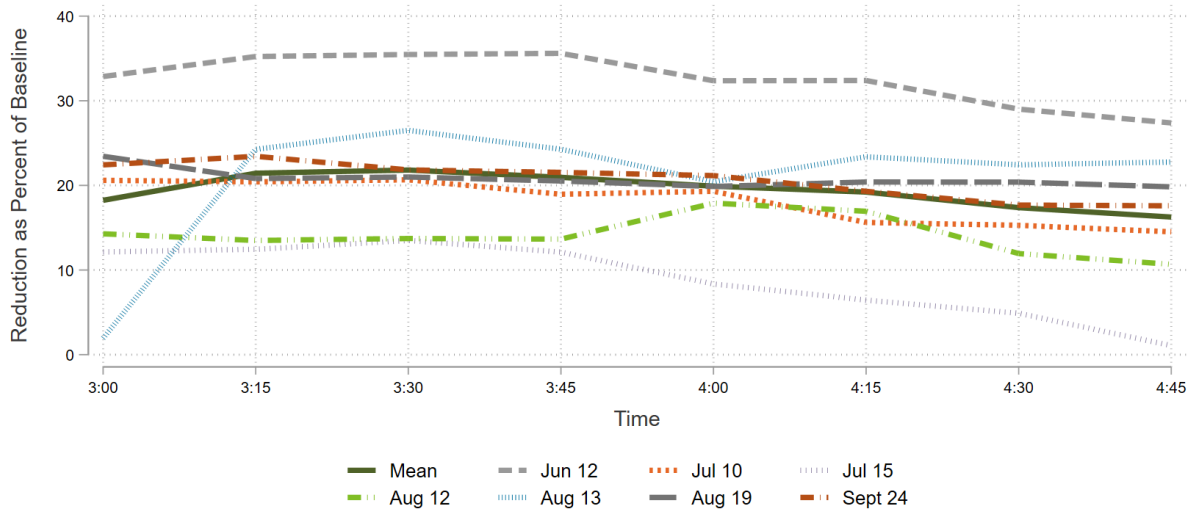


Figure 7 shows how load reductions vary by interval across different dates. Consistent with Table 1, the highest delivered load reductions happened on June 12th.

Figure 7: Load Reduction by 15-Minute Interval and Event (Average of all Sites)

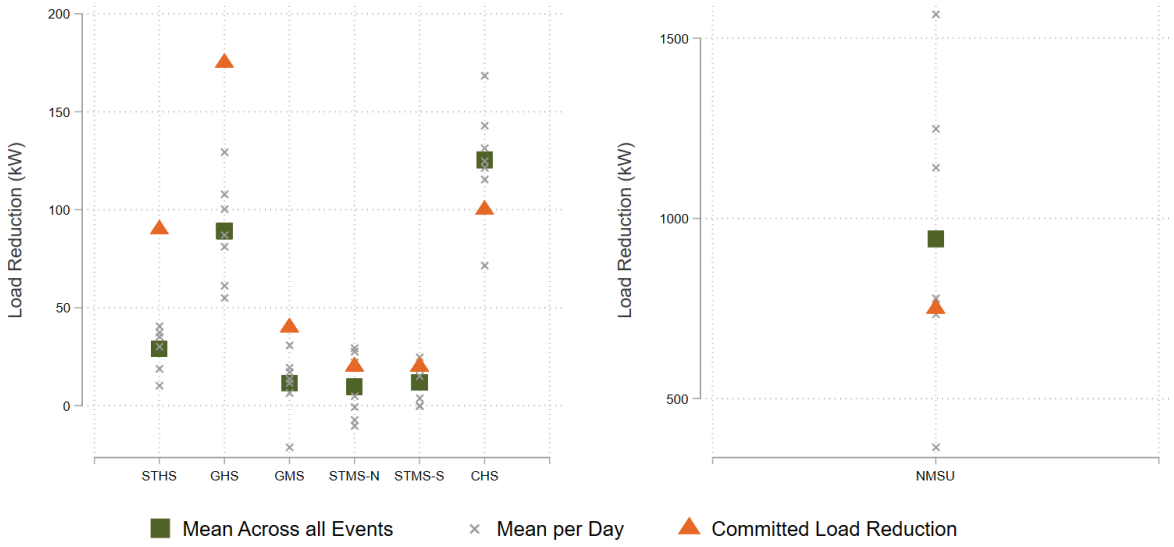


Load Reduction by School

Figure 8 shows the variance by site of the average event load reductions across the seven summer 2020 DR events. The gray marks represent average load reduction for each of the seven events, and the green square represents the average load reduction across all seven events. The orange triangle represents the committed reduction for each site. NMSU is shown in a separate panel since its loads are significantly higher than the high school and middle school sites.

The graph shows that only two sites – Chaparral High School and NMSU Central Plant - outperformed their committed reductions on average. The two Santa Teresa Middle School sites performed in line with their committed reductions on average, while the remaining three sites were below their target capacity for every event.

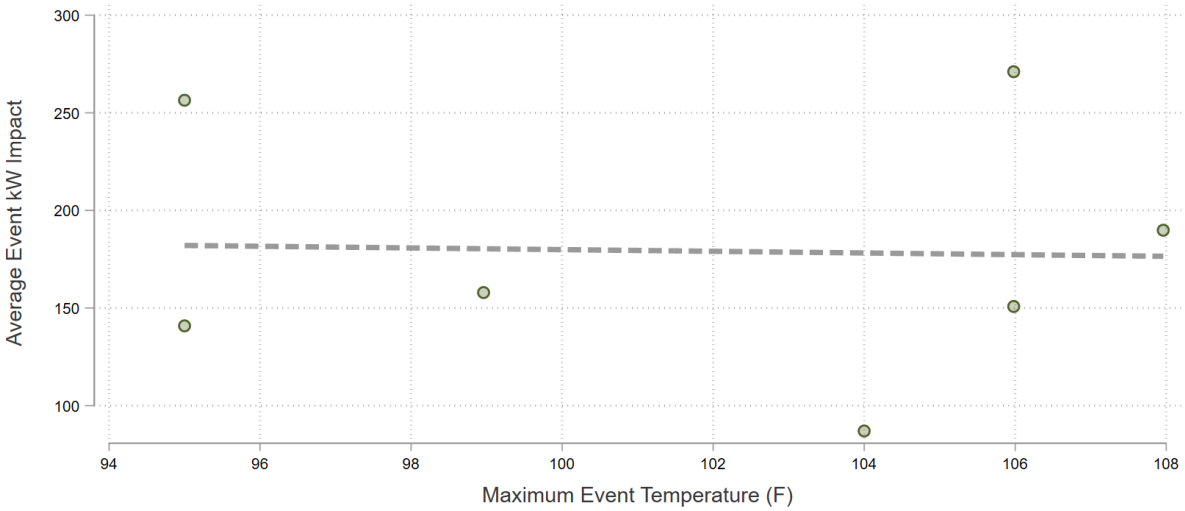
Figure 8: Average Event Reduction by Day



Load Reduction as Function of Temperature

To test whether load reductions were correlated with outside temperature, in Figure 9 we plot the average event load reduction against the maximum hourly temperature during each event window. The figure does not show evidence of a strong relationship between temperature and event load reductions; however, this is driven by strong performance in the June 12th event, which occurred at lower temperatures relative to the rest of the season.

Figure 9: Average Hourly Load Reduction vs Temperature

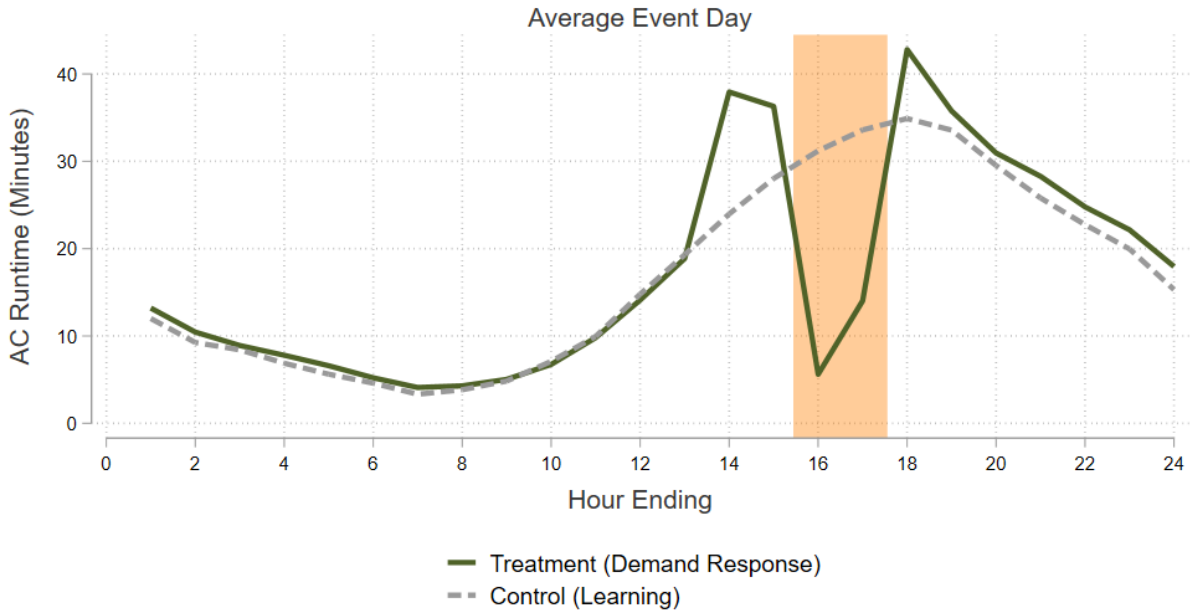


Appendix E: Residential Load Management Detailed Methods and Findings

Background

El Paso Electric (EPE) operates a residential load management program for approximately 500 customers. The program compensates participants for reducing electric load upon dispatch during periods of high system load. During an event, load curtailment is achieved via communication with the WiFi-enabled thermostat. Devices are remotely controlled to raise temperature setpoints and reduce air conditioning (AC) runtime, which in turn translates to reduced electric loads. Figure 1 illustrates the impact of the smart thermostat DR on AC runtime during an event.

Figure 1: Smart Thermostat Demand Response Example



During the summer 2020 demand response season, EPE and the program implementer (Uplight) called eight demand response events, all of which lasted two hours from 3:00-5:00 PM Mountain Daylight Time (MDT). By the end of summer 2020, there were 495 devices and 421 distinct locations enrolled in the program. Table 1 provides some information on these eight 2020 events. Note that the event start times, and end times are in Mountain Daylight Time (MDT).

Table 1: 2020 Power Saver Event Summary

Date	Weekday	Start Time (MDT)	End Time (MDT)	Max Temp in Interval (°F)
6-Aug	Thursday	3:00 PM	5:00 PM	98
11-Aug	Tuesday	3:00 PM	5:00 PM	102
12-Aug	Wednesday	3:00 PM	5:00 PM	106
13-Aug	Thursday	3:00 PM	5:00 PM	106
19-Aug	Wednesday	3:00 PM	5:00 PM	99
20-Aug	Thursday	3:00 PM	5:00 PM	101
3-Sep	Thursday	3:00 PM	5:00 PM	101
24-Sep	Thursday	3:00 PM	5:00 PM	95

New thermostat installations are also treated as an energy efficiency measure with annual kWh savings over the life of the device. During 2020 EPE rebated 252 new WiFi thermostats. Of these 252 devices, 184 enrolled in the Load Management component of the program and 68 did not. The remainder of the program devices were existing devices recruited exclusively for DR purposes. As the statewide evaluator for New Mexico, Evergreen Economics was asked to perform an independent evaluation of program performance and verify the savings achieved by the program. Table 2 shows the results.

Table 2: Evaluation Results

Resource	Number of Devices	Verified Savings	Measure Life (Years)
Demand (kW)	488	409	1
Energy (kWh)	252	240,190	10

Evaluation Methodology

Experimental Design

The program uses an alternating treatment design, based on measurement and verification (M&V) statuses that are randomly assigned to devices daily. On non-event days, devices are uncontrolled and allowed to operate based on customer preferences, indicated by the “Learning” status. For each event day, devices are randomized to either the treatment group (“Demand Response”) or the control group (“Learning”). Treatment group devices receive the DR signal and the control

group does not. The purpose of the control group is to facilitate measurement of impacts. Devices that are unavailable for the randomization and cannot be remotely controlled are indicated by other statuses ("Ineligible", "Inoperative", "Pending"). Table 3 summarizes the daily statuses across all participating devices on each event day. Note that the number of devices enrolled in the program increased by approximately 75% from the first event to the last.

Table 3: Device Counts by Status on Event Days

Date	Demand Response	Learning	Ineligible	Inoperative	Pending	TOTAL
6-Aug	112	24	26	97	22	281
11-Aug	99	18	32	114	25	288
12-Aug	102	17	33	108	25	285
13-Aug	97	23	35	108	25	288
19-Aug	148	72	42	127	0	389
20-Aug	138	72	44	141	0	395
3-Sep	142	51	34	174	49	450
24-Sep	161	54	35	179	63	492

Event day impacts are then estimated using the comparison of hourly AC runtime between the treatment group ("Demand Response") group and the control group ("Learning"). This type of experimental design allows for a robust estimation of impacts. Customers do not know which status they have been assigned on a given day, on average, they experience similar conditions and behave in the same way under each status. This also the enables comparison of runtime between "Demand Response" and "Learning" statuses at the individual device level, essentially producing an individual experiment for each customer.

Impact Evaluation

The Evergreen team chose a blended evaluation approach that employs both difference-in-difference calculation, using the randomly assigned control group devices, and within-subjects regression analysis.

The analysis uses hourly smart thermostat runtime data provided by the three participating device manufacturers – Nest, Emerson, and Ecobee. In the analysis, two baselines are estimated.

1. The first employs difference-in-difference regression to estimate the runtime without demand response in each event hour. The method utilizes the experimental design and controls for existing differences between the treatment and control groups on each event

day. For a given event day, the non-event days are used as the "pre-treatment" data for the randomized treatment and control customers.

2. The second baseline is estimated using within-subjects regression. For each event day and hour, the non-event day data for each of the devices in the daily experimental group is used to predict the runtime without demand response at the device level. The average predicted runtime across all experimental devices on each event day is used as the baseline.

Both methods provide an estimate of average baseline runtime per experimental device, in the absence of the demand response intervention, for a given event day and hour. The two estimates are then blended by using a simple average to provide a final runtime estimate.

The raw runtime impacts are then estimated by subtracting the actual runtime from the blended baseline runtime estimate in each event hour, where runtime is expressed as the percentage of the hour that the HVAC system is running. The cooling runtime impacts are then converted to cooling load impacts, using the connected load assumptions in the New Mexico TRM, shown in Equation 1.

Equation 1: New Mexico TRM Smart Thermostat Connected Load

$$HVAC\ Capacity\ (kW) = \frac{Capacity_{cool}}{1000\frac{W}{kW}} x \frac{1}{SEER\ x\ Eff_{duct}} = \frac{36{,}000\ Btu/h}{1000\frac{W}{kW}} x \frac{1}{13\frac{Btu}{Wh} x 0.8} = 3.4615\ kW$$

For each event hour, the reduction in cooling runtime per hour is multiplied by the estimated HVAC system capacity. This represents the demand impact per treatment device per hour, which is averaged across the two event hours to provide the impact per DR device for each event. This number is then used to provide a picture of the overall program impact delivered, as well as load reduction capability.

Results

Demand Impacts

Evergreen's gross verified impacts by event day are summarized in Table 4.

Table 4: Demand Impacts by Event Day

Date	Impact per DR Device (kW)	Total Impact (kW)	Capability per Device (kW)	Total Capability (kW)
6-Aug	1.023	113	0.703	198
11-Aug	1.331	129	0.901	260
12-Aug	1.301	131	0.881	251
13-Aug	1.209	112	0.789	227
19-Aug	1.387	175	0.899	350
20-Aug	1.448	161	0.924	365
3-Sep	1.336	183	0.891	401
24-Sep	1.048	169	0.716	352
Average	**1.261**	**147**	**0.838**	**300**

The Total Impact refers to the actual load reduction (in kW) delivered on each event day. This number is calculated by multiplying the impact per device and the total treatment ("Demand Response") devices on each event day. Total Capability refers to load reduction capability of the program in each event hour if no operable devices had been assigned to the control group. This is calculated by multiplying the per device impact and total operable devices, which are the devices that are available to be remotely controlled by the program implementor ("Demand Response" + "Learning"). Capability per device is then calculated as the total capability divided by all enrolled devices, in order to account for both operable and non-operable devices.

Program capability provides an estimate of the load reduction that EPE could expect if demand response was called for all enrolled customers. This is calculated by combining the capability per device with the number of customers that were enrolled in the program at the end of the summer DR season (September 30, 2020). Overall capability is presented in Table 5.

Table 5: Gross Verified Program Capability

Capability per Device (kW)	End of Season Enrollment	Program Capability (kW)
0.838	488	409

Energy Impacts for New Devices

New smart thermostat devices that are purchased in the EPE marketplace and enrolled in the load management program are also treated as an energy efficiency measure. Evergreen was able to exactly replicate EPE's calculation of annual energy savings per device using the assumptions from the New Mexico TRM. In 2020, EPE incentivized a total of 252 eligible smart thermostat devices that were incentivized. Table 6 shows the annual energy savings results for these devices along with the measure life and lifetime savings. No peak demand savings are claimed for the efficiency measure.

Table 6: Annual Energy Savings Values

Annual Energy Savings per Device (kWh)	Total Devices Purchase in EPE Marketplace	Total Energy Savings (kWh)	Measure Life (Years)	Lifetime kWh Savings
953.14	252	240,190.5	10	2,401,905

Detailed Results

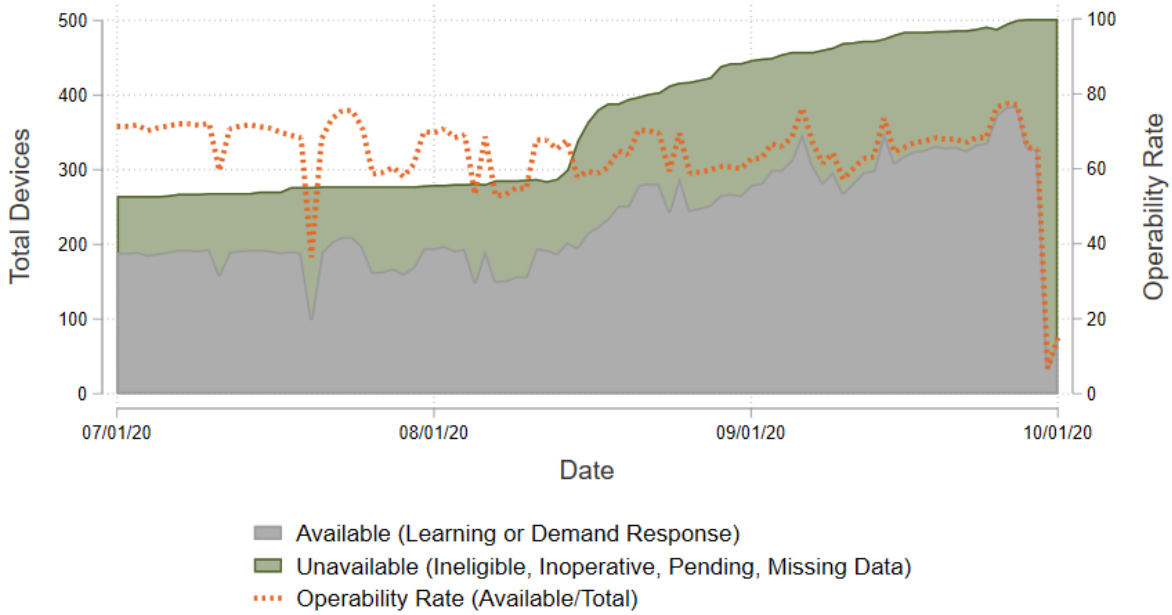
This section reviews the impacts calculated by the Evergreen team and presents other relevant findings from the evaluation.

Operability

It is important to note that demand response can only be called on *operable* devices, or devices that can be remotely controlled by the program implementer, as described in the Experimental Design section above. Program capability is intended to show what the program could achieve under emergency conditions, if a demand response event was called for all enrolled devices. The program must consider the operability of devices, not just the impacts per device, to maximize program capability.

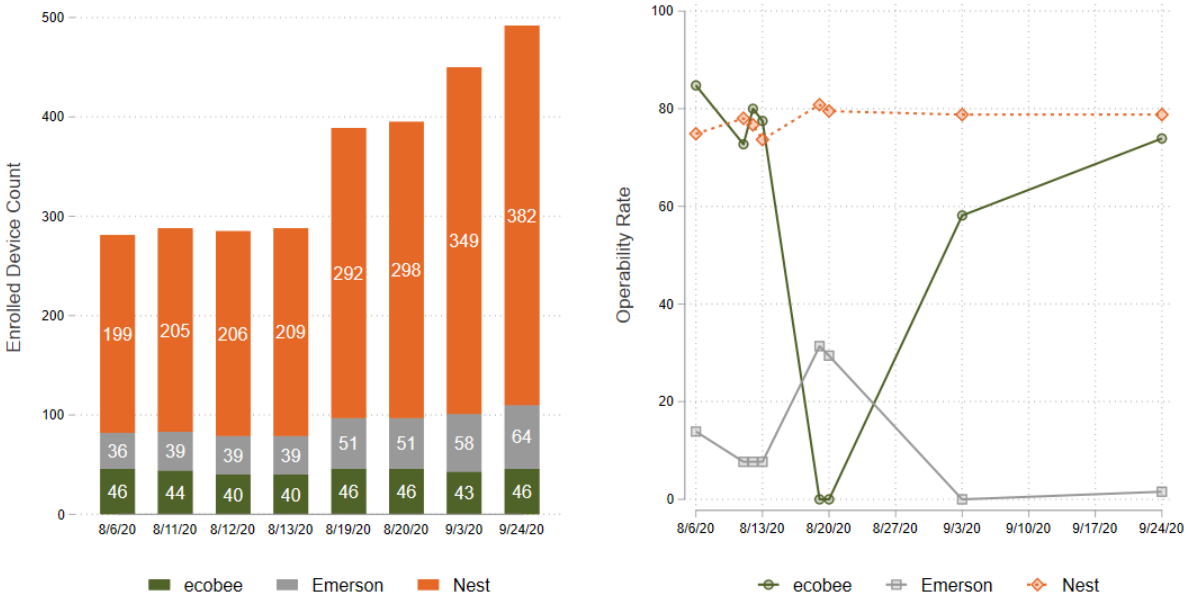
Figure 2 shows the total devices and the operability rate each day from July 1, 2020 through the end of the summer DR season. The operability rate is calculated as the total number of available devices ("Learning" and "Demand Response") over the total enrolled device count. Although the enrolled device count increased throughout the summer, operability stayed around 65%. On event days, the operability rate ranged from 64-69%.

Figure 2: Daily Operability Rate and Total Devices



Further investigation revealed that operability varied widely across the three participating device brands; Ecobee, Emerson, and Nest. In Figure 3, the left panel shows the total device count by brand on each event day and the right panel shows the operability rate by brand for each event. Nest had the most participating devices and consistently high operability rates, averaging 77% operability across the summer. Ecobee and Emerson experienced volatile operability throughout the summer, with average operability rates of 46.8% and 10.4% respectively.

Figure 3: Total Count and Operability by Device Brand



It is also important to note that operability is impacted by the number of devices with missing data, since Evergreen is unable to estimate the impacts for these customers, even if they did receive the treatment.

Demand Impacts

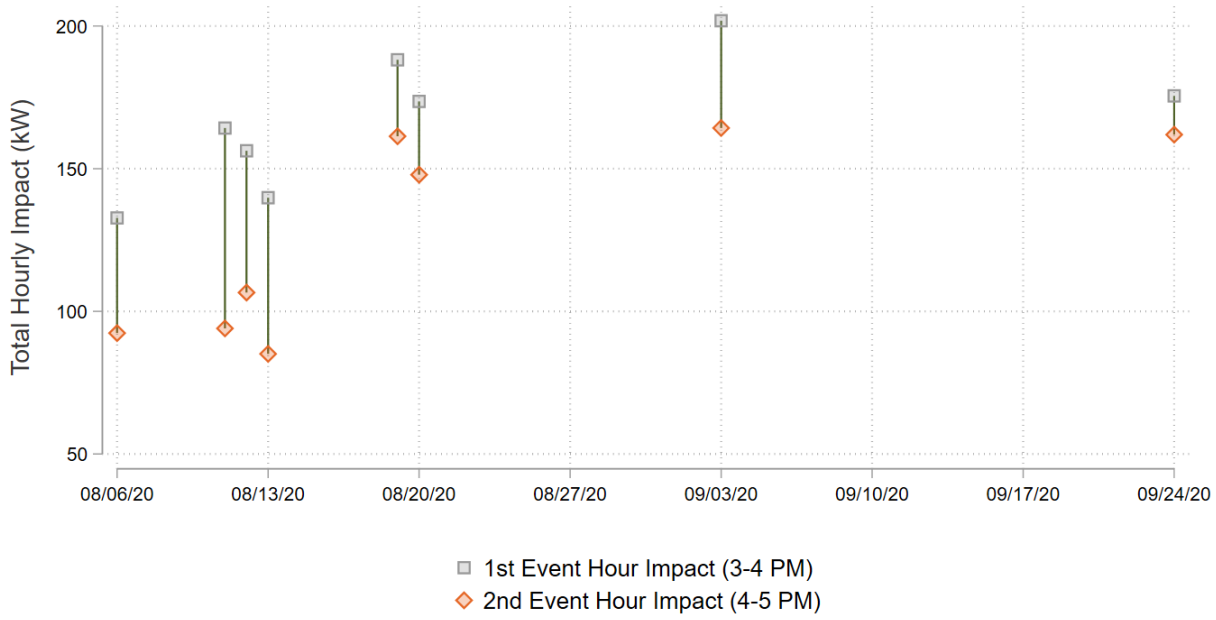
Table 7 shows Evergreen's hourly demand impacts and capability, as well as an overview of devices and temperature during each event.

Table 7: Hourly Demand Impacts

Date	Demand Response Devices	Total Devices	Hour Ending MDT	Temp. (F)	Impact per DR Device (kW)	Total Impact (kW)	Capability per Device (kW)	Total Capability (kW)
8/6/2020	110	281	16	95	1.207	133	0.829	233
			17	95	0.840	92	0.577	162
8/11/2020	97	288	16	101	1.693	164	1.147	330
			17	100	0.969	94	0.656	189
8/12/2020	101	285	16	102	1.547	156	1.048	299
			17	101	1.055	107	0.715	204
8/13/2020	93	288	16	98	1.504	140	0.982	283
			17	98	0.915	85	0.597	172
8/19/2020	126	389	16	96	1.493	188	0.967	376
			17	96	1.281	161	0.830	323
8/20/2020	111	395	16	102	1.564	174	0.998	394
			17	101	1.332	148	0.850	336
9/3/2020	137	450	16	98	1.473	202	0.982	442
			17	98	1.199	164	0.799	360
9/24/2020	161	492	16	92	1.090	176	0.745	366
			17	91	1.006	162	0.687	338

In every event, load impacts were larger in the first hour than they were in the second hour. In calculating the event-level impacts, Evergreen used the average of the two hourly impacts. Figure 4 provides a visual of the diminishing impacts for each of the eight events.

Figure 4: Diminishing Hourly Impacts



EPE resource planners and system operators should be aware of this decay. Since the events are only two hours, it is impossible to predict if these decays would continue if the events were longer. However, if the impact on demand becomes negligible after the first few event hours, this could affect the value of the program as a demand resource.

Net Energy Impacts

The residential load management program provides load reductions by reducing the amount of time a customer's HVAC system is running and cooling the home. If load reduction was the only program goal, program implementors would turn off the HVAC system entirely, rather than just manipulating temperature setpoints, however, customer comfort is also an important consideration. To help keep households cool throughout the event, Uplight "pre-cools" the home in the hours before the event by lowering the setpoint and then also allows the system to run more after the event to return the home to the customer's desired temperature. As a result, the demand response treatment increase runtime and energy usage in the hours before and after the event. This can sometimes lead to overall energy usage, even if there are significant demand savings. Figure 5 shows the estimated hourly energy impacts for each event day to illustrate the increased energy usage before and after the event and the decreased usage during the event. Negative impacts represent an increase in hourly cooling energy consumption at the device level.

Figure 5: Hourly Energy Impact by Event Day

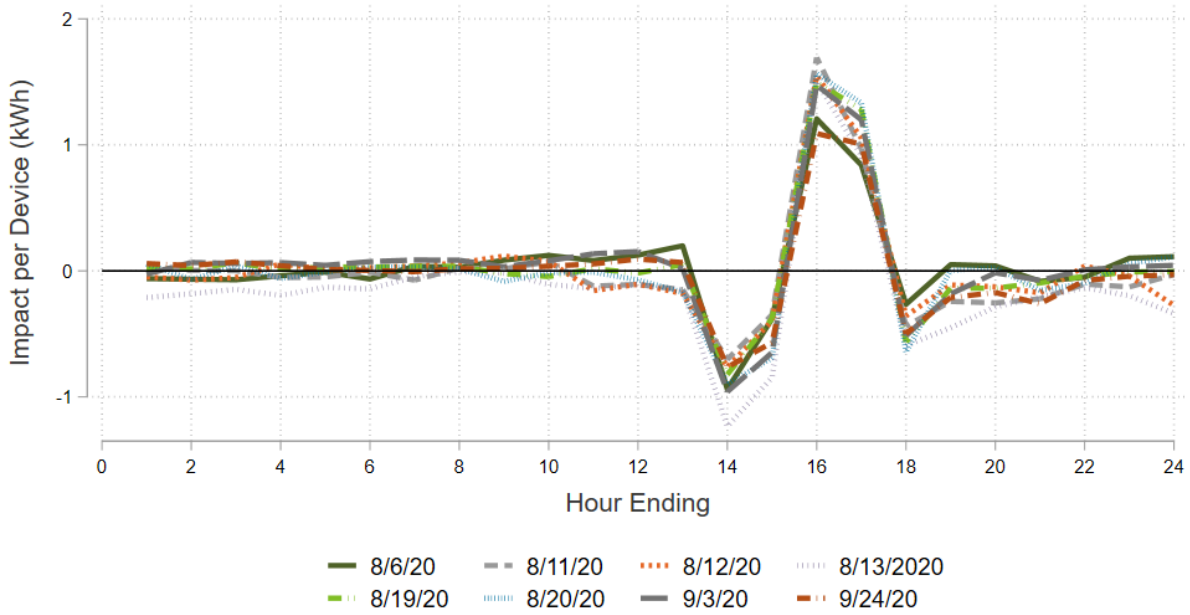


Table 8 shows the net energy impact of the demand response across each full event day. Energy impacts varied by event day, with a positive impact for five event days and negative impact for three event days. The average impact across all eight event days for the smart thermostat demand response program was very close to zero and not statistically significant. Our interpretation of these results is that the DR events are energy neutral and the kWh impacts of the program should be limited to the energy efficiency impacts discussed in the Energy Impacts for New Devices section above.

Table 8: Net Energy Impact by Event Day

Date	Overall Event Day Impact (kWh)
6-Aug	1.01
11-Aug	-0.22
12-Aug	0.17
13-Aug	-3.45
19-Aug	0.81
20-Aug	0.3
3-Sep	1.24
24-Sep	-0.01
Average	**-0.02**

Conclusions & Recommendations

Based on our impact evaluation of the 2020 Residential Load Management Program, the Evergreen team offers the following conclusions and recommendations:

- The residential load management program achieves substantial impacts per device; however, the overall capability would increase significantly with if more devices were operable.
  - In particular, Emerson and Ecobee have operability issues that should be investigated
- We recommend several tests for 2021
  - A "no learning" event where all available devices are dispatched
  - A four-hour event. It would be useful to understand what program performance might look like during a system emergency when dispatch for more than two hours is needed.

Appendix F: Small Commercial Comprehensive and SCORE Plus Desk Review Detailed Results

Project ID	20CLG2	20CLG4	20CLG7	20LFSH1
Utility	EPE	EPE	EPE	EPE
Program	Commercial Comprehensive	Commercial Comprehensive	Commercial Comprehensive	Commercial Comprehensive
Measure Type	Other	Other	Other	Other
Project Description	DX Air Conditioners & Heat Pumps	HVAC Install New Construction	HVAC Install New Construction	Installation of low flow showerhead
Building Type	Assembly	Office - Small	Office - Small	Health/Medical - Nursing Home
Other Building Type				Exterior
Site Visit Being Conducted	No	No	No	No
Other General Project Info Comments				
Gross Reported kWh	3,082	982	982	1,007
Gross Reported kW	0.91	0.29	0.29	0.55
Gross Verified kWh	3,080	982	982	1,007
Gross Verified kW	0.91	0.29	0.29	0.55
kWh Realization Rate	1.00	1.00	1.00	1.00
kW Realization Rate	1.00	0.99	0.99	1.00
Calculation Assessment		The implementer used EPE HVAC calculator to estimate savings for the project. The methodology followed is in line with the NM TRM.	The implementer used EPE HVAC calculator to estimate savings for the project. The methodology followed is in line with the NM TRM.	
TRM/Workpaper Assessment				
Reasons for RR(s) <> 1		The slight deviation in the ex post peak demand savings may be attributed to rounding.	The slight deviation in the ex post peak demand savings may be attributed to rounding.	
Include any other important observations here				

Project ID	20LFSH2	20LFSH4	20LGT01	20LGT02
Utility	EPE	EPE	EPE	EPE
Program	Commercial Comprehensive	Commercial Comprehensive	Commercial Comprehensive	Commercial Comprehensive
Measure Type	Other	Other	Lighting	Lighting
Project Description	Low-Flow Showerheads & Faucet Aerators	Low-Flow Showerheads & Faucet Aerators	Installation of new high-efficiency lighting fixtures.	Installation of new high-efficiency lighting fixtures.
Building Type	Health/Medical - Nursing Home	Health/Medical - Nursing Home	Retail - Small	Office - Small
Other Building Type				
Site Visit Being Conducted	No	No	No	No
Other General Project Info Comments				
Gross Reported kWh	3,020	5,369	120,604	63,312
Gross Reported kW	1.66	2.96	13.15	11.07
Gross Verified kWh	3,020	5,369	118,376	63,524
Gross Verified kW	1.66	2.96	12.92	11.50
kWh Realization Rate	1.00	1.00	0.98	1.00
kW Realization Rate	1.00	1.00	0.98	1.04
Calculation Assessment				
TRM/Workpaper Assessment				
Reasons for RR(s) <> 1			The evaluation team utilized the equations in the NM TRM and the information in the project files to calculate the ex post savings. The small discrepancy between the ex ante and ex post savings is not known based on the supplied documentation.	The evaluation team utilized the equations in the NM TRM and the information in the project files to calculate the ex post savings. The small discrepancy between the ex ante and ex post savings is not known based on the supplied documentation.
Include any other important observations here			The evaluation team referenced the fixture wattages and HOUs listed in the supplied ex ante calculator.	The evaluation team referenced the fixture wattages and HOUs listed in the supplied ex ante calculator.

Project ID	20LGT04	20LGT07	20LGT08	20LGT24
Utility	EPE	EPE	EPE	EPE
Program	Commercial Comprehensive	Commercial Comprehensive	Commercial Comprehensive	Commercial Comprehensive
Measure Type	Lighting	Lighting New Construction	Lighting	Lighting Retrofit
Project Description	Installation of new high-efficiency lighting fixtures.	Installation of new high-efficiency lighting fixtures.	Installation of new high-efficiency lighting fixtures.	Lighting retrofit to LED
Building Type	Retail - Small	Other:	Other:	Office - Small
Other Building Type		Gymnasium	Exterior	
Site Visit Being Conducted	No	No	No	No
Other General Project Info Comments				
Gross Reported kWh	39,098	14,866	29,964	14,482
Gross Reported kW	9.89	4.10	0.00	4.34
Gross Verified kWh	39,098	14,866	29,948	14,420
Gross Verified kW	9.88	4.10	0.00	4.35
kWh Realization Rate	1.00	1.00	1.00	1.00
kW Realization Rate	1.00	1.00		1.00
Calculation Assessment				
TRM/Workpaper Assessment				
Reasons for RR(s) <> 1				
Include any other important observations here				

Project ID	20LGT33	20LGT38	20LGT43	20LGT54
Utility	EPE	EPE	EPE	EPE
Program	Commercial Comprehensive	Commercial Comprehensive	Commercial Comprehensive	Commercial Comprehensive
Measure Type	Lighting Retrofit	Lighting	Lighting	Lighting Retrofit
Project Description	Interior and Exterior Lighting Retrofit	Installation of new high-efficiency lighting fixtures.	Installation of new high-efficiency lighting fixtures.	0
Building Type	Office - Small	Assembly	Other:	Retail - Small
Other Building Type			Exterior	
Site Visit Being Conducted	No	No	No	No
Other General Project Info Comments				
Gross Reported kWh	2,378	37,053	34,207	5,454
Gross Reported kW	0.65	8.29	0.00	1.38
Gross Verified kWh	2,423	37,057	34,185	5,506
Gross Verified kW	0.65	8.29	0.00	1.38
kWh Realization Rate	1.02	1.00	1.00	1.01
kW Realization Rate	1.00	1.00		1.00
Calculation Assessment				
TRM/Workpaper Assessment				
Reasons for RR(s) <> 1	The evaluation team utilized the equations in the NM TRM and the information in the project files to calculate the ex post savings for a small office building type. The small discrepancy between the ex ante and ex post savings is not known based on the supplied documentation.			
Include any other important observations here	The evaluation team referenced the fixture wattages and HOUs listed in the supplied ex ante calculator.			

Project ID	20LGT57	20LGT60	20LGT61	20LGT71
Utility	EPE	EPE	EPE	EPE
Program	Commercial Comprehensive	Commercial Comprehensive	Commercial Comprehensive	Commercial Comprehensive
Measure Type	Lighting	Lighting	Lighting	Lighting
Project Description	Installation of new high-efficiency lighting fixtures.	Installation of new high-efficiency interior lighting fixtures.	Installation of new high-efficiency interior lighting fixtures.	Installation of new high-efficiency lighting fixtures.
Building Type	Assembly	Health/Medical - Nursing Home	Health/Medical - Nursing Home	Restaurant - Sit-Down
Other Building Type				
Site Visit Being Conducted	No	No	No	No
Other General Project Info Comments				
Gross Reported kWh	28,088	82,313	106,345	72,820
Gross Reported kW	7.34	17.90	23.28	3.29
Gross Verified kWh	28,334	82,317	106,359	72,026
Gross Verified kW	7.40	17.45	23.28	3.27
kWh Realization Rate	1.01	1.00	1.00	0.99
kW Realization Rate	1.01	0.97	1.00	0.99
Calculation Assessment				
TRM/Workpaper Assessment				
Reasons for RR(s) <> 1	The evaluation team utilized the equations in the NM TRM and the information in the project files to calculate the ex post savings for an Assembly building type. The small discrepancy between the ex ante and ex post savings is not known based on the supplied documentation.	The evaluation team utilized the equations in the NM TRM and the information in the project files to calculate the ex post savings for a Health/Medical - Nursing Home building type. The small discrepancy between the ex ante and ex post peak demand savings is not known based on the supplied documentation.		The evaluation team utilized the equations in the NM TRM and the information in the project files to calculate the ex post savings for a Restaurant - Sit-Down and exterior building types. The small discrepancy between the ex ante and ex post savings is not known based on the supplied documentation.
Include any other important observations here	The evaluation team referenced the fixture wattages and HOUs listed in the supplied ex ante calculator.			The evaluation team used the deemed factors for the Dining Area space type under the Restaurant - Sit-Down building type for the interior fixtures and the deemed factors listed under Outdoor for the exterior fixtures.

Project ID	20LGT78	20LGT79	PRJ-2501563	PRJ-2308577
Utility	EPE	EPE	EPE	EPE
Program	Commercial Comprehensive	Commercial Comprehensive	Commercial Comprehensive	Commercial Comprehensive
Measure Type	Lighting Retrofit	Lighting	Other	Other
Project Description	Installation of new high-efficiency lighting fixtures.	Installation of new high-efficiency lighting fixtures.	DX Heat Pumps	DX Heat Pumps
Building Type	Other:	Other:	Other:	Office - Large
Other Building Type	Exterior	Exterior	Detention Center	
Site Visit Being Conducted	No	No	No	No
Other General Project Info Comments				
Gross Reported kWh	6,015	653,278	3,615	3,184
Gross Reported kW	0.00	0.00	0.83	0.80
Gross Verified kWh	6,017	652,825	3,615	3,184
Gross Verified kW	0.00	0.00	0.83	0.80
kWh Realization Rate	1.00	1.00	1.00	1.00
kW Realization Rate			1.01	0.99
Calculation Assessment				
TRM/Workpaper Assessment				
Reasons for RR(s) <> 1			The evaluation team used the savings algorithms in the NM TRM for High Efficiency Unitary and Split Air-Conditioning and Heat Pump Systems to calculate the savings for this project. The evaluation team also used the project specific inputs referenced from the project documentation.	The evaluation team used the savings algorithms in the NM TRM for High Efficiency Unitary and Split Air-Conditioning and Heat Pump Systems to calculate the savings for this project. The evaluation team also used the project specific inputs referenced from the project documentation. The discrepancy between the ex ante and ex post savings is not clear since the ex ante calculations were not provided.
Include any other important observations here				

Project ID	PRJ-2400883	PRJ-2403538	PRJ-2429307	PRJ-2458364
Utility	EPE	EPE	EPE	EPE
Program	Commercial Comprehensive	SCORE PLUS	SCORE PLUS	SCORE PLUS
Measure Type	Other	Other	Lighting	Lighting
Project Description	DX Heat Pumps	Cool Roof	Exterior LED lighting	Interior & exterior LED lighting
Building Type	Office - Large	Other:	Retail - Single-Story Large	Education - Secondary School
Other Building Type				
Site Visit Being Conducted	No	No	No	No
Other General Project Info Comments				
Gross Reported kWh	240,741	8,731	88,586	23,139
Gross Reported kW	20.03	1.87	0.00	7.99
Gross Verified kWh	240,742	8,731	88,585	29,680
Gross Verified kW	20.03	1.87	0.00	7.99
kWh Realization Rate	1.00	1.00	1.00	1.28
kW Realization Rate	1.00	1.00		1.00
Calculation Assessment				
TRM/Workpaper Assessment				
Reasons for RR(s) <> 1				RR for peak kW savings is 100%. The evaluation team adjusted the building type from Education - Primary to Education - Secondary based on the research that showed the facility teaches grades 7-12. This adjustment increased the HOUs for the respective spaces. The evaluator confirmed that the ex-ante calculations utilize appropriate and accurate inputs.
Include any other important observations here				Apart from adjusting the building type to Secondary from Primary, the evaluation team used the same space types that were listed in the ex ante calculations (Kitchen and Food Prep and Whole Building).

Project ID	PRJ-2470320	PRJ-2470343	PRJ-2497599	PRJ-2497623
Utility	EPE	EPE	EPE	EPE
Program	SCORE PLUS	SCORE PLUS	SCORE PLUS	SCORE PLUS
Measure Type	Lighting	Other	Other	Lighting
Project Description	Interior & exterior LED lighting retrofits	Cool Roof	Cool Roof	Exterior LED lighting retrofit
Building Type	Health/Medical - Hospital	Health/Medical - Nursing Home	Health/Medical - Nursing Home	Other:
Other Building Type				Border crossing station
Site Visit Being Conducted	No	No	No	No
Other General Project Info Comments				
Gross Reported kWh	1,317,011	269	192	98,114
Gross Reported kW	181.55	0.09	0.06	0.00
Gross Verified kWh	1,393,940	269	192	98,114
Gross Verified kW	189.02	0.09	0.06	0.00
kWh Realization Rate	1.06	1.00	1.00	1.00
kW Realization Rate	1.04	1.00	1.07	
Calculation Assessment				
TRM/Workpaper Assessment				
Reasons for RR(s) <> 1	The evaluation team utilized the equations in the NM TRM and the information in the project files to calculate the ex post savings for Health/Medical - Hospital and exterior building types. The small discrepancy between the ex ante and ex post savings is not known based on the supplied documentation.		The discrepancy between the ex ante and ex post savings are not clear based on the supplied project documentation.	
Include any other important observations here	The evaluation team used the deemed factors for the Dining Area, Kitchen and Food Prep, Laboratory/Medical, Medical and Clinical Care, Office (General), and Whole Building space types under the Health/Medical - Hospital building type for the interior fixtures and the deemed factors listed under Outdoor for the exterior fixtures.			

Project ID	PRJ-2501639	PRJ-2523354	PRJ-2546390	PRJ-2566103
Utility	EPE	EPE	EPE	EPE
Program	SCORE PLUS	SCORE PLUS	SCORE PLUS	SCORE PLUS
Measure Type	Lighting	Lighting	Other	Lighting
Project Description	Interior lighting retrofit	Interior Lighting Retrofit	Window film	Interior lighting retrofit
Building Type	Education - Secondary School	Retail - Single-Story Large	Office - Large	Office - Small
Other Building Type				
Site Visit Being Conducted	No	No	No	No
Other General Project Info Comments				
Gross Reported kWh	3,912	160,181	29,057	8,882
Gross Reported kW	1.12	25.42	16.91	2.66
Gross Verified kWh	3,905	160,181	29,057	8,882
Gross Verified kW	1.09	25.42	16.91	2.65
kWh Realization Rate	1.00	1.00	1.00	1.00
kW Realization Rate	0.97	1.00	1.00	1.00
Calculation Assessment				
TRM/Workpaper Assessment				
Reasons for RR(s) <> 1	The evaluation team utilized the equations in the NM TRM and the information in the project files to calculate the ex post savings for an Education - Secondary building type. The small discrepancy between the ex ante and ex post savings is not known based on the supplied documentation.			
Include any other important observations here				

Project ID	PRJ-2617451	PRJ-2617467	PRJ-2617603	PRJ-2702607
Utility	EPE	EPE	EPE	EPE
Program	SCORE PLUS	SCORE PLUS	SCORE PLUS	SCORE PLUS
Measure Type	Lighting	Lighting	Lighting	Kitchen Equipment NC
Project Description	Interior lighting retrofit	Interior lighting retrofit	Lighting retrofit	Installation of VFDs on existing motors
Building Type	Assembly	Education - Primary School	Other:	Health/Medical - Hospital
Other Building Type			Exterior	
Site Visit Being Conducted	No	No	No	No
Other General Project Info Comments				
Gross Reported kWh	5,585	48,550	8,954	425,709
Gross Reported kW	1.60	14.06	0.00	50.64
Gross Verified kWh	5,583	48,557	8,954	425,709
Gross Verified kW	1.58	14.14	0.00	50.64
kWh Realization Rate	1.00	1.00	1.00	1.00
kW Realization Rate	0.99	1.01		1.00
Calculation Assessment				
TRM/Workpaper Assessment				
Reasons for RR(s) <> 1	The evaluation team utilized the equations in the NM TRM and the information in the project files to calculate the ex post savings for an Assembly building type. The small discrepancy between the ex ante and ex post peak demand savings is not known based on the supplied documentation.	The evaluation team utilized the equations in the NM TRM and the information in the project files to calculate the ex post savings for an Education - Primary building type. The small discrepancy between the ex ante and ex post peak demand savings is not known based on the supplied documentation.		
Include any other important observations here				

Project ID	PRJ-2308576
Utility	EPE
Program	SCORE PLUS
Measure Type	New Construction Lighting
Project Description	Installation of lighting in NC building
Building Type	Office - Small
Other Building Type	
Site Visit Being Conducted	No
Other General Project Info Comments	
Gross Reported kWh	3,775
Gross Reported kW	1.13
Gross Verified kWh	3,800
Gross Verified kW	1.13
kWh Realization Rate	1.01
kW Realization Rate	1.00
Calculation Assessment	
TRM/Workpaper Assessment	
Reasons for RR(s) <> 1	Building type is categorized as a small office. HVAC Energy Factor, HVAC Demand Factor, CF, Annual Hours are taken for Office from Table 16, Table 18 and Table 20. Per floor sq. ft. area is given in post saving documents. Multiplied the area to get area for two floors and subtracted Laundry area (on 1st floor) and two storage areas (not considered in savings calculations) are subtracted to obtain effective area for calculations. Control device saving for exterior area is not considered in calculations
Include any other important observations here	

Appendix G: New Homes Desk Review Detailed Results

Project ID	105326770	105326923	105331766	105340257
Utility	EPE	EPE	EPE	EPE
Program	Energy Star New Homes	Energy Star New Homes	Energy Star New Homes	Energy Star New Homes
Measure Type	Other	Other	Other	Other
Project Description	HVAC & LED Lighting	HVAC & LED Lighting	HVAC & LED Lighting	HVAC & LED Lighting
Building Type	Residential - Single Family	Residential - Single Family	Residential - Single Family	Residential - Single Family
Other Building Type				
Site Visit Being Conducted	No	No	No	No
Other General Project Info Comments				
Gross Reported kWh	2,342	1,674	3,420	2,886
Gross Reported kW	0.80	0.70	1.70	1.50
Gross Verified kWh	2,341	1,674	3,420	2,885
Gross Verified kW	0.80	0.70	1.80	1.60
kWh Realization Rate	1.00	1.00	1.00	1.00
kW Realization Rate	1.00	1.00	1.06	1.07
Calculation Assessment				
TRM/Workpaper Assessment				
Reasons for RR(s) <> 1			The discrepancy between the ex ante and ex post savings is not known based on the supplied project documentation. The evaluation team utilized the supplied REM/Rate report to determine the verified savings.	The discrepancy between the ex ante and ex post savings is not known based on the supplied project documentation. The evaluation team utilized the supplied REM/Rate report to determine the verified savings.
Include any other important observations here	Verified the reported savings matched the REM/Rate Report; The Residential Energy Analysis and Rating Software v15.8 follows IECC 2009	Verified the reported savings matched the REM/Rate Report; The Residential Energy Analysis and Rating Software v15.8 follows IECC 2009		

Project ID	105340420	105340484	105340490	105340501
Utility	EPE	EPE	EPE	EPE
Program	Energy Star New Homes	Energy Star New Homes	Energy Star New Homes	Energy Star New Homes
Measure Type	Other	Other	Other	Other
Project Description	HVAC & LED Lighting	HVAC & LED Lighting	HVAC & LED Lighting	HVAC & LED Lighting
Building Type	Residential - Single Family	Residential - Single Family	Residential - Single Family	Residential - Single Family
Other Building Type				
Site Visit Being Conducted	No	No	No	No
Other General Project Info Comments				
Gross Reported kWh	2,752	2,722	6,026	3,417
Gross Reported kW	1.30	1.30	3.50	1.60
Gross Verified kWh	2,752	2,722	6,026	3,418
Gross Verified kW	1.40	1.40	3.70	1.70
kWh Realization Rate	1.00	1.00	1.00	1.00
kW Realization Rate	1.08	1.08	1.06	1.06
Calculation Assessment				
TRM/Workpaper Assessment				
Reasons for RR(s) <> 1	The discrepancy between the ex ante and ex post savings is not known based on the supplied project documentation. The evaluation team utilized the supplied REM/Rate report to determine the verified savings.	The discrepancy between the ex ante and ex post savings is not known based on the supplied project documentation. The evaluation team utilized the supplied REM/Rate report to determine the verified savings.	The discrepancy between the ex ante and ex post savings is not known based on the supplied project documentation. The evaluation team utilized the supplied REM/Rate report to determine the verified savings.	The discrepancy between the ex ante and ex post savings is not known based on the supplied project documentation. The evaluation team utilized the supplied REM/Rate report to determine the verified savings.
Include any other important observations here				

Project ID	105368766	105368885
Utility	EPE	EPE
Program	Energy Star New Homes	Energy Star New Homes
Measure Type	Other	Other
Project Description	HVAC & LED Lighting	HVAC & LED Lighting
Building Type	Residential - Single Family	Residential - Single Family
Other Building Type		
Site Visit Being Conducted	No	No
Other General Project Info Comments		
Gross Reported kWh	2,316	3,033
Gross Reported kW	1.30	1.50
Gross Verified kWh	2,316	3,033
Gross Verified kW	1.40	1.60
kWh Realization Rate	1.00	1.00
kW Realization Rate	1.08	1.07
Calculation Assessment		
TRM/Workpaper Assessment		
Reasons for RR(s) <> 1	The discrepancy between the ex ante and ex post savings is not known based on the supplied project documentation. The evaluation team utilized the supplied REM/Rate report to determine the verified savings.	The discrepancy between the ex ante and ex post savings is not known based on the supplied project documentation. The evaluation team utilized the supplied REM/Rate report to determine the verified savings.
Include any other important observations here		