SAFER, SMARTER, GREENER

Upstream and Residential Downstream Lighting Impact Evaluation Report

Lighting Sector – Program Year 2018

EM&V Group A

CALIFORNIA PUBLIC UTILITIES COMMISSION

April 24, 2020

CALMAC Study ID CPU0210.01

LEGAL NOTICE

This report was prepared as an account of work sponsored by the California Public Utilities Commission. It does not necessarily represent the views of the Commission or any of its employees except to the extent, if any, that it has formally been approved by the Commission at a public meeting. For information regarding any such action, communicate directly with the Commission at 505 Van Ness Avenue, San Francisco, California 94102. Neither the Commission nor the State of California, nor any officer, employee, or any of its contractors or subcontractors makes any warranty, express or implied, or assumes any legal liability whatsoever for the contents of this document.

Information	Details
Sector Lead	Jonathan Taffel
Project Manager	Geoff Barker
Telephone Number	(510) 891-0446
Mailing Address	155 Grand Avenue, Suite 500, Oakland, CA 94612
Email Address	jonathan.taffel@dnvgl.com, geoff.barker@dnvgl.com
Report Location	http://www.calmac.org (Search term: Lighting Upstream Impact 2018)

Table of contents

List of figures

List of tables

List of abbreviations

ANCOVA	Analysis of covariance
CF	Coincidence factor
CFL	Compact fluorescent lamp
CLASS	California Lighting and Appliance Saturation Survey
CREED	Consortium of Retail Energy Efficiency Data
DEER	Database for Energy-Efficient Resources
EISA	Energy Independence and Security Act (2007)
EM&V	Evaluation, Measurement, and Verification
ESPI	Energy Savings Performance Incentive
EUL	Effective useful life
GWh	Gigawatt hour
HOU	Hours of use
HVAC	Heating, ventilation, and air-conditioning
IE	Interactive effects
IESR	Impact Evaluation Standard Reporting
Inc	Incandescent
IOU	Investor-owned utility
kW	Kilowatt
kWh	Kilowatt hour
LCM	Lamp Choice Model
LED	Light-emitting diode
MR	Multifaceted reflector
MSB	Medium screw base
MW	Megawatt
MWh	Megawatt hour
NCP	National Consumer Panel
NTGR	Net-to-gross ratio
PA	Program administrator
PAR	Parabolic aluminized reflector
PL	Program lamp
POS	Point-of-sale
Q1	First quarter
Q2	Second quarter
Q3	Third quarter
Q4	Fourth quarter
UES	Unit energy savings
UPC	Universal Product Code
W	Watt
WO28	California Upstream and Residential Lighting Impact Evaluation Work Order 28

1 EXECUTIVE SUMMARY

This report presents the energy savings evaluation of the California 2018 upstream lighting programs offered by California program administrators (PAs) and funded by ratepayers. Upstream programs provide monetary incentives to manufacturers (and in some cases, large retail chains) to encourage deployment and stocking of energy efficient technologies and, in this study, we focus on lighting technologies mainly used in the residential sector. We should note there are also lighting rebate programs that provide incentives directly to utility customers (downstream programs) that are also part of this evaluation. DNV GL conducted this evaluation as part of the California Public Utilities Commission (CPUC) Energy Division (ED) Evaluation, Measurement & Verification contract.

For all upstream residential technologies, we present the energy savings and peak demand reductions that these technologies achieved relative to technologies that they displaced (gross savings), as well as the energy savings and peak demand reduction these technologies achieved directly due to the program intervention (net savings).[1] The energy savings and peak demand reductions from upstream residential technologies account for the vast majority of savings from the upstream lighting program.

1.1 Study background

This energy savings evaluation studied all lighting technologies deployed using the upstream lighting program and lighting rebates offered for technologies deployed within the residential programs by Pacific Gas and Electric Company (PG&E), Southern California Edison (SCE), and San Diego Gas & Electric Company (SDG&E). Table 1-1 shows the PA-reported net annual savings from the 2018 upstream lighting program

[1] Note that LEDs emit less heat to the surrounding space than less-efficient incandescent or halogen bulbs. Therefore, in addition to electricity energy savings and peak demand reduction, we account for the small associated increase in winter gas use due to an increase in space heating. We also include a slight reduction in summer electricity consumption and peak demand due to reduced space cooling.

and the percent of net savings that upstream lighting accounts for in the total portfolio. Each PA's lighting program savings accounted for substantially different proportions of their respective overall portfolio savings in 2018. PG&E's upstream lighting programs accounted for 4% of its portfolio-wide net energy savings, SCE's accounted for 17%, and SDG&E's accounted for 36%.

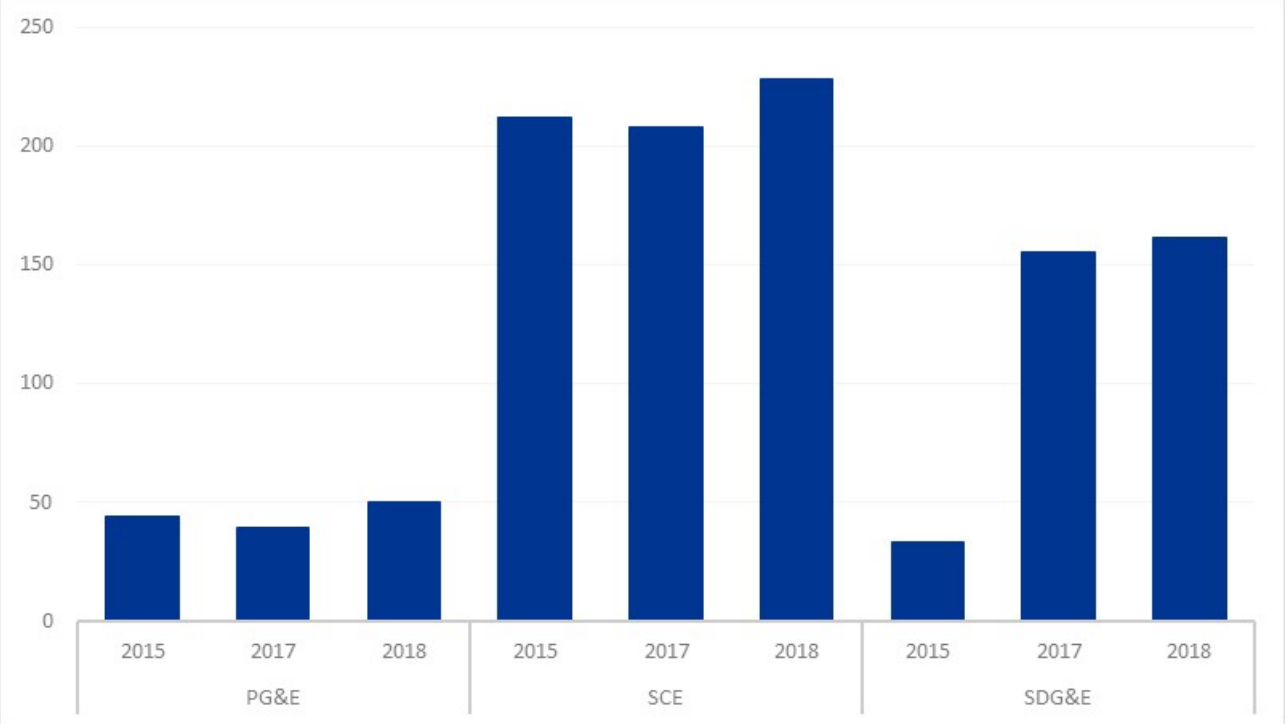
Table 1-1. Summary of PA-reported net annual savings from upstream lighting, 2018

PA	PA-Reported Net Annual Savings					
	Total Portfolio		Upstream Lighting		Upstream Lighting as Percent of Total Portfolio	
	Energy (GWh)	Peak Demand Reduction (MW)	Energy (GWh)	Peak Demand Reduction (MW)	Energy (GWh)	Peak Demand Reduction (MW)
PG&E	1,285	342	49	7	4%	2%
SCE	1,347	286	224	34	17%	12%
SDG&E	441	131	161	23	36%	17%
Statewide	**3,073**	**759**	**434**	**64**	**14%**	**8%**

The 2018 upstream and residential downstream lighting programs continued the trend of the 2017 programs, which changed significantly from the 2015 program in terms of total quantity of light bulbs and associated savings.[2] Figure 1-1 shows the net annual energy savings from upstream and residential downstream lighting programs for each PA, comparing programs from 2015, 2017, and 2018. SDG&E implemented the most dramatic change over that timeframe, increasing its upstream and residential lighting rebate portfolio by nearly five-fold—SDG&E's programs achieved a reported 161 GWh net savings in 2018 compared to an estimated 33 GWh net savings in 2015. SCE increased the quantity of light bulbs it discounted between 2015 and 2018, which resulted in an increase in net savings from 212 GWh in 2015 to 228 GWh in 2018. With its comparatively smaller lighting programs, PG&E increased its net annual savings from 44 GWh in 2015 to 50 GWh in 2018. Section 1.3.1 below provides details on the quantity of light bulbs each of the PAs discounted in 2015, 2017, and 2018.

[2] There was no evaluation of the 2016 upstream and residential downstream lighting programs as the CPUC did not have an evaluator in contract at that time.

Figure 1-1. Summary of PA-reported net annual energy savings (GWh) from upstream and residential downstream lighting rebates, 2015, 2017, and 2018



1.2 Technologies evaluated

This evaluation focuses on three lighting technologies that account for 99% of the PAs' reported net savings from the upstream lighting programs. The 2018 evaluation addresses these three types of light-emitting diode (LED) light bulbs:

- LED reflector light bulbs – These are the type of light bulbs found in a recessed can in a kitchen ceiling.
- LED candelabra light bulbs – These are the type of light bulbs found in a chandelier lamp at home.
- LED globe light bulbs – These are the type of light bulbs found in a bathroom vanity at home.

The combined total light bulbs shipped from manufacturers to retail stores across the three PAs was more than 26 million (Table 1-2). Overall, LED reflector bulbs comprised the vast majority of light bulbs across the PAs (83%) and within each PA. The quantities of LED candelabra bulbs and LED globe bulbs shipped were considerably lower when compared to LED reflectors.

Table 1-2. Quantity of light bulbs in evaluated upstream lighting measure groups by PA, 2018

Evaluated Upstream Lighting Measure Group	Quantity (Number of Light Bulbs)			Overall Quantity (Across PAs)	
	PG&E	SCE	SDG&E	Total	% of Total
LED Reflector	2,700,536	12,446,953	6,652,773	21,800,262	83%
LED Candelabra	443,598	1,411,210	879,124	2,733,932	10%
LED Globe	75,200	1,124,552	569,501	1,769,253	7%
Overall	**3,219,334**	**14,982,715**	**8,101,398**	**26,303,447**	**100%**

1.3 Approach

The evaluation team used methodologies developed for the 2015 program and 2017 evaluations with modifications that preserve the value of the approach and improve transparency. We used a streamlined method for net savings estimation in 2018 compared to 2017 and 2015. As was the case in the 2017 evaluation, the 2018 evaluation also used a modification of the gross savings baseline that provides a more coherent market-based framework.

In any energy savings evaluation, establishment of the baseline—that is, what the energy use would have been in absence of the program—directly impacts the savings determination. We used the average wattage of displaced purchases as the baseline. We then used results from an online consumer survey and other data sources to estimate the proportion of lighting technologies that would have been sold with and without the upstream lighting program[3] and used this "net-to-gross ratio" [4] to calculate the amount of program-discounted light bulbs that would not have been bought without the program.

1.3.1 Shipment versus sales quantity adjustment

We reviewed the PA-submitted annual 2018 program data and found unusually large volumes of light bulbs shipped to discount and grocery stores, particularly in SCE and SDG&E territories.[5] The reported number of light bulbs shipped to discount and grocery stores was significantly higher than the number of total California light bulb sales in these stores, as determined from other data sources.

Figure 1-2 shows the quantity of light bulbs shipped by sales channel (grocery store, discount store, and all other sales channels) and PA in 2015, 2017, and 2018. As was the case in 2017, the vast majority of upstream lighting program light bulbs were shipped to discount and grocery channels in 2018. Over 80% of the 2018 program shipments went to discount and grocery channels across all PAs, and nearly 90% SCE's and SDG&E's 2018 program shipments went to these two channels. PG&E did increase program shipments in 2018, as well as shipments to the grocery channel, but not at the same magnitude as the other PAs.[6]

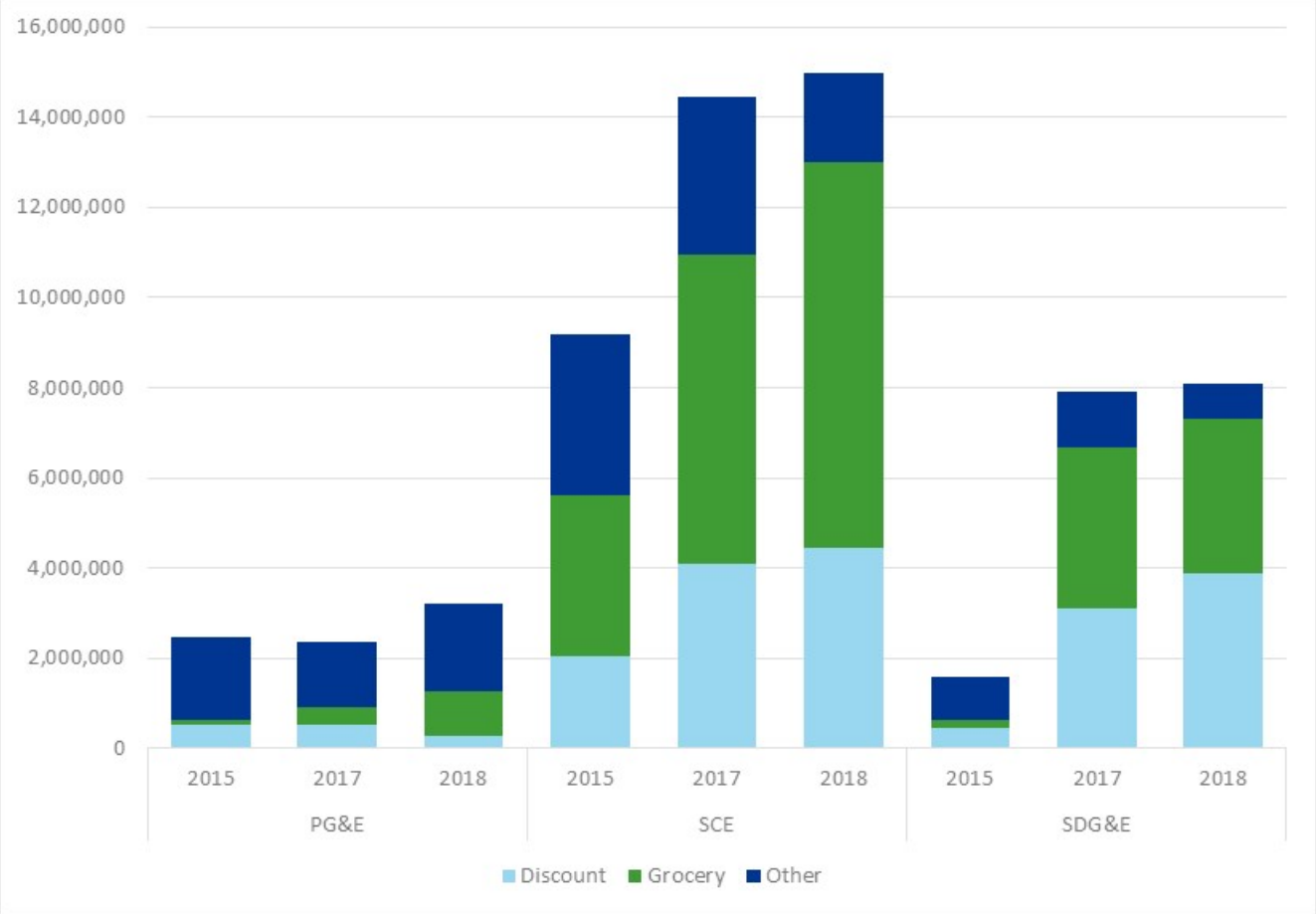
[3] The online consumer survey presented a set of light bulb purchasing scenarios to simulate consumer choices with and without program intervention. These scenarios included choices between an LED light bulb and an inefficient light bulb. See Section 3.8 and Appendix F for further details on this analysis.

[4] Net-to-gross ratio is the ratio of energy savings that occurred due to the program and the energy savings that would have occurred without the program. It is indicative of the customers who would have purchased that same measure even without the program rebate; these customers are known as free riders. Net-to-gross ratios range from 0 to 1. The higher the net-to-gross ratio, the more that the program influenced consumer choice.

[5] The 2017 evaluation observed similar trends in the 2017 program data.

[6] In contrast to the other PAs, only 38% of PG&E's program shipments went to discount and grocery stores in 2018.

Figure 1-2. Quantity of light bulbs in evaluated upstream lighting technologies by sales channel* and PA, 2017 and 2018



*Other sales channels include drug, hardware, home improvement, lighting and electronics, mass merchandise, and membership club stores.

Across the three PAs, more than half of the discount and grocery stores that participated in the 2018 program received shipments that exceeded 10,000 light bulbs. The PAs collectively shipped more than 50,000 discounted light bulbs each to 32 different stores*, with some stores receiving more than 200,000 light bulbs at an individual store*. When reviewed against multiple data sources that give reliable estimates of statewide sales, these data reveal that the market could not have supported the volume of sales that the 2018 program data reported as shipped.

1.4 Results

1.4.1 Shipment versus sales quantity adjustment

We utilized multiple data sources to analyze the California light bulb market, including a telephone survey of retail store representatives, and calculated an adjustment to the quantity of light bulbs shipped to estimate the quantity of light bulbs sold.[7] Table 1-3 shows the sales quantity adjustments that we applied. This

[7] For more details on how sales quantity adjustments were calculated, please see Section 4 of the main report.

resulted in the PAs receiving credit for only 30% of the light bulbs that were shipped. In other words, almost 18.5 million light bulbs did not receive credit for savings in 2018 as determined by the evaluation.

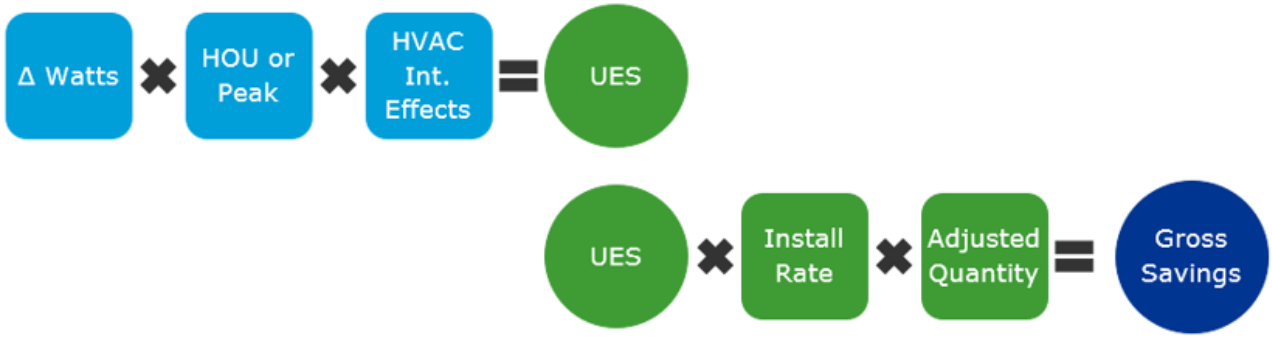
Table 1-3. Light bulb quantity adjustments by PA, 2018

PA and Channel	Light bulbs Shipped	Sales Quantity Adjustment	Light Bulbs Credited
PG&E			
Discount	273,056	100%	273,055
Grocery	993,866	14%	140,982
Remaining Channels	1,952,412	100%	1,952,424
Total	**3,219,334**		**2,366,461**
SCE			
Discount	4,453,072	27%	1,187,501
Grocery	8,568,254	10%	859,339
Remaining Channels	1,961,389	100%	1,961,389
Total	**14,982,715**		**4,008,229**
SDG&E			
Discount	3,860,998	10%	366,906
Grocery	3,442,555	8%	274,876
Remaining Channels	797,845	100%	797,845
Total	**8,101,398**		**1,439,627**
Statewide total	**26,303,447**	**30%**	**7,814,317**

1.4.2 Gross savings results

The evaluation team calculated gross savings for upstream technologies using the formula shown in Figure 1-3. We calculate the unit energy savings and then adjust quantities to calculate the gross savings.

Figure 1-3. Gross savings overview



Where:

- Delta Watts = The difference in wattage between the energy efficient light bulb and the light bulb being replaced

- HOU= Hours of use
- HVAC Int. Effects = HVAC interactive effects.[8]
- UES= Unit energy savings

Table 1-4 shows the gross realization rates for the evaluated technologies in the upstream lighting program.[9] A gross realization rate of 100% means the evaluated results were able to verify all the reported gross savings occurred. A realization rate greater than 100% indicates evaluated gross savings are higher than the reported savings, while a rate lower than 100% indicated evaluated gross savings are lower than the reported savings.

The gross realization rates reflect a blend of two separate evaluation results. The evaluated energy savings of the individual light bulb measures were up to six times greater than the reported savings in the program tracking data, which helped increase gross savings. On the other hand, the evaluation reduced the estimated total quantities of light bulbs sold in the market by as much as 90%, which contributed to reductions in the gross savings. These competing calculations are why the gross realization rates for individual measures can vary above and below 100%.

Table 1-4. Gross kWh realization rates by evaluated upstream lighting technologies, 2018

Evaluated Measure Group	PG&E	SCE	SDG&E	Overall
LED Reflector	120%	56%	16%	48%
LED Candelabra	195%	139%	83%	135%
LED Globe	56%	123%	63%	94%

1.4.3 Net savings results

Net savings are the gross savings minus energy savings attributed to customers who would have purchased LEDs without the program rebates. The "net-to-gross" ratio is result of net savings divided by gross savings. A ratio equal to 100% or 1.0 means the IOU-sponsored program completely influenced the installation of the energy efficient equipment.

The evaluation determined a net-to-gross ratio for each evaluated technology in the upstream lighting program. The results strongly indicate that the lighting market has shifted to a point where LEDs dominate the market and most customers would purchase LEDs even without program rebates. For instance, PG&E's LED reflectors received a net-to-gross ratio of 7%, meaning 93% of the savings would have occurred without the program and only 7% can be attributed to the program activity. Table 1-5 shows the net-to-gross ratios by evaluated technology and PA for light bulbs that were sold to residential customers.

[8] LEDs produce less heat than incandescent light bulbs, so their installation causes a minor increase in heating loads.

[9] The gross realization rate is a comparison between predicted and actual gross energy savings.

Table 1-5. Net-to-gross ratios for all evaluated residential upstream lighting technologies by PA, 2018

Evaluated Measure Group	PA		
	PG&E	SCE	SDG&E
LED Reflector	7%	7%	7%
LED Candelabra	10%	10%	10%
LED Globe	26%	26%	26%

We applied these net-to-gross ratios to the gross savings to calculate the net savings for the program, or the savings that occurred as a direct result of the program. Table 1-6 shows the net realization rates. Statewide, LED reflector light bulbs had a 3% net realization rate, which means 97% of the savings for LED reflectors could not be verified or attributed to the upstream lighting program. Table 1-6 and Table 1-7 include savings for all evaluated upstream measures and include the non-residential savings.

Table 1-6. Net kWh realization rates by evaluated upstream lighting technologies, 2018

Evaluated Measure Group	PG&E	SCE	SDG&E	Overall
LED Reflector	22%	8%	4%	8%
LED Candelabra	47%	21%	16%	24%
LED Globe	18%	37%	21%	29%

Table 1-7 shows the total reported and evaluated net savings by PA for GWh, MW and therms.

Table 1-7. Net savings for evaluated upstream lighting technologies by PA, 2018

PA	Reported			Evaluated		
	GWh	MW	Million Therms	GWh	MW	Million Therms
PG&E	46	7	(0.9)	11	2	(0.2)
SCE	222	33	(3.4)	20	4	(0.2)
SDG&E	160	23	(2.1)	8	2	(0.1)
Total	**428**	**63**	**(6.3)**	**38**	**8**	**(0.4)**

1.5 Conclusions and recommendations

Figure 1-4 presents the key conclusions and recommendations of this evaluation. We provide more detailed conclusions and recommendations in Section 8 of the main report.

Figure 1-4. Key conclusions and recommendations

Key Conclusions	Recommendations
Evaluation results suggest that the California lighting market has shifted to a point where LEDs are the dominate technology and are the preferred choice among most consumers. LEDs comprise well over 50% of the market for all three evaluated measure groups, and LED prices have fallen to a point where they are competitive with inefficient technologies, even without program incentives. Upstream lighting program incentives no longer influence customer purchases as much as they did when inefficient light bulbs dominated the lighting market.	PAs should move away from a statewide upstream lighting program model. Increases in standards are expected to remove the final pockets of halogen bulbs in the market, and halogens that remain in sockets have such short measure lives that they will soon be replaced by LEDs. To the extent that pockets of inefficient bulbs remain and or these changes happen inequitably, residential lighting programs should be tailored to reach the appropriate segments of customers, but these programs should be designed thoughtfully to maximize impact.
The 2018 upstream lighting programs continued to ship significantly more light bulbs to individual stores, particularly in the discount and grocery channels, than stores could reasonably stock and sell. Evaluation results suggest that there was inadequate monitoring and verification of program light bulb shipments and that many participating retail stores were not required to purchase program discounted light bulbs from manufacturers.	Upstream lighting programs need to strike a balance between market size and program shipments and include careful monitoring of program sales in these stores to ensure program light bulbs are selling as expected. PAs should also allocate more resources to verify program activity. This should include verification of shipment and delivery documentation from manufacturers and more in-store verifications to confirm stocking and adequate sell-through rates of program discounted light bulbs.
Gross unit energy savings for LED light bulbs still show energy savings opportunities. However, the rapidly transforming lighting market suggests that the market share of inefficient light bulbs is shrinking. This indicates that a baseline that includes inefficient light bulbs will continue to decline as LEDs comprise the vast majority of the market and continue to grow.	Energy savings per light bulb will continue to decline. Residential lighting programs should be targeted at customer segments and applications where savings opportunities still exist.

2 INTRODUCTION

In this section, we provide an overview of the California lighting programs, detail the research objectives of the impact evaluation, provide an overview of the evaluation, and outline the organization of the report.

2.1 Program overview

Each California program administrator (PA)—including Pacific Gas and Electric Company (PG&E), Southern California Edison (SCE), and San Diego Gas and Electric Company (SDG&E)—implemented lighting programs designed to promote energy-efficient lighting across all market sectors during the 2018 program period. The scope of this evaluation focuses on residential lighting measures.

The largest lighting program for each PA intended for the residential sector was the Primary Lighting Program. This program administered upstream incentives, meaning they provided discounts to manufacturers with the expectation that manufacturers and retail stores will pass those discounts on to customers in the form of reduced-price lamps (commonly referred to as light bulbs). While Primary Lighting is designed as a residential program, previous evaluations have found that around 6% to 7% of program lamps end up in non-residential sockets. We therefore include those non-residential measures as part of this evaluation.

In addition to the Primary Lighting Program, there are an assortment of residential downstream programs. In these programs, residential customers directly received a rebate or the lamp itself. Downstream lighting programs make up a relatively small percentage of the program portfolio measure quantities and savings. Table 2-1 below displays the residential and non-residential quantity of lamps that each program discounted.

Table 2-1. Quantity of lamps discounted by program for all PAs, 2018

Program Type	Residential/Non-Residential	Measure Groups Offered in Program – Quantity				
		LED Reflector Lamps	LED Candelabra Lamps	LED Globe Lamps	LED A-Lamps	Other*
Upstream	Residential	20,491,825	2,569,896	1,663,098	412,048	304,921
	Non-Residential	1,308,437	164,036	106,155	26,301	19,463
Downstream	Residential	51,078	29,284	0	139,024	117,303

*Other measure groups include indoor LED fixtures, outdoor LED fixtures, other outdoor LED lamps, and high-wattage (>30 watts) CFLs.

The upstream delivery mechanism has been a core part of the California PAs' compact fluorescent lamp (CFL) program activities for many years, but during the 2013-14 program period, PAs began a shift away from CFLs and toward light-emitting diode (LED) lamps. Starting in January 2014, the California Public Utilities Commission's Energy Division (CPUC ED) required that the PAs demonstrate that the LED lamps that they incentivize meet the performance requirements outlined in the California Quality LED Specification developed by the California Energy Commission (CEC).[10] The requirements in the specification go beyond ENERGY STAR for lamp attributes such as color, dimmability, light distribution, and warranty, with the intent of meeting or exceeding customer expectations regarding lamp performance and light quality. The PAs began introducing LED lamps into the upstream program in relatively small quantities during 2013 and in ever

[10] CEC 2017.

increasing quantities from 2014 to 2017. In 2018, the quantities of LED lamps that the PAs included in the upstream lighting program was nearly the same as it was in 2017. Since 2015, the PAs have collectively reduced the number of CFLs that they provide incentives for each year.[11]

The upstream and residential downstream lighting programs changed considerably since the 2015 program, and it is important to highlight how the 2017 and 2018 programs total quantity of lamps and associated savings compare to 2015 (Table 2-2). SDG&E implemented the most dramatic change, increasing their upstream and residential lighting rebate portfolio by nearly 5-fold and estimated that these programs achieved 161 GWh net savings in 2018, compared to an estimated 33 GWh net savings in 2015. To report these savings, they discounted more than four times as many lamps in 2018 compared to 2015. SCE increased the quantity of lamps it discounted by nearly 50% beginning in 2017 and discounted a similar number of lamps in 2018. This resulted in relatively small 8% increase in savings between 2015 and 2018 for SCE. PG&E increased the quantity of lamps it discounted by 11% between 2015 and 2018, which resulted in a modest 14% increase in net savings.

Table 2-2. Summary of PA-reported ex ante net annual energy savings and quantity of discounted lamps from upstream and residential downstream lighting measures, 2015, 2017 and 2018

Program Year	PA Reported Net Energy Savings (GWh)				Quantity of Lamps			
	PG&E	SCE	SDG&E	Total	PG&E	SCE	SDG&E	Total
2015	44	212	33	**288**	3,440,260	10,258,827	2,019,998	**15,719,085**
2017	39	208	155	**401**	3,951,597	15,153,891	8,700,049	**27,805,537**
2018	50	228	161	**439**	3,820,911	15,346,110	8,235,848	**27,402,869**

As the LED market continues to mature, efficient lamps have become more cost effective and more popular, and it has become more difficult for upstream lighting programs to achieve the same overall magnitudes of savings. Our evaluation investigates the impacts of these changes at the retail channel level.

2.2 Analysis of measure uncertainty

The Energy Savings Performance Incentive (ESPI) uncertain measure list[12] estimates the areas of greatest savings uncertainty within California's Energy Efficiency portfolio. This list serves as guidance for evaluators to consider when they develop their evaluation work plans. It is important for regulators, program staff, and evaluators to understand why measures are on the uncertain measure list and what keeps measure on the uncertain measures list. Measure level uncertainty contributes to overall portfolio uncertainty, so it is important for evaluations to reduce that uncertainty moving forward.

As the vast majority 2018 residential lighting claims were administered through the Primary Lighting Program, we considered measures on the uncertain measure list as upstream measures and passed-through all downstream savings. The 2018 uncertain measure list included one of the three measure groups that we researched in this evaluation—indoor LED reflectors. Although the uncertain measure list also included indoor LED A-lamps, indoor LED fixtures, and outdoor LED fixtures, we did not evaluate these measure groups due to their small contribution to the overall portfolio. In addition to the measures on the uncertain measure list, our review of updated tracking data revealed the need to also research LED candelabra and

[11] In 2018, only SCE continued to provide incentives for CFLs.

[12] CPUC 2016 and CPUC 2017.

LED globe lamps because these measure groups contributed to the second and third largest share of savings after indoor LED reflectors in 2018.

We designed the primary research questions and methodologies of this evaluation to reduce the uncertainty of gross energy consumption baselines[13] and net-to-gross ratios, both of which the uncertain measure list classified as uncertain. The current ex ante assumptions for gross baselines and net-to-gross ratios were assigned within the ex ante lighting disposition and not necessarily from an evaluation. Therefore, they may not have the same quantitative methodological rigor as the results in this evaluation. The impact evaluation results will be applied to future ex ante planning assumptions to reduce future uncertainty around these parameters. It is important to recognize that lighting baselines are continuing to change rapidly. Therefore, even as we reduce savings uncertainty this year, the savings will again be uncertain next year due to new market changes. Table 2-3, below, lists the measures that the 2017 and 2018 uncertain measure lists and the 2017 and 2018 impact evaluations included.

Table 2-3. 2018 uncertain measure list measures included in impact evaluation

Measures	Uncertain Measure List		Evaluation		Factors Driving Uncertainty in 2018
	2017	2018	2017	2018	
LED Reflector	X	X	X	X	Large portion of portfolio savings; baseline mix assumptions, installation rates, and sell-through rates
LED Candelabra				X	Large portion of portfolio savings; baseline mix assumptions, installation rates, and sell-through rates
LED Globe				X	Large portion of portfolio savings; baseline mix assumptions, installation rates, and sell-through rates
LED Lamp (A-Lamp)	X	X	X		Small portion of portfolio savings in 2018; included in PY 2017 evaluation
LED Fixture (Indoor)	X	X			Small portion of portfolio savings in 2018 and 2017
High Wattage CFL			X		Low uncertainty in 2018; small portion of portfolio savings in 2018; included in PY 2017 evaluation

The number of uncertain measures and parameters that the uncertain measure list has identified has continued to decrease since the inception of the rolling portfolio. Selecting measures to include in the uncertain measure list depends on the uncertainties among the parameters within savings calculations as well as the quantities of each measure group that the program discounted. For example, as lighting measures have moved away from CFLs and towards LEDs, the uncertain measure list has removed CFLs. This is in part because measure-level uncertainty has been reduced, and also because their portion of portfolio-level savings was reduced as programs moved towards LEDs. Additionally, prior upstream lighting evaluations have invested research efforts to reduce the uncertainty of hours-of-use (HOU), installation rates, and baseline estimates. The evaluation results of this report will reduce the uncertainty of 2018 gross and net savings relative to their ex ante estimates.

[13] Energy savings are the difference between energy consumption with an energy efficient measure in place and the consumption that otherwise would have occurred during the same period. The energy consumption that otherwise would have occurred is called the baseline.

2.3 Research objectives

The primary objective of this impact evaluation is to verify and validate the PAs' reported energy savings and peak demand reduction estimates. Our approach has three goals:

1. Develop measure quantity adjustments and an assessment of the percentage of discounted products purchased by residential versus non-residential customers. As part of the 2018 evaluation, we also added a sales-to-shipment ratio to adjust the quantity of program lamps so that they reflect the estimated quantity of lamps that participating retail stores actually sold. The evaluation team also calculated sales-to-shipment ratios for the 2017 evaluation.
2. Develop gross savings inputs, which include an assessment of the percentage of discounted measures installed as well as estimates of the average daily HOU, the average percent of measures operating at peak coincidence factor (CF), the difference between the program lamp wattage and the wattage displaced by PA-discounted measures (delta watts), unit energy savings (UES) in kWh/year and peak kW, and installation rate. As part of the 2018 evaluation, we updated the gross savings baseline wattage in the delta watts calculation to reflect the wattage of non-program technologies that would be sold naturally in the market absent a program (as opposed to using the wattage installed in homes as the baseline wattage).
3. Develop net savings inputs, which include estimates of the net-to-gross ratio (NTGR) for each evaluated measure.

To accomplish the goals mentioned above, this evaluation addresses six specific research questions:

1. **What is the average wattage of lamps displaced by upstream program lamps?** We answer this question by using a market-based approach to estimate technology sales shares both with and without program discounts in place and quantify the difference in energy consumption between the two scenarios. The baseline is a key component to calculating the delta watts parameter. We discuss this methodology and present calculated LED baselines in Section 5 (Gross Savings Analysis).
2. **What is the appropriate baseline for residential upstream LEDs?** We answer this question to quantify the average wattage that program LEDs displace in the market. The baseline is a key component to calculating the delta watts parameter. We discuss this methodology and present calculated LED baselines in Section 5 (Gross Savings Analysis).
3. **What are the ex post savings results for evaluated measures?** This question is the thrust of this evaluation. We present our ex post savings research methodologies in in in Section 5 (Gross Savings Methodology) and Section 6 (Net Savings Analysis), and present lighting program savings estimates in Section 7 (Study Results).
4. **What is the free-ridership level for residential upstream LED reflector lamps, LED candelabra lamps, and LED globe lamps?**
5. **What are the annual sales of lamps in different retail channels?** We added this research question as part of the 2017 impact evaluation after we began observing unexpectedly large quantities of LED lamps shipped to discount and grocery stores. A review of 2018 program tracking data revealed that large quantities of LED lamps continued to be shipped to discount and grocery stores. We looked at multiple sources of data to estimate low and high bounds of annual lamp sales in grocery and discount stores. We present this methodology and related findings in Section 4.1 (Sales-to-shipment ratios)
6. **After verifying program lamp shipment quantities in different retail channels and estimating annual lamp sales in these channels, what are the lamp sales-to-shipment ratios for each**

retail channel? Once we estimated the lighting market potential sales volumes in discount, grocery, big box, and other retail channels, we determined it was necessary to reduce the number of program lamps that programs shipped to quantities that were actually sold in the discount channel for some of the PAs and grocery channels for all of the PAs. We developed the sales-to-shipment ratio to answer this research question and present this methodology and related findings in Section 4.1 (Sales-to-shipment ratios).

2.4 Evaluation overview

We designed this impact evaluation to address all lighting measures associated with the upstream delivery mechanism as well as all downstream lighting measures targeted at the residential sector by PG&E, SCE, and SDG&E. Upstream and residential downstream lighting measures accounted for 4% to 37% of each PA's ex ante net annual electric savings and 2% to 17% of each PA's net peak demand reductions (see Table 2-5). During the 2017 program period, upstream and residential downstream lighting measures accounted for 3% to 35% of each PA's reported net energy savings and 2% to 27% of each PA's reported net peak demand impacts.

Table 2-4. Summary of PA-reported ex ante net annual savings from upstream and residential downstream lighting measures, 2018

PA	PA Reported Net Annual Savings					
	Total Portfolio		Upstream/Residential Downstream Lighting		Upstream/Residential Downstream Lighting as Percent of Total Portfolio	
	Energy (GWh)	Peak Demand Reduction (MW)	Energy (GWh)	Peak Demand Reduction (MW)	Energy (GWh)	Peak Demand Reduction (MW)
PG&E	1,285	342	50	7	4%	2%
SCE	1,347	286	228	34	17%	12%
SDG&E	441	131	161	23	37%	17%
Statewide	**3,073**	**759**	**439**	**64**	**14%**	**8%**

Upstream lighting measures comprised the vast majority of the combined total upstream and residential downstream lighting measures during the 2018 program period (Table 2-5). As such, the remainder of this report focuses on upstream lighting measures, and in particular, the measures identified as part of the ESPI uncertain measure list[14] that account for the majority of ex ante savings within the upstream program. For residential downstream measures and for all upstream measures not included in the three evaluated upstream lighting measure groups described below, we are passing through the ex ante estimates for energy savings (kWh), demand reductions (kW), and gas impacts (therms).[15]

[14] CPUC 2017.

[15] For these "pass through" measures, all ex ante assumptions and inputs are passed through as ex post.

Table 2-5. Summary of PA-reported ex ante upstream and residential downstream lighting measure savings for evaluated and passed-through measure groups, 2018

PA/Lighting Measure Category	Ex Ante Upstream and Residential Downstream Lighting Gross Savings					
	Energy		Demand		Gas Impacts	
	GWh	% of GWh	MW	% of MW	Million Therms	% of Therms
PG&E						
Upstream - evaluated	49.7	93%	7.2	93%	-0.9	93%
Upstream - passed through	2.5	5%	0.4	5%	0.0	5%
Downstream - passed through	1.1	2%	0.1	2%	0.0	2%
Subtotal – PG&E	**53.3**	**100%**	**7.7**	**100%**	**-1.0**	**100%**
Upstream - evaluated	231.2	97%	34.8	98%	-3.5	97%
Upstream - passed through	2.9	1%	0.5	1%	0.0	1%
Downstream - passed through	5.3	2%	0.1	0%	-0.1	2%
Subtotal – SCE	**239.5**	**100%**	**35.3**	**100%**	**-3.6**	**100%**
Upstream - evaluated	166.4	99%	23.6	99%	-2.2	99%
Upstream - passed through	1.1	1%	0.2	1%	0.0	1%
Downstream - passed through	0.6	0%	0.0	0%	0.0	0%
Subtotal – SDG&E	**168.1**	**100%**	**23.8**	**100%**	**-2.2**	**100%**
Upstream – evaluated	447.2	97%	65.5	98%	-6.6	97%
Upstream - passed through	6.5	1%	1.0	1%	-0.1	2%
Downstream - passed through	7.1	2%	0.3	0%	-0.1	1%
Grand Total – All PAs	**460.9**	**100%**	**66.7**	**100%**	**-6.8**	**100%**

Upstream lighting measures fall into six groups, each of which consists of similar measures. For example, the LED reflector measure group includes all LED reflector lamp wattages and styles, such as parabolic aluminized reflector (PAR) and multifaceted reflector (MR) lamps. While savings claims included within the PA tracking data are based on assumptions tied to specific measure characteristics, the evaluation applies updates to savings at the measure group level. The six measure groups are:

- LED reflector lamps of all wattages
- LED candelabra lamps of all wattages
- LED globe lamps of all wattages
- LED A-lamps of all wattages
- LED fixtures of all wattages
- CFL high wattage (> 30 watts)

This evaluation focuses on three of the six upstream lighting measure groups. Taken together, these measures account for 99% of the PAs' ex ante net savings for upstream lighting. Table 2-6 shows the quantity of lamps shipped in 2018 by evaluated lighting measure group and PA.

Table 2-6. Quantity of lamps by evaluated upstream lighting measure group and PA, 2018

Evaluated Upstream Lighting Measure Group	Quantity (Number of Lamps)			Overall Quantity (Across PAs)	
	PG&E	SCE	SDG&E	Total	% of Total
LED reflector	2,700,536	12,446,953	6,652,773	21,800,262	83%
LED candelabra	443,598	1,411,210	879,124	2,733,932	10%
LED globe	75,200	1,124,552	569,501	1,769,253	7%
Overall	**3,219,334**	**14,982,715**	**8,101,398**	**26,303,447**	**100%**

Table 2-7 lists the PA-reported portfolio-level net annual energy savings by evaluated upstream lighting measure for residential and non-residential programs

Table 2-7. Reported portfolio-level ex ante net annual energy savings by upstream lighting measure group for residential and non-residential measures, 2018

Evaluated Upstream Lighting Measure Group	Ex Ante Net Annual Energy Savings (kWh)			
	PG&E	SCE	SDG&E	Overall
LED reflector, all wattages	42,743,253	207,799,922	149,712,783	400,255,957
LED candelabra, wall wattages	3,433,848	9,408,513	6,244,268	19,086,629
LED globe, all wattages	298,528	4,320,725	3,744,399	8,363,653
Pass-through lighting measures	2,405,387	2,641,138	1,040,692	6,087,217
Overall	**48,881,016**	**224,170,298**	**160,742,142**	**433,793,456**

Table 2-8 lists the PA-reported portfolio-level peak demand reductions by evaluated upstream lighting measure for residential and non-residential programs.

Table 2-8. Reported portfolio-level ex ante net annual peak demand reductions by upstream lighting measure group for residential and non-residential measures, 2018

Evaluated Upstream Lighting Measure Group	Ex Ante Net Peak Demand Reductions (kW)			
	PG&E	SCE	SDG&E	Overall
LED reflector, all wattages	6,168	31,244	21,205	58,618
LED candelabra, wall wattages	496	1,409	897	2,802
LED globe, all wattages	43	650	549	1,242
Pass-through lighting measures	347	415	147	909
Overall	**7,054**	**33,719**	**22,798**	**63,571**

2.5 Report overview

We have organized the remainder of this report as follows:

- Section 3 describes the study's data sources.
- Section 4 describes our approach to measure quantity adjustment.
- Section 5 gives an overview of the gross savings methodology and results with examples.
- Section 6 gives an overview of net savings methodology and results with examples as well as the net-to-gross ratios.
- Section 7 provides evaluated gross savings results and net savings results by PA.
- Section 8 includes the evaluation's conclusions and recommendations.
- Section 9 includes a list of references.
- Appendix A provides the ex ante and ex post first year and lifecycle savings tables per the CPUC ED Impact Evaluation Standard Reporting (IESR) Guidelines.[16]
- Appendix B provides the ex post first year, annual, and lifecycle savings and effective useful life (EUL) per the CPUC ED IESR Guidelines.
- Appendix C provides standardized recommendations per the CPUC ED IESR Guidelines.
- Appendix D provides waterfall graphics that demonstrate the energy savings changes relative to each parameter.
- Appendix E includes the data collection instruments used to support the evaluation.
- Appendix F describes the net-to-gross methodology used for this study.
- Appendix G describes the approach for compiling CREED lamp sales data and provides additional sales data tables.
- Appendix H provides tables on results of the lighting shelf stocking surveys.
- Appendix I provides tables on the results of the lighting retail store telephone survey.
- Appendix J provides banner tables of results from the consumer surveys.
- Appendix K describes the methods used for the supplier interviews.

[16] CPUC ED 2015a.

3 DATA SOURCES

In this section, we provide an overview of the data sources used for the evaluation and a summary description of the method used to calculate net-to-gross ratios.

The 2018 impact evaluation relied upon several data sources. Table 3-1 below shows the research activity and data sources aligned with the primary and supporting research questions. We provide more details on these sources in the remainder of this section.

Table 3-1. Research questions and associated research activity/data sources, 2018

Research Question	Research Activity/Data Source							
	Topic	Program Tracking Data	Consumer Lamp Price Elasticity Model	Consumer surveys	Supplier Interviews	Retail Store Surveys	Retail Lamp Shelf Stocking Surveys	CREED Light-Tracker Sales Data
1a. What are the ex post gross savings for evaluated measures?	Evaluated Savings	x	x	x		x	x	
1b. What is the appropriate baseline for residential upstream LED lamps?	Baseline	x	x	x			x	
1c. Of the program lamps that were claimed, what percent and quantity were sold in stores?	Quantity Adjustment	x		x	x	x	x	x
1d. What are the annual sales of lamps and sales-to-shipment ratios in retail stores (including grocery and discount stores)?	Quantity Adjustment	x		x	x	x		x
1e. What are the percent and quantity of claimed program lamps that are received at the intended storefront destination?	Quantity Adjustment/ Leakage	x			x	x	x	
1f. What do retailers do with excess lamp stock?	Quantity Adjustment/ Leakage	x			x	x		
1g. To what extent are program shipments being sold outside of California?	Leakage	x		x		x		
2a. What is the free-ridership level for residential upstream LED lamps?	Freeridership		x	x				
2b. To what extent, if any, did the program increase sales of LED lamps?	Freeridership/ Program Influence	x	x	x	x	x	x	
2c. Are program incentives being passed on to customers when they purchase program lamps?	Program Influence	x	x	x	x	x	x	
2d. What percent of lamp purchases are made online?	Program Influence			x				x

3.1 Program tracking data

Each of the PAs uploads program tracking data onto a centralized server. We downloaded these data and then analyzed, cleaned, re-categorized, reformatted, and merged these separate datasets into one program tracking database. Tracking data provide details regarding the quantity of lighting measures shipped as well as details regarding the manufacturers and retail stores involved in the 2018 upstream lighting program. Tracking data also enable us to produce estimates of the average discounted lamp wattage for each evaluated upstream lighting measure group and PA and provide the ex ante values needed to pass through for specific parameters that we did not address in this evaluation. We provide more discussion regarding the program tracking data in the measure quantity adjustments (Section 4.1) and gross savings analyses (Section 7.1).

3.1.1 Data issues

The evaluation team encountered data quality issues with the program tracking data and residential customer data during the course of the 2018 impact evaluation, including:

- Incomplete or inaccurate retail store phone numbers:
  - Phone numbers of retail stores were missing for numerous records in the tracking data of one PA. After a follow-up data request, the PA provided the missing phone numbers.
  - Approximately one-third of the claims for one PA did not map to any retail stores. After a follow-up data request, the evaluation team was able to resolve the issue.
  - The phone numbers for some retail stores were not accurate across all three PAs. The evaluation team had to do additional research to correct inaccurate phone numbers.
- Estimated shipment quantities:
  - Many stores had an average quantity of shipments across multiple stores. For example, a shipment of 4,000 lamps would be split evenly for a given chain into shipments of 800 across five store fronts.
- Incomplete or inaccurate residential customer data:
  - The evaluation team requested service addresses for one PA, but instead received mailing addresses.
  - The climate zone for the customers of one PA was incorrect. The evaluation team was able to correct the error by referring to other datasets from previous evaluations.

3.2 Lighting sales data

Apex Analytics provided DNV GL with 2018 retail replacement lamp sales data in California from CREED.[17] The sales data included point of sales (POS) data for select retail stores from discount, drug, grocery, mass merchandise, and membership club sales channels. The data also included a panel estimate of the remaining sales across the California market, which included home improvement, hardware, remaining stores from the point-of-sale (POS) channels, and online stores. Apex Analytics processed and analyzed the POS and non-POS panel data and summarized the data in tables by lighting technology (CFL, LED, halogen, incandescent) and by lamp style (reflector, candelabra, globe, A-lamp/spiral). See Appendix G for a description of the CREED sales data and associated 2018 sales data tables.

[17] Apex Analytics 2020.

3.3 Lighting retail store telephone surveys

During October 2019 the evaluation team conducted computer-assisted telephone interviewing (CATI) surveys with grocery, discount, big box, and other stores in PGE, SCE, and SDG&E service territories that received shipments of PA-discounted lamps in 2018.[18] The primary research objective of the telephone surveys was to obtain an estimate of lighting sales volume in these stores in each service territory. The secondary research objective of the surveys was to better understand what these stores do with any unsold PA-discounted lamps.

The team's sampling expert divided the stores that received 2018 PA-discounted lamps in 2018 into 18 strata, which included combinations of independent and chain grocery and discount stores in each service territory. As shown in Table 3-2, the team targeted 600 completed surveys and ultimately completed 583 surveys. Discount and grocery stores comprised more than 80% of the targeted sample because 81% of PA-discounted lamps were shipped to these stores in 2018. The sample design was created with a targeted 90/10 precision on sales estimates, using the shipments as proxy. Notably, there were 112 stores that responded they did not sell light bulbs and had not sold any in the last three years. We show results and standard errors in Section 4.1.5. For further details on the results of the fall 2019 retail store telephone surveys, please see Appendix I. For the data collection instrument, please see Appendix E.

Table 3-2. Final disposition of fall 2019 lighting retail store telephone surveys

PA	Channel	Target	No Lamp Sales (in last 3 years)	Sell or Have Sold Lamps and Provided Sales Estimate	Total Complete
PGE	Big Box	20	0	20	20
PGE	Chain Discount	20	0	20	20
PGE	Independent Discount	7	0	2	2
PGE	Chain Grocery	17	2	15	17
PGE	Independent Grocery	32	8	22	30
PGE	Other	25	0	25	25
SCE	Big Box	20	0	20	20
SCE	Chain Discount	40	6	34	40
SCE	Independent Discount	54	5	42	47
SCE	Chain Grocery	35	5	30	35
SCE	Independent Grocery	130	35	96	131
SCE	Other	15	0	15	15
SDG&E	Big Box	16	0	15	15
SDG&E	Chain Discount	20	5	15	20
SDG&E	Independent Discount	15	4	9	13
SDG&E	Chain Grocery	4	1	3	4
SDG&E	Independent Grocery	120	41	78	119
SDG&E	Other	10	0	10	10
Total		**600**	**112**	**471**	**583**

[18] Big box stores included large home improvement and membership club stores. Other stores primarily included small hardware stores as well as some lighting and electronics stores.

3.4 Consumer surveys

During November 2019, DNV GL conducted online surveys with PG&E, SCE, and SDG&E residential electric customers in support of the 2018 impact evaluation. These surveys asked consumers how many lamps they purchased within the reflector, candelabra, and globe lamp replacement categories since January 1, 2018, and where they made those purchases. The 2019 consumer telephone survey addressed several key inputs to the 2018 upstream and residential downstream lighting program impact evaluation, including:

- Retail channels where consumers purchased lamps
- Quantity and proportion of lamps purchased in each retail channel
- Installation rates
- Inputs into Consumer Lamp Price Elasticity Model[19]

Respondents to the online consumer survey were asked to verify their electricity provider and zip code of their primary home before being asked a series of questions on any recent lamp purchases in California. All recent purchasers were asked whether they purchased reflector, candelabra, or globe lamps in four primary technology categories (LED, incandescent/halogen, CFL). Images of each lamp style shown for multiple technologies were presented to respondents along with the question of whether their recent purchase was a given lamp style (e.g., reflectors) in the live online version of the survey. Within each of the three lamp styles, respondents were asked to identify the technology or technologies they purchased, where they made their purchase or purchases, and how many lamps they purchased at each purchase location. Again, respondents were prompted with photos of each technology to help them identify the technology they purchased in the online version of the survey.

After collecting information on purchase location and total number of lamps purchased, respondents who purchased LEDs were asked how many lamps from their recent purchase(s) are currently installed. LED purchasers who did not install all of their recently purchased LED lamps were asked how many lamps they plan to install at their home in the next year. From this series of questions, we were able to determine an installation rate for the three evaluated measures. Section 4.4 provides a summary of installation rate results.

Following the series of questions on LED installations, respondents were presented with lamp purchasing scenarios, depending on the lamps that they bought, showing choices between LED and incandescent/halogen lamps at different price points for one or more lamp styles (reflector, candelabra, and/or globe). We provide a description of how these results were used to inform the Lamp Price Elasticity Model and net-to-gross calculations in Section 3.8 and Appendix F. For detailed consumer survey banner tables of results, please see Appendix J. For the online consumer survey data collection instrument, please see Appendix E.

Table 3-3 shows the targeted and actual number of completed online surveys by stratum. We allocated approximately 40% of the overall sample for PG&E, 40% for SCE, and 20% to SDG&E, and then allocated the sample proportionally to the average daily kWh in each stratum. The targeted number of completed surveys was 599 and the actual number of completed surveys was 1,765. The available number of customers in each stratum was based on availability of the email addresses. We provide further details on

[19] Please see Section 3.8 for a description of the Lamp Price Elasticity Model.

the sample stratification for the online consumer survey in the data collection and sampling plan for the 2018 program year.[20]

Table 3-3. Final disposition of the 2019 online consumer surveys

PA/Stratum	Climate Zone Group	CARE/ FERA Participant	Usage Class	Targeted Completes	Actual Completes	Total Customers	Available Number of Customers
PG&E				**238**	**574**	**5,748,067**	**3,819,033**
1	Inland/Desert	Y	Low	20	57	399,108	203,881
2	Inland/Desert	Y	Med	20	39	206,774	120,953
3	Inland/Desert	Y	High	20	39	118,579	78,666
4	Inland/Desert	N	Low	22	53	1,020,214	693,857
5	Inland/Desert	N	Med	22	39	409,887	275,561
6	Inland/Desert	N	High	22	59	217,059	150,216
7	Inland/Desert	Net Meter	Net Meter	6	16	102,478	75,465
8	Mild	Y	Low	17	50	319,152	152,826
9	Mild	Y	Med	17	36	150,216	84,145
10	Mild	Y	High	17	45	60,340	37,454
11	Mild	N	Low	17	36	1,705,761	1,225,941
12	Mild	N	Med	17	50	681,724	470,485
13	Mild	N	High	17	41	297,857	206,431
14	Mild	Net Meter	Net Meter	4	14	58,918	43,152
SCE				**243**	**882**	**4,622,195**	**1,421,254**
15	Inland/Desert	Y	Low	21	95	168,095	50,043
16	Inland/Desert	Y	Med	21	73	75,947	31,678
17	Inland/Desert	Y	High	21	56	34,076	15,211
18	Inland/Desert	N	Low	16	36	1,777,890	439,265
19	Inland/Desert	N	Med	16	56	832,347	297,987
20	Inland/Desert	N	High	16	53	443,721	173,219
21	Inland/Desert	Net Meter	Net Meter	16	66	261,967	125,223
22	Mild	Y	Low	20	71	64,019	18,507
23	Mild	Y	Med	20	73	26,910	10,112
24	Mild	Y	High	20	85	10,893	4,187
25	Mild	N	Low	14	36	542,580	127,681
26	Mild	N	Med	14	61	235,831	74,743
27	Mild	N	High	14	42	110,368	36,442
28	Mild	Net Meter	Net Meter	14	79	37,551	16,956

[20] DNV GL 2019b.

PA/Stratum	Climate Zone Group	CARE/ FERA Participant	Usage Class	Targeted Completes	Actual Completes	Total Customers	Available Number of Customers
SDG&E				**118**	**309**	**1,569,894**	**1,307,489**
29	Inland/Desert	Y	Low	9	22	54,941	38,744
30	Inland/Desert	Y	Med	9	14	29,130	22,639
31	Inland/Desert	Y	High	9	23	16,113	13,404
32	Inland/Desert	N	Low	11	22	159,913	131,448
33	Inland/Desert	N	Med	11	34	68,970	56,932
34	Inland/Desert	N	High	11	35	36,681	31,100
35	Inland/Desert	Net Meter	Net Meter	5	25	67,730	62,023
36	Mild	Y	Low	7	14	134,143	97,568
37	Mild	Y	Med	7	15	68,896	54,755
38	Mild	Y	High	7	15	39,501	33,068
39	Mild	N	Low	9	21	500,673	429,132
40	Mild	N	Med	9	22	206,773	173,596
41	Mild	N	High	9	27	101,556	85,958
42	Mild	Net Meter	Net Meter	5	20	84,874	77,122
Total for all PAs				**599**	**1,765**	**11,940,156**	**6,547,776**

3.5 Lamp supplier in-depth interviews

DNV GL staff conducted in-depth telephone interviews with lamp supplier representatives during November and December of 2019. Individual respondents were representatives of lamp manufacturing organizations, and the sample frame included 11 lamp manufacturers that shipped discounted lamps in evaluated upstream lighting measure groups through the 2018 upstream lighting program.[21]

Our supplier interviews addressed the following topics:

- Upstream lighting program and participation history
- LED and other lamp technology sales in California
- Influence of upstream lighting program on LED lamp sales
- Insights into where LED lamps are sold and how the program influences lamps sales by channel (channel shift)

In addition to these topics, interviewers asked manufacturer representatives a series of questions about the process and requirements of participating in the 2018 upstream lighting program. Topics included:

- Communications with program staff
- Required documentation for lamps shipped through the program

[21] The eight lamp manufacturing organizations that were successfully reach for in-depth interviews accounted for 98% of the program lamps that were shipped through the 2018 California Upstream Lighting Program.

- How manufacturers determine which retail stores to partner with
- Communications with retail store representatives
- How program rebates are issued and the extent to which the rebates cover lamp manufacturing costs and profit
- Whether retail stores were required to purchase program lamps from manufacturers
- Details on the process for shipping program discounted lamps to retail stores

We provide further details on the results of these interview in Appendix K. For the supplier interview guide, please see Appendix E.

3.6 Retail lamp shelf stocking surveys

The evaluation team conducted detailed inventories of lamps for sale in California retail stores throughout PG&E, SCE, and SDG&E service territories in support of the 2018 impact evaluation and prior evaluation periods. The shelf stocking surveys gathered information regarding residential replacement lamps stocked in retail stores. The team completed the most recent phase of shelf stocking surveys during the winter of 2018-19 (November 2018 through February 2019).

The shelf stocking surveys targeted a sample of 200 stores. We stratified the sample by retail channel and PA service territory and designed the sample to represent the retail market for residential lamps in these areas. The sample design targeted roughly equal numbers of stores in each retail channel to ensure enough sample points per channel to enable channel-to-channel comparisons. Field staff attempted to revisit the stores included in the Winter 2015-16 shelf stocking surveys to enable time-series comparisons of lamp stocking volumes across the retail stores for market characterization purposes.

Table 3-4. Number of targeted and completed shelf stocking surveys by channel and PA, winter 2018-19

Channel	PG&E	SCE	SDG&E	Total
Discount	11	11	7	29
Drug	11	11	7	29
Grocery	10	11	7	28
Hardware	11	11	7	29
Home improvement	11	10	7	28
Mass merchandise	10	11	8	29
Membership club	11	10	7	28
Total	**75**	**75**	**50**	**200**

We provide a summary of the Winter 2018-19 and Winter 2015-16 shelf stocking results in Appendix H. These results include comparisons of lamp availability and pricing for those two time periods. Appendix B of the 2015 upstream lighting impact evaluation provides further details on the sampling approach for the shelf stocking surveys.[22] For the shelf stocking survey guide, please see Appendix E.

3.7 Prior EM&V studies

[22] DNV GL 2017b.

We relied upon data from other EM&V studies to support the overall evaluation efforts that we describe below. These data sources include:

- Upstream and Residential Downstream Lighting Impact Evaluation Report: Lighting Sector – Program Year 2017 (DNV GL, 2019c). This study included all lighting measures associated with upstream delivery mechanisms and all downstream lighting measures targeted at the residential sector. The impact evaluation focused on four measures that collectively accounted for 90% percent of the PAs' ex ante net savings from upstream and residential downstream measures. These measures included LED A-lamps, LED reflectors, high wattage CFLs (>30 watts), and basic spiral CFLs.
- Impact Evaluation of 2015 California Upstream and Residential Downstream Lighting Programs (DNV GL, 2017). This study included all lighting measures associated with upstream delivery mechanisms and all downstream lighting measures targeted at the residential sector. The impact evaluation focused on six measures that collectively accounted for over 87% percent of the PAs' ex ante net savings from upstream and residential downstream measures. These measures included basic spiral CFLs, CFL A-lamps, CFL reflectors, high wattage CFLs (>30 watts) LED A-lamps, and LED reflectors.
- California Lighting and Appliance Saturation Study (DNV GL, 2014a). The California Lighting and Appliance Saturation Study (CLASS) updates and augments saturation and efficiency characteristics from previous CLASS studies conducted in 2005 and 2000 for use in understanding future energy savings potential and past accomplishments in the residential sector. The 2012 CLASS included onsite observations on a sample of 1,987 single-family, multi-family, and mobile home residences with individually metered electric accounts across the service territories of PG&E, SCE, and SDG&E. The program year 2018 impact evaluation relied upon CLASS data to update the HOU and peak coincidence factors for LED lamps. We provide more detail in Section 5 (Gross Savings).
- Residential Lamp Inventory and Metering Study (DNV GL, 2014c). We conducted detailed lamp inventories and hours-of-use metering of lamps in more than 2,000 California households as part of the California Upstream and Residential Lighting Impact Evaluation Work Order 28 (WO28) Final Report. In this evaluation, we apply these saturation data to metering data collected in support of the 2006-2008 evaluation to support estimates of average daily hours of use and peak coincidence factor. Please refer to our gross savings analyses in Section 5 for further detail.

3.8 Lamp Price Elasticity Model

The evaluation developed a residential consumer Lamp Price Elasticity Model to support the NTGR methodology in this evaluation. This year's model is similar to the model used in the California 2010-12, 2013-14, 2015, and 2017 upstream and residential downstream lighting evaluations.[23] The model differs from those used in prior evaluations in the following ways:

- We calculated a **market-wide counterfactual** with an assumption that lamp purchases would have occurred throughout the lighting market in the proportions that customers reported making them. Prior evaluations calculated NTGR for each channel. Due to the dominance of lamps in the grocery and discount channels and the likelihood that these purchases shifted customers from other channels, it was most appropriate to consider the counterfactual across the entire market.

[23] DNV GL 2014c, DNV GL 2016a, DNV GL 2017b, and DNV GL 2019c.

- We used a **price elasticity model** rather than a discrete choice logit model, which was the most appropriate method to leverage our data within the time and resources we had available
- Due to low CFL stock and sales in the market, we only included **incandescent/halogen** lamps in the model and simulations.

As with the models in prior evaluations, the Lamp Price Elasticity Model relies on data from the retail lamp shelf stocking surveys. We used an online survey that collected information on consumer choices required for the model, and we used the shelf surveys to capture information regarding the context for those choices, including details related to the selected lamp and its price.

For the 2018 impact evaluation, our approach to using the price elasticity model was as follows:

1. **Calculate channel-level average prices** for program LED lamps, non-program LED lamps, and incandescent/halogen lamps for each lamp style in each channel. We used data from shelf stocking surveys conducted in Winter 2018-19 to calculate these averages. The average prices for incandescent/halogen categories were combined weighted averages of both technologies.
2. **Weight channel-level prices to overall program and market prices.** For program LED lamps, we weighted up to an overall average program price using program lamp sales (as calculated in Section 4.1). We use this weight because the overall average price is reflective of the distribution of prices of program lamps that sold. For the average prices of non-program LED lamps and incandescent/halogen lamps, we weighted up to an overall average price using the relative percent of market sales for each channel (as reported in the Consumer Survey discussed in Section 3.4). We chose these weights because we assumed that most program LED lamps were within grocery and discount stores at very low prices, and therefore, these program lamps most likely induced channel shift. To account for channel shift, we considered market-wide prices for alternative and non-program lamps.
3. **Estimate market shares under two scenarios.** We used the average program LED lamp, non-program LED lamp, and incandescent/halogen prices to estimate market shares within a "with program scenario" and a "without program scenario."
   - **With program scenario.** This scenario reflects the average program lamp prices that the evaluation team observed in retail stores during the shelf stocking surveys conducted in Winter 2018-19. This scenario results in an estimate of the share of program lamp sales for LEDs and incandescent/halogen lamps.
   - **Without program scenario.** This scenario reflects the lamp prices that consumers would have seen in California retail stores in 2018 if the program had not occurred. This scenario results in a counterfactual estimate of market shares that would have occurred if only prices of program discounted lamps changed due no program activity.

In the 2017 evaluation, we used the Lamp Choice Model to calculate the market shares of incandescent/halogen lamps and CFLs in the delta watts baseline. In this evaluation, we found that CFLs no longer have enough market saturation to merit their inclusion in the model. Therefore, since the only alternative technologies are halogen and incandescent lamps, we no longer need the Lamp Choice Model to estimate a baseline.

Table 3-5 lists the strengths and weaknesses of the model-based net savings approach. Appendix F provides the coefficients for the price elasticity model and provides more detail regarding its methodology.

Table 3-5. Strengths and weaknesses of the model-based net savings approach

Strengths	Weaknesses
• *Representative consumer surveys inform the model estimation:* We conducted a robust, stratified consumer survey to quantify customer purchasing decisions. This approach is the most representative way to capture state-wide price elasticity. • *Streamlined, practical, and efficient:* While prior evaluations leveraged the Lamp Choice Model, using that model for the 2018 program would require a new round of intercept surveys. The 2018 program was heavily concentrated in grocery and discount stores; these stores are notoriously difficult to intercept customers actively purchasing lamps. In prior intercept survey efforts, field staff would typically not encounter any lamp purchasers in grocery and discount stores. Therefore, the efficiency and practicality of this approach is a core strength. • *Simulation based on up-to-date retail stocking information:* We built the simulation using shelf survey data from a representative sample of California retail stores that sold replacement lamps during the 2018 program period. These data record the distribution of lamp models and prices at each store, and these data ground our analyses in the choices that consumers faced during the program period. • *Model stability:* Through a rigorous sensitivity analysis, we found that the model results remained stable and intuitive.	• *The model does not explicitly represent sales volume:* The model predicts market shares. As such, the model does not endogenously account for the different volumes of program shipments. • *The model does not comprehensively address substitution between program and non-program lamps:* Some stores, such as those in the home improvement channel, have more non-program lamps than program-discounted lamps. The model does not handle this market situation as well as situations in which the volume differences are less skewed. • *The model does not capture nuances of lamp, customer, or retail attributes.* The model is based exclusively on price. Therefore, it does not account for other lamp attributes, such as color temperature or rated life, and it does not account for other influences such as marketing and product location in the store.

4 MEASURE QUANTITY ADJUSTMENT

An important part of the upstream evaluation is to verify and adjust the quantity of measures claimed in the program tracking data. This evaluation uses multiple measure quantity adjustments to the claimed quantities of measures to determine the final quantities that will have the evaluated unit energy savings (UES) applied to for savings calculations. We produced an updated "sales-to-shipment ratio" quantity adjustment using a robust retail store survey. The evaluation team created the "sales-to-shipment ratio" quantity adjustment in the 2017 upstream lighting impact evaluation. The evaluation also applied a residential and non-residential split for all upstream measures, and applied an installation rate to all upstream measures, consistent with prior upstream lighting evaluations.

4.1 Sales-to-shipment ratio

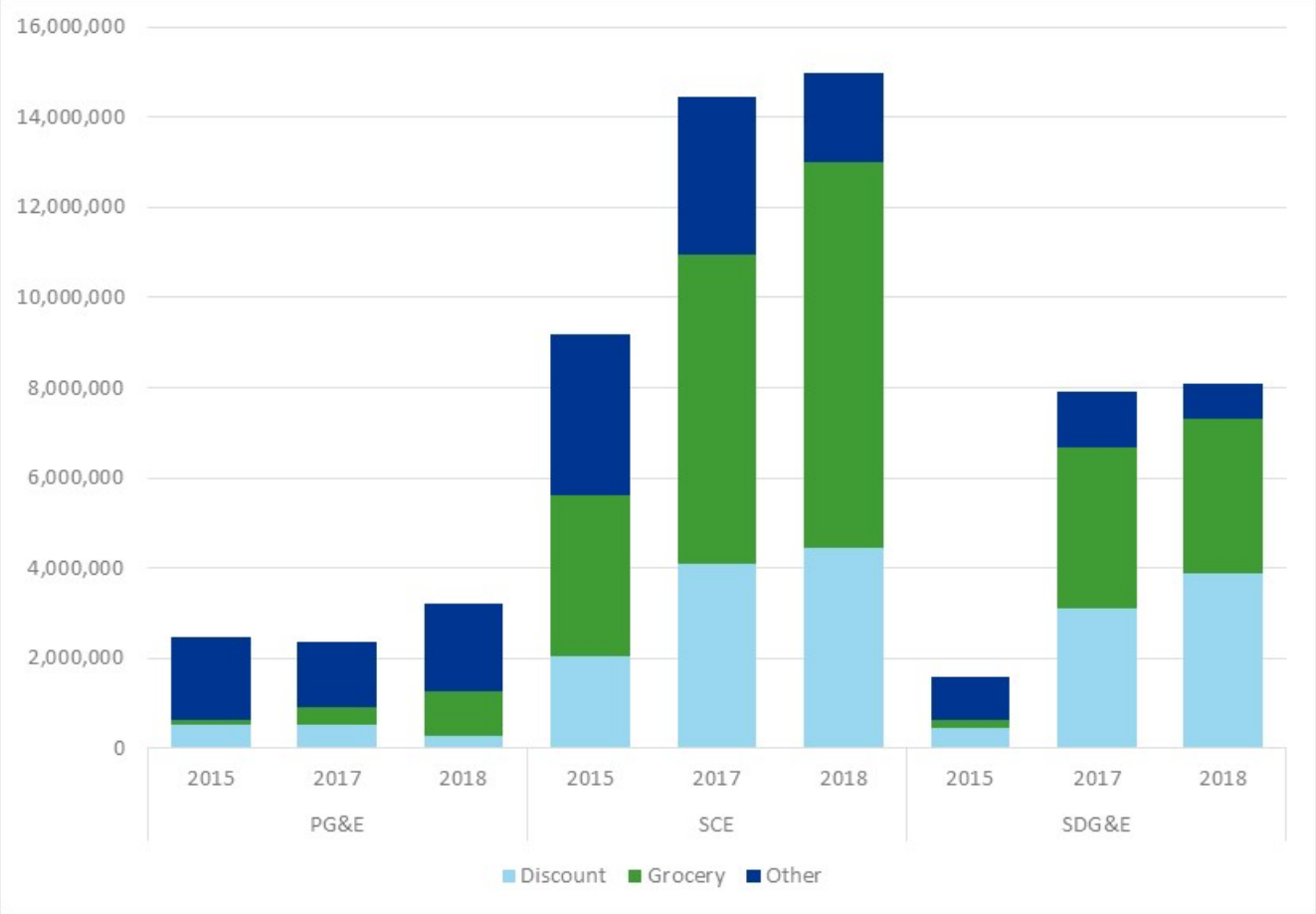
4.1.1 Overview

The 2018 impact evaluation applied a "sales-to-shipment ratio" at the sales channel level. The quantity adjustment is needed to account for heavy program activity in sales channels, mainly grocery and discount stores, that could not support the volume of lamps that were shipped through the upstream lighting program.

The "sales-to-shipment ratio" was introduced in the 2017 impact evaluation when evaluators found unusually large volumes of lamps shipped to many small stores in SCE and SDG&E territories. The reported number of lamps shipped to certain sales channels was significantly higher than the number of total California lamp sales in those channels, as determined from other data sources. The 2018 upstream lighting program continued this trend, especially in the discount and grocery sales channels.

Figure 4-1 shows the quantity of lamps shipped by channel and PA in 2015, 2017 and 2018. As was the case in 2017, the vast majority of upstream lighting program lamps were shipped to discount and grocery channels in 2018. Over 80% of the 2018 program shipments went to discount and grocery channels across all PAs, and nearly 90% SCE's and SDG&E's 2018 program shipments went to these two channels.

Figure 4-1. Quantity of lamps in evaluated upstream lighting measure groups by channel* and PA, 2015, 2017 and 2018



*Other channels include drug, hardware, home improvement, lighting and electronics, mass merchandise, and membership club stores.

To address the issue of such large quantities of lamps being shipped to discount and grocery stores, we calculated and applied a sales-to-shipment quantity adjustment. This quantity adjustment aligned the quantity of measures discounted and shipped in the upstream lighting program with the sales volume that the California replacement lamp market could reasonably accommodate. To understand the relative size and distribution of the California replacement lamp market, we leveraged the data sources in Table 4-1. To calculate the sales-to-shipment ratio, we used the results of the Fall 2019 Retail Store Survey.

Table 4-1. Datasets, sources, and value points used in calculating the sales-to-shipment ratio.

Dataset	Source	Analysis
California Lamp Sales Data	Consortium of Retail Energy Efficiency Data (CREED)*	Estimated top down total sales volume in California and select metro areas
PGE, SCE and SDG&E participating store lamp inventory and sales	Fall 2019 Store Manager Survey^	Estimated total lamp sales volume within the stores that participated in the program in all sales channels
California lamp purchase locations	2019 Online Consumer Survey[#]	Estimated where consumers buy lamps by channel
California statewide retail lamp stock inventory	2008-2019 Shelf Surveys[$]	Reviewed statewide stocking patterns

*Please see Appendix G for more information on the CREED sales data.
^To view the store manager survey instrument, please see Appendix E.
[#]For further details on the 2019 Consumer Survey approach and results, please see Section 3.4 and Appendix J.
[$]For an overview of the Winter 2018-2019 and Winter 2015-2016 shelf survey results, please see Appendix H.

4.1.2 Size of the California lighting market

Apex Analytics compiled sales data for California in 2018 through the Consortium of Retail Energy Efficiency Data (CREED). The data included point-of-sale (POS) data for select retail stores from discount, drug, grocery, mass merchandise, and select membership club channels (POS estimate). The data also included a panel estimate of sales from other channels in the market, which included home improvement, hardware, and online stores, and remaining stores not included in the POS dataset (non-POS estimate).

We did not use the CREED sales data for any calculations of quantity adjustments or savings for impact analysis. Instead, we show the data to illustrate the overall size of market and relative shares of lamp technologies and styles.

Table 4-2 shows a breakdown of total lamp sales in California in 2018 by technology and lamp style for the POS and non-POS estimates as well as the combined total sales from the POS and non-POS datasets. The CREED estimates for total lamp sales volume are on the low end of the range the evaluation team looked at for California lighting market sales. However, the data illustrate which technologies and lamp styles comprised the largest and smallest percent of total sales in California. LEDs comprised over 60% of all screw-base lamp sales in 2018. Additionally, LED A-lamps accounted for 79% of all LED sales, while the lamps identified as evaluated measures for PY 2018 (reflector, candelabra, and globe) accounted for approximately 21% of all LED sales.

Table 4-2. California replacement lamp sales estimates, 2018

Technology	Lamp Shape	Total Sales by Lamp Style	Total Sales
LED	A Lamp	40,219,152	52,133,804
	Reflector	5,094,092	
	Candelabra	3,802,522	
	Globe	1,985,778	
CFL	A Lamp/Spiral	6,250,764	6,307,853
	Reflector	46,762	
	Candelabra	726	
	Globe	9,599	
Halogen	A Lamp	9,724,834	15,668,459
	Reflector	971,934	
	Candelabra	2,877,379	
	Globe	1,754,697	
Incandescent	A Lamp	3,891,496	9,894,188
	Reflector	724,896	
	Candelabra	3,337,381	
	Globe	1,679,904	
Total Sales		**82,371,916**	**84,004,304**

4.1.3 Discount and grocery channels market capacity compared with program volumes

We used the CREED sales data estimates of the entire California lamp market and 2018 consumer surveys to estimate sales in discount and grocery store. This is an illustrative example of why we believe that the program activity in these sales channels is oversaturating the market to the point that these stores could not support. Table 4-3 shows a breakdown of estimated total lamp sales, lamp sales in grocery and discount channels, and program lamp shipments in California in 2018. When comparing the estimated 4 to 5 million lamps sold across *all* lamp technologies and styles in discount and grocery stores to the program shipments of LED lamps (almost 22 million), it becomes clear that the upstream lighting program discounted and shipped more lamps than these channels could support.

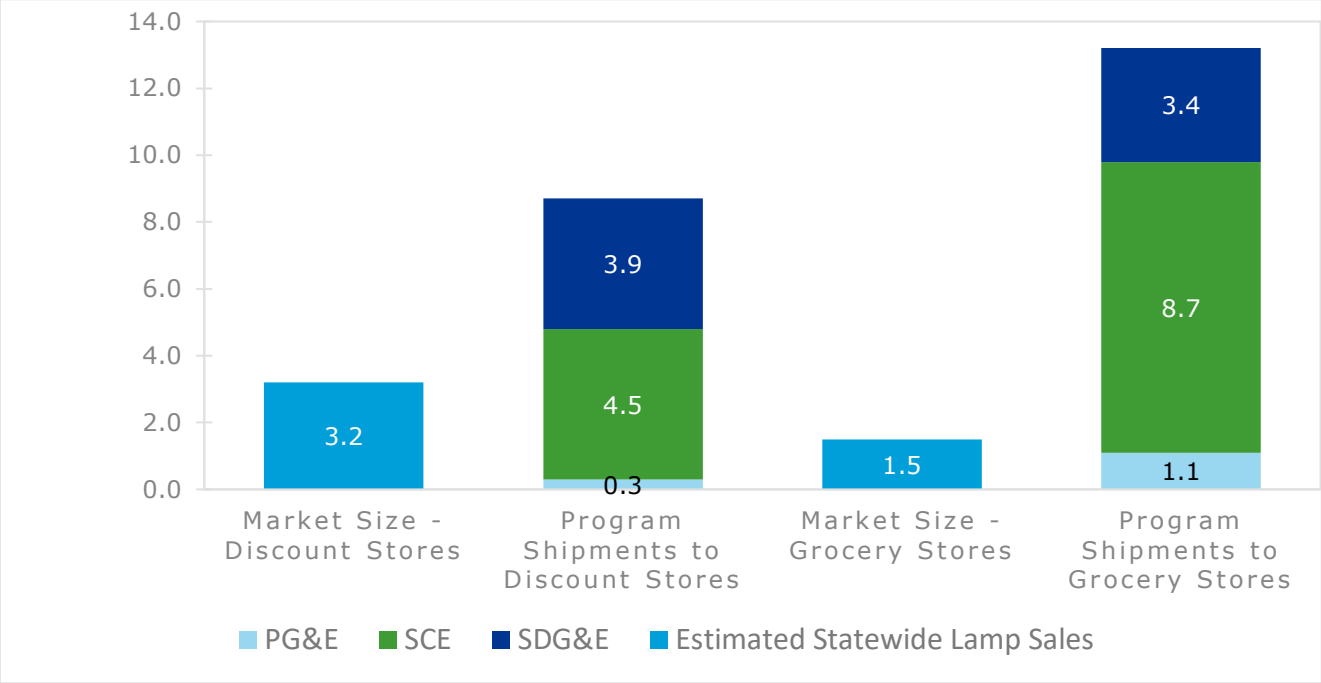
Table 4-3 Estimated California lamp market size (sales) and program shipments for discount and grocery channels, 2018

Retail Channel and Data Source	Estimated Statewide Lamp Sales Range (Million)	Program Shipments (Million)			
		PG&E	SCE	SDG&E	Total
Discount Stores*	2.9-3.3	0.3	4.5	3.9	**8.7**
Grocery Stores*	1.3-1.5	1.1	8.7	3.4	**13.2**
Total California Market^	80-90				

*The 2019 consumer survey results show that slightly more than 5% of the lamps that consumers purchased were in the discount and grocery channels (3.6% of lamps were purchased in the discount channel and 1.6% of lamps were purchased in the grocery channel).
^ CREED 2018 California lamp sales data.

To further illustrate the magnitude of program lamps shipped to the discount and grocery channels, Figure 4-2 shows a comparison of the estimated lighting market in the discount and grocery channels when compared to the program shipments in 2018. For this illustration, we have assumed a total market size of 90 million lamps across all retail store types. It is important to note that the market size estimate is for all lighting products, including the most common general service A-lamps, while the program bulbs were overwhelmingly comprised of reflector, candelabra, and globe lamps. The figure clearly illustrates the magnitude of the over-shipment of lamps to these two sales channels. Even if the total market size were double our estimate of 90 million lamps, the program still would have shipped far more lamps to grocery and discount stores than the market capacity for all lighting products in discount and grocery stores.

Figure 4-2 Quantity of lamps program lamps shipped to grocery and discount stores compared to the estimated market size of the sales channel (in millions of lamps)



4.1.4 Distribution of shipments to individual stores

The evaluation team also analyzed the quantity of lamps that programs shipped to each individual store in the tracking data to understand how the program was functioning in the market. Table 4-4 breaks down the number of stores in the discount and grocery channel by bins of total program lamps shipped in 2018. To give some context of how program lamp shipments and lamp sales relate to one another, a store receiving 10,000 lamps would need to sell nearly 30 lamps a day, every day of the year, to sell through that volume of lamps. Over 85% of all upstream shipments went to stores that received over 10,000 lamps in 2018, with some stores receiving more than 50,000 or 100,000 lamps. This analysis further reinforces the need to determine a sales-to-shipment quantity adjustment to account for the sales volume that stores in the discount and grocery sales channels could support.

Table 4-4 Number of discount and grocery stores receiving program lamps by PA, by quantity of shipped program lamps, 2018

Range of Lamps Shipped to Individual Store	Count of Participant Stores			Total Quantity of Discounted Lamps		
	PG&E	SCE	SDG&E	PG&E	SCE	SDG&E
Discount Stores						
1-1,000	2	-	13	1,352	-	9,488
1,001 – 5,000	56	53	4	132,482	198,484	9,116
5,001 – 10,000	19	82	4	119,700	653,680	29,608
10,001 – 50,000	5	187	50	62,440	3,604,302	1,112,088
50,001 – 100,000	-	1	20	-	52,206	1,262,040
Greater than 100,000	-	-	7	-	-	1,464,608
Total	**82**	**323**	**98**	**315,974**	**4,508,672**	**3,886,948**
Grocery Stores						
1-1,000	49	-	177	30,424	-	133,480
1,001 – 5,000	19	93	47	58,560	318,525	158,197
5,001 – 10,000	5	141	42	42,336	976,768	293,935
10,001 – 50,000	69	366	155	925,162	7,265,461	2,796,593
50,001 – 100,000	-	3	1	-	182,100	65,100
Greater than 100,000	-	-	-	-	-	-
Total	**142**	**603**	**422**	**1,056,482**	**8,742,854**	**3,447,305**

4.1.5 Sales-to-shipment ratios determined from store manager surveys

Tables 4-3 and 4-4 above provide evidence that the 2018 upstream lighting program shipments exceeded the capacities of the discount and grocery channels. However, that analysis does not provide the data needed for adjusting the shipments to estimated sales quantities. To develop the sales-to-shipment quantity adjustment factor, the evaluation team conducted a CATI survey of store retail store representatives that participated in the 2018 upstream lighting programs. For the survey, we designed a sample that would be representative of participating stores. See Section 3.3 above for the sample targets and actual completes. We asked the store representatives if they sold light bulbs. We then asked them to estimate their weekly lamp sales and describe what their store does with any unsold lamps. From these data, we calculated the ratio of annual sales capacity to 2018 program shipments, by PA, channel, and subchannel (independent vs. chain store). We applied this sales-to-shipment ratio as a quantity adjustment factor for each of these segments. See Appendix I for additional results from the survey, and Appendix E for the data collection instrument.

Table 4-5 shows the results from the retail store survey. Most survey respondents provided estimates of weekly lamp sales as a range in response to the survey question about weekly sales. However, the CATI survey instrument was programmed to extrapolate daily, monthly, or quarterly estimated sales to annual sales, if respondents preferred to estimate sales in different increments of time. We took the highest value of the weekly range estimates and multiplied it by 52 to obtain yearly sales estimates. The sales-to-shipment ratio for each PA and sub-channel is calculated as a standard ratio estimate. Specifically, the numerator of the ratio is the weighted total of yearly sales calculated from the survey responses, using the

sample-based expansion weights. The denominator of the ratio is the corresponding expansion-weighted total of shipments for the stores in the sample.

Table 4-5 - Store manager survey results by PA and chain and independent channel

PA and Channel	Completed Surveys	Number of Stores in Program	Program Shipments	Weighted Shipments	Weighted Sales Estimate	Sales-to-Shipment Ratio
PGE	114	463	3,610,411	1,610,906	15,669,014	
Big Box	20	121	2,064,393	341,819	13,378,365	1
Chain Discount	20	73	242,822	215,124	592,935	1
Independent Discount	17	9	73,152	6,084	126,360	1
Chain Grocery	2	56	71,912	46,263	37,856	0.82
Independent Grocery	30	86	984,570	900,500	96,446	0.11
Other	25	118	173,562	101,117	1,437,051	1
SCE	288	1,113	15,216,915	13,227,534	12,126,281	
Big Box	20	132	1,057,239	58,648	9,630,192	1
Chain Discount	40	144	1,390,210	1,384,077	526,219	0.38
Independent Discount	35	179	3,118,462	2,912,231	619,477	0.21
Chain Grocery	47	138	1,198,620	1,361,532	283,349	0.21
Independent Grocery	131	465	7,544,234	6,745,631	529,745	0.08
Other	15	55	908,150	765,417	537,299	0.7
SDG&E	181	595	8,222,282	8,027,442	3,877,395	
Big Box	15	48	725,953	302,470	2,853,760	1
Chain Discount	20	56	3,395,096	3,755,410	239,221	0.06
Independent Discount	4	42	491,852	443,197	159,768	0.36
Chain Grocery	13	4	48,552	83,388	8,632	0.1
Independent Grocery	119	418	3,398,753	3,259,360	258,275	0.08
Other	10	27	162,076	183,616	357,739	1

Table 4-5 above shows that the ratios of sales-to-shipments were different for independent stores than for chains. This was a primary reason why we chose to sample by subchannel for the survey. For the evaluation, we combined the subchannel ratios to provide channel-level ratios, weighting each subchannel ratio in proportion to its total shipments.

Table 4-6 shows the channel-level sales-to-shipment ratios. These are the ratios that were applied to the quantities in the program tracking data. For PG&E we applied a 14% quantity adjustment for the grocery channel. We did not apply an adjustment for discount stores in PGE territory because the shipments in that channel did not exceed estimated sales. For SCE, we applied a 27% quantity adjustment in the discount channel and a 10% quantity adjustment in the grocery channel. For SDG&E, we applied a 10% quantity adjustment in the discount channel and an 8% quantity adjustment in the grocery channel.

Table 4-6 - Store manager survey results by aggregated channel

PA and Channel	Completed Surveys	Number of Stores in Program	Program Shipments	Weighted Shipments	Weighted Sales Estimate	Sales-to-Shipment Ratio	Ratio Standard Error
PGE	**114**	**463**	**3,610,411**	**1,610,906**	**15,669,014**		
Big Box	20	121	2,064,393	341,819	13,378,365	1.00	N/A
Discount	37	82	315,974	221,208	719,295	1.00	N/A
Grocery	32	142	1,056,482	946,763	134,302	**0.14**	0.04
Other	25	118	173,562	101,117	1,437,051	1.00	N/A
SCE	**288**	**1,113**	**15,216,915**	**13,227,534**	**12,126,281**		
Big Box	20	132	1,057,239	58,648	9,630,192	1.00	N/A
Discount	75	323	4,508,672	4,296,308	1,145,696	**0.27**	0.05
Grocery	178	603	8,742,854	8,107,162	813,095	**0.10**	0.02
Other*	15	55	908,150	765,417	537,299	1.00	N/A
SDG&E	**181**	**595**	**8,222,282**	**8,027,442**	**3,877,395**		
Big Box	15	48	725,953	302,470	2,853,760	1.00	N/A
Discount	24	98	3,886,948	4,198,607	398,989	**0.10**	0.04
Grocery	132	422	3,447,305	3,342,748	266,907	**0.08**	0.02
Other	10	27	162,076	183,616	357,739	1.00	N/A

*The "Other" channel for SCE had a sales-to-shipment ratio of 0.70, due to the smaller number of completed surveys in this stratum. Because the "Other" channel for PG&E and SDG&E has a sales-to-shipment ratio of 1.00 and considering the higher likelihood of variation with a lower number of sample points, the evaluation team decided not to apply the sales to shipment ratio in this channel for SCE.

Table 4-7 shows the effect of the sales-to-shipment quantity adjustments that we applied to the grocery channel for PG&E and discount and grocery channels for SCE and SDG&E. The affected channels are highlighted in green. The quantity adjustments resulted in a significant decrease in the number of lamps that were credited with savings.

Table 4-7. Lamp quantity adjustments for evaluated measures by PA and channel, 2018

PA and Channel	Evaluated Measures Lamps Shipped	Sales Quantity Adjustment	Evaluated Measures Lamps Credited
PG&E			
Discount	273,056	100%	273,056
Grocery	993,866	14%	140,984
Big Box and Other	1,952,412	100%	1,952,412
Total	**3,219,334**		**2,366,452**
SCE			
Discount	4,453,072	27%	1,187,501
Grocery	8,568,254	10%	859,339
Big Box and Other	1,961,389	100%	1,961,389
Total	**14,982,715**		**4,008,229**
SDG&E			
Discount	3,860,998	10%	366,906
Grocery	3,442,555	8%	274,876
Big Box and Other	797,845	100%	797,845
Total	**8,101,398**		**1,439,627**

Table 4-8 below shows the shipment and adjusted sales quantities for LED reflector lamps.

Table 4-8. Program lamp quantity shipments and adjustments by PA, LED reflectors, 2018

PA and Channel	Quantity Shipped	Sales-to-Shipment Ratio	Quantity Sold
PGE	**2,700,536**		**1,912,186**
Discount	273,056	100%	273,056
Grocery	918,666	14%	130,316
Hardware	79,133	100%	79,133
Home Improvement	55,774	100%	55,774
Membership Club	1,294,962	100%	1,294,962
Online	13,444	100%	13,444
Other	65,501	100%	65,501
SCE	**12,446,953**		**3,231,787**
Discount	3,654,132	27%	974,447
Drug	31,710	100%	31,710
Grocery	7,264,014	10%	728,532
Hardware	679,520	100%	679,520
Home Improvement	10,317	100%	10,317
Membership Club	759,460	100%	759,460
Other	47,800	100%	47,800

PA and Channel	Quantity Shipped	Sales-to-Shipment Ratio	Quantity Sold
SDG&E	**6,652,773**		**1,013,117**
Discount	2,819,094	10%	267,895
Drug	0	100%	0
Grocery	3,356,459	8%	268,002
Hardware	82,532	100%	82,532
Home Improvement	117,262	100%	117,262
Membership Club	243,882	100%	243,882
Other	33,544	100%	33,544

Table 4-9 below shows the shipment and adjusted sales quantities for LED candelabra lamps.

Table 4-9. Program lamp quantity shipments and adjustments by PA, LED candelabras, 2018

PA and Channel	Quantity Shipped	Sales-to-Shipment Ratio	Quantity Sold
PGE	**443,598**		**443,598**
Home Improvement	16,344	100%	16,344
Membership Club	427,254	100%	427,254
SCE	**1,411,210**		**508,557**
Discount	368,940	27%	98,385
Drug	2,400	100%	2,400
Grocery	702,560	10%	70,462
Hardware	77,360	100%	77,360
Membership Club	252,750	100%	252,750
Other	7,200	100%	7,200
SDG&E	**879,124**		**288,150**
Discount	590,584	10%	56,123
Grocery	61,416	8%	4,904
Hardware	27,000	100%	27,000
Home Improvement	97,002	100%	97,002
Membership Club	103,122	100%	103,122

Table 4-10 below shows the shipment and adjusted sales quantities for LED globe lamps.

Table 4-10. Program lamp quantity shipments and adjustments by PA, LED globes, 2018

PA and Channel	Quantity Shipped	Sales-to-Shipment Ratio	Quantity Sold
PGE	**75,200**		**10,667**
Grocery	75,200	14%	10,667
SCE	**1,124,552**		**267,885**
Discount	430,000	27%	114,668
Drug	3,360	100%	3,360
Grocery	601,680	10%	60,345
Hardware	47,600	100%	47,600
Membership Club	34,712	100%	34,712
Other	7,200	100%	7,200

PA and Channel	Quantity Shipped	Sales-to-Shipment Ratio	Quantity Sold
SDG&E	**569,501**		**138,360**
Discount	451,320	10%	42,888
Grocery	24,680	8%	1,971
Hardware	19,000	100%	19,000
Home Improvement	62,901	100%	62,901
Membership Club	11,600	100%	11,600

4.2 Residential vs non-residential

To estimate the portion of upstream lamps that are installed in non-residential applications, the 2010-12 evaluation relied on the results of two onsite survey studies conducted during the 2010-12 period—the CLASS[24] and the Commercial Market Share Tracking Study.[25] These efforts yielded the residential versus non-residential shares of total upstream lighting program measures shown in Table 4-11. For this evaluation, tracking data accurately accounted for residential and non-residential savings, so we made no additional adjustment.

Table 4-11. Ex post share of residential vs. non-residential upstream lighting measures by PA, 2017

PA	Ex Post	
	Residential	Non-Residential
PG&E	94%	6%
SCE	94%	6%
SDG&E	94%	6%

4.3 Leakage

In past upstream lighting evaluations, leakage is defined as the quantity of program-discounted upstream lamps that "leak" out of the collective PA service territories. The quantity adjustment described above does raise questions about whether leakage may have accounted for at least small percentage of the lamps that that did not ultimately sell through the discount and grocery channels. However, because of the importance of understanding the quantity of programs lamps sold in retail stores, investigating where and how lamps may have been sold or given away was not within the scope of this study. For the purposes of this evaluation, leakage is being captured in the sales-to-shipment quantity adjustment factor, as lamps that may have leaked out of PA service territory were likely captured in that analysis. No additional leakage adjustments were made to the evaluation results.

4.4 Installation rate

For the 2018 impact evaluation, the evaluation team calculated LED lamp installation rates as part of the 2019 Online Consumer Survey. We applied installation rates that credit savings for lamps purchased within

[24] DNV GL 2014a. See also Appendix F in DNV GL 2017b for details regarding the CLASS sampling approach.
[25] Itron, Inc. 2014.

the 2018 program period that were installed or were planned to be installed within one year. The surveys asked respondents about the quantity of LED lamps that they purchased, the quantity that they installed, and the quantity that would be installed within the next year.

Survey results suggest that 94% of LEDs in residential applications within PG&E, SCE, and SDG&E's residential electric service territories are or will be installed within the next year (Table 4-12). We applied these installation rates to calculate gross savings.

Table 4-12. Residential upstream evaluated LED lamp installation rates, 2018

Classification	Percent of LEDs in Household (n = 956)	Standard Error
Installed or will be installed within a year	94%	1.8%
Will not be installed within a year	6%	
Total Lamps in Household	**100%**	

Table 4-13 shows ex ante and ex post installation rates for 2018 upstream lighting measures by PA and sector for each measure group. For all LED lamp measure groups, residential installation rate estimates were 94%. For non-residential upstream measures, and residential downstream lighting measures, we passed through the ex ante installation rates.

Table 4-13. Ex ante and ex post residential and non-residential installation rates by PA and upstream lighting measure group, 2018

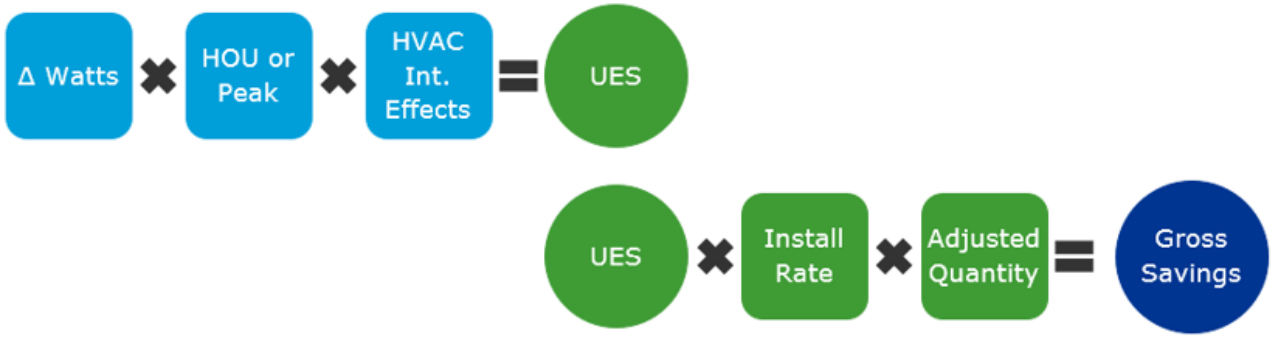
PA	Evaluated Upstream Lighting Measure Group	Residential		Non-residential	
		Ex Ante	Ex Post	Ex Ante	Ex Post
PG&E	LED reflector, all wattages	100%	94%	100%	100%
	LED candelabra, all wattages	100%	94%	100%	100%
	LED globe, all wattages	100%	94%	100%	100%
SCE	LED reflector, all wattages	100%	94%	100%	100%
	LED candelabra, all wattages	100%	94%	100%	100%
	LED globe, all wattages	100%	94%	100%	100%
SDG&E	LED reflector, all wattages	100%	94%	100%	100%
	LED candelabra, all wattages	100%	94%	100%	100%
	LED globe, all wattages	100%	94%	100%	100%

5 GROSS SAVINGS ANALYSIS

5.1 Overview

This section of the report focuses on the gross savings methods and results for the PAs' 2018 upstream and residential downstream lighting programs. Figure 5-1 below shows the components of the gross savings assessment.

Figure 5-1. Gross savings overview



We calculate gross savings using an estimate for UES, an evaluated installation rate, and an adjusted quantity factor. We define the UES for each measure group as the product of three parameters, namely: delta watts (Δ watts), daily hours of use (HOU) or peak coincidence factor (CF), and HVAC interactive effects (IE). The equations for these calculations are presented below in Equation 5-1 through Equation 5-4.

Equation 5-1. Gross unit energy savings

$$UES_L\left[\frac{kWh}{year}\right] = \Delta Watts_L[W] * HOU_L[h] * \frac{1\ kWh}{1000\ Wh} * \frac{365\ days}{1\ year} * IE_L[kWh]$$

Where:

$\Delta Watts_L$ = average displaced (delta) wattage for PA-discounted lamp measure group, L, in watts (W)

HOU_L = daily average HOU for PA-discounted lamp measure group, L, in hours (h)

IE_L = HVAC interactive effects factor

Equation 5-2. Gross savings

$$Gross\ savings_L[kWh] = UES_L[kWh] * IR_L * Q_L$$

Where:

UES_L = unit energy savings for lamp measure group, L

IR_L = installation rate for lamp measure group, L

Q_L = rebated measure quantity for lamp measure group, L

Equation 5-3. Gross peak unit energy savings

$$UES_L\left[\frac{kW}{year}\right] = \Delta Watts_L[W] * CF_L * \frac{1\,kW}{1000\,W} * IE_L[kW]$$

Where:

$\Delta watts_L$ = average displaced (delta) wattage for PA-discounted lamp measure group, L, in watts (W)

CF_L = average percent on at peak for PA-discounted lamp measure group, L

IE_L = HVAC interactive effects factor

Equation 5-4. Gross peak demand reduction

$$Gross\ savings_L[kW] = UES_L[kW] * IR_L * Q_L$$

Where:

UES = unit peak demand reduction for lamp measure group,

IR_L = installation rate for lamp measure group, L

Q_L = rebated measure quantity for lamp measure group, L

5.2 Hours of use

The average daily hours-of-use (HOU) are multiplied by the delta watts and interactive effects parameters to calculate UES for each relevant measure group. For this evaluation, daily HOU estimates are estimated at a population-level average daily HOU estimates for each measure group. This section of the report applies only to residential HOU estimates, as we passed through the ex ante UES for non-residential savings estimates.

The 2006-2008 upstream lighting impact evaluation provided the best available data for HOU estimate for This evaluation. The 2006-2008 evaluation developed an ANCOVA model that produced HOU estimated using logger data HOU profiles from the Residential Lighting Metering Study,[26] [27] and lamp installation locations. The ANCOVA methodology takes into account lamp shape as well as room location and usage within the population.

[26] KEMA, Inc. and Cadmus Group, 2010. The study included 1,200 households recruited randomly throughout California over three overlapping waves of data collection from July 2008 through December 2009. Please refer to for more details regarding metering study sample sizes.

[27] While more current metering data would certainly be preferable, these data are not available. In the absence of more current data, DNV GL believes that adjustments to the 2010 study's metering results provide the most accurate representation available for residential lamp usage in California.

While we acknowledge that these results are dated, this is the best available data for residential HOU in California. The lack of a more recent in-home lighting inventory study and data from a recent residential lighting end-use metering study presented several challenges for creating the LED HOU estimates needed for this evaluation. Most notably, the saturation of LEDs in the 2008 inventory was too small to produce shape-level estimates of HOU with sufficient confidence. It is important to understand technology-specific HOU in the early adoption years because customers usually replace high-use sockets first. As LED saturation has increased, we expect customers install LEDs in increasingly lower-use sockets. We addressed this challenge in the 2015 and 2017 evaluations by estimating HOU of all CFLs and LEDs within the 2012 CLASS inventory, as this served as a proxy of high- and medium-use sockets.[28]

In 2018, as shown in the 2019 consumer surveys, most residential customers have purchased and installed many LEDs. It is no longer justifiable to apply an HOU estimate based on 2008 LED and CFL saturations. We instead applied the overall HOU estimate for each lamp shape, agnostic of the technology in the socket. In other words, because LEDs are the dominant technology in the market, customers are no longer discriminating between high-, medium-, or low-use sockets.

The model produced estimates for lamp shape, which we applied to each measure group at the statewide level and for each PA. Table 5-1 provides an overview of the HOU results used in this evaluation, including confidence intervals (CI).

Table 5-1. Residential lighting HOU estimates by evaluated upstream lighting measure group and PA, 2018

Evaluated Upstream Lighting Measure Group	PG&E		SCE		SDG&E	
	HOU	90% CI	HOU	90% CI	HOU	90% CI
LED Reflector	1.7	0.4	2.2	0.3	1.4	0.4
LED Candelabra	1.7	0.3	2.1	0.3	1.5	0.3
LED Globe	1.4	0.3	1.7	0.3	1.3	0.3

* Please refer to the 2006-2008 lighting impact evaluation for more details regarding metering study (KEMA 2010).

5.3 Peak coincidence factor

Peak CF represents the average percent of time that a lamp is switched on during the peak period, which varies by climate zone. Similar to our approach for HOU estimates, we used lamp shape-specific, technology-agnostic Peak CF values that we calculated in the 2006-2008 evaluation. Table 5-2 shows the final peak CF values that we used in this evaluation.

[28] DNV GL 2014a.

Table 5-2. Residential lighting peak CF by evaluated upstream lighting measure group and PA, 2018

Evaluated Upstream Lighting Measure Group	PG&E		SCE		SDG&E	
	Peak CF	90% CI	Peak CF	90% CI	Peak CF	90% CI
LED Reflector	0.065	0.032	0.076	0.028	0.032	0.033
LED Candelabra	0.057	0.029	0.079	0.029	0.045	0.03
LED Globe	0.059	0.028	0.074	0.028	0.05	0.029

5.4 Delta watts

In this section we discuss the methodology used to calculate delta watts for estimating savings. The delta watts parameter is the difference in wattage between the baseline, an inefficient non-program lamp, and the rebated program lamp. The wattage difference between the two lamps characterizes the demand savings, which are realized when the consumer purchases a program LED instead of the inefficient baseline alternative. Delta watts is used to calculate the unit energy savings for each evaluated technology.

We compared program lamps to a baseline of incandescent and halogen lamps with the same shape and brightness as the program lamps. In this way, the baseline represents inefficient lamps which are functionally similar to the program lamps, and therefore are displaced by the program. The baseline does not include non-program LEDs, as the program's influence on LEDs is characterized later in the net-to-gross analysis (see Section 6).

This evaluation calculates three delta watts estimates—one for each of the three evaluated technologies for each of the three PAs. We recognize that the baseline and program wattages vary by channel, so we first calculate a delta watt specific to each channel, and then aggregate these channel-based results into a PA average for each evaluated technology, weighted by the sales of program lamps in each channel. In this way, our channel-weighted delta watts proportionally reflect the wattage differences within each channel.

5.4.1 Methodology

To calculate delta watts, we completed four steps. We:

4. Defined baseline and rebated wattage for each sales channel. As needed for each PA, we used average wattages to impute missing values for channels not represented in the shelf database.
5. Calculated the average program-rebated wattage by channel
6. Calculated channel-specific delta watts as the difference between the baseline wattage and the rebated wattage.
7. Calculated channel-weighted delta watts, for each measure group and PA.

Baseline wattage is defined as the weighted average wattage of alternative lamps with the same shape and brightness as the program lamps. We used DNV GL's 2018-2019 shelf survey database to characterize the incandescent and halogen lamps being sold by retail stores. We constructed the weights as the product of the number of lamps on the shelf and the store weight within the overall population of retail stores in California.

Incandescent and halogen alternative lamps are absent from some channels in the shelf database. Most notably, membership club stores. In this case, we use a PA average wattage to impute the average wattage

for unrepresented channels. The PA average baseline wattage for each technology is constructed as a weighted average of the channel-specific baseline wattages. Weights are consumer purchases of inefficient lamps in each channel as reported in the 2019 consumer survey, which we describe in Section 3.4.

Rebated wattage is defined as the average program wattage for each technology type, PA, and channel. We used the measure names to identify the wattage of each measure. To arrive at a rebated wattage for each channel, we calculated a weighted average wattage of the program shipments which were sent to that channel. Weights were defined as program sales in each channel, calculated using the program shipments and sales-to-shipment ratio derived in Section 4.1.

The channel-specific delta watts are calculated as the difference between the baseline and rebated wattages. We average the channel-specific delta watts into a channel-weighted delta watt for each technology type and PA. We use program lamp sales as weights, calculated using the program shipments and sales-to-shipment ratio.

5.4.2 Reflector delta watts

Table 5-3 provides the channel-specific delta watts for LED reflectors. The shelf survey did not find any incandescent or halogen reflectors for sale in membership club stores, so we used the PA average displaced wattage as the baseline wattage in this channel. We also used the PA average as the baseline wattage in the online and other channels, reflecting that program lamps sold through these channels are displacing non-program lamps sold in other channels.

The baseline wattage for reflectors had quite a large variance across channels, ranging from 40.8 to 65.0 watts. Incandescent and halogen reflectors have a wide range of efficiencies, and it is worth noting that the program impact depends on distribution channel. The baseline wattage was the highest for reflectors in the discount channel, so this channel had the largest delta watts. While this channel does have a larger delta watts value than other channels, it is important to note that discount stores have relatively small sales volumes, as we note in Section 4.1.

Table 5-3 shows the delta watts results for LED reflectors by PA and channel. The PA average baseline wattage was used to impute the displaced wattage for the membership club, online, and other channels.

Table 5-3. Delta watts results by PA and channel for LED reflectors*

Channel	Quantity of Sold Program Lamps^	Average Displaced Wattage	Average Program Discounted Wattage	Delta Watts
PG&E Overall				
Discount	273,056	65.0	11.5	53.5
Grocery#	130,316	55.8	14.2	41.6
Hardware	79,133	52.3	10.7	41.6
Home improvement	55,774	50.3	10.9	39.5
Membership club$	1,294,962	53.5	10.7	42.8
Online$	13,444	53.5	12.3	41.1
Other$	65,501	53.5	10.8	42.6
Overall	**1,912,186**	**55.1**	**11.1**	**44.1**
SCE				
Discount#	974,447	59.1	10.7	48.4
Drug	31,710	54.5	10.5	44.0
Grocery#	728,532	51.9	11.1	40.8
Hardware	679,520	56.2	10.7	45.5
Home improvement	10,317	55.0	8.2	46.9
Membership club$	759,460	55.9	6.5	49.4
Other$	47,800	55.9	13.4	42.5
Overall	**3,231,787**	**56.0**	**9.8**	**46.2**
SDG&E				
Discount#	267,895	65.0	10.3	54.7
Grocery#	268,002	40.8	11.5	29.3
Hardware	82,532	53.7	10.7	43.0
Home improvement	117,262	51.0	8.8	42.2
Membership club$	243,882	52.1	8.4	43.6
Other$	33,544	52.1	11.5	40.6
Overall	**1,013,117**	**52.5**	**10.1**	**42.5**

* This table omits channels where the PA did not discount any LED reflectors.
^ The count of sold lamps is the program shipments, adjusted where applicable by the sales-to-shipment ratio, per Section 4.1.
# Sales-to-shipment quantity adjustments are applied to this channel for this PA, as described in Section 4.1.
$ Alternative lamps in this channel were absent from the shelf database. The PA average was used as the baseline.

5.4.3 Candelabra delta watts

Table 5-4 provides the channel-specific delta watts for LED candelabras. The PA average baseline wattage was used to impute the displaced wattage for the membership club and other channels.

Table 5-4. Delta watts results by PA and channel for LED candelabras*

Channel	Quantity of Sold Program Lamps^	Average Displaced Wattage	Average Program Discounted Wattage	Delta Watts
PG&E				
Home improvement	16,344	37.2	4.0	33.2
Membership club[$]	427,254	38.1	4.0	34.1
Overall	**443,598**	**38.1**	**4.0**	**34.1**
SCE				
Discount[#]	98,385	40.0	4.0	36.0
Drug	2,400	43.2	4.0	39.2
Grocery[#]	70,462	42.5	4.0	38.5
Hardware	77,360	39.5	4.0	35.5
Membership club[$]	252,750	40.9	4.0	36.9
Other[$]	7,200	40.9	4.0	36.9
Overall	**508,557**	**40.7**	**4.0**	**36.7**
SDG&E				
Discount[#]	56,123	40.0	3.3	36.8
Grocery[#]	4,904	44.2	3.3	40.9
Hardware	27,000	39.6	3.3	36.3
Home improvement	97,002	36.4	4.0	32.4
Membership club[$]	103,122	37.5	3.3	34.3
Overall	**288,150**	**37.9**	**3.5**	**34.4**

* This table omits channels where the PA did not discount any LED reflectors.
^ The count of sold lamps is the program shipments, adjusted where applicable by the sales-to-shipment ratio, per Section 4.1.
[#] Sales-to-shipment quantity adjustments are applied to this channel for this PA, as described in Section 4.1.
[$] Alternative lamps in this channel were absent from the shelf database. The PA average was used as the baseline.

5.4.4 Globe results

Table 5-5 provides the channel-specific delta watts for LED globes. The PA average baseline wattage was used to impute the displaced wattage for the membership club and other channels. The baseline wattage of globes was more consistent across channels when compared to candelabras and reflectors. The range of globe displaced wattages were 4.4 watts, as compared with 6.8 watts for candelabra and 24.2 watts for reflectors.

Table 5-5. Delta watts results by PA and channel for LED globes*

Channel	Quantity of Sold Program Lamps^	Average Displaced Wattage	Average Program Discounted Wattage	Delta Watts
PG&E				
Grocery[#]	10,667	40.0	6.5	33.5
Overall	**10,667**	**40.0**	**6.5**	**33.5**
SCE				
Discount[#]	114,668	40.0	6.5	33.5
Drug	3,360	40.0	6.5	33.5
Grocery[#]	60,345	40.0	6.5	33.5
Hardware	47,600	42.3	6.5	35.8
Membership club[$]	34,712	43.2	6.5	36.7
Other[$]	7,200	43.2	6.5	36.7
Overall	**267,885**	**40.9**	**6.5**	**34.4**
SDG&E				
Discount[#]	42,888	40.0	5.3	34.8
Grocery[#]	1,971	42.8	5.3	37.6
Hardware	19,000	41.9	5.3	36.6
Home improvement	62,901	44.4	4.4	40.0
Membership club[$]	11,600	42.8	5.3	37.6
Overall	**138,360**	**42.5**	**4.9**	**37.7**

* This table omits channels where the PA did not discount any LED reflectors.
^ The count of sold lamps is the program shipments, adjusted where applicable by the sales-to-shipment ratio, per Section 4.1.
[#] Sales-to-shipment quantity adjustments are applied to this channel for this PA, as described in Section 4.1.
[$] Alternative lamps in this channel were absent from the shelf database. The PA average was used as the baseline.

5.4.5 Overall delta watts results

Table 5-6 provides the channel-weighted delta watts for all technology types, and PAs. Reflectors had the highest delta watts of the three evaluated technologies, as reflectors had a higher baseline wattage than candelabras and globes.

Table 5-6. Overall delta watts results by PA and measure group

PA and Measure Group	Program Sales	Delta Watts
PG&E		
LED Reflector	1,912,186	44.1
LED Candelabra	443,598	34.1
LED Globe	10,667	33.5
SCE		
LED Reflector	3,231,787	46.2
LED Candelabra	508,557	36.7
LED Globe	267,885	34.4
SDG&E		
LED Reflector	1,013,117	42.5
LED Candelabra	288,150	34.4
LED Globe	138,360	37.7

5.5 HVAC interactive effects

HVAC interactive effects account for the changes in heating and cooling energy requirements due to changes in lamp wattages and efficiency. Generally, lower-wattage efficient lamps release less heat than higher-wattage, inefficient lamps, which results in air conditioning energy savings and increased space heating requirements. DEER reports the estimated kWh, kW, and therm savings factors for indoor LED measures. In this evaluation, we applied the PA-specific residential multipliers reported in DEER (Table 5-7) The same ratios apply to all LED lamps as the interactive effects vary by the wattage reduction estimate and not by lamp technology. Our evaluation team applied these savings factors to the direct impacts as a multiplier for both kWh and kW and a factor of therms per kWh for therm impacts.[29] For non-residential measures, we passed through all ex ante savings and accompanying parameters.

Table 5-7. Residential LED HVAC interactive effects factors by PA

Units	PA		
	PG&E	SCE	SDG&E
kWh	1.02	1.07	1.03
kW	1.33	1.40	1.23
Therms	-0.025	-0.019	-0.018

5.6 UES results

The unit energy savings estimate the annual gross energy and peak demand impacts per unit of each measure. The evaluation team calculated residential UES values for each of the evaluated measure groups using the delta watts, HOU, peak coincidence factor, and HVAC interactive effects. As in prior evaluations,

[29] Therm impacts for upstream lighting measures are negative.

this report focuses on the parameters necessary for calculating the residential UES. We show the equations for estimating the residential UES in Section 5.1 above.

For upstream measures installed in non-residential settings, we passed through the ex ante UES as the ex post value. To calculate the ex ante UES for upstream nonresidential measures, we divided ex ante gross savings by the product of measure quantity and ex ante installation rates. The ex ante UES was multiplied by the adjusted quantiles to calculate the ex post for nonresidential upstream measures. In this way, the ex post gross savings for non-residential upstream measures reflects the ex ante UES implicit in the PA-reported gross savings.

In Table 5-8, we present the 2018 residential UES results by PA and measure group for the three upstream lighting measure groups evaluated in this report. Reflectors exhibited the largest UES of the three evaluated measures. The high UES of reflectors was influenced by the relatively high delta watts of reflectors when compared to candelabras and globes. The ex post UES were significantly larger than the ex ante UES for all residential measures.

Table 5-8. 2018 Ex ante and ex post upstream residential UES values by PA and measure group

PA	kWh		kW		Therms	
	Ex Ante	Ex Post	Ex Ante	Ex Post	Ex Ante	Ex Post
PG&E						
LED Reflector	14	28	0.002	0.004	-0.309	-0.684
LED Candelabra	9	22	0.001	0.003	-0.205	-0.529
LED Globe	3	17	0.000	0.003	-0.077	-0.428
SCE						
LED Reflector	16	40	0.002	0.005	-0.278	-0.704
LED Candelabra	7	30	0.001	0.004	-0.115	-0.535
LED Globe	4	23	0.000	0.004	-0.065	-0.406
SDG&E						
LED Reflector	20	22	0.002	0.002	-0.307	-0.390
LED Candelabra	6	19	0.001	0.002	-0.097	-0.339
LED Globe	6	18	0.001	0.002	-0.090	-0.322

6 NET SAVINGS ANALYSIS

This section describes how the evaluation team developed 2018 program year net savings.

6.1 Overview of NTGR methodology

The net-to-gross ratio (NTGR) is the proportion of all program lamp purchases that are attributable to the program. Program-attributable lamps are defined as lamp purchases of a given technology for which customers would have purchased a different technology in the absence of the program. As with prior evaluations, our NTGR analysis leverages a model that predicts the probability that customers would purchase an LED or alternative technology based on program LED prices and counterfactual non-program LED prices. Section 3.8 and Appendix F provide an overview of the price elasticity model that we used for this analysis. In subsequent subsections, we will cover the following calculations:

- Market prices
- Price elasticity model results
- NTGR

6.2 Market prices

Our first step in calculating the NTGR was to calculate the average price of each modeled lamp style using the Winter 2018-19 shelf stocking data. In this analysis, the average program lamp price reflects the relative channel distributions through which programs sold lamps (as calculated in Section 4.1). However, through the shelf survey data, we found that many of the channels that programs targeted (primarily discount and grocery) did not include non-program lamps (LEDs and incandescent/halogen lamps). This finding is consistent with customer survey data, which shows that most lamps sell through home improvement, membership club, and hardware stores.[30] We thus assumed that program lamps likely converted shoppers from the channel through which they usually buy lamps to the channel in which they ultimately bought the program lamp. We refer to this concept as "channel shift." Therefore, the most appropriate way to calculate average non-program lamp prices was to weight prices by respective lamp quantities sold market-wide through each channel per the consumer survey.

Table 6-1 below displays the average prices for each of the three technologies that we included in our reflector price elasticity model. Note that to most accurately reflect the program LED brightness range, these averages subset non-program LEDs and incandescent/halogen lamps to a lumen range of 310-749. This table demonstrates that program discounts were successful in pushing the price of LED reflector lamps to $1.45 on average, which was significantly below the naturally occurring market rate of $4.02. However, the data also show that the naturally occurring $4.02 was already $0.46 less than the incandescent/halogen alternative. It could be argued that programs were successful in moving LED prices within discount and grocery stores from above the price of incandescent/halogen lamps to significantly below those prices. However, retail store surveys showed that the volume of shipments to these stores flooded these markets.

[30] These three channels represented 69% of the lamps consumers purchased based on results from the 2019 consumer survey. More than 16% of lamps were purchased online according to the survey. Only 5% of lamps were sold in discount and grocery stores.

Many of the lamps in these channels did not sell at all (Section 4.1), and those that did sell appear to have shifted purchasers from other channels due to the very low prices.[31]

Table 6-1. Average price of reflector lamps by technology, channel, and program classification (retail lamp stock inventory, 2018)

Channel	Program LED		Non-Program LED		Incandescent/halogen	
	Average Price	Weight*	Average Price	Weight^	Average Price	Weight^
Discount	$0.50	1,515,399	$1.34	1,695,270	$1.21	182,068
Drug	$7.65	31,710	$19.49	49,489	$10.93	11,098
Grocery	$0.60	1,126,850	$9.16	340,550	$5.83	567,798
Hardware	$5.64	841,185	$6.40	4,422,186	$6.00	1,048,213
Home improvement	$3.81	183,353	$3.69	19,677,833	$4.04	2,842,032
Mass merchandise	N/A	N/A	$4.31	1,034,214	$3.69	719,588
Membership club	$0.68	2,298,304	$3.82	12,345,277	N/A	N/A
Overall	**$1.45**		**$4.02**		**$4.48**	

* This quantity reflects the quantity of program LEDs sold in each channel (i.e., the quantity of shipments times the sales-to-shipment ratio)
^ This quantity reflects the weighted number of the respective lamp shape and technology sold in California per the consumer survey (Section 3.4)

In Table 6-2 below, we present the average prices for candelabra lamps and associated weights. To ensure that we only included comparable lamps in this analysis, we restricted the brightness range to 210-515 lumens. The average incandescent/halogen price was $0.94 and without discounts, the average non-program LED candelabra was $3.21 across all channels. With discounts accounted for, the average LED candelabra was $2.15, and in the case of discount stores, as low as $0.25. In spite of the higher price of the non-program candelabra as compared to its incandescent/halogen counterpart, many consumers still chose the LED, as discussed in Section 6.3 below.

[31] Note that in prior evaluations, we calculated NTGR by each channel. In this evaluation, because all IOU's shipped the vast majority of bulbs to stores where customers do not typically purchase light bulbs (discount, grocery, and membership club), the comparable incandescent price within each channel is far less relevant. In this evaluation, we assume that the program shifted purchases away from other, more typical channels, and a market-wide NTGR is in fact the most appropriate representation of the program's influence.

Table 6-2. Average price of candelabra lamps by technology, channel, and program classification (retail lamp stock inventory, 2018)

Channel	Program LED		Non-Program LED		Incandescent/halogen	
	Average Price	Weight*	Average Price	Weight^	Average Price	Weight^
Discount	$0.25	154,508	$1.87	405,627	$0.54	116,522
Drug	N/A	N/A	$7.68	195,534	$3.13	0
Grocery	N/A	N/A	$7.83	86,344	$1.55	284,294
Hardware	N/A	N/A	$5.91	878,352	$1.48	212,154
Home improvement	$4.16	113,346	$3.07	7,106,357	$0.97	3,528,820
Mass merchandise	N/A	N/A	$4.91	1,067,842	$0.54	807,777
Membership club	$2.24	783,126	$1.88	2,951,214	N/A	N/A
Overall	**$2.15**		**$3.21**		**$0.94**	

* This quantity reflects the quantity of program LEDs sold in each channel (i.e., the quantity of shipments times the sales-to-shipment ratio)
^ This quantity reflects the weighted number of the respective lamp shape and technology sold in California per the consumer survey (Section 3.4)

Finally, Table 6-3 provides average prices and weights for program LED, non-program LED, and incandescent/halogen lamps. Program discounts moved LED globe prices ($1.41 on average) below incandescent/halogen prices ($2.68 on average). Without he discounts, LED globes were $4.33 on average. Again, as we will describe in Section 6.3 below, even at $4.33 per lamp, customers showed a dominant preference for LEDs over the cheaper incandescent/halogen.

Table 6-3. Average price of globe lamps by technology, channel, and program classification (retail lamp stock inventory, 2018)

Channel	Program LED		Non-Program LED		Incandescent/halogen	
	Average Price	Weight*	Average Price	Weight^	Average Price	Weight^
Discount	$0.50	157,557	N/A	N/A	$1.02	579,054
Drug	N/A	N/A	$11.24	2,596	$4.36	22,425
Grocery	N/A	N/A	$9.07	67,541	$3.41	298,087
Hardware	N/A	N/A	$7.55	1,057,207	$3.17	250,631
Home improvement	$2.91	62,901	$4.67	8,676,297	$3.25	1,840,594
Mass merchandise	N/A	N/A	$4.37	1,187,762	$2.02	679,127
Membership club	$2.49	46,312	$2.49	3,678,615	N/A	N/A
Overall	**$1.41**		**$4.33**		**$2.68**	

* This quantity reflects the quantity of program LEDs sold in each channel (i.e., the quantity of shipments times the sales-to-shipment ratio)
^ This quantity reflects the weighted number of the respective lamp shape and technology sold in California per the consumer survey (Section 3.4)

6.3 Price elasticity model results

To calculate the NTGR, we used the price elasticity model to estimate market shares of each lamp technology within a specific lamp shape, as discussed in Section 3.8 and Appendix F. Using this model, we

calculated market shares of each technology with and without program discounts. While prior evaluations required calculating LED, CFL, incandescent, and halogen market shares, the 2018 lighting market was so heavily dominated by LED and incandescent/halogen products, we only needed to consider incandescent/halogen lamps as the alternative choice.[32] As discussed in Section 5.4, we accounted for the difference in halogen and incandescent wattages within the delta watts parameter.

Table 6-4 below shows the LED market shares that the model produced for each lamp style. As noted above, in both with-program and without-program scenarios, the remaining market share is assumed to be incandescent/halogen lamps. For each shape, it is notable how high the without-program market share is. Without program incentives, LEDs would have accounted for 74% of reflector lamp sales, the lamp shape that overwhelmingly dominated program activity. As observed in shelf stocking data, the non-program LED reflector price was, on average, $0.46 less expensive than the alternative price. The program was successfully able to push that LED price significantly lower to $1.45. However, that reduction in price appears to have been an unnecessarily aggressive reduction, as it only boosted LEDs to an estimated 80% of the reflector market.

For the candelabra measure group, program discounts moved the market slightly more significantly. Without the program, LEDs would have accounted for an estimated 69% of candelabra lamp sales, with incandescent/halogen lamps costing an average $0.94 and non-program LEDs costing an average $3.21. Program discounts pushed the price of LEDs down to $2.16 on average, which, while still higher than the inefficient alternative, did boost the LED market share to an estimated 77%.

Lastly, the program seemed to have the greatest influence on the globe measure group. Without program discounts, LEDs would have accounted for an estimated 64% of globe lamps. In this simulation, incandescent/halogen lamps were $2.68 on average and non-program LEDs were $4.33. Programs reduced LED globes to an average of $1.41 per lamp, which boosted the LED globe market share to 87%. Still, for each of the three lamp shapes, the non-program LED market shares were already so high that programs could do very little to substantially move the market. These findings support the view that LED sales dominated a largely transformed lighting market.

Table 6-4. Average price and market share of lamps by lamp style, technology and program classification

Lamp style	Program LED Price	Non-Program LED Price	Alternative Price	With-Program LED Market Share	Without Program LED Market Share
Reflector	$1.45	$4.02	$4.48	80%	74%
Candelabra	$2.16	$3.21	$0.94	77%	69%
Globe	$1.41	$4.33	$2.68	87%	64%

6.4 NTGR

As described above, we used the price elasticity model to calculate the market shares of LEDs and incandescent/halogen lamps using the LED prices with program and the LED prices without program. The NTGR is equal to the percentage of program-discounted lamps that displaced purchases of other

[32] CFLs comprised 4% of all lamp stock in the Winter 2018-2019 shelf surveys. Reflector CFLs comprised 2% of total reflector lamp stock, candelabra CFLs less than 1%, and globe CFLs less than 0.5%.

technologies. Table 6-5 presents the final NTGR for each measure group.[33] Consistent with the findings discussed in Section 6.3, the without-program LED market share was above 60% for each of the technologies. LED reflectors, which make up the majority of shipments and savings within the upstream program, received a NTGR of 0.073, LED candelabras received a NTGR of 0.105, and LED globes received a TGR of 0.264. Once again, while we note that these are low NTGR, they are indicative of a transformed lighting market.

Table 6-5. LED market share and NTGR results with standard errors

Measure Group	With Program LED Market Share	Without Program LED Market Share	NTGR	Standard Error
LED Reflector	80%	74%	0.073	0.002
LED Candelabra	77%	69%	0.105	0.017
LED Globe	87%	64%	0.264	0.003

We note that these NTGRs are significantly lower than those in the PY2017 evaluation. This dramatic reduction in program attribution is due to substantive market changes within the past three years. We have seen an increase in the quality of bulbs available in the lighting market and a dramatic reduction in pricing. We have identified that there have also been significant changes in customer preferences and increased preference for LEDs over incandescents. Furthermore, across the market, LED reflectors without program discounts were cheaper than incandescent reflectors. While the reduction of NTGR between the PY 2017 and PY 2018 evaluations is dramatic, our PY 2017 evaluation relied on intercept surveys that supported the PY 2013-14 and PY 2015 evaluations and did not adequately reflect the changes in customer lamp purchasing preferences used to support the 2018 evaluation. It is very likely that the PY 2017 evaluation NTGR would have been significantly lower had we been able to utilize more recent consumer preference data to support that analysis.

[33] Utilizing the price elasticity model to generate a statewide net-to-gross estimate yields the greatest precision. PG&E distributed 44% of LED reflectors to discount and grocery stores (as well as 48% to membership club stores). SCE distributed 88% of their LED reflectors to discount and grocery stores, and SDG&E distributed 93% of their LED reflectors to grocery and discount stores. Our shelf stocking survey research found that program discounted LED reflectors were $0.50 per bulb in discount stores, $0.60 per bulb in grocery stores, and $0.68 per bulb in membership club stores. The counterfactual scenarios used channel-shifted market-wide prices as the program within these channels most likely pulled sales away from regular lighting sales channels. Therefore, segmenting by channel would have made almost no difference in the estimated NTGR, but would have significantly diminished confidence intervals.

7 EVALUATION RESULTS

In this section, we provide gross savings and net savings results by PA.

7.1 Gross savings results

This section presents the total gross savings results by measure group and PA. The methodology for calculating gross savings is described in Section 5. Gross realization rates are the ratio of ex post evaluated savings to the reported ex ante savings assumptions. Upstream lighting measures generally had ex post gross unit energy savings that exceeded ex ante assumptions. However, the sales-to-shipment quantity adjustment described in section 4.1 reduced overall gross savings. Below we show overall gross savings results for the evaluated measures as well as a breakdown by each PA.

7.1.1 Overall

Table 7-1 provides statewide gross realization rates for each evaluated measure group by kWh, kW, and therms. The evaluated upstream measures include both residential and non-residential savings. The pass-through measures include upstream measures that were not evaluated and residential downstream measures.

Table 7-1. Ex ante and ex post gross savings and gross realization rates by measure group across all PAs, 2018

Evaluated Upstream Lighting Measure Group	Ex Ante			Ex Post			Gross Realization Rates		
	kWh	kW	Therms	kWh	kW	Therms	kWh	kW	Therms
LED Reflector	416,933,284	61,060	-6,171,102	199,473,666	27,224	-3,585,291	48%	45%	58%
LED Candelabra	21,528,481	3,158	-331,018	29,054,516	3,880	-543,626	135%	123%	164%
LED Globe	8,760,992	1,301	-126,755	8,199,201	1,257	-140,481	94%	97%	111%
Pass-through measures	13,638,695	1,230	-207,792	13,638,695	1,230	-207,792	100%	100%	100%
Overall	**460,861,451**	**66,750**	**-6,836,667**	**250,366,078**	**33,591**	**-4,477,190**	**54%**	**50%**	**65%**

Table 7-2 shows a breakdown of statewide ex post results split into residential and non-residential gross savings. We explain how the residential and non-residential split is calculated and applied for the evaluated upstream measures in section 4.2. The pass-through measures include upstream measures that were not evaluated and residential downstream measures.

Table 7-2. Ex post gross savings by lighting measure group and sector across all PAs, 2018

Measure Group	Annual Energy Savings (kWh)		Peak Demand Reductions (kW)		Gas Impact (Therms)	
	Residential	Non-residential	Residential	Non-residential	Residential	Non-residential
LED Reflector	180,590,026	18,883,639	21,993	5,231	-3,519,575	-65,716
LED Candelabra	26,968,805	2,085,711	3,329	551	-534,702	-8,924
LED Globe	7,832,204	366,998	1,154	104	-139,555	-926
Pass-through measures	12,411,522	1,227,173	894	336	-203,015	-4,776
Overall	**227,802,557**	**22,563,521**	**27,370**	**6,221**	**-4,396,848**	**-80,343**

7.1.2 PG&E

Table 7-3 provides the PG&E gross realization rates for each evaluated measure group by kWh, kW, and therms.

Table 7-3. PG&E ex ante and ex post gross savings and gross realization rates by lighting measure group, 2018

Evaluated Upstream Lighting Measure Group	Ex Ante			Ex Post			Gross Realization Rates		
	kWh	kW	Therms	kWh	kW	Therms	kWh	kW	Therms
LED Reflector	44,524,222	6,425	-845,102	53,394,229	7,918	-1,196,427	120%	123%	142%
LED Candelabra	4,854,755	701	-92,157	9,485,197	1,255	-214,224	195%	179%	232%
LED Globe	310,967	45	-5,892	173,977	27	-4,098	56%	60%	70%
Pass-through measures	3,644,130	503	-72,424	3,644,130	503	-72,424	100%	100%	100%
Overall	**53,334,073**	**7,674**	**-1,015,575**	**66,697,532**	**9,703**	**-1,487,173**	**125%**	**126%**	**146%**

Table 7-4 shows a breakdown of PG&E ex post results split into residential and non-residential gross savings.

Table 7-4. PG&E ex post gross savings by evaluated upstream lighting measure group and sector, 2018

Measure Group	Annual Energy Savings (kWh)		Peak Demand Reductions (kW)		Gas Impact (Therms)	
	Residential	Non-residential	Residential	Non-residential	Residential	Non-residential
LED Reflector	47,160,907	6,233,322	6,442	1,476	-1,155,905	-40,523
LED Candelabra	8,471,850	1,013,347	1,015	240	-207,643	-6,581
LED Globe	164,760	9,217	25	2	-4,038	-60
Pass-through measures	3,121,743	522,387	379	124	-69,017	-3,407
Overall	**58,919,259**	**7,778,273**	**7,860**	**1,842**	**-1,436,603**	**-50,570**

7.1.3 SCE

SCE gross realization rates are presented in Table 7-5. As explained in Section 4.1, SCE focused a large portion of their program on the discount and grocery channels. This evaluation applied a significant adjustment to the quantity of measures that received savings credit within those channels. As such, the measures that were affected by the quantity adjustment achieved a lower gross realization rate.

Table 7-5. SCE ex ante and ex post gross savings and gross realization rates by measure group, 2018

Evaluated Upstream Lighting Measure Group	Ex Ante			Ex Post			Gross Realization Rates		
	kWh	kW	Therms	kWh	kW	Therms	kWh	kW	Therms
LED Reflector	216,458,252	32,546	-3,284,314	121,437,930	16,656	-2,021,894	56%	51%	62%
LED Candelabra	10,169,280	1,523	-153,690	14,143,731	2,021	-241,173	139%	133%	157%
LED Globe	4,549,609	685	-69,753	5,582,671	900	-96,304	123%	131%	138%
Pass-through measures	8,277,922	565	-113,291	8,277,922	565	-113,291	100%	100%	100%
Overall	**239,455,063**	**35,319**	**-3,621,048**	**149,442,254**	**20,142**	**-2,472,662**	**62%**	**57%**	**68%**

Table 7-6 shows a breakdown of SCE ex post results split into residential and non-residential gross savings.

Table 7-6. SCE ex post gross energy savings by measure group and sector, 2018

Measure Group	Annual Energy Savings (kWh)		Peak Demand Reductions (kW)		Gas Impact (Therms)	
	Residential	Non-residential	Residential	Non-residential	Residential	Non-residential
LED Reflector	113,406,186	8,031,744	14,054	2,603	-2,013,755	-8,139
LED Candelabra	13,549,173	594,559	1,828	193	-240,593	-581
LED Globe	5,413,935	168,736	845	55	-96,135	-169
Pass-through measures	7,803,167	474,755	411	154	-112,774	-517
Overall	**140,172,460**	**9,269,793**	**17,138**	**3,004**	**-2,463,256**	**-9,406**

7.1.4 SDG&E

Similar to the results for SCE, SDG&E had low gross realization rates largely due to the sales-to-shipment quantity adjustment described in section 4.1. SDG&E gross realization rates are presented in Table 7-7.

Table 7-7. SDG&E ex ante and ex post gross savings and gross realization rates by measure group, 2018

Evaluated Upstream Lighting Measure Group	Ex Ante			Ex Post			Gross Realization Rates		
	kWh	kW	Therms	kWh	kW	Therms	kWh	kW	Therms
LED Reflector	155,950,810	22,089	-2,041,687	24,641,507	2,650	-366,970	16%	12%	18%
LED Candelabra	6,504,446	934	-85,171	5,425,588	604	-88,229	83%	65%	104%
LED Globe	3,900,416	572	-51,110	2,442,554	330	-40,079	63%	58%	78%
Pass-through measures	1,716,644	162	-22,077	1,716,644	162	-22,077	100%	100%	100%
Overall	**168,072,316**	**23,756**	**-2,200,045**	**34,226,292**	**3,746**	**-517,355**	**20%**	**16%**	**24%**

Table 7-8 shows a breakdown of SDG&E ex post results split into residential and non-residential gross savings.

Table 7-8. SDG&E ex post gross savings by measure group and sector, 2018

Measure Group	Annual Energy Savings (kWh)		Peak Demand Reductions (kW)		Gas Impact (Therms)	
	Residential	Non-residential	Residential	Non-residential	Residential	Non-residential
LED Reflector	20,022,934	4,618,573	1,497	1,152	-349,915	-17,055
LED Candelabra	4,947,782	477,806	486	118	-86,466	-1,763
LED Globe	2,253,509	189,045	284	47	-39,382	-697
Pass-through measures	1,486,613	230,031	104	57	-21,225	-852
Overall	**28,710,837**	**5,515,455**	**2,371**	**1,375**	**-496,988**	**-20,367**

7.2 Net savings results

This section presents the total net savings results by measure group and PA. The methodology for calculating gross savings is described in Section 6. The net-to-gross ratios from Section 6 are applied to the residential UES of the evaluated upstream measures. Net realization rates are the ratio of ex post evaluated net savings to the reported ex ante net savings assumptions. Below we show overall net savings results for the evaluated measures as well as a breakdown by each PA.

7.2.1 Overall

Table 7-9 provides statewide net realization rates for each evaluated measure group by kWh, kW, and therms. The evaluated upstream measures include both residential and non-residential savings. The pass-through measures include upstream measures that were not evaluated and residential downstream measures.

Table 7-9. Ex ante and ex post net savings and realization rates by measure group across all PAs, 2018

Measure Group	Ex Ante			Ex Post			Net Realization Rates		
	kWh	kW	Therms	kWh	kW	Therms	kWh	kW	Therms
LED Reflector	400,255,957	58,618	-5,924,258	31,336,206	6,630	-320,500	8%	11%	5%
LED Candelabra	19,086,629	2,802	-289,033	4,534,419	802	-63,182	24%	29%	22%
LED Globe	8,363,653	1,242	-120,937	2,411,120	402	-37,677	29%	32%	31%
Pass-through measures	11,771,450	1,131	-181,998	11,771,450	1,131	-181,998	100%	100%	100%
Overall	**439,477,689**	**63,793**	**-6,516,227**	**50,053,195**	**8,965**	**-603,357**	**11%**	**14%**	**9%**

Table 7-10 shows a breakdown of statewide ex post results split into residential and non-residential net savings. We explain how the residential and non-residential split is calculated and applied in for the evaluated upstream measures section 4.2. The pass-through measures include upstream measures that were not evaluated and residential downstream measures.

Table 7-10. Ex post net savings by measure group and sector across all PAs, 2018

Measure Group	Annual Energy Savings (kWh)		Peak Demand Reductions (kW)		Gas Impact (Therms)	
	Residential	Non-residential	Residential	Non-residential	Residential	Non-residential
LED Reflector	13,207,913	18,128,294	1,608	5,022	-257,413	-63,087
LED Candelabra	2,841,148	1,693,271	351	451	-56,331	-6,851
LED Globe	2,064,954	346,166	304	97	-36,794	-883
Pass-through measures	10,621,883	1,149,567	818	313	-177,444	-4,554
Overall	**28,735,897**	**21,317,298**	**3,082**	**5,883**	**-527,981**	**-75,376**

7.2.2 PG&E

We present PG&E net realization rates in Table 7-11.

Table 7-11. PG&E ex ante and ex post net savings and realization rates by measure group, 2018

Measure Group	Ex Ante			Ex Post			Net Realization Rates		
	kWh	kW	Therms	kWh	kW	Therms	kWh	kW	Therms
LED Reflector	42,743,253	6,168	-811,298	9,433,223	1,888	-123,442	22%	31%	15%
LED Candelabra	3,433,848	496	-65,176	1,609,235	277	-26,529	47%	56%	41%
LED Globe	298,528	43	-5,657	52,287	9	-1,122	18%	20%	20%
Pass-through measures	3,467,173	479	-68,830	3,467,173	479	-68,830	100%	100%	100%
Overall	**49,942,802**	**7,186**	**-950,960**	**14,561,917**	**2,652**	**-219,922**	**29%**	**37%**	**23%**

Table 7-12 shows a breakdown of PG&E ex post results split into residential and non-residential net savings.

Table 7-12. PG&E ex post net savings by measure group and sector, 2018

Measure Group	Annual Energy Savings (kWh)		Peak Demand Reductions (kW)		Gas Impact (Therms)	
	Residential	Non-residential	Residential	Non-residential	Residential	Non-residential
LED Reflector	3,449,233	5,983,990	471	1,417	-84,540	-38,902
LED Candelabra	892,505	716,730	107	170	-21,875	-4,654
LED Globe	43,439	8,848	7	2	-1,065	-57
Pass-through measures	2,965,681	501,491	360	119	-65,559	-3,270
Overall	**7,350,858**	**7,211,059**	**945**	**1,708**	**-173,039**	**-46,883**

7.2.3 SCE

We present SCE net realization rates in Table 7-13.

Table 7-13. SCE ex ante and ex post net savings and realization rates by measure group, 2018

Measure Group	Ex Ante			Ex Post			Net Realization Rates		
	kWh	kW	Therms	kWh	kW	Therms	kWh	kW	Therms
LED Reflector	207,799,922	31,244	-3,152,941	16,004,725	3,526	-155,094	8%	11%	5%
LED Candelabra	9,408,513	1,409	-142,093	1,945,244	360	-25,852	21%	26%	18%
LED Globe	4,320,725	650	-66,215	1,583,215	273	-25,502	37%	42%	39%
Pass-through measures	6,773,911	499	-93,480	6,773,911	499	-93,480	100%	100%	100%
Overall	**228,303,071**	**33,803**	**-3,454,730**	**26,307,095**	**4,659**	**-299,928**	**12%**	**14%**	**9%**

Table 7-14 shows a breakdown of SCE ex post results split into residential and non-residential net savings.

Table 7-14. SCE ex post net savings by evaluated upstream lighting measure group and sector, 2018

Measure Group	Annual Energy Savings (kWh)		Peak Demand Reductions (kW)		Gas Impact (Therms)	
	Residential	Non-residential	Residential	Non-residential	Residential	Non-residential
LED Reflector	8,294,251	7,710,474	1,028	2,499	-147,281	-7,813
LED Candelabra	1,427,398	517,847	193	168	-25,346	-505
LED Globe	1,427,380	155,835	223	50	-25,346	-156
Pass-through measures	6,346,631	427,279	360	139	-93,015	-466
Overall	**17,495,659**	**8,811,435**	**1,803**	**2,855**	**-290,988**	**-8,940**

7.2.4 SDG&E

We present SDG&E's net realization rates in Table 7-15. SDG&E's program was dominated by large shipments to discount and grocery stores, and therefore this adjustment had a large impact on their program-level net realization rates.

Table 7-15. SDG&E ex ante and ex post net savings and realization rates by measure group, 2018

Measure Group	Ex Ante			Ex Post			Net Realization Rates		
	kWh	kW	Therms	kWh	kW	Therms	kWh	kW	Therms
LED Reflector	149,712,783	21,205	-1,960,019	5,898,259	1,216	-41,964	4%	6%	2%
LED Candelabra	6,244,268	897	-81,764	979,940	165	-10,802	16%	18%	13%
LED Globe	3,744,399	549	-49,065	775,619	120	-11,052	21%	22%	23%
Pass-through measures	1,530,366	154	-19,688	1,530,366	154	-19,688	100%	100%	100%
Overall	**161,231,817**	**22,804**	**-2,110,537**	**9,184,183**	**1,654**	**-83,507**	**6%**	**7%**	**4%**

Table 7-16 shows a breakdown of SDG&E ex post results split into residential and non-residential net savings.

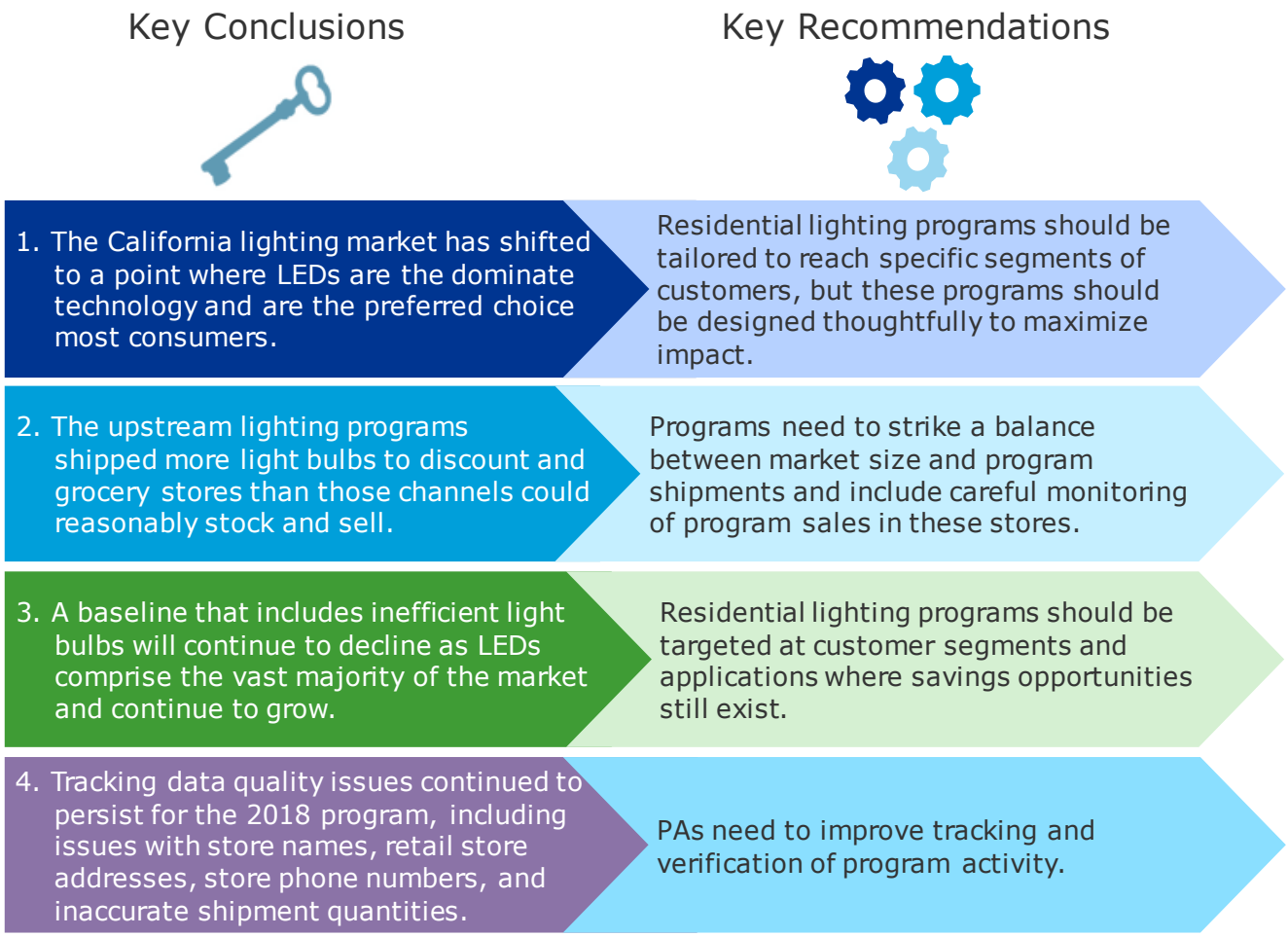
Table 7-16. SDG&E ex post net savings by measure group and sector, 2018

Measure Group	Annual Energy Savings (kWh)		Peak Demand Reductions (kW)		Gas Impact (Therms)	
	Residential	Non-residential	Residential	Non-residential	Residential	Non-residential
LED Reflector	1,464,428	4,433,830	110	1,106	-25,592	-16,372
LED Candelabra	521,246	458,694	51	114	-9,109	-1,692
LED Globe	594,136	181,483	75	45	-10,383	-670
Pass-through measures	1,309,570	220,796	98	55	-18,870	-818
Overall	**3,889,380**	**5,294,803**	**334**	**1,320**	**-63,954**	**-19,552**

8 CONCLUSIONS AND RECOMMENDATIONS

We summarize the conclusions and recommendations below.

Figure 8-1. Key conclusions and recommendations



8.1 Conclusions and recommendations for programs

8.1.1 Market conditions

Evaluation results suggest that the California lighting market has shifted to a point where LEDs are the dominate technology and are the preferred choice among most consumers. LEDs comprise well over 50% of the market for all three evaluated measure groups, and LED prices have fallen to a point where they are competitive with inefficient technologies, even without program incentives. Upstream lighting program incentives no longer influence customer purchases as much as they did when inefficient lamps dominated the lighting market. Based on these conclusions, we have the following recommendation:

- **Recommendation 1:** PAs should move away from a statewide upstream lighting program model. Increases in standards are expected to remove the final pockets of halogen bulbs in the market, and halogens that remain in sockets have such short measure lives that they will soon be replaced by LEDs. To the extent that pockets of inefficient bulbs remain and or these changes happen inequitably,

residential lighting programs should be tailored to reach the appropriate segments of customers, but these programs should be designed thoughtfully to maximize impact.

8.1.2 Quantity adjustments

The 2018 upstream lighting programs continued to ship significantly more light bulbs to individual stores, particularly in the discount and grocery channels, than stores could reasonably stock and sell. Evaluation results suggest that there was inadequate monitoring and verification of program light bulb shipments and that many participating retail stores were not required to purchase program discounted light bulbs from manufacturers. Based on these conclusions we have the following recommendations:

- **Recommendation 2:** Upstream lighting programs need to strike a balance between market size and program shipments and include careful monitoring of program sales in these stores to ensure program light bulbs are selling as expected.
- **Recommendation 3:** PAs should also allocate more resources to verify program activity. This should include verification of shipment and delivery documentation from manufacturers and more in-store verifications to confirm stocking and adequate sell-through rates of program discounted light bulbs.

8.1.3 Gross baseline

Gross unit energy savings for LED lamps still show energy savings opportunities. However, the rapidly transforming lighting market suggests that the market share of inefficient lamps is shrinking. This indicates that a baseline that includes inefficient lamps will continue to decline as LEDs comprise the vast majority of the market and continue to grow.

Based on these conclusions, we have the following recommendation:

- **Recommendation 4:** Unit energy savings will continue to decline. Residential lighting programs should be targeted at customer segments and applications where savings opportunities still exist.

8.1.4 Tracking data and verification data issues

Program tracking data for the 2018 programs were comparatively better than the data for the 2017 programs. However, data quality issues continued to persist for the 2018 program, including missing or inaccurate store names, incomplete retail store addresses, missing or inaccurate retail store phone numbers, and inaccurate shipment quantities. There were also instances of incomplete or inaccurate residential customer data, including missing customer service addresses and incorrect climate zones for some customers. Follow-up data requests and discussions were required with program staff for the evaluators to get the necessary data to complete the evaluation.

Based on these conclusions we have the following recommendations:

- **Recommendation 5:** PAs need to improve tracking and verification of program activity. Program tracking data at a minimum should have complete and accurate data on program shipment quantities as well as retail store addresses, phone numbers, and key contacts.

8.2 Further research

Based on the conclusions and recommendations for programs from this evaluation, we have identified potential topics for further research.

8.2.1 Develop lessons learned from program intervention and market transformation

The evaluation comes at a time when the lighting market has largely been transformed in California. The upstream lighting programs have been successful for years, incentivizing CFLs when the programs first began and then shifting to incentivizing LEDs in recent years. A study on lessons learned from this evaluation could be highly beneficial to program administrators in other states that have less mature programs and lighting markets as well as program administrators of other non-lighting measures. Such a study could further investigate how programs can effectively utilize smaller, niche channels to reach disadvantaged communities while not oversaturating these markets. In addition, the study could identify the final pockets of customers who are not willing to adopt LEDs or have limited access to them. This research would thus identify the specific remaining barriers to adoption and recommend the most cost-effective ways of overcoming those barriers.

8.2.2 Residential lighting usage patterns

Lighting programs and measures are continuing to evolve as the market changes. The last study that measured actual residential lighting usage was the 2006-2008 impact evaluation metering study.[34] The hours of use and peak coincidence factors in this evaluation still rely on the meter data from that study. An In-Home Lighting Inventory and Metering Study Research Plan was scoped for the CPUC in 2017.[35] Stakeholders should review this research plan and assess whether a new study investigating residential lighting usage patterns is needed to update gross saving assumptions. While residential lighting programs are being scaled back, such a study could identify new opportunities for targeted lighting programs.

[34] KEMA, Inc. and Cadmus Group 2010.

[35] DNV GL 2017a.

9 REFERENCES

Apex Analytics, 2020. Consortium for Retail Energy Efficiency Data (CREED). https://www.creedlighttracker.com/ (accessed February 1, 2020).

CEC, 2019. California Code of Regulations. Title 20. Public Utilities and Energy. Division 2. State Energy Resources Conservation and Development Commission. CEC-140-2019-002. January 2019.

_____, 2018. Analysis of General Service Lamps (Expanded Scope). 2018 Appliance Efficiency Pre-Rulemaking. Draft Staff Report. Docket Number 17-AAER-07. August 2018.

_____, 2017. Voluntary California Quality Light-Emitting Diode (LED) Lamp Specification 3.1: A Voluntary Minimum Specification for "California Quality" LED Lamps. CEC-400-2017-015-SF. December 2017.

CPUC ED, 2018. 2017-2019 Energy Division & Program Administrator Energy Efficiency Evaluation, Measurement and Verification Plan - Version 8. December 31, 2018.

_____, 2017. Final 2018 Efficiency Savings and Performance Incentive (ESPI) Uncertain Measures List. October 31, 2017.

_____, 2016. Final 2017 Efficiency Savings and Performance Incentive (ESPI) Uncertain Measures List. December 22, 2016.

_____, 2015a. CPUC Energy Division Impact Evaluation Standard Reporting Guidelines. November 2015.

_____, 2015b. Ex Ante Update for ESPI Uncertain Measures Compact Fluorescent Lamps 30 Watts and Less. May 21, 2015.

_____, 2013. Decision Adopting Efficiency Savings and Performance Incentive (ESPI) Mechanism (D.13-09-023). September 5, 2013.

DNV GL, 2020. The California Retail Lighting Shelf Survey Online Tool. https://webtools.dnvgl.com/projects62/Default.aspx?tabid=221 (accessed February 1, 2020).

_____, 2019a. Data Collection and Sampling Plan: Upstream Lighting and Residential Downstream Lighting – Program Years 2018-2019. Prepared for the CPUC ED. November 15, 2019.

_____, 2019b. Work Plan: Lighting Sector – Program Years 2018-2019. Prepared for the CPUC ED. June 28, 2019.

_____, 2019c. Upstream and Residential Downstream Lighting Impact Evaluation Report: Lighting Sector – Program Year 2017. Prepared for the CPUC ED. April 26, 2019.

_____, 2018a. Data Collection and Sampling Plan: Lighting Sector – Program Years 2017-2019. Prepared for the CPUC ED. October 31, 2018.

_____, 2018b. Work Plan: Lighting Sector – Program Years 2017-2019. Prepared for the CPUC ED. September 7, 2018.

_____, 2017a. Research Plan: In-Home Lighting Inventory and Metering Study. Prepared for the CPUC ED. October 6, 2017.

_____, 2017b. Impact Evaluation of 2015 Upstream and Residential Downstream Lighting Programs. Prepared for the CPUC ED. April 1, 2017.

_____, 2016a. Impact Evaluation of 2013-14 Upstream and Residential Downstream Lighting Programs. Prepared for the CPUC ED. April 1, 2016.

_____, 2016b. DNV GL's LED Hedonic Pricing Model and Forecast. Prepared for the CPUC ED. December 1, 2016.

_____, 2015. Memo: 2013 Upstream and Residential Lighting Impacts. Prepared for the CPUC ED. February 27, 2015.

_____, 2014a. Final Report - WO21: Residential On-site Study: California Lighting and Appliance Saturation Study (CLASS 2012). Prepared for the CPUC, ED. November 24, 2014.

_____, 2014b. California Residential Replacement Lamp Market Status Report: Upstream Lighting Program and Market Activities in California through 2013. Prepared for the CPUC, ED. CALMAC Study ID CPU0091.01. September 10, 2014.

_____, 2014c. California Upstream and Residential Lighting Impact Evaluation Work Order 28 (WO28) Final Report. Prepared for the CPUC, ED. August 4, 2014.

Itron and DNV GL., 2014. 2010-2012 WO017 Ex Ante Measure Cost Study Final Report. Prepared for the CPUC ED. May 27, 2014.

Itron, Inc., 2014. California Commercial Market Share Tracking Study. Prepared for the CPUC, ED. November 13, 2014.

KEMA, Inc. and Cadmus Group, 2010. Final Evaluation Report: Upstream Lighting Program, Volume 1. Prepared for the CPUC, ED. February 8, 2010.

TecMarket Works *et al.*, 2006. California Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals. Prepared for the CPUC, ED. April 2006.

10APPENDICES

10.1 Appendix A: Data standardized high-level savings

Gross Lifecycle Savings (MWh)

PA	Standard Report Group	Ex-Ante Gross	Ex-Post Gross	GRR	% Ex-Ante Gross Pass Through	Eval GRR
PGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	7,093	7,094	1.00	0.0%	1.00
PGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	611	87	0.14	0.0%	0.14
PGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	87,571	58,594	0.67	0.0%	0.67
PGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	61,463	135,550	2.21	0.0%	2.21
PGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	3,936	2,636	0.67	0.0%	0.67
PGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	563,331	754,575	1.34	0.0%	1.34
PGE	PassThru Res Downstream	17,929	17,929	1.00	100.0%	
PGE	PassThru Upstream	36,642	36,642	1.00	100.0%	
PGE	**Total**	**778,575**	**1,013,105**	**1.30**	**7.0%**	**1.32**
SCE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	16,506	6,463	0.39	0.0%	0.39
SCE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	8,137	2,025	0.25	0.0%	0.25
SCE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	386,899	96,381	0.25	0.0%	0.25
SCE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	138,413	216,787	1.57	0.0%	1.57
SCE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	61,945	86,623	1.40	0.0%	1.40
SCE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	2,947,466	1,814,499	0.62	0.0%	0.62
SCE	PassThru Res Downstream	29,362	29,362	1.00	100.0%	
SCE	PassThru Upstream	12,051	12,051	1.00	100.0%	
SCE	**Total**	**3,600,779**	**2,264,191**	**0.63**	**1.2%**	**0.62**
SDGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	9,674	3,345	0.35	0.0%	0.35
SDGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	7,783	1,777	0.23	0.0%	0.23
SDGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	310,902	43,415	0.14	0.0%	0.14
SDGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	81,959	79,165	0.97	0.0%	0.97
SDGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	49,159	36,056	0.73	0.0%	0.73
SDGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	1,966,018	320,367	0.16	0.0%	0.16
SDGE	PassThru Res Downstream	3,385	3,385	1.00	100.0%	
SDGE	PassThru Upstream	15,837	15,837	1.00	100.0%	
SDGE	**Total**	**2,444,716**	**503,345**	**0.21**	**0.8%**	**0.20**
MCE	PassThru Res Downstream	2,569	2,569	1.00	100.0%	
MCE	**Total**	**2,569**	**2,569**	**1.00**	**100.0%**	

Note: The net savings within the ATR database include a 5% NTGR market effects adder that is not included in Chapter 7 ex post tables.

Gross Lifecycle Savings (MWh)

PA	Standard Report Group	Ex-Ante Gross	Ex-Post Gross	GRR	% Ex-Ante Gross Pass Through	Eval GRR
Statewide		***6,826,640***	***3,783,210***	***0.55***	***1.7%***	***0.55***

Note: The net savings within the ATR database include a 5% NTGR market effects adder that is not included in Chapter 7 ex post tables.

Net Lifecycle Savings (MWh)

PA	Standard Report Group	Ex-Ante Net	Ex-Post Net	NRR	% Ex-Ante Net Pass Through	Ex-Ante NTG	Ex-Post NTG	Eval Ex-Ante NTG	Eval Ex-Post NTG
PGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	5,017	5,018	1.00	0.0%	0.71	0.71	0.71	0.71
PGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	586	83	0.14	0.0%	0.96	0.96	0.96	0.96
PGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	84,068	56,250	0.67	0.0%	0.96	0.96	0.96	0.96
PGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	43,474	21,058	0.48	0.0%	0.71	0.16	0.71	0.16
PGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	3,778	827	0.22	0.0%	0.96	0.31	0.96	0.31
PGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	540,798	92,916	0.17	0.0%	0.96	0.12	0.96	0.12
PGE	PassThru Res Downstream	16,719	16,719	1.00	100.0%	0.93	0.93		
PGE	PassThru Upstream	35,176	35,176	1.00	100.0%	0.96	0.96		
PGE	**Total**	**729,617**	**228,047**	**0.31**	**7.1%**	**0.94**	**0.23**	**0.94**	**0.18**
SCE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	15,270	5,629	0.37	0.0%	0.93	0.87	0.93	0.87
SCE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	7,737	1,870	0.24	0.0%	0.95	0.92	0.95	0.92
SCE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	371,423	92,526	0.25	0.0%	0.96	0.96	0.96	0.96
SCE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	128,059	33,678	0.26	0.0%	0.93	0.16	0.93	0.16
SCE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	58,815	27,169	0.46	0.0%	0.95	0.31	0.95	0.31
SCE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	2,829,568	223,433	0.08	0.0%	0.96	0.12	0.96	0.12
SCE	PassThru Res Downstream	22,983	22,983	1.00	100.0%	0.78	0.78		
SCE	PassThru Upstream	10,846	10,846	1.00	100.0%	0.90	0.90		
SCE	**Total**	**3,444,702**	**418,134**	**0.12**	**1.0%**	**0.96**	**0.18**	**0.96**	**0.17**
SDGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	9,287	3,211	0.35	0.0%	0.96	0.96	0.96	0.96
SDGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	7,472	1,706	0.23	0.0%	0.96	0.96	0.96	0.96
SDGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	298,466	41,678	0.14	0.0%	0.96	0.96	0.96	0.96
SDGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	78,681	12,298	0.16	0.0%	0.96	0.16	0.96	0.16
SDGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	47,192	11,309	0.24	0.0%	0.96	0.31	0.96	0.31
SDGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	1,887,377	39,449	0.02	0.0%	0.96	0.12	0.96	0.12
SDGE	PassThru Res Downstream	2,653	2,653	1.00	100.0%	0.78	0.78		
SDGE	PassThru Upstream	15,194	15,194	1.00	100.0%	0.96	0.96		
SDGE	**Total**	**2,346,322**	**127,498**	**0.05**	**0.8%**	**0.96**	**0.25**	**0.96**	**0.23**
MCE	PassThru Res Downstream	2,023	2,023	1.00	100.0%	0.79	0.79		
MCE	**Total**	**2,023**	**2,023**	**1.00**	**100.0%**	**0.79**	**0.79**		
	Statewide	***6,522,665***	***775,702***	***0.12***	***1.6%***	***0.96***	***0.21***	***0.96***	***0.18***

Note: The net savings within the ATR database include a 5% NTGR market effects adder that is not included in Chapter 7 ex post tables.

Gross Lifecycle Savings (MW)

PA	Standard Report Group	Ex-Ante Gross	Ex-Post Gross	GRR	% Ex-Ante Gross Pass Through	Eval GRR
PGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	1.7	1.7	1.00	0.0%	1.00
PGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	0.1	0.0	0.14	0.0%	0.14
PGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	20.7	13.9	0.67	0.0%	0.67
PGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	7.4	16.2	2.20	0.0%	2.20
PGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	0.5	0.4	0.84	0.0%	0.84
PGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	67.5	103.1	1.53	0.0%	1.53
PGE	PassThru Res Downstream	2.2	2.2	1.00	100.0%	
PGE	PassThru Upstream	5.0	5.0	1.00	100.0%	
PGE	**Total**	**105.1**	**142.5**	**1.36**	**6.8%**	**1.38**
SCE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	5.4	2.1	0.39	0.0%	0.39
SCE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	2.6	0.7	0.25	0.0%	0.25
SCE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	125.5	31.2	0.25	0.0%	0.25
SCE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	16.5	29.3	1.77	0.0%	1.77
SCE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	7.4	13.5	1.82	0.0%	1.82
SCE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	353.4	224.9	0.64	0.0%	0.64
SCE	PassThru Res Downstream	0.9	0.9	1.00	100.0%	
SCE	PassThru Upstream	2.2	2.2	1.00	100.0%	
SCE	**Total**	**513.9**	**304.7**	**0.59**	**0.6%**	**0.59**
SDGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	2.4	0.8	0.35	0.0%	0.35
SDGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	1.9	0.4	0.23	0.0%	0.23
SDGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	77.6	10.8	0.14	0.0%	0.14
SDGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	9.5	7.8	0.82	0.0%	0.82
SDGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	5.9	4.5	0.77	0.0%	0.77
SDGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	221.4	24.0	0.11	0.0%	0.11
SDGE	PassThru Res Downstream	0.0	0.0	1.00	100.0%	
SDGE	PassThru Upstream	2.1	2.1	1.00	100.0%	
SDGE	**Total**	**320.8**	**50.5**	**0.16**	**0.7%**	**0.15**
MCE	PassThru Res Downstream	0.0	0.0	1.00	100.0%	
MCE	**Total**	**0.0**	**0.0**	**1.00**	**100.0%**	

Note: The net savings within the ATR database include a 5% NTGR market effects adder that is not included in Chapter 7 ex post tables.

Gross Lifecycle Savings (MW)

PA	Standard Report Group	Ex-Ante Gross	Ex-Post Gross	GRR	% Ex-Ante Gross Pass Through	Eval GRR
Statewide		***939.8***	***497.7***	***0.53***	***1.3%***	***0.52***

Note: The net savings within the ATR database include a 5% NTGR market effects adder that is not included in Chapter 7 ex post tables.

Net Lifecycle Savings (MW)

PA	Standard Report Group	Ex-Ante Net	Ex-Post Net	NRR	% Ex-Ante Net Pass Through	Ex-Ante NTG	Ex-Post NTG	Eval Ex-Ante NTG	Eval Ex-Post NTG
PGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	1.2	1.2	1.00	0.0%	0.71	0.71	0.71	0.71
PGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	0.1	0.0	0.14	0.0%	0.96	0.96	0.96	0.96
PGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	19.9	13.3	0.67	0.0%	0.96	0.96	0.96	0.96
PGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	5.2	2.5	0.48	0.0%	0.71	0.16	0.71	0.16
PGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	0.5	0.1	0.28	0.0%	0.96	0.31	0.96	0.31
PGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	64.8	12.7	0.20	0.0%	0.96	0.12	0.96	0.12
PGE	PassThru Res Downstream	2.1	2.1	1.00	100.0%	0.93	0.93		
PGE	PassThru Upstream	4.8	4.8	1.00	100.0%	0.96	0.96		
PGE	**Total**	**98.5**	**36.7**	**0.37**	**6.9%**	**0.94**	**0.26**	**0.94**	**0.22**
SCE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	5.0	1.8	0.37	0.0%	0.93	0.87	0.93	0.87
SCE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	2.5	0.6	0.24	0.0%	0.95	0.92	0.95	0.92
SCE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	120.5	30.0	0.25	0.0%	0.96	0.96	0.96	0.96
SCE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	15.3	4.5	0.30	0.0%	0.93	0.16	0.93	0.16
SCE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	7.1	4.2	0.60	0.0%	0.95	0.31	0.95	0.31
SCE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	339.2	27.7	0.08	0.0%	0.96	0.12	0.96	0.12
SCE	PassThru Res Downstream	0.7	0.7	1.00	100.0%	0.84	0.84		
SCE	PassThru Upstream	2.0	2.0	1.00	100.0%	0.90	0.90		
SCE	**Total**	**492.2**	**71.6**	**0.15**	**0.6%**	**0.96**	**0.23**	**0.96**	**0.23**
SDGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	2.3	0.8	0.35	0.0%	0.96	0.96	0.96	0.96
SDGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	1.8	0.4	0.23	0.0%	0.96	0.96	0.96	0.96
SDGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	74.4	10.4	0.14	0.0%	0.96	0.96	0.96	0.96
SDGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	9.1	1.2	0.13	0.0%	0.96	0.16	0.96	0.16
SDGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	5.6	1.4	0.25	0.0%	0.96	0.31	0.96	0.31
SDGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	212.6	3.0	0.01	0.0%	0.96	0.12	0.96	0.12
SDGE	PassThru Res Downstream	0.0	0.0	1.00	100.0%	0.77	0.77		
SDGE	PassThru Upstream	2.0	2.0	1.00	100.0%	0.96	0.96		
SDGE	**Total**	**307.9**	**19.2**	**0.06**	**0.7%**	**0.96**	**0.38**	**0.96**	**0.36**
MCE	PassThru Res Downstream	0.0	0.0	1.00	100.0%	0.81	0.81		
MCE	**Total**	**0.0**	**0.0**	**1.00**	**100.0%**	**0.81**	**0.81**		
	Statewide	***898.7***	***127.5***	***0.14***	***1.3%***	***0.96***	***0.26***	***0.96***	***0.24***

Note: The net savings within the ATR database include a 5% NTGR market effects adder that is not included in Chapter 7 ex post tables.

Gross Lifecycle Savings (MTherms)

PA	Standard Report Group	Ex-Ante Gross	Ex-Post Gross	GRR	% Ex-Ante Gross Pass Through	Eval GRR
PGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	-46	-46	1.00	0.0%	1.00
PGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	-4	-1	0.14	0.0%	0.14
PGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	-569	-381	0.67	0.0%	0.67
PGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	-1,369	-3,322	2.43	0.0%	2.43
PGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	-88	-65	0.74	0.0%	0.74
PGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	-12,553	-18,494	1.47	0.0%	1.47
PGE	PassThru Res Downstream	-399	-399	1.00	100.0%	
PGE	PassThru Upstream	-737	-737	1.00	100.0%	
PGE	**Total**	**-15,764**	**-23,444**	**1.49**	**7.2%**	**1.52**
SCE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	-17	-6	0.38	0.0%	0.38
SCE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	-9	-2	0.23	0.0%	0.23
SCE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	-410	-98	0.24	0.0%	0.24
SCE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	-2,434	-3,849	1.58	0.0%	1.58
SCE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	-1,104	-1,538	1.39	0.0%	1.39
SCE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	-52,002	-32,220	0.62	0.0%	0.62
SCE	PassThru Res Downstream	-367	-367	1.00	100.0%	
SCE	PassThru Upstream	-165	-165	1.00	100.0%	
SCE	**Total**	**-56,509**	**-38,246**	**0.68**	**0.9%**	**0.67**
SDGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	-36	-12	0.35	0.0%	0.35
SDGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	-29	-7	0.23	0.0%	0.23
SDGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	-1,148	-160	0.14	0.0%	0.14
SDGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	-1,281	-1,383	1.08	0.0%	1.08
SDGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	-769	-630	0.82	0.0%	0.82
SDGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	-30,713	-5,599	0.18	0.0%	0.18
SDGE	PassThru Res Downstream	-39	-39	1.00	100.0%	
SDGE	PassThru Upstream	-222	-222	1.00	100.0%	
SDGE	**Total**	**-34,237**	**-8,053**	**0.24**	**0.8%**	**0.23**
MCE	PassThru Res Downstream	-11	-11	1.00	100.0%	
MCE	**Total**	**-11**	**-11**	**1.00**	**100.0%**	

Note: The net savings within the ATR database include a 5% NTGR market effects adder that is not included in Chapter 7 ex post tables.

Gross Lifecycle Savings (MTherms)

PA	Standard Report Group	Ex-Ante Gross	Ex-Post Gross	GRR	% Ex-Ante Gross Pass Through	Eval GRR
Statewide		***-106,520***	***-69,753***	***0.65***	***1.8%***	***0.65***

Note: The net savings within the ATR database include a 5% NTGR market effects adder that is not included in Chapter 7 ex post tables.

Net Lifecycle Savings (MTherms)

PA	Standard Report Group	Ex-Ante Net	Ex-Post Net	NRR	% Ex-Ante Net Pass Through	Ex-Ante NTG	Ex-Post NTG	Eval Ex-Ante NTG	Eval Ex-Post NTG
PGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	-33	-33	1.00	0.0%	0.71	0.71	0.71	0.71
PGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	-4	-1	0.14	0.0%	0.96	0.96	0.96	0.96
PGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	-546	-366	0.67	0.0%	0.96	0.96	0.96	0.96
PGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	-968	-516	0.53	0.0%	0.71	0.16	0.71	0.16
PGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	-84	-20	0.24	0.0%	0.96	0.31	0.96	0.31
PGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	-12,051	-2,277	0.19	0.0%	0.96	0.12	0.96	0.12
PGE	PassThru Res Downstream	-372	-372	1.00	100.0%	0.93	0.93		
PGE	PassThru Upstream	-707	-707	1.00	100.0%	0.96	0.96		
PGE	**Total**	**-14,765**	**-4,291**	**0.29**	**7.3%**	**0.94**	**0.18**	**0.94**	**0.14**
SCE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	-16	-5	0.35	0.0%	0.93	0.87	0.93	0.87
SCE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	-8	-2	0.23	0.0%	0.95	0.93	0.95	0.93
SCE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	-394	-94	0.24	0.0%	0.96	0.96	0.96	0.96
SCE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	-2,251	-598	0.27	0.0%	0.92	0.16	0.92	0.16
SCE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	-1,048	-482	0.46	0.0%	0.95	0.31	0.95	0.31
SCE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	-49,922	-3,968	0.08	0.0%	0.96	0.12	0.96	0.12
SCE	PassThru Res Downstream	-287	-287	1.00	100.0%	0.78	0.78		
SCE	PassThru Upstream	-148	-148	1.00	100.0%	0.90	0.90		
SCE	**Total**	**-54,074**	**-5,585**	**0.10**	**0.8%**	**0.96**	**0.15**	**0.96**	**0.14**
SDGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	-34	-12	0.35	0.0%	0.96	0.96	0.96	0.96
SDGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	-28	-6	0.23	0.0%	0.96	0.96	0.96	0.96
SDGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	-1,102	-154	0.14	0.0%	0.96	0.96	0.96	0.96
SDGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	-1,230	-215	0.17	0.0%	0.96	0.16	0.96	0.16
SDGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	-738	-198	0.27	0.0%	0.96	0.31	0.96	0.31
SDGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	-29,485	-689	0.02	0.0%	0.96	0.12	0.96	0.12
SDGE	PassThru Res Downstream	-30	-30	1.00	100.0%	0.77	0.77		
SDGE	PassThru Upstream	-213	-213	1.00	100.0%	0.96	0.96		
SDGE	**Total**	**-32,860**	**-1,517**	**0.05**	**0.7%**	**0.96**	**0.19**	**0.96**	**0.16**
MCE	PassThru Res Downstream	-9	-9	1.00	100.0%	0.82	0.82		
MCE	**Total**	**-9**	**-9**	**1.00**	**100.0%**	**0.82**	**0.82**		
	Statewide	***-101,707***	***-11,402***	***0.11***	***1.7%***	***0.95***	***0.16***	***0.96***	***0.14***

Note: The net savings within the ATR database include a 5% NTGR market effects adder that is not included in Chapter 7 ex post tables.

Gross First Year Savings (MWh)

PA	Standard Report Group	Ex-Ante Gross	Ex-Post Gross	GRR	% Ex-Ante Gross Pass Through	Eval GRR
PGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	1,013	1,013	1.00	0.0%	1.00
PGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	65	9	0.14	0.0%	0.14
PGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	9,316	6,233	0.67	0.0%	0.67
PGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	3,841	8,472	2.21	0.0%	2.21
PGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	246	165	0.67	0.0%	0.67
PGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	35,208	47,161	1.34	0.0%	1.34
PGE	PassThru Res Downstream	1,139	1,139	1.00	100.0%	
PGE	PassThru Upstream	2,506	2,506	1.00	100.0%	
PGE	**Total**	**53,334**	**66,698**	**1.25**	**6.8%**	**1.27**
SCE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	1,518	595	0.39	0.0%	0.39
SCE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	678	169	0.25	0.0%	0.25
SCE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	32,242	8,032	0.25	0.0%	0.25
SCE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	8,651	13,549	1.57	0.0%	1.57
SCE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	3,872	5,414	1.40	0.0%	1.40
SCE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	184,217	113,406	0.62	0.0%	0.62
SCE	PassThru Res Downstream	5,343	5,343	1.00	100.0%	
SCE	PassThru Upstream	2,935	2,935	1.00	100.0%	
SCE	**Total**	**239,455**	**149,442**	**0.62**	**3.5%**	**0.61**
SDGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	1,382	478	0.35	0.0%	0.35
SDGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	828	189	0.23	0.0%	0.23
SDGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	33,075	4,619	0.14	0.0%	0.14
SDGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	5,122	4,948	0.97	0.0%	0.97
SDGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	3,072	2,254	0.73	0.0%	0.73
SDGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	122,876	20,023	0.16	0.0%	0.16
SDGE	PassThru Res Downstream	632	632	1.00	100.0%	
SDGE	PassThru Upstream	1,085	1,085	1.00	100.0%	
SDGE	**Total**	**168,072**	**34,226**	**0.20**	**1.0%**	**0.20**
MCE	PassThru Res Downstream	168	168	1.00	100.0%	
MCE	**Total**	**168**	**168**	**1.00**	**100.0%**	

Note: The net savings within the ATR database include a 5% NTGR market effects adder that is not included in Chapter 7 ex post tables.

Gross First Year Savings (MWh)

PA	Standard Report Group	Ex-Ante Gross	Ex-Post Gross	GRR	% Ex-Ante Gross Pass Through	Eval GRR
Statewide		***461,030***	***250,534***	***0.54***	***3.0%***	***0.53***

Note: The net savings within the ATR database include a 5% NTGR market effects adder that is not included in Chapter 7 ex post tables.

Net First Year Savings (MWh)

PA	Standard Report Group	Ex-Ante Net	Ex-Post Net	NRR	% Ex-Ante Net Pass Through	Ex-Ante NTG	Ex-Post NTG	Eval Ex-Ante NTG	Eval Ex-Post NTG
PGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	717	717	1.00	0.0%	0.71	0.71	0.71	0.71
PGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	62	9	0.14	0.0%	0.96	0.96	0.96	0.96
PGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	8,943	5,984	0.67	0.0%	0.96	0.96	0.96	0.96
PGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	2,717	1,316	0.48	0.0%	0.71	0.16	0.71	0.16
PGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	236	52	0.22	0.0%	0.96	0.31	0.96	0.31
PGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	33,800	5,807	0.17	0.0%	0.96	0.12	0.96	0.12
PGE	PassThru Res Downstream	1,062	1,062	1.00	100.0%	0.93	0.93		
PGE	PassThru Upstream	2,405	2,405	1.00	100.0%	0.96	0.96		
PGE	**Total**	**49,943**	**17,352**	**0.35**	**6.9%**	**0.94**	**0.26**	**0.94**	**0.22**
SCE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	1,405	518	0.37	0.0%	0.93	0.87	0.93	0.87
SCE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	645	156	0.24	0.0%	0.95	0.92	0.95	0.92
SCE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	30,952	7,710	0.25	0.0%	0.96	0.96	0.96	0.96
SCE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	8,004	2,105	0.26	0.0%	0.93	0.16	0.93	0.16
SCE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	3,676	1,698	0.46	0.0%	0.95	0.31	0.95	0.31
SCE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	176,848	13,965	0.08	0.0%	0.96	0.12	0.96	0.12
SCE	PassThru Res Downstream	4,133	4,133	1.00	100.0%	0.77	0.77		
SCE	PassThru Upstream	2,641	2,641	1.00	100.0%	0.90	0.90		
SCE	**Total**	**228,303**	**32,926**	**0.14**	**3.0%**	**0.95**	**0.22**	**0.96**	**0.19**
SDGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	1,327	459	0.35	0.0%	0.96	0.96	0.96	0.96
SDGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	795	181	0.23	0.0%	0.96	0.96	0.96	0.96
SDGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	31,752	4,434	0.14	0.0%	0.96	0.96	0.96	0.96
SDGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	4,918	769	0.16	0.0%	0.96	0.16	0.96	0.16
SDGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	2,950	707	0.24	0.0%	0.96	0.31	0.96	0.31
SDGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	117,961	2,466	0.02	0.0%	0.96	0.12	0.96	0.12
SDGE	PassThru Res Downstream	490	490	1.00	100.0%	0.77	0.77		
SDGE	PassThru Upstream	1,041	1,041	1.00	100.0%	0.96	0.96		
SDGE	**Total**	**161,232**	**10,545**	**0.07**	**0.9%**	**0.96**	**0.31**	**0.96**	**0.28**
MCE	PassThru Res Downstream	133	133	1.00	100.0%	0.79	0.79		
MCE	**Total**	**133**	**133**	**1.00**	**100.0%**	**0.79**	**0.79**		
	Statewide	***439,611***	***60,956***	***0.14***	***2.7%***	***0.95***	***0.24***	***0.96***	***0.21***

Note: The net savings within the ATR database include a 5% NTGR market effects adder that is not included in Chapter 7 ex post tables.

Gross First Year Savings (MW)

PA	Standard Report Group	Ex-Ante Gross	Ex-Post Gross	GRR	% Ex-Ante Gross Pass Through	Eval GRR
PGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	0.2	0.2	1.00	0.0%	1.00
PGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	0.0	0.0	0.14	0.0%	0.14
PGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	2.2	1.5	0.67	0.0%	0.67
PGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	0.5	1.0	2.20	0.0%	2.20
PGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	0.0	0.0	0.84	0.0%	0.84
PGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	4.2	6.4	1.53	0.0%	1.53
PGE	PassThru Res Downstream	0.1	0.1	1.00	100.0%	
PGE	PassThru Upstream	0.4	0.4	1.00	100.0%	
PGE	**Total**	**7.7**	**9.7**	**1.26**	**6.6%**	**1.28**
SCE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	0.5	0.2	0.39	0.0%	0.39
SCE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	0.2	0.1	0.25	0.0%	0.25
SCE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	10.5	2.6	0.25	0.0%	0.25
SCE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	1.0	1.8	1.77	0.0%	1.77
SCE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	0.5	0.8	1.82	0.0%	1.82
SCE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	22.1	14.1	0.64	0.0%	0.64
SCE	PassThru Res Downstream	0.1	0.1	1.00	100.0%	
SCE	PassThru Upstream	0.5	0.5	1.00	100.0%	
SCE	**Total**	**35.3**	**20.1**	**0.57**	**1.6%**	**0.56**
SDGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	0.3	0.1	0.35	0.0%	0.35
SDGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	0.2	0.0	0.23	0.0%	0.23
SDGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	8.3	1.2	0.14	0.0%	0.14
SDGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	0.6	0.5	0.82	0.0%	0.82
SDGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	0.4	0.3	0.77	0.0%	0.77
SDGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	13.8	1.5	0.11	0.0%	0.11
SDGE	PassThru Res Downstream	0.0	0.0	1.00	100.0%	
SDGE	PassThru Upstream	0.2	0.2	1.00	100.0%	
SDGE	**Total**	**23.8**	**3.7**	**0.16**	**0.7%**	**0.15**
MCE	PassThru Res Downstream	0.0	0.0	1.00	100.0%	
MCE	**Total**	**0.0**	**0.0**	**1.00**	**100.0%**	

Note: The net savings within the ATR database include a 5% NTGR market effects adder that is not included in Chapter 7 ex post tables.

Gross First Year Savings (MW)

PA	Standard Report Group	Ex-Ante Gross	Ex-Post Gross	GRR	% Ex-Ante Gross Pass Through	Eval GRR
Statewide		***66.8***	***33.6***	***0.50***	***1.8%***	***0.49***

Note: The net savings within the ATR database include a 5% NTGR market effects adder that is not included in Chapter 7 ex post tables.

Net First Year Savings (MW)

PA	Standard Report Group	Ex-Ante Net	Ex-Post Net	NRR	% Ex-Ante Net Pass Through	Ex-Ante NTG	Ex-Post NTG	Eval Ex-Ante NTG	Eval Ex-Post NTG
PGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	0.2	0.2	1.00	0.0%	0.71	0.71	0.71	0.71
PGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	0.0	0.0	0.14	0.0%	0.96	0.96	0.96	0.96
PGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	2.1	1.4	0.67	0.0%	0.96	0.96	0.96	0.96
PGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	0.3	0.2	0.48	0.0%	0.71	0.16	0.71	0.16
PGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	0.0	0.0	0.28	0.0%	0.96	0.31	0.96	0.31
PGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	4.1	0.8	0.20	0.0%	0.96	0.12	0.96	0.12
PGE	PassThru Res Downstream	0.1	0.1	1.00	100.0%	0.93	0.93		
PGE	PassThru Upstream	0.3	0.3	1.00	100.0%	0.96	0.96		
PGE	**Total**	**7.2**	**3.0**	**0.42**	**6.7%**	**0.94**	**0.31**	**0.94**	**0.28**
SCE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	0.5	0.2	0.37	0.0%	0.93	0.87	0.93	0.87
SCE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	0.2	0.1	0.24	0.0%	0.95	0.92	0.95	0.92
SCE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	10.0	2.5	0.25	0.0%	0.96	0.96	0.96	0.96
SCE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	1.0	0.3	0.30	0.0%	0.93	0.16	0.93	0.16
SCE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	0.4	0.3	0.60	0.0%	0.95	0.31	0.95	0.31
SCE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	21.2	1.7	0.08	0.0%	0.96	0.12	0.96	0.12
SCE	PassThru Res Downstream	0.1	0.1	1.00	100.0%	0.81	0.81		
SCE	PassThru Upstream	0.4	0.4	1.00	100.0%	0.90	0.90		
SCE	**Total**	**33.8**	**5.5**	**0.16**	**1.5%**	**0.96**	**0.27**	**0.96**	**0.26**
SDGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	0.3	0.1	0.35	0.0%	0.96	0.96	0.96	0.96
SDGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	0.2	0.0	0.23	0.0%	0.96	0.96	0.96	0.96
SDGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	7.9	1.1	0.14	0.0%	0.96	0.96	0.96	0.96
SDGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	0.6	0.1	0.13	0.0%	0.96	0.16	0.96	0.16
SDGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	0.4	0.1	0.25	0.0%	0.96	0.31	0.96	0.31
SDGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	13.3	0.2	0.01	0.0%	0.96	0.12	0.96	0.12
SDGE	PassThru Res Downstream	0.0	0.0	1.00	100.0%	0.77	0.77		
SDGE	PassThru Upstream	0.1	0.1	1.00	100.0%	0.96	0.96		
SDGE	**Total**	**22.8**	**1.8**	**0.08**	**0.7%**	**0.96**	**0.47**	**0.96**	**0.45**
MCE	PassThru Res Downstream	0.0	0.0	1.00	100.0%	0.82	0.82		
MCE	**Total**	**0.0**	**0.0**	**1.00**	**100.0%**	**0.82**	**0.82**		
	Statewide	***63.8***	***10.3***	***0.16***	***1.8%***	***0.96***	***0.31***	***0.96***	***0.28***

Note: The net savings within the ATR database include a 5% NTGR market effects adder that is not included in Chapter 7 ex post tables.

Gross First Year Savings (MTherms)

PA	Standard Report Group	Ex-Ante Gross	Ex-Post Gross	GRR	% Ex-Ante Gross Pass Through	Eval GRR
PGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	-7	-7	1.00	0.0%	1.00
PGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	0	0	0.14	0.0%	0.14
PGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	-61	-41	0.67	0.0%	0.67
PGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	-86	-208	2.43	0.0%	2.43
PGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	-5	-4	0.74	0.0%	0.74
PGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	-785	-1,156	1.47	0.0%	1.47
PGE	PassThru Res Downstream	-25	-25	1.00	100.0%	
PGE	PassThru Upstream	-47	-47	1.00	100.0%	
PGE	**Total**	**-1,016**	**-1,487**	**1.46**	**7.1%**	**1.50**
SCE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	-2	-1	0.38	0.0%	0.38
SCE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	-1	0	0.23	0.0%	0.23
SCE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	-34	-8	0.24	0.0%	0.24
SCE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	-152	-241	1.58	0.0%	1.58
SCE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	-69	-96	1.39	0.0%	1.39
SCE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	-3,250	-2,014	0.62	0.0%	0.62
SCE	PassThru Res Downstream	-67	-67	1.00	100.0%	
SCE	PassThru Upstream	-46	-46	1.00	100.0%	
SCE	**Total**	**-3,621**	**-2,473**	**0.68**	**3.1%**	**0.67**
SDGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	-5	-2	0.35	0.0%	0.35
SDGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	-3	-1	0.23	0.0%	0.23
SDGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	-122	-17	0.14	0.0%	0.14
SDGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	-80	-86	1.08	0.0%	1.08
SDGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	-48	-39	0.82	0.0%	0.82
SDGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	-1,920	-350	0.18	0.0%	0.18
SDGE	PassThru Res Downstream	-8	-8	1.00	100.0%	
SDGE	PassThru Upstream	-14	-14	1.00	100.0%	
SDGE	**Total**	**-2,200**	**-517**	**0.24**	**1.0%**	**0.23**
MCE	PassThru Res Downstream	-1	-1	1.00	100.0%	
MCE	**Total**	**-1**	**-1**	**1.00**	**100.0%**	

Note: The net savings within the ATR database include a 5% NTGR market effects adder that is not included in Chapter 7 ex post tables.

Gross First Year Savings (MTherms)

PA	Standard Report Group	Ex-Ante Gross	Ex-Post Gross	GRR	% Ex-Ante Gross Pass Through	Eval GRR
Statewide		***-6,838***	***-4,478***	***0.65***	***3.1%***	***0.64***

Note: The net savings within the ATR database include a 5% NTGR market effects adder that is not included in Chapter 7 ex post tables.

Net First Year Savings (MTherms)

PA	Standard Report Group	Ex-Ante Net	Ex-Post Net	NRR	% Ex-Ante Net Pass Through	Ex-Ante NTG	Ex-Post NTG	Eval Ex-Ante NTG	Eval Ex-Post NTG
PGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	-5	-5	1.00	0.0%	0.71	0.71	0.71	0.71
PGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	0	0	0.14	0.0%	0.96	0.96	0.96	0.96
PGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	-58	-39	0.67	0.0%	0.96	0.96	0.96	0.96
PGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	-61	-32	0.53	0.0%	0.71	0.16	0.71	0.16
PGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	-5	-1	0.24	0.0%	0.96	0.31	0.96	0.31
PGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	-753	-142	0.19	0.0%	0.96	0.12	0.96	0.12
PGE	PassThru Res Downstream	-23	-23	1.00	100.0%	0.93	0.93		
PGE	PassThru Upstream	-46	-46	1.00	100.0%	0.96	0.96		
PGE	**Total**	**-951**	**-288**	**0.30**	**7.2%**	**0.94**	**0.19**	**0.94**	**0.16**
SCE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	-1	-1	0.35	0.0%	0.93	0.87	0.93	0.87
SCE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	-1	0	0.23	0.0%	0.95	0.93	0.95	0.93
SCE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	-33	-8	0.24	0.0%	0.96	0.96	0.96	0.96
SCE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	-141	-37	0.27	0.0%	0.92	0.16	0.92	0.16
SCE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	-66	-30	0.46	0.0%	0.95	0.31	0.95	0.31
SCE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	-3,120	-248	0.08	0.0%	0.96	0.12	0.96	0.12
SCE	PassThru Res Downstream	-52	-52	1.00	100.0%	0.77	0.77		
SCE	PassThru Upstream	-42	-42	1.00	100.0%	0.90	0.90		
SCE	**Total**	**-3,455**	**-417**	**0.12**	**2.7%**	**0.95**	**0.17**	**0.96**	**0.14**
SDGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	-5	-2	0.35	0.0%	0.96	0.96	0.96	0.96
SDGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	-3	-1	0.23	0.0%	0.96	0.96	0.96	0.96
SDGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	-117	-16	0.14	0.0%	0.96	0.96	0.96	0.96
SDGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	-77	-13	0.17	0.0%	0.96	0.16	0.96	0.16
SDGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	-46	-12	0.27	0.0%	0.96	0.31	0.96	0.31
SDGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	-1,843	-43	0.02	0.0%	0.96	0.12	0.96	0.12
SDGE	PassThru Res Downstream	-6	-6	1.00	100.0%	0.77	0.77		
SDGE	PassThru Upstream	-14	-14	1.00	100.0%	0.96	0.96		
SDGE	**Total**	**-2,111**	**-107**	**0.05**	**0.9%**	**0.96**	**0.21**	**0.96**	**0.18**
MCE	PassThru Res Downstream	-1	-1	1.00	100.0%	0.83	0.83		
MCE	**Total**	**-1**	**-1**	**1.00**	**100.0%**	**0.83**	**0.83**		
	Statewide	***-6,517***	***-814***	***0.12***	***2.8%***	***0.95***	***0.18***	***0.96***	***0.15***

Note: The net savings within the ATR database include a 5% NTGR market effects adder that is not included in Chapter 7 ex post tables.

10.2 Appendix B: Standardized per unit savings

Per Unit (Quantity) Gross Energy Savings (kWh)

PA	Standard Report Group	Pass Through	% ER Ex-Ante	% ER Ex-Post	Average EUL (yr)	Ex-Post Lifecycle	Ex-Post First Year	Ex-Post Annualized
PGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	7.0	266.5	38.1	38.1
PGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	9.4	135.4	14.4	14.4
PGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	9.4	508.8	54.1	54.1
PGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	16.0	325.1	20.3	20.3
PGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	16.0	262.9	16.4	16.4
PGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	16.0	419.9	26.2	26.2
PGE	PassThru Res Downstream	1	0.0%		15.9	92.4	5.9	5.9
PGE	PassThru Upstream	1	0.0%		15.6	89.9	6.1	6.1
SCE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	10.9	211.8	19.5	19.5
SCE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	12.0	126.0	10.5	10.5
SCE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	12.0	497.0	41.4	41.4
SCE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	16.0	453.5	28.3	28.3
SCE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	16.0	344.0	21.5	21.5
SCE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	16.0	597.3	37.3	37.3
SCE	PassThru Res Downstream	1	0.0%		7.0	227.3	41.4	41.4
SCE	PassThru Upstream	1	0.0%		3.7	51.5	12.5	12.5
SDGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	7.0	193.5	27.6	27.6
SDGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	9.4	214.1	22.8	22.8
SDGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	9.4	714.2	76.0	76.0
SDGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	16.0	292.3	18.3	18.3
SDGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	16.0	277.2	17.3	17.3
SDGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	16.0	336.4	21.0	21.0
SDGE	PassThru Res Downstream	1	98.3%		15.0	249.5	46.6	16.5
SDGE	PassThru Upstream	1	0.0%		15.6	131.0	9.0	9.0
MCE	PassThru Res Downstream	1	0.0%		13.7	5,363.8	350.9	350.9

Note: The net savings within the ATR database include a 5% NTGR market effects adder that is not included in Chapter 7 ex post tables.

Per Unit (Quantity) Gross Energy Savings (Therms)

PA	Standard Report Group	Pass Through	% ER Ex-Ante	% ER Ex-Post	Average EUL (yr)	Ex-Post Lifecycle	Ex-Post First Year	Ex-Post Annualized
PGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	7.0	-1.7	-0.2	-0.2
PGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	9.4	-0.9	-0.1	-0.1
PGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	9.4	-3.3	-0.4	-0.4
PGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	16.0	-8.0	-0.5	-0.5
PGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	16.0	-6.4	-0.4	-0.4
PGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	16.0	-10.3	-0.6	-0.6
PGE	PassThru Res Downstream	1	0.0%		15.9	-2.1	-0.1	-0.1
PGE	PassThru Upstream	1	0.0%		15.6	-1.8	-0.1	-0.1
SCE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	10.9	-0.2	0.0	0.0
SCE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	12.0	-0.1	0.0	0.0
SCE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	12.0	-0.5	0.0	0.0
SCE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	16.0	-8.1	-0.5	-0.5
SCE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	16.0	-6.1	-0.4	-0.4
SCE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	16.0	-10.6	-0.7	-0.7
SCE	PassThru Res Downstream	1	0.0%		7.0	-2.8	-0.5	-0.5
SCE	PassThru Upstream	1	0.0%		3.7	-0.7	-0.2	-0.2
SDGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	7.0	-0.7	-0.1	-0.1
SDGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	9.4	-0.8	-0.1	-0.1
SDGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	9.4	-2.6	-0.3	-0.3
SDGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	16.0	-5.1	-0.3	-0.3
SDGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	16.0	-4.8	-0.3	-0.3
SDGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	16.0	-5.9	-0.4	-0.4
SDGE	PassThru Res Downstream	1	98.3%		15.0	-2.9	-0.6	-0.2
SDGE	PassThru Upstream	1	0.0%		15.6	-1.8	-0.1	-0.1
MCE	PassThru Res Downstream	1	0.0%		13.7	-22.3	-1.8	-1.8

Note: The net savings within the ATR database include a 5% NTGR market effects adder that is not included in Chapter 7 ex post tables.

Per Unit (Quantity) Net Energy Savings (kWh)

PA	Standard Report Group	Pass Through	% ER Ex-Ante	% ER Ex-Post	Average EUL (yr)	Ex-Post Lifecycle	Ex-Post First Year	Ex-Post Annualized
PGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	7.0	188.5	26.9	26.9
PGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	9.4	129.9	13.8	13.8
PGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	9.4	488.5	52.0	52.0
PGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	16.0	50.5	3.2	3.2
PGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	16.0	82.5	5.2	5.2
PGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	16.0	51.7	3.2	3.2
PGE	PassThru Res Downstream	1	0.0%		15.9	86.2	5.5	5.5
PGE	PassThru Upstream	1	0.0%		15.6	86.3	5.9	5.9
SCE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	10.9	184.5	17.0	17.0
SCE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	12.0	116.3	9.7	9.7
SCE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	12.0	477.2	39.8	39.8
SCE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	16.0	70.4	4.4	4.4
SCE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	16.0	107.9	6.7	6.7
SCE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	16.0	73.5	4.6	4.6
SCE	PassThru Res Downstream	1	0.0%		7.0	177.9	32.0	32.0
SCE	PassThru Upstream	1	0.0%		3.7	46.3	11.3	11.3
SDGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	7.0	185.7	26.5	26.5
SDGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	9.4	205.5	21.9	21.9
SDGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	9.4	685.6	72.9	72.9
SDGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	16.0	45.4	2.8	2.8
SDGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	16.0	87.0	5.4	5.4
SDGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	16.0	41.4	2.6	2.6
SDGE	PassThru Res Downstream	1	98.3%		15.0	195.5	36.1	12.9
SDGE	PassThru Upstream	1	0.0%		15.6	125.7	8.6	8.6
MCE	PassThru Res Downstream	1	0.0%		13.7	4,223.8	277.7	277.7

Note: The net savings within the ATR database include a 5% NTGR market effects adder that is not included in Chapter 7 ex post tables.

Per Unit (Quantity) Net Energy Savings (Therms)

PA	Standard Report Group	Pass Through	% ER Ex-Ante	% ER Ex-Post	Average EUL (yr)	Ex-Post Lifecycle	Ex-Post First Year	Ex-Post Annualized
PGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	7.0	-1.2	-0.2	-0.2
PGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	9.4	-0.8	-0.1	-0.1
PGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	9.4	-3.2	-0.3	-0.3
PGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	16.0	-1.2	-0.1	-0.1
PGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	16.0	-2.0	-0.1	-0.1
PGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	16.0	-1.3	-0.1	-0.1
PGE	PassThru Res Downstream	1	0.0%		15.9	-1.9	-0.1	-0.1
PGE	PassThru Upstream	1	0.0%		15.6	-1.7	-0.1	-0.1
SCE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	10.9	-0.2	0.0	0.0
SCE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	12.0	-0.1	0.0	0.0
SCE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	12.0	-0.5	0.0	0.0
SCE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	16.0	-1.3	-0.1	-0.1
SCE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	16.0	-1.9	-0.1	-0.1
SCE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	16.0	-1.3	-0.1	-0.1
SCE	PassThru Res Downstream	1	0.0%		7.0	-2.2	-0.4	-0.4
SCE	PassThru Upstream	1	0.0%		3.7	-0.6	-0.2	-0.2
SDGE	Eval NR UpstreamLIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	7.0	-0.7	-0.1	-0.1
SDGE	Eval NR UpstreamLIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	9.4	-0.8	-0.1	-0.1
SDGE	Eval NR UpstreamLIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	9.4	-2.5	-0.3	-0.3
SDGE	Eval Res Upstream LIGHTING INDOOR LED CANDELABRA	0	0.0%	0.0%	16.0	-0.8	0.0	0.0
SDGE	Eval Res Upstream LIGHTING INDOOR LED GLOBE	0	0.0%	0.0%	16.0	-1.5	-0.1	-0.1
SDGE	Eval Res Upstream LIGHTING INDOOR LED REFLECTOR LAMP	0	0.0%	0.0%	16.0	-0.7	0.0	0.0
SDGE	PassThru Res Downstream	1	98.3%		15.0	-2.2	-0.4	-0.1
SDGE	PassThru Upstream	1	0.0%		15.6	-1.8	-0.1	-0.1
MCE	PassThru Res Downstream	1	0.0%		13.7	-18.3	-1.5	-1.5

Note: The net savings within the ATR database include a 5% NTGR market effects adder that is not included in Chapter 7 ex post tables.

10.3 Appendix C: Recommendations

Study ID	Study Type	Study Title	Study Manager
Group A Lighting Sector	Impact Evaluation	Impact Evaluation of 2018 Upstream and Residential Downstream Lighting Programs	Jacob "Coby" Rudolph

Rec #	Program or Database	Summary of Findings	Additional Supporting Information	Best Practice/Recommendations	Recipient	Affected Workpaper or DEER
1	Upstream Lighting Program	LEDs are the dominate lighting technology and are the preferred choice among most consumers.	LEDs comprise well over 50% of the market for all three evaluated measure groups, and LED prices have fallen to a point where they are competitive with inefficient technologies, even without program incentives. Upstream lighting program incentives no longer influence customer purchases as much as they did when inefficient lamps dominated the lighting market.	PAs should move away from a statewide upstream lighting program model. Increases in standards are expected to remove the final pockets of halogen bulbs in the market, and halogens that remain in sockets have such short measure lives that they will soon be replaced by LEDs. To the extent that pockets of inefficient bulbs remain and or these changes happen inequitably, residential lighting programs should be tailored to reach the appropriate segments of customers, but these programs should be designed thoughtfully to maximize impact.	All PAs	All upstream measures
2	Upstream Lighting Program	Upstream lighting programs shipped more lamps to discount and grocery stores than those channels could reasonably stock and sell.	Retail store surveys revealed that participating discount and grocery stores sell far fewer lamps than were shipped to them through the program. Evaluation results also suggest that there was inadequate monitoring and	Upstream lighting programs need to strike a balance between market size and program shipments and include careful monitoring of program sales in these stores to ensure program lamps are selling as expected.	All PAs	All upstream measures

Rec #	Program or Database	Summary of Findings	Additional Supporting Information	Best Practice/Recommendations	Recipient	Affected Workpaper or DEER
3	Upstream Lighting Program		verification of program lamp shipments and that many participating retail stores were not required to purchase program discounted lamps from manufacturers.	PAs should allocate more resources to verify program activity. This should include verification of shipment and delivery documentation from manufacturers and more in-store verifications to confirm stocking and adequate sell-through rates of program discounted lamps.		
4	Upstream Lighting Program	A baseline that includes inefficient lamps will continue to decline as LEDs comprise the vast majority of the market and continue to grow.	Gross unit energy savings for LED lamps still show energy savings opportunities. However, the rapidly transforming lighting market suggests that the market share of inefficient lamps is shrinking.	Unit energy savings will continue to decline. Residential lighting programs should be targeted at customer segments and applications where savings opportunities still exist.	All PAs	All upstream measures
5	Upstream Lighting Program	Program tracking data for the 2018 programs were comparatively better than the data for the 2017 programs. However, data quality issues continued to persist for the 2018 program.	Tracking data quality issues included missing or inaccurate store names, incomplete retail store addresses, missing or inaccurate retail store phone numbers, and inaccurate shipment quantities. There were also instances of incomplete or inaccurate residential customer data, including missing customer service addresses and incorrect climate zones for some customers. Follow-up data requests and discussions were required with program staff for the evaluators to get the necessary data to complete the evaluation.	PAs need to improve tracking and verification of program activity. Program tracking data at a minimum should have complete and accurate data on program shipment quantities as well as retail store addresses, phone numbers, and key contacts.	All PAs	All upstream measures

10.4 Appendix D: Waterfall graphics

In this section, we present waterfall graphics that to demonstrate the energy savings changes relative to each parameter.

10.4.1 LED Reflectors

Figure 10-1. Upstream and residential downstream LED reflectors gross savings waterfall, PG&E

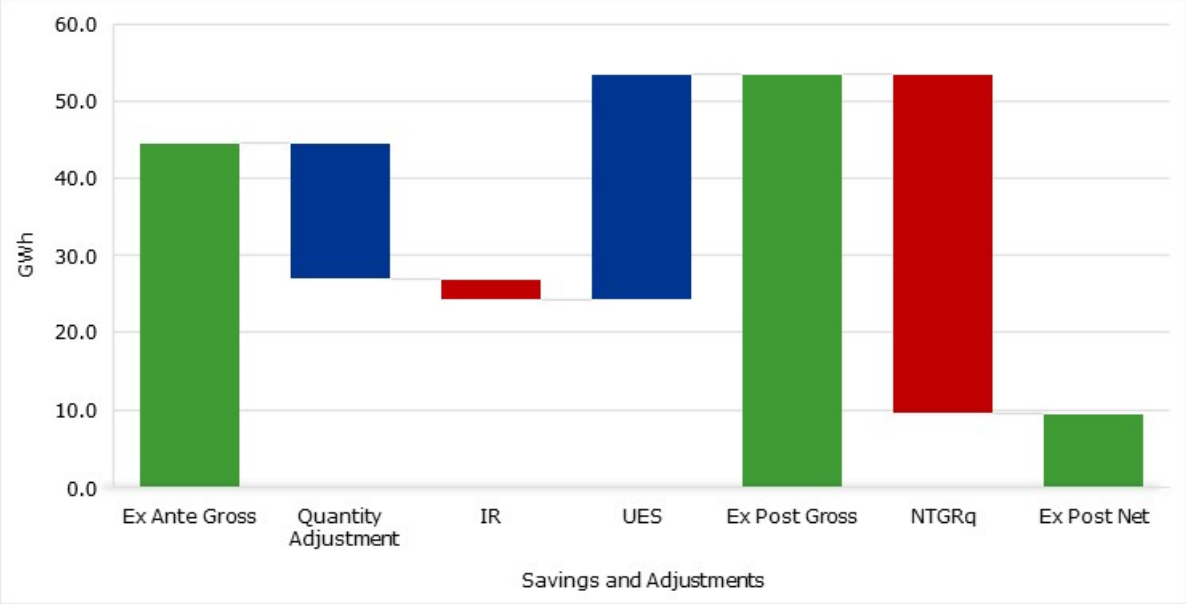


Figure 10-2. Upstream and residential downstream LED reflectors gross savings waterfall, SCE

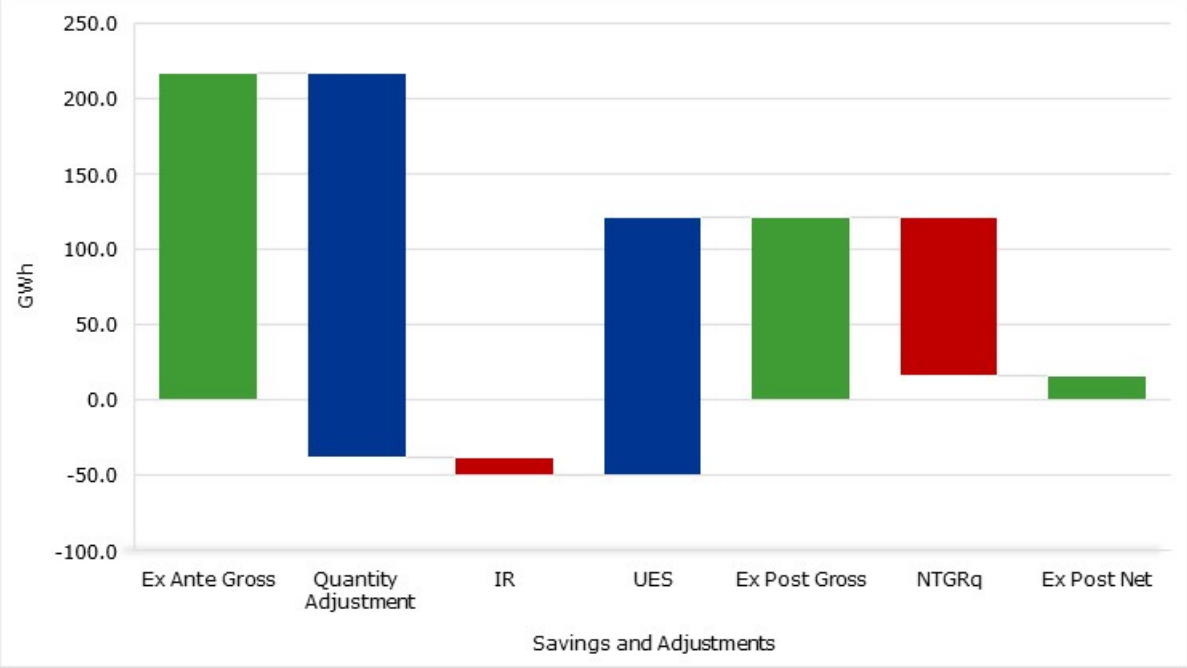
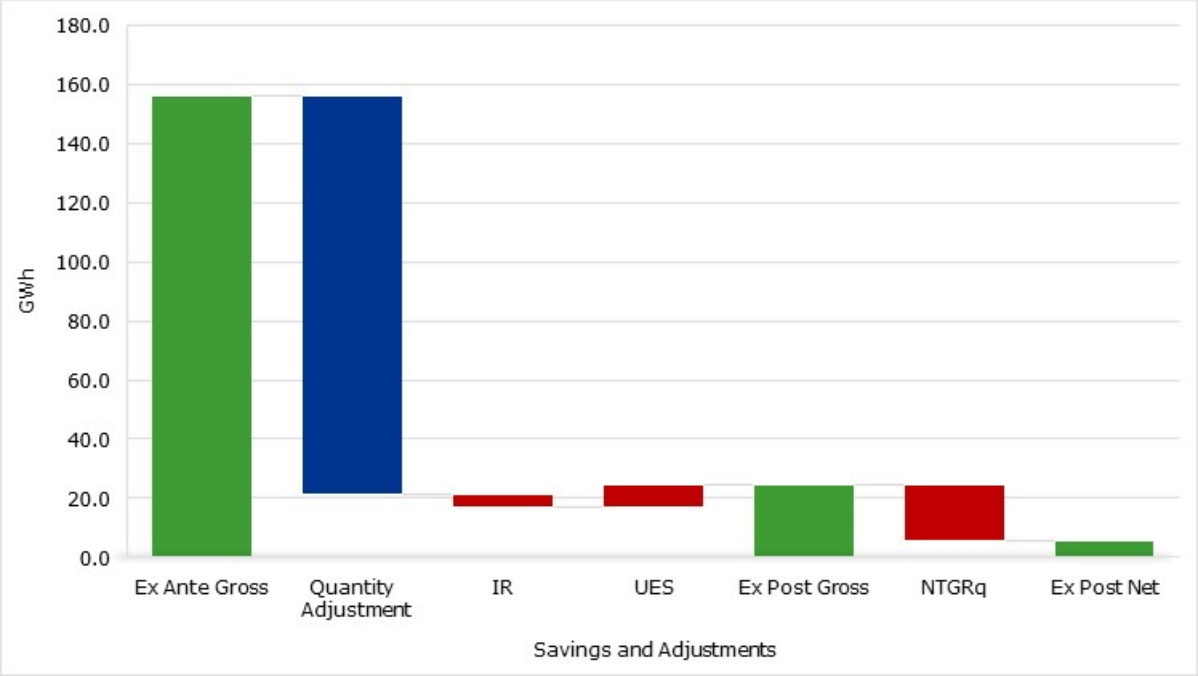


Figure 10-3. Upstream and residential downstream LED reflectors gross savings waterfall, SDG&E



10.4.2 LED Candelabras

Figure 10-4. Upstream and residential downstream LED candelabras gross savings waterfall, PG&E

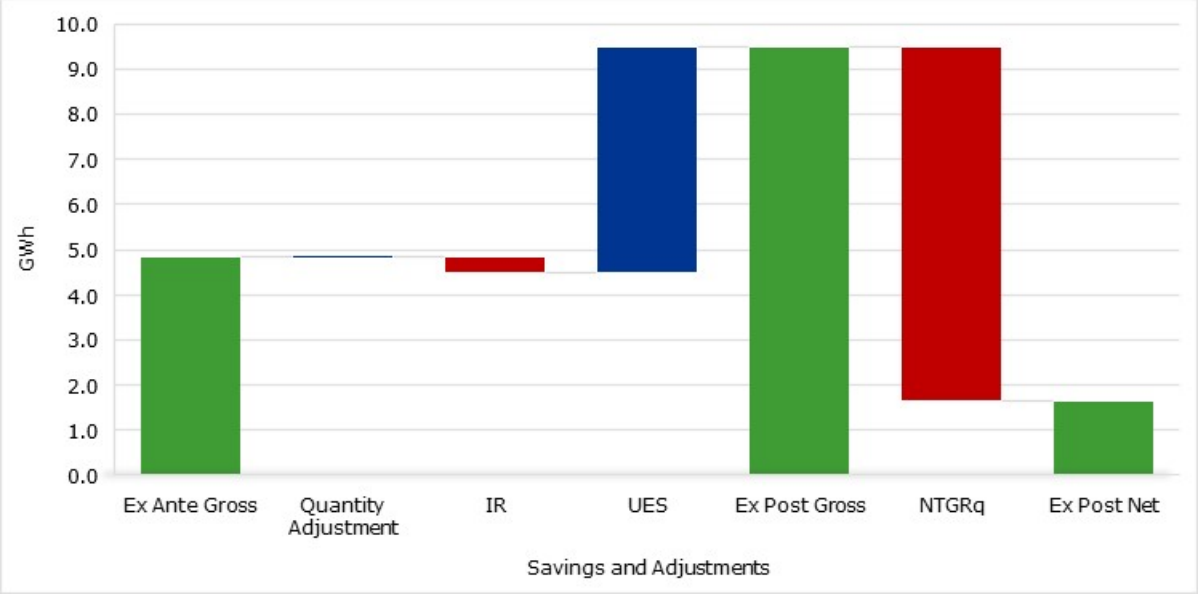


Figure 10-5. Upstream and residential downstream LED candelabras gross savings waterfall, SCE

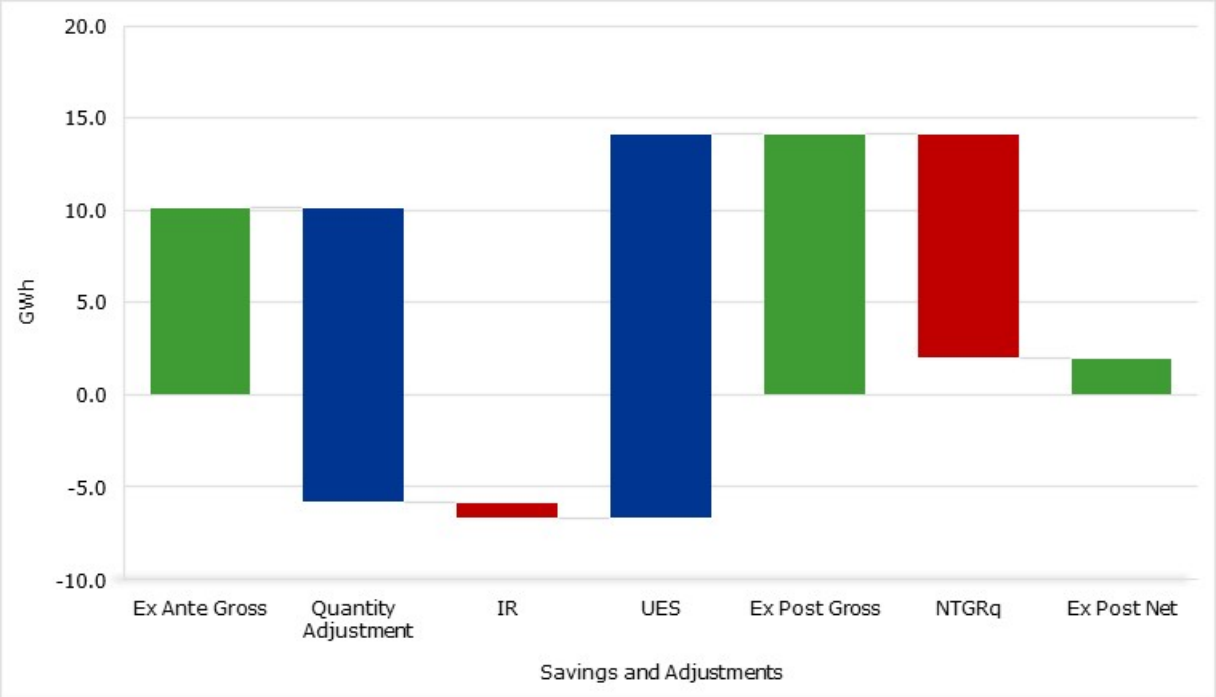
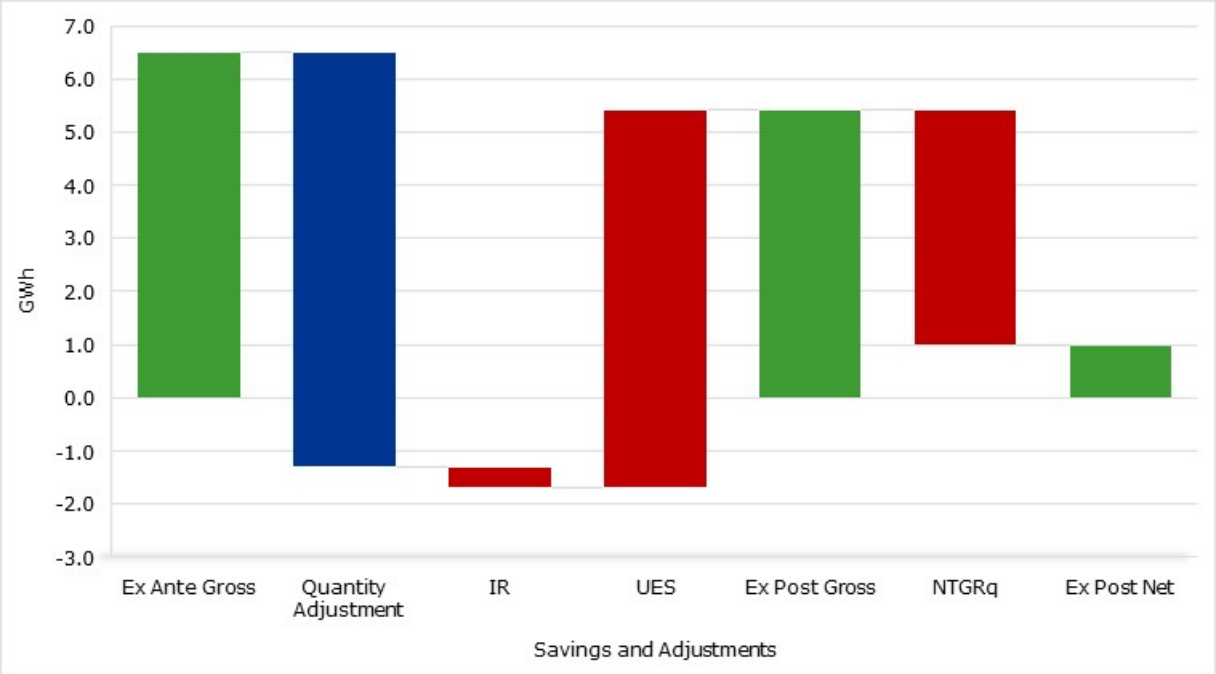


Figure 10-6. Upstream and residential downstream LED candelabras gross savings waterfall, SDG&E



10.4.3 LED Globe

Figure 10-7. Upstream and residential downstream LED Globe gross savings waterfall, PG&E

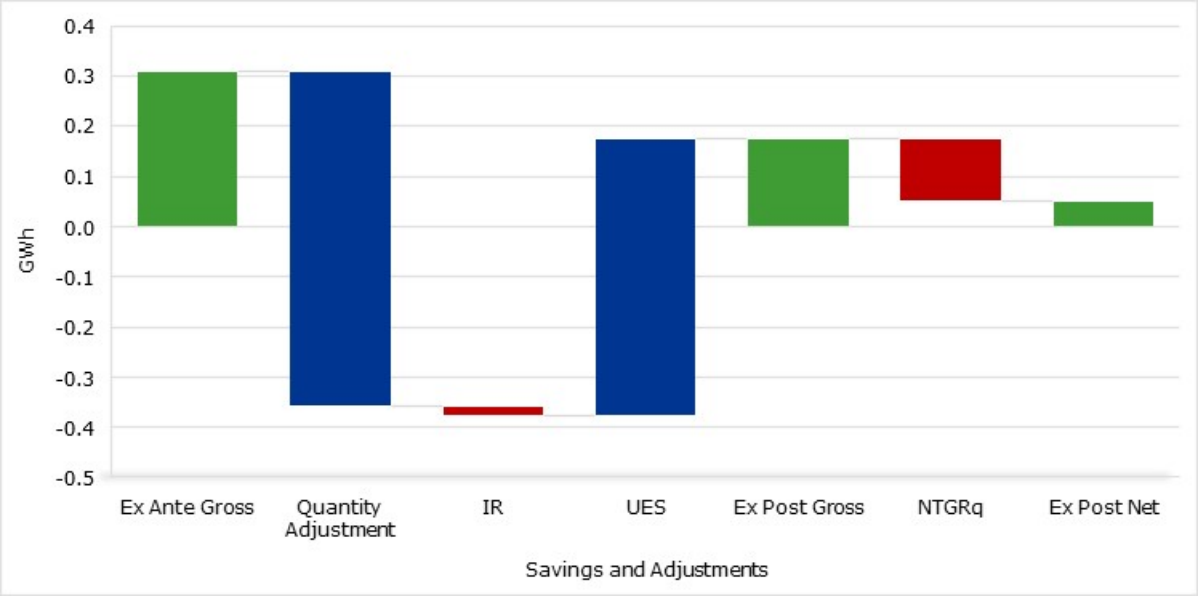


Figure 10-8. Upstream and residential downstream LED Globe gross savings waterfall, SCE

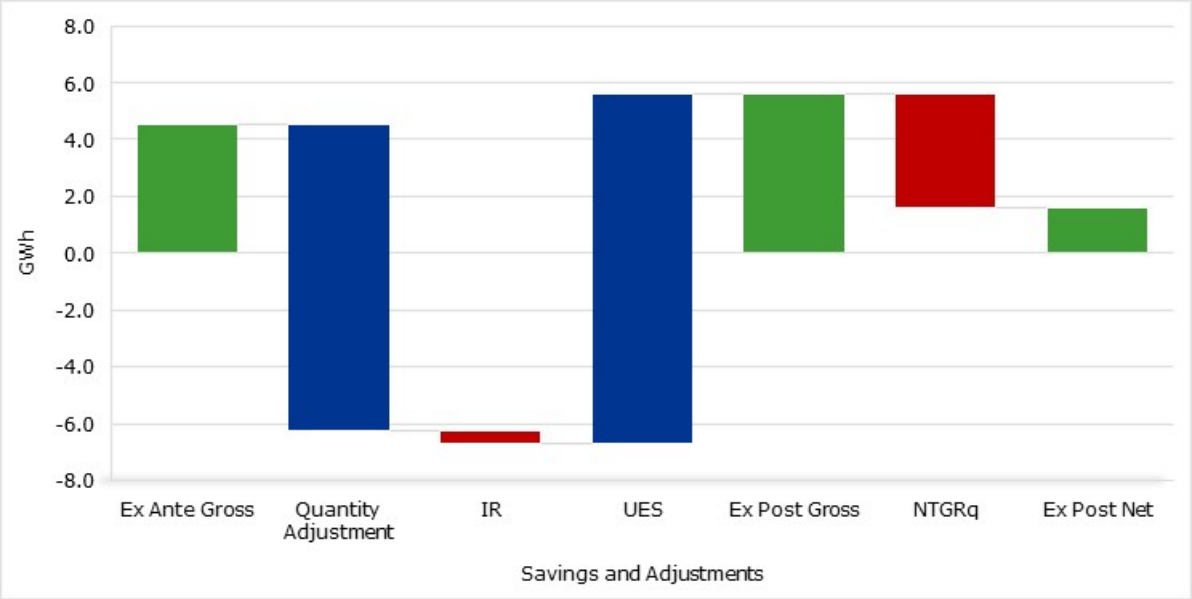
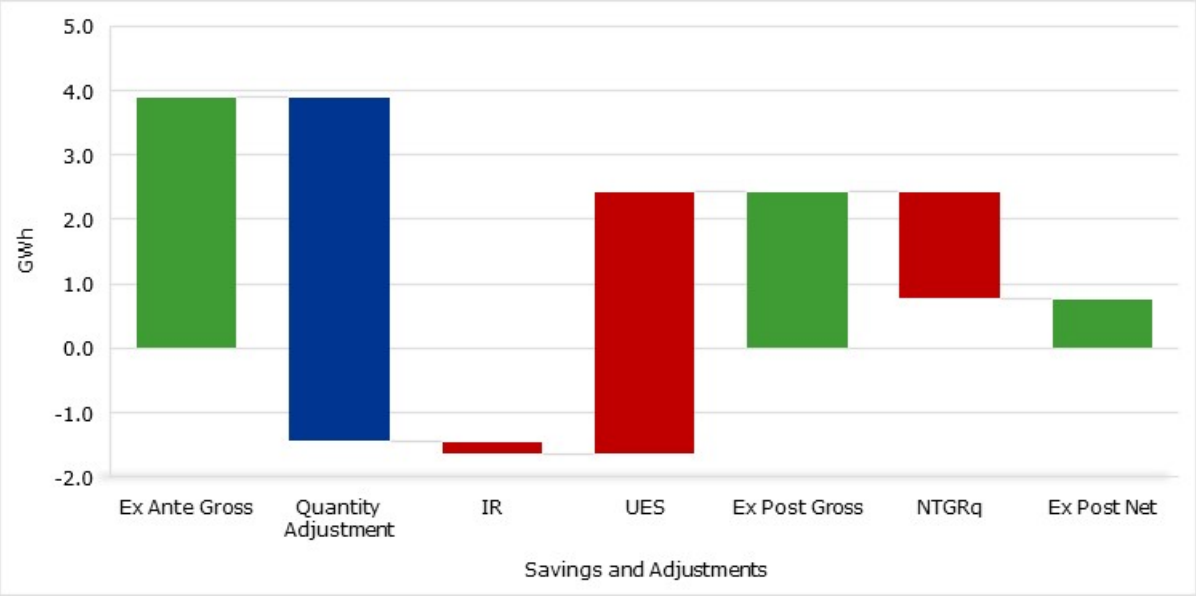


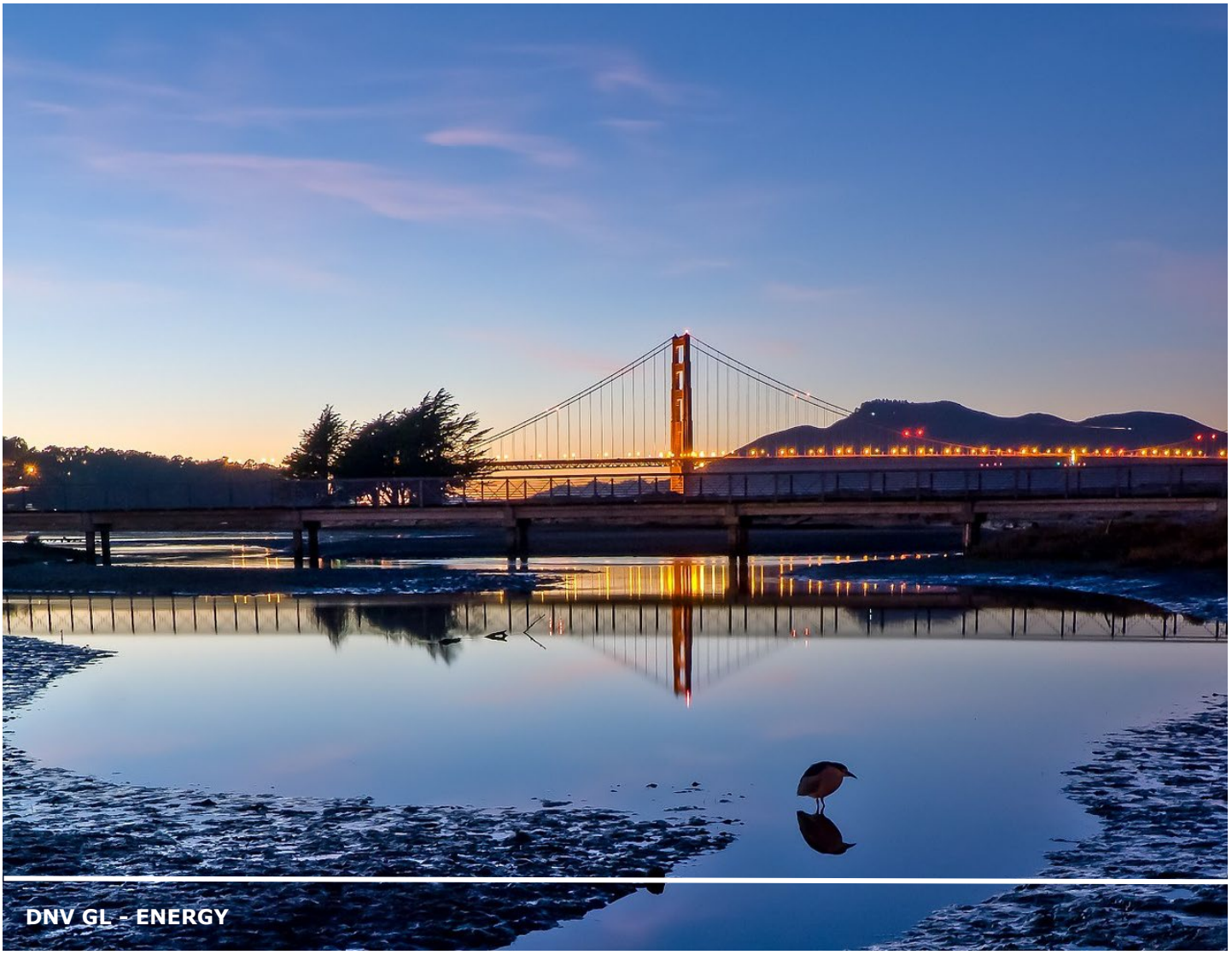
Figure 10-9. Upstream and residential downstream LED Globe gross savings waterfall, SDG&E



10.5 Appendix E: Data collection instruments

In this section, we include the lighting retail store telephone survey instrument used to support this evaluation.

DNV·GL



SAFER, SMARTER, GREENER

Program Year 2018 Upstream Lighting Retail Store Survey-FINAL

Lighting Sector

CALIFORNIA PUBLIC UTILITIES COMMISSION

EM&V Group A

September 16, 2019

1 RESEARCH QUESTIONS

Primary Research Question: What is the estimated lighting sales volume in independent and chain grocery and discount, big box, and other channels?

Secondary Research Question: What do stores in independent and chain grocery and discount, big box, and other channels do with overstock of lighting products?

2 SURVEY QUESTIONS

Screener: Hello, is this <STORE NAME>?

[IF DISCOUNT, GROCERY, or OTHER, ASK QUESTION 1]

[IF HOME IMPROVEMENT OR MEMBERSHIP CLUB, SKIP TO INTRODUCTION]

Question 1. Does your store sell light bulbs?

Yes [IF YES, GO TO INTRODUCTION]

No/Don't know/Refused [IF NO/DON'T KNOW/REFUSED, GO TO QUESTION 1a]

Question 1a. Have you sold light bulbs in the last 3 years? (Yes/No/Don't know/Refused)

[IF YES, GO TO INTRODUCTION. IF NO/DON'T KNOW/REFUSED, TERMINATE SURVEY]

Introduction: I am calling on behalf of the California Public Utilities Commission to research lighting products in California.

[IF DISCOUNT, GROCERY, or OTHER, ask for store manager or owner, if available. Then continue with introduction.]

[IF HOME IMPROVEMENT, ask to speak with Lighting and Electrical Manager.]

[IF MEMBERSHIP CLUB, ask to speak with Home Improvement or DIY Department manager who is familiar with lighting.]

Can I ask you a few questions? This will only take a minute or two. [IF NEEDED] This data will not be shared publicly and will be kept confidential. We are conducting this research for the California Public Utilities Commission.

Question 2: By your estimate, how many light bulbs do customers purchase at your store in an average week? We are looking for number of bulbs purchased, not packages purchased. [NOTE TO INTERVIEWER: Be sure we're getting counts of bulbs sold, not packages of bulbs. If it's easier for the respondent to estimate per day or per month, record and convert sell rate to per week after interview]

Record Answer <NUMBER OF BULBS SOLD PER WEEK>

[IF DISCOUNT, GROCERY, or OTHER, ASK QUESTION 3]

[IF HOME IMPROVEMENT OR MEMBERSHIP CLUB, SKIP TO QUESTION 4]

Question 3: Thanks. Next, I want to ask if you sell some different light bulb technologies.

3.1: Do you sell LED bulbs? (Yes/No/Don't know/Refused)

3.1.1 Do you sell LED spotlight or reflector bulbs? (Yes/No/Don't know/Refused)

3.2: Do you sell CFL bulbs? (Yes/No/Don't know/Refused)

3.3: Do you sell any other types of light bulbs such as incandescent or halogen? (Yes/No/Don't know/Refused)

Record answer <OTHER LIGHT BULB TYPES SOLD>

[IF DISCOUNT, GROCERY, OTHER, or MEMBERSHIP CLUB, ASK QUESTION 4]

[IF HOME IMPROVEMENT, SKIP TO QUESTION 5]

Question 4: Does your store have back stock of light bulbs in storage that are not displayed for sale? (Yes/No/Don't know/Refused)

[CLARIFY IF NEEDED: By storage, I mean any back stock that you have for the bulbs that currently aren't on shelves]

Question 5: If you have excess bulbs that you can't sell in a reasonable amount of time, what do you do with them? [Select all that apply, unless option A is selected] [PROBE IF NEEDED: Does the store sell overstock? Who do they sell it to?]

A. Store does not have excess bulbs/ Store sells through all bulbs [If A is selected, no other options may be selected]
B. Keep excess bulbs in back storage
C. Keep excess bulbs on store floor
D. Send excess bulbs back to corporate warehouse
E. Send excess bulbs to a different store
F. Other <RECORD RESPONSE>
G. Don't know
H. Refused

[GO TO CLOSE OUT]

Close out: Thank you for your answers. [IF NOT STATED ABOVE] What is your position or title at this store? Record answer <RESPONDENT POSITION: E.g., manager, owner, cashier, etc.>

End Survey: Great, thank you very much for your time!

Email Invitation Text

To: [CUSTOMER NAME AND EMAIL]

From: [SENDER NAME AND EMAIL]
[NOTE: Use BCC line for actual customer email addresses to ensure they are not visible]

Subject: Incentive card for participation in a CPUC Home Lighting Questionnaire

Dear [CUSTOMER NAME],

The Energy Division of the **California Public Utilities Commission (CPUC)** would like to learn more from residential customers of [IOU] who have purchased light bulbs in the last two years. Your household has been selected as a potential candidate for this study. The CPUC is interested in understanding the energy savings associated with different types of light bulb purchases. All data collected, including responses to this questionnaire, will be kept confidential and only used for the purpose of this study.

If you qualify and complete the questionnaire by November 15, 2019, you will be eligible for a drawing to receive a $600 incentive card as a way to thank you for your participation. If you complete the questionnaire after November 15, 2019, you will be entered into a drawing to receive a $300 incentive card.

To get started, please click on this link: [LINK TO STUDY]

This questionnaire request is NOT an attempt to sell you any products or services of any kind. The CPUC has retained DNV GL and Pacific Market Research to complete this study. To verify the authenticity of this request or the managing contractor (DNV GL) please visit the following website: www.cpuc.ca.gov/eevalidation

On behalf of the CPUC Energy Division, thank you in advance for your participation.

California Public Utilities Commission
505 Van Ness Ave.
San Francisco, CA 94102

If you would like to unsubscribe from this questionnaire request, please click on this link: [remove]

Intro Screen

California Home Lighting Survey

Dear [CUSTOMER NAME],

Thank you for your interest in the California Home Lighting Questionnaire. If you qualify and complete the questionnaire by November 15, 2019, you will be eligible for a drawing to receive a $600 incentive card as a way to thank you for your participation. If you complete the questionnaire after November 15, 2019, you will be entered into a drawing to receive a $300 incentive card.

To verify the authenticity of this request, please visit the following web site:

www.cpuc.ca.gov/eevalidation

Confidentiality and Disclosures: This information will be used solely for research purposes. No one associated with this study is soliciting any products or services of any kind. All data collected, including the responses to this questionnaire, will be treated confidentially by the CPUC and authorized vendors. You will not be asked to make changes of any kind as a result of the research. You are not obligated to participate in the study and may decline now or at a later date if so desired.

We'll start with a few questions to make sure you qualify. Please click NEXT to continue.

NEXT SCREEN

1 SURVEY INTRODUCTION

S1 Can you please confirm that [IOU] provides electricity to your home?

1	Yes	[SKIP TO S3]
2	No	
-88	Don't know	

S2 Who provides electricity to your home?

	[Verbatim]	
-88	Don't Know	

S3 Can you please confirm that [ZIP CODE] is the zip code of your primary home?

1	Yes	[SKIP TO LP1]
2	No	
-88	Don't know	

S4 What is the zip code of your primary home?

1	Zip code	[RECORD ZIP CODE]
-88	Don't know	[SKIP TO CLOSE_DQ]

2 LED AWARENESS AND RECENT BULB PURCHASES

LP1. Have you heard of LED light bulbs?

1	Yes	
2	No	[SKIP TO CLOSE_DQ]
-88	Don't know	[SKIP TO CLOSE_DQ]

LP2. Have you ever purchased any LED light bulbs? Please consider only LED light bulbs that can go into sockets inside or outside a home. Do *not* consider nightlights, holiday lights or Christmas lights.

1	Yes	
2	No	
-88	Don't know	

LP3. Have you purchased any light bulbs in California for your home since January 1, 2018? Consider any LED, compact fluorescent (CFL), incandescent, or halogen light bulb purchases you made.

1	Yes	
2	No	[SKIP TO RG1A]
-88	Don't know	[SKIP TO RG1A]

LP4. How many light bulbs did you purchase since January 1, 2018? Please provide a count of individual bulbs purchased, not packages.

	Quantity of light bulbs purchased	[RECORD QUANTITY]
0	Zero	[SKIP TO RG1A]
-88	Don't know	[SKIP TO RG1A]

3 REFLECTOR PURCHASES

RL1. The first light bulb shape I want to ask you about is reflector or flood light bulbs. Of the [LP4 quantity] light bulbs you've purchased since January 1, 2018, did you buy any reflector or flood bulbs?

1	Yes	
2	No	[SKIP TO SECTION 4]
-88	Don't know	[SKIP TO SECTION 4]

RL2. What type of reflector bulbs were they? [Select all that apply]

1	LED	
2	Incandescent/ Halogen	
3	CFL	
-88	Don't know	[SKIP TO SECTION 4]

RL3. Where did you purchase these reflector bulbs? [Select all that apply]

1	Home Depot or Lowe's	
2	Other Large Home Improvement Store (e.g., Dixieline Lumber, Ashby Lumber, Orchard Supply or HD Supply)	
3	Costco or Sam's Club	
4	Wal-Mart or Target	
5	Small Hardware Store (e.g., Ace Hardware or True Value Hardware)	
6	Convenience Store	
7	Discount Store (e.g., 99 Cents Only Store, Dollar Tree, or Dollar General)	
8	Grocery Store (e.g., Safeway, Vons, Ralph's, Sprouts, Northgate Market)	
9	Lighting and Electronics Store (e.g., Best Buy or Fry's)	

10	Drug Store (e.g., CVS or Walgreens)	
11	Online Purchase from Online Retailer (e.g., Amazon.com or 1000bulbs.com)	
12	Retail Store Website (e.g., HomeDepot.com or Walmart.com)	
-77	Other [SPECIFY NAME OF STORE]	
-88	Don't know	

RL4. How many reflector bulbs did you purchase at these locations? Please provide a count of individual bulbs purchased, not packages. [NOTE TO PROGRAMER: ONLY SHOW STORE TYPES SELECTED BY RESPONDENT IN RL3]

	Store Type	**LED**	**Incandescent/ Halogen**	**CFL**
1	Home Depot or Lowe's			
2	Other Large Home Improvement Store (e.g., Dixieline Lumber, Ashby Lumber, Orchard Supply or HD Supply)			
3	Costco or Sam's Club			
4	Wal-Mart or Target			
5	Small Hardware Store (e.g., Ace Hardware or True Value Hardware)			
6	Convenience Store			
7	Discount Store (e.g., 99 Cents Only Store, Dollar Tree, or Dollar General)			
8	Grocery Store (e.g., Safeway, Vons, Ralph's, Sprouts, Northgate Market)			
9	Lighting and Electronics Store (e.g., Best Buy or Fry's)			
10	Drug Store (e.g., CVS or Walgreens)			
11	Online Purchase from Online Retailer (e.g., Amazon.com or 1000bulbs.com)			
12	Retail Store Website (e.g., HomeDepot.com or Walmart.com)			
-77	Other [SPECIFY NAME OF STORE]			
-88	Don't know			

LED Reflector Installation

RL5. [IF LED BULB COUNT IN RL4=0, SKIP TO SECTION 4] How many of the [RL4] LED reflector bulbs you purchased are currently installed at your home (either indoors or outdoors)?

	Quantity of LED reflector bulbs installed	[RECORD QUANTITY] [IF LED BULB COUNT IN RL5= LED BULB COUNT IN RL4, SKIP TO SECTION 4]
0	Zero	
-88	Don't know	[SKIP TO SECTION 4]

RL6. Of the remaining [RL4 – RL5] LED reflector bulbs you purchased and have not yet installed, how many bulbs do you plan to install at your home within the next year (either indoors or outdoors)?

	Quantity of LED reflector bulbs installed	[RECORD QUANTITY]
0	Zero	
-88	Don't know	

4 CANDELABRA PURCHASES

[IF BULB COUNT IN LP4 = BULB COUNT IN RL4, SKIP TO LRG1A]

CL1. The next light bulb shape I want to ask you about is candelabra light bulbs. Of the [LP4 quantity] light bulbs you've purchased since January 1, 2018, did you buy any candelabra bulbs?

1	Yes	
2	No	[SKIP TO SECTION 5]
-88	Don't know	[SKIP TO SECTION 5]

CL2. What type of candelabra bulbs were they? [Select all that apply]

1	LED	
2	Incandescent/ Halogen	
3	CFL	
-88	Don't know	[SKIP TO SECTION 5]

CL3. Where did you purchase these candelabra bulbs? [Select all that apply]

1	Home Depot or Lowe's	
2	Other Large Home Improvement Store (e.g., Dixieline Lumber, Ashby Lumber, Orchard Supply or HD Supply)	
3	Costco or Sam's Club	
4	Wal-Mart or Target	
5	Small Hardware Store (e.g., Ace Hardware or True Value Hardware)	

6	Convenience Store	
7	Discount Store (e.g., 99 Cents Only Store, Dollar Tree, or Dollar General)	
8	Grocery Store (e.g., Safeway, Vons, Ralph's, Sprouts, Northgate Market)	
9	Lighting and Electronics Store (e.g., Best Buy or Fry's)	
10	Drug Store (e.g., CVS or Walgreens)	
11	Online Purchase from Online Retailer (e.g., Amazon.com or 1000bulbs.com)	
12	Retail Store Website (e.g., HomeDepot.com or Walmart.com)	
-77	Other [SPECIFY NAME OF STORE]	
-88	Don't know	

CL4. How many candelabra bulbs did you purchase at these locations? Please provide a count of individual bulbs purchased, not packages. [NOTE TO PROGRAMER: ONLY SHOW STORE TYPES SELECTED BY RESPONDENT IN CL3]

	Store Type	**LED**	**Incandescent/ Halogen**	**CFL**
1	Home Depot or Lowe's			
2	Other Large Home Improvement Store (e.g., Dixieline Lumber, Ashby Lumber, Orchard Supply or HD Supply)			
3	Costco or Sam's Club			
4	Wal-Mart or Target			
5	Small Hardware Store (e.g., Ace Hardware or True Value Hardware)			
6	Convenience Store			
7	Discount Store (e.g., 99 Cents Only Store, Dollar Tree, or Dollar General)			
8	Grocery Store (e.g., Safeway, Vons, Ralph's, Sprouts, Northgate Market)			
9	Lighting and Electronics Store (e.g., Best Buy or Fry's)			
10	Drug Store (e.g., CVS or Walgreens)			
11	Online Purchase from Online Retailer (e.g., Amazon.com or 1000bulbs.com)			
12	Retail Store Website (e.g., HomeDepot.com or Walmart.com)			
-77	Other [SPECIFY NAME OF STORE]			
-88	Don't know			

LED Candelabra Installation

CL5. [IF LED BULB COUNT IN CL4=0, SKIP TO SECTION 5] How many of the [CL4] LED candelabra bulbs you purchased are currently installed at your home (either indoors or outdoors)?

	Quantity of LED candelabra bulbs installed	[RECORD QUANTITY] [IF LED BULB COUNT IN CL5= LED BULB COUNT IN CL4, SKIP TO SECTION 5]
0	Zero	
-88	Don't know	[SKIP TO SECTION 5]

CL6. Of the remaining [CL4 – CL5] LED candelabra bulbs you purchased and have not yet installed, how many bulbs do you plan to install at your home within the next year (either indoors or outdoors)?

	Quantity of LED candelabra bulbs installed	[RECORD QUANTITY]
0	Zero	
-88	Don't know	

5 GLOBE PURCHASES

[IF BULB COUNT IN LP4 = BULB COUNT IN RL4 + BULB COUNT IN CL4, SKIP TO LAMP PURCHASING GAME 1]

GL1. The last light bulb shape I want to ask you about is globe light bulbs. Of the [LP4 quantity] light bulbs you've purchased since January 1, 2018, did you buy any globe bulbs? Please only consider purchases of round globe shape bulbs, and not standard A-lamp or pear shaped bulbs that are commonly used in the home.

1	Yes	
2	No	[SKIP TO SECTION 6]
-88	Don't know	[SKIP TO SECTION 6]

GL2. What type of globe bulbs were they? [Select all that apply]

1	LED	
2	Incandescent/ Halogen	
3	CFL	
-88	Don't know	[SKIP TO SECTION 6]

GL3. Where did you purchase these globe bulbs? [Select all that apply]

1	Home Depot or Lowe's	
2	Other Large Home Improvement Store (e.g., Dixieline Lumber, Ashby Lumber, Orchard Supply or HD Supply)	
3	Costco or Sam's Club	
4	Wal-Mart or Target	
5	Small Hardware Store (e.g., Ace Hardware or True Value Hardware)	
6	Convenience Store	
7	Discount Store (e.g., 99 Cents Only Store, Dollar Tree, or Dollar General)	
8	Grocery Store (e.g., Safeway, Vons, Ralph's, Sprouts, Northgate Market)	
9	Lighting and Electronics Store (e.g., Best Buy or Fry's)	
10	Drug Store (e.g., CVS or Walgreens)	
11	Online Purchase from Online Retailer (e.g., Amazon.com or 1000bulbs.com)	
12	Retail Store Website (e.g., HomeDepot.com or Walmart.com)	
-77	Other [SPECIFY NAME OF STORE]	
-88	Don't know	

GL4. How many globe bulbs did you purchase at these locations? Please provide a count of individual bulbs purchased, not packages. [NOTE TO PROGRAMER: ONLY SHOW STORE TYPES SELECTED BY RESPONDENT IN GL3]

	Store Type	**LED**	**Incandescent/ Halogen**	**CFL**
1	Home Depot or Lowe's			
2	Other Large Home Improvement Store (e.g., Dixieline Lumber, Ashby Lumber, Orchard Supply or HD Supply)			
3	Costco or Sam's Club			
4	Wal-Mart or Target			
5	Small Hardware Store (e.g., Ace Hardware or True Value Hardware)			
6	Convenience Store			
7	Discount Store (e.g., 99 Cents Only Store, Dollar Tree, or Dollar General)			
8	Grocery Store (e.g., Safeway, Vons, Ralph's, Sprouts, Northgate Market)			
9	Lighting and Electronics Store (e.g., Best Buy or Fry's)			
10	Drug Store (e.g., CVS or Walgreens)			

11	Online Purchase from Online Retailer (e.g., Amazon.com or 1000bulbs.com)			
12	Retail Store Website (e.g., HomeDepot.com or Walmart.com)			
-77	Other [SPECIFY NAME OF STORE]			
-88	Don't know			

LED Globe Installation

GL5. [IF LED BULB COUNT IN GL4=0, SKIP TO SECTION 6] How many of the [GL4] LED globe bulbs you purchased are currently installed at your home (either indoors or outdoors)?

	Quantity of LED globe bulbs installed	[RECORD QUANTITY] [IF LED BULB COUNT IN GL5= LED BULB COUNT IN GL4, SKIP TO SECTION 6]
0	Zero	
-88	Don't know	[SKIP TO SECTION 6]

GL6. Of the remaining [GL4 – GL5] LED candelabra bulbs you purchased and have not yet installed, how many bulbs do you plan to install at your home within the next year (either indoors or outdoors)?

	Quantity of LED globe bulbs installed	[RECORD QUANTITY]
0	Zero	
-88	Don't know	

6 REFLECTOR LAMP PURCHASING GAME

[IF REFLECTOR PURCHASER (RL1=1); OR LP1 = 1 and CL1=2 or -88 and GL1=2 or -88; OR LP3 = 2 or -88]

- Purchasers of reflectors, candelabras and/or globes will be prioritized above all other respondents.
- Respondents who did recently purchase light bulbs [LP3 = 1], but did not purchase any reflector, candelabra, or globe lamps will only play the reflector lamp purchasing game. This could be A-lamp purchasers, for example.
- Respondents who did not recently purchase light bulbs [LP3 = 2 or -88] will play only the reflector lamp purchasing game.

- For purchasers of reflectors, candelabras and/or globes, respondent will only get game for the bulb styles(s) they purchased.
- Respondents will see lamp purchasing games in the channel in which they bought their bulbs prioritized as shown below.
- If respondents didn't purchase any lamps in any of the high priority channels (grocery, discount, hardware, and home improvement), then prioritize as follows:

Channel	Reflector Lamps	Candelabra Lamps	Globe Lamps
Grocery	40%	0%	0%
Discount	40%	75%	75%
Hardware	10%	0%	0%
Home Improvement	10%	25%	25%

- Respondents will see up to two lamp purchasing questions for up to three lamp styles (for a maximum of six lamp purchasing games).
- Randomize order of 1A and 1B questions (without program and with program discount)
- Randomize order that LED and incandescent bulbs appear (left or right)

RG1A [without program]: Which bulb would you buy at the following prices? [SHOW ONLY ONE CHANNEL ACCORDING TO PRIORITY LISTED BELOW BASED ON WHERE RESPONDENT PURCHASED BULBS]?

Channel	**LED Reflector [Prices based on average shelf data excluding all program lamps]**	**Incandescent/Halogen Reflector [Prices based on average shelf data]**
	Photo of LED reflector lamp	**Photo of incandescent reflector lamp**
Grocery (first priority)	$9.15	$5.85
Discount (second priority)	$1.35	$1.20
Hardware (third priority)	$6.40	$6.00
Home Improvement (fourth priority)	$3.70	$4.05

RG1B [with program]: Which bulb would you buy at the following prices? [SHOW ONLY ONE CHANNEL ACCORDING TO PRIORITY LISTED BELOW BASED ON WHERE RESPONDENT PURCHASED BULBS]?

Channel	**LED reflector [Prices based on average shelf data including program lamps only]** **Photo of LED reflector lamp**	**Incandescent/Halogen Reflector [Prices based on average shelf data]** **Photo of incandescent reflector lamp**
Grocery (first priority)	$0.60	$5.85
Discount (second priority)	$0.50	$1.20
Hardware (third priority)	$5.65	$6.00
Home Improvement (fourth priority)	$3.80	$4.05

7 CANDELABRA LAMP PURCHASING GAME

[IF CANDELABRA PURCHASER (CL1=1)]

CG1A [without program]: Which bulb would you buy at the following prices? [SHOW ONLY ONE CHANNEL ACCORDING TO PRIORITY LISTED BELOW BASED ON WHERE RESPONDENT PURCHASED BULBS]?

Channel	**LED Candelabra [Prices based on average shelf data excluding all program lamps]** **Photo of LED candelabra lamp**	**Incandescent/Halogen Candelabra [Prices based on average shelf data]** **Photo of incandescent candelabra lamp**
Discount (first priority)	$1.85	$0.55
Home Improvement (second priority)	$3.05	$0.95

CG1B [with program]: Which bulb would you buy at the following prices? [SHOW ONLY ONE CHANNEL ACCORDING TO PRIORITY LISTED BELOW BASED ON WHERE RESPONDENT PURCHASED BULBS]?

Channel	**LED Candelabra [Prices based on average shelf data including program lamps only]**	**Incandescent/Halogen Candelabra [Prices based on average shelf data]**
	Photo of LED candelabra lamp	**Photo of incandescent candelabra lamp**
Discount (first priority)	$0.25	$0.55
Home Improvement (second priority)	$4.15	$0.95

8 GLOBE LAMP PURCHASING GAME

[IF GLOBE PURCHASER (GL1=1)]

GG1A [without program]: Which bulb would you buy at the following prices? [SHOW ONLY ONE CHANNEL ACCORDING TO PRIORITY LISTED BELOW BASED ON WHERE RESPONDENT PURCHASED BULBS]?

Channel	**LED Globe [Prices based on average shelf data excluding all program lamps]**	**Incandescent/Halogen Globe [Prices based on average shelf data]**
	Photo of LED globe lamp	**Photo of incandescent globe lamp**
Discount (first priority)	$1.00	$1.00
Home Improvement (first priority)	$4.65	$3.25

GG1B [with program]: Which bulb would you buy at the following prices? [SHOW ONLY ONE CHANNEL ACCORDING TO PRIORITY LISTED BELOW BASED ON WHERE RESPONDENT PURCHASED BULBS]?

Channel	**LED Globe [Prices based on average shelf data including program lamps only]**	**Incandescent/Halogen Globe [Prices based on average shelf data]**
	Photo of LED globe lamp	**Photo of incandescent globe lamp**
Discount (first priority)	$0.50	$1.00
Home Improvement (second priority)	$2.90	$3.25

9 LIGHT SOCKET PERCENTAGE

LSP1. Thinking of all the light bulbs installed in your home, about what percent of your sockets have LED bulbs in them?

1	None of them	
2	1% - 25%	
3	26% - 50%	
4	51% - 75%	
5	76% - 99%	
6	All of them	
-88	Don't know	

NEXT SCREEN

10 DEMOGRAPHICS

DEM1. Do you or members of your household own your home, or do you rent it?

1	Own/Buying	
2	Rent/Lease	
3	Occupied without payment of rent	
-77	Other [SPECIFY]	
-88	Don't know	

DEM2. How many full bathrooms do you have at your home?

A full bathroom is one that has a sink with running water, and a toilet, and either a bathtub or shower. A half bathroom has a sink and either a toilet, bathtub or shower.

	Number of full bathrooms	[RECORD QUANTITY]
-88	Don't know	

DEM3. How many bedrooms do you have at your home?
If you have a STUDIO or a ONE-ROOM APARTMENT, please enter "0" (zero).

	Number of bedrooms	[RECORD QUANTITY]
-88	Don't know	

DEM4. What is the highest level of education you have completed?

1	Elementary (grades 1-8)	
2	Some high school (grades 9-12)	
3	High school graduate	

4	Some college/trade/vocational school	
5	College graduate	
6	Postgraduate degree	
-88	Don't know	

DEM5. What was your annual household income from all sources in 2018, before taxes? (Note: This information is confidential and will only be used for the purpose of characterizing study respondents.)

1	Less than $10,000 per year	
2	$10,000 - $19,999	
3	$20,000 - $24,999	
4	$25,000 - $49,999	
5	$50,000 - $74,999	
6	$75,000 - $99,999	
7	$100,000 - $149,999	
8	$150,000 - $174,999	
9	$175,000 - $199,999	
10	$200,000 - $249,999	
11	$250,000 or more	
-99	Prefer not to answer	

DEM6. Would you like to be entered into the drawing for an incentive card?

1	Yes	
2	No	
-88	Don't know	

[CLOSE_COMPLETE]
Thank you for completing the questionnaire! If you are selected as a winner of the incentive card drawing, we will notify you by email by [XX Date].

[CLOSE_DQ]
We are sorry, but you do not qualify for this survey. These are all of the questions I have for you today. Thank you for your time, and have a great day**.**

Interview Guide for Manufacturers Participating in the 2018 California Upstream Lighting Programs

Introduction

Contact Protocol

1. Send email interview invitation to appropriate interviewee. This invitation will include:
   a) Explanation of purpose and scope of interview.
   b) Explanation of time frame within which the interview will need to be completed.
   c) Instructions to propose a convenient interview time.
   d) Contact information for interviewers.
   e) Assurances of confidentiality.
   f) A letter attachment from the CPUC explaining the purpose of the study
2. If target interviewee does not respond to the email invitation within a week, a follow-up call will be made to try to schedule an interview time, find an alternate interview target, or determine reasons for refusal.
3. Once an interview time has been arranged, the interviewee will be emailed, a couple days in advance of the interview, a copy of a summary of the interview guide as well as a customized data table similar to Table 1 below. The email will contain additional assurances of confidentiality.

At the beginning of the interview, collect information on interviewee's position and overall responsibilities, and experience with the program.

1. Program Participation Confirmation

1-1. Pacific Gas and Electric, Southern California Edison, and San Diego Gas and Electric jointly participate in an Upstream Lighting Program which provides financial incentives to buy down the cost of energy efficient lighting products. According to our information your company has receiving these manufacturer buydown incentives from this California Upstream Lighting Program during the 2018 program period. Are you aware of your company's participation in this program? [IF UNAWARE, FIND SOMEONE WITH THE COMPANY WHO IS AWARE. IF THEY RECOGNIZE THIS PROGRAM BY A DIFFERENT NAME, EXPLAIN THAT FOR THE SAKE OF SIMPLICITY YOU'LL HENCEFORTH REFER TO THE PROGRAM AS "THE CALIFORNIA UPSTREAM LIGHTING PROGRAM."]

2. LED Product Sales and California Upstream Lighting Program Trends

2-1. My next questions concern which lighting products you sell in California and what retail channels you sell them through. Is this a topic that you are familiar with? [IF INTERVIEWEE IS FAMILIAR, PROCEED. IF NOT FAMILIAR, GET ALTERNATIVE CONTACT NAME AND SKIP TO NEXT SECTION]

2-2. First, I'm going to ask you some questions about your sales of LED bulbs in California in 2018. Specifically, I'd like to ask you about LED reflector style, candelabra style, and globe style bulbs.

By reflector bulbs, I mean LED medium screw base lamps that produce directional light, such as BR20, BR30, and PAR 38 lamps.

By candelabra bulbs, I mean LED small screw base lamps that are commonly used in decorative fixtures, such as chandeliers, and sometimes have flame tips.

By globe bulbs, I mean LED medium screw base lamps that are round like a ball and produce omni-directional light. These are different than standard general purpose A-lamps shaped like a pear.

Earlier I emailed you a table showing LED bulbs that your company sold through the California Upstream Lighting Program in 2018, according to our records. Does the information I sent you look correct to you? [REPEAT ASSURANCES OF CONFIDENTIALITY]

Table 1. Number of Lamps Rebated by the California Upstream Lighting Program, 2018

Product Type	Number of Lamps Rebated
LED Reflector Lamps	
LED Candelabra Lamps	
LED Globe Lamps	

a) [IF NO] [Record any corrections to the table]

b) Were you able to sell through all of the bulbs that the program discounted?

c) [IF NO] About what percent of the program discounted lamps were you able to sell [ASK FOR EACH LAMP STYLE SOLD]?

d) [IF NOT ABLE TO SELL THROUGH ALL ULP LAMPS] Why were you not able to sell through all of the lamps discounted by the program?

2-3. [IF ULP LED REFLECTOR LAMPS SOLD] Did you sell any LED reflector lamps in California that did NOT receive discounts from the Upstream Lighting Program in 2018?

a) [IF YES] About what percent of all of your LED reflector lamps sold in California were discounted by the Upstream Lighting Program compared to the percent of LED reflector lamps that were not discounted by the Upstream Lighting Program in 2018? [NOTE TO INTERVIEWER: TOTAL SHOULD EQUAL 100%]

Table 2. Percent of LED Reflector Lamps Discounted by the California Upstream Lighting Program, 2018

Product Type	% of Lamps Discounted by ULP	% of Lamps NOT Discounted by ULP
LED Reflector Lamps		

2-4. [IF ULP LED CANDELABRA LAMPS SOLD] Did you sell any LED candelabra lamps in California that did NOT receive discounts from the Upstream Lighting Program in 2018?

a) [IF YES] About what percent of all of your LED candelabra lamps sold in California were discounted by the Upstream Lighting Program compared to the percent of LED candelabra lamps that were not discounted by the Upstream Lighting Program in 2018? [NOTE TO INTERVIEWER: TOTAL SHOULD EQUAL 100%]

Table 3. Percent of LED Candelabra Lamps Discounted by the California Upstream Lighting Program, 2018

Product Type	% of Lamps Discounted by ULP	% of Lamps NOT Discounted by ULP
LED Candelabra Lamps		

2-5. [IF ULP LED GLOBE LAMPS SOLD] Did you sell any LED globe lamps in California that did not receive discounts from the Upstream Lighting Program in 2018?

a) [IF YES] About what percent of all of your LED globe lamps sold in California were discounted by the Upstream Lighting Program compared to the percent of LED globe lamps that were not discounted by the Upstream Lighting Program in 2018? [NOTE TO INTERVIEWER: TOTAL SHOULD EQUAL 100%]

Table 4. Percent of LED Globe Lamps Discounted by the California Upstream Lighting Program, 2018

Product Type	% of Lamps Discounted by ULP	% of Lamps NOT Discounted by ULP
LED Globe Lamps		

2-6. [IF SOLD ULP LED REFLECTOR LAMPS] Did you sell any incandescent, halogen, or CFL reflector lamps in California in 2018?

a) [IF YES] About what percent of all of your reflector lamps sold in California were LED reflector lamps? About what percent were incandescent and halogen reflector lamps? About what percent were CFLs? [NOTE TO INTERVIEWER: TOTAL SHOULD EQUAL 100%]

Table 5. Percent of LED Reflector Lamps Sold in California, 2018

Product Type	% LED Lamps	% Incandescent and Halogen Lamps	% CFL Lamps
Reflector Lamps			

2-7. [IF SOLD ULP LED CANDELABRA LAMPS] Did you sell any incandescent, halogen, or CFL candelabra lamps in California in 2018?

a) [IF YES] About what percent of all of your candelabra lamps sold in California were LED candelabra lamps? About what percent were incandescent and halogen candelabra lamps? About what percent were CFLs? [NOTE TO INTERVIEWER: TOTAL SHOULD EQUAL 100%]

Table 6. Percent of LED Candelabra Lamps Sold in California, 2018

Product Type	% LED Lamps	% Incandescent and Halogen Lamps	% CFL Lamps
Candelabra Lamps			

2-8. [IF SOLD ULP LED GLOBE LAMPS] Did you sell any incandescent, halogen, or CFL globe lamps in California in 2018?

a) [IF YES] About what percent of all of your globe lamps sold in California were LED globe lamps? About what percent were incandescent and halogen globe lamps? About what percent were CFLs? [NOTE TO INTERVIEWER: TOTAL SHOULD EQUAL 100%]

Table 7. Percent of LED Globe Lamps Sold in California, 2018

Product Type	% LED Lamps	% Incandescent and Halogen Lamps	% CFL Lamps
Globe Lamps			

2-9. [IF ULP REFLECTORS SOLD = 100% in 2-3] Would you have sold LED reflector bulbs in California in 2018 had the Upstream Lighting Program discounts not been available?

a) [IF YES] In which retails channels would you have sold LED reflector had program discounts not been available in California in 2018?

Table 8. Retail Channel Sales of LED Reflector Lamps, No Program Scenario, 2018

Channel	Examples stores	Mark all that apply
Discount	99 Cents Only, Dollar Tree	
Drug	CVS, Longs, Rite Aid, Walgreens	
Grocery	Ralphs, Albertson's, Vons, Safeway, 7-11	
Hardware	True Value, Ace Hardware	
Home Improvement	Home Depot, Lowe's, Dixieline, HD Supply	

Channel	Examples stores	Mark all that apply
Mass Merchandise	Walmart, Target	
Membership Club	Costco, Sam's Club	
Other	Fry's, Best Buy, Lamps Plus	

2-10. [IF ULP CANDELABRAS SOLD = 100% in 2-4] Would you have sold LED candelabra bulbs in California in 2018 had the Upstream Lighting Program discounts not been available?

a) [IF YES] In which retails channels would you have sold LED candelabras had program discounts not been available in California in 2018?

Table 9. Retail Channel Sales of LED Candelabra Lamps, No Program Scenario, 2018

Channel	Examples stores	Mark all that apply
Discount	99 Cents Only, Dollar Tree	
Drug	CVS, Longs, Rite Aid, Walgreens	
Grocery	Ralphs, Albertson's, Vons, Safeway, 7-11	
Hardware	True Value, Ace Hardware	
Home Improvement	Home Depot, Lowe's, Dixieline, HD Supply	
Mass Merchandise	Walmart, Target	
Membership Club	Costco, Sam's Club	
Other	Fry's, Best Buy, Lamps Plus	

2-11. [IF ULP GLOBES SOLD = 100% in 2-5] Would you have sold LED globe bulbs in California in 2018 had the Upstream Lighting Program discounts not been available?

a) [IF YES] In which retails channels would you have sold LED globes had program discounts not been available in California in 2018?

Table 10. Retail Channel Sales of LED Globe Lamps, No Program Scenario, 2018

Channel	Examples stores	Mark all that apply
Discount	99 Cents Only, Dollar Tree	
Drug	CVS, Longs, Rite Aid, Walgreens	
Grocery	Ralphs, Albertson's, Vons, Safeway, 7-11	
Hardware	True Value, Ace Hardware	
Home Improvement	Home Depot, Lowe's, Dixieline, HD Supply	
Mass Merchandise	Walmart, Target	
Membership Club	Costco, Sam's Club	
Other	Fry's, Best Buy, Lamps Plus	

2-12. [IF ULP REFLECTORS SOLD < 100% in 2-3 OR 2-9=YES] Would your total sales of LED reflector bulbs in California in 2018 been lower, higher, or about the same had the Upstream Lighting Program discounts not been available?

a) [IF HIGHER] So your sales of LED reflectors in California would have been ***higher*** had Upstream Lighting Program discounts ***not*** been available? Why is that?

b) [IF HIGHER or LOWER] About what percent [HIGHER/LOWER] would your sales of LED reflectors have been had the program discounts not been available in 2018 in California?

c) [IF HIGHER or LOWER AND IF SOLD IN MORE THAN ONE CHANNEL – SEE TABLE 2-9] You mentioned earlier that you would have sold LED reflectors in [CHANNELS] had program discounts not been available in 2018. By about what percent would your sales of LED reflectors in each of those channels have changed had program discounts not been available in 2018?

Table 11. Retail Channel Change in Sales of LED Reflector Lamps, No Program Scenario, 2018

Channel	Examples stores	Record % Change in Sales
Discount	99 Cents Only, Dollar Tree	

Channel	Examples stores	Record % Change in Sales
Drug	CVS, Longs, Rite Aid, Walgreens	
Grocery	Ralphs, Albertson's, Vons, Safeway, 7-11	
Hardware	True Value, Ace Hardware	
Home Improvement	Home Depot, Lowe's, Dixieline, HD Supply	
Mass Merchandise	Walmart, Target	
Membership Club	Costco, Sam's Club	
Other	Fry's, Best Buy, Lamps Plus	

2-13. [IF ULP CANDELBRAS SOLD < 100% in 2-4 OR 2-10=YES] Would your total sales of LED candelabra bulbs in California in 2018 been lower, higher, or about the same had the Upstream Lighting Program discounts not been available?

a) [IF HIGHER] So your sales of LED candelabras in California would have been ***higher*** had Upstream Lighting Program discounts ***not*** been available? Why is that?

b) [IF HIGHER or LOWER] About what percent [HIGHER/LOWER] would your sales of LED candelabras have been had the program discounts not been available in 2018 in California?

c) [IF HIGHER or LOWER AND IF SOLD IN MORE THAN ONE CHANNEL – SEE TABLE 2-10] You mentioned earlier that you would have sold LED candelabras in [CHANNELS] had program discounts not been available in 2018. By about what percent would your sales of LED reflectors in each of those channels have changed had program discounts not been available in 2018?

Table 12. Retail Channel Change in Sales of LED Candelabra Lamps, No Program Scenario, 2018

Channel	Examples stores	Record % Change in Sales
Discount	99 Cents Only, Dollar Tree	
Drug	CVS, Longs, Rite Aid, Walgreens	
Grocery	Ralphs, Albertson's, Vons, Safeway, 7-11	

Channel	Examples stores	Record % Change in Sales
Hardware	True Value, Ace Hardware	
Home Improvement	Home Depot, Lowe's, Dixieline, HD Supply	
Mass Merchandise	Walmart, Target	
Membership Club	Costco, Sam's Club	
Other	Fry's, Best Buy, Lamps Plus	

2-14. [IF ULP GLOBES SOLD < 100% in 2-5 OR 2-11=YES] Would your total sales of LED globe bulbs in California in 2018 been lower, higher, or about the same had the Upstream Lighting Program discounts not been available?

a) [IF HIGHER] So your sales of LED globes in California would have been ***higher*** had Upstream Lighting Program discounts ***not*** been available? Why is that?

b) [IF HIGHER or LOWER] About what percent [HIGHER/LOWER] would your sales of LED globes have been had the program discounts not been available in 2018 in California?

c) [IF HIGHER or LOWER AND IF SOLD IN MORE THAN ONE CHANNEL – SEE TABLE 2-11] You mentioned earlier that you would have sold LED globes in [CHANNELS] had program discounts not been available in 2018. By about what percent would your sales of LED globes in each of those channels have changed had program discounts not been available in 2018?

Table 13. Retail Channel Change in Sales of LED Candelabra Lamps, No Program Scenario, 2018

Channel	Examples stores	Record % Change in Sales
Discount	99 Cents Only, Dollar Tree	
Drug	CVS, Longs, Rite Aid, Walgreens	
Grocery	Ralphs, Albertson's, Vons, Safeway, 7-11	
Hardware	True Value, Ace Hardware	
Home Improvement	Home Depot, Lowe's, Dixieline, HD Supply	
Mass Merchandise	Walmart, Target	

Channel	Examples stores	Record % Change in Sales
Membership Club	Costco, Sam's Club	
Other	Fry's, Best Buy, Lamps Plus	

3. Upstream Lighting Program Process

Now I'm going to ask you some questions about the process of participating in the Upstream Lighting Program.

3-1. How long have you participated in the California Upstream Lighting program?

a) How has your participation changed over time?

b) Have the quantities of bulbs discounted by the program changed from prior years?

3-2. How did you communicate with any program staff at the utilities while participating in the 2018 Upstream Lighting Program?

a) [IF YES] Which program representatives did you communicate with? [PROBE if program staff were from PG&E, SCE, and/or SDG&E]

b) [IF YES] What did you discuss?

3-3. Were you required to complete any paperwork to participate in the 2018 Upstream Lighting Program?

a) [IF YES] What type of paperwork was required?

3-4. Did program staff give you instructions on which retailers to ship program Upstream Lighting Program discounted bulbs to in 2018? [PROBE – Did they provide instructions on shipping bulbs to specific retail channels?]

a) [IF YES] Please describe what those instructions were [PROBE IF INSTRUCTIONS INCLUDED NUMBER OF LAMPS TO SHIP TO INDIVIDUAL RETAIL ADDRESSES AND/OR IF SHIPMENTS WENT TO CORPORATE WAREHOUSE LOCATIONS]

b) [IF NOT ADDRESSED] Did those instructions include how many program discounted light bulbs to ship to individual stores?

3-5. Did you need to provide any documentation to program staff on how many bulbs you shipped to individual retailers in 2018 that were part of the Upstream Lighting Program?

a) [IF YES] What type of documentation was required?

b) [IF YES] Whom did you send the documentation to?

3-6. [IF NOT ADDRESSED IN 3-5] How did you determine how many Upstream Lighting Program discounted bulbs to send to each retailer?

a) [PROBE] Were there any differences in how this process worked by retailer?

3-7. Did you have any communications with retail store representatives about shipping Upstream Lighting Program discounted bulbs to them in 2018?

a) [IF YES] Please describe what those communications were?

b) [IF NO] Why not?

3-8. Did retail stores purchase Upstream Lighting Program discounted bulbs in 2018 directly from you, or did the Upstream Lighting Program fully cover the cost of your bulbs? [IF NEEDED: In other words, did the retailers have to pay you any money for the program discounted bulbs, or not?]

a) [PROBE] How did this differ by retail store?

b) [IF NOT MENTIONED] Did the 2018 Upstream Lighting Program reimburse you for the entire cost of your program discounted bulbs?

c) [PROBE] What percent of your costs of manufacturing program discounted lamps was paid for the by the 2018 Upstream Lighting Program?

3-9. Please describe the process of how you shipped Upstream Lighting Program discounted bulbs to retailers in 2018?

a) [PROBE] Were there any differences in how this process worked by retailer?

b) How frequently did you ship program discounted bulbs to stores during 2018? [PROBE: monthly, quarterly, etc.]

c) [IF NOT MENTIONED] How did you know when to ship more program discounted bulbs?

d) [IF NOT MENTIONED] Did retailers ask you to ship more program discounted bulbs?

e) [PROBE ON DOCUMENTATION] Do you have any documentation of shipments of program discounted bulbs to retail stores in 2018? [IF YES] Can you send that documentation with me?

3-10. Did you have any bulbs that were discounted through the Upstream Lighting Program in 2018 that you were not able to sell?

a) [IF YES] What did you do with these unsold program discounted bulbs?

b) [PROBE] Do you have any documentation on the number of discounted bulbs you did and did not sell? [IF YES] Can you send that documentation to me? [IF NO] Why not?

3-11. [FOR MANUFACTURERS THAT SHIPPED UNUSUALLY LARGE QUANTITIES OF BULBS TO DISCOUNT AND/OR GROCERY STORES. ASK REPRESENTATIVE ABOUT 1 OR 2 EXAMPLES OF A LARGE SHIPMENT BY THE MANUFACTURER TO A RETAIL GROCERY OR DISOUNT STORE FRONT]:

a) According to our records, your company shipped [NUMBER OF BULBS] bulbs discounted by the California Upstream Lighting Program in 2018 to [NAME AND ADDRESS OF RETAIL STORE]. Is this information correct?

b) [IF NO] How many bulbs did you ship to [NAME AND ADDRESS OF RETAIL STORE]?

c) [IF YES] Was [RETAIL STORE] able to sell through all [NUMBER OF BULBS]? [IF YES] How?

d) Do you have any records of bulbs shipments to [RETAIL STORE]? [IF YES] Would you be able to send me those records?

DNV·GL

WINTER 2018-2019 CALIFORNIA RETAIL LIGHTING SHELF SURVEYS
CPUC PROGRAM YEAR 2018 RESIDENTIAL LIGHTING IMPACT EVALUATION

STORE DETAILS

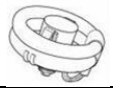
PLEASE FILL IN THIS SECTION USING THE INFORMATION CONTAINED IN THE SAMPLE DATABASE

Field researcher name:	Store address:
Date:	Store city:
Store name:	Store zip code:
Store channel:	

LAMP CODES (TECHNOLOGY TYPE AND BASE TYPE)

Technology Type Codes		Base Type Codes	
Technology Type	**Code**	**Base Type Codes**	**Code**
CFL	CF	Medium Screw	M
Incandescent	I	Pin	P
Halogen	H	GU-Type	G
LED	L	Candelabra/Intermediate	C
Smart LED	SL	Large Screw Base	L
Cold Cathode	CC	Candelabra with Medium Screw Adaptor	C/M
Other	OT	Other	OT

LAMP CODES (STYLE CODES)

Lamp Style Codes					
Lamp Style	**Code**	**Image**	**Lamp Style**	**Code**	**Image**
Spiral/Twister	TW		Spotlight/Reflector/ Flood	See below	See spotlight/reflector/flood codes in table below.
Globe (e.g., for bathroom vanity fixtures)	GL		Circline	CI	
A-lamp (shaped like standard incandescent)	AL		Tube Style	TU	
Torpedo/Bullet	TO		Night Light	NL	
Bug Light	BU		Other/Unknown	OT	Record style code, if indicated on package.

LAMP CODES (CONTINUED)

Reflector Lamp Style Codes					
Lamp Style	**Code**	**Image**	**Lamp Style**	**Code**	**Image**
BR25	B25		PAR16	P16	
BR30	B30		PAR20	P20	
BR40	B40		PAR30	P30	
R20	R20		PAR38	P38	
R30	R30		MR16	M16	
R40	R40		Other	OT	Record other style if indicated on package

LAMP INVENTORY

Survey all replacement CFLs, cold cathodes, incandescents, halogens, LEDs and Smart LEDs.
Use as many pages as necessary.
For 3-way, dimmable, ENERGY STAR, and rough/vibration service incandescent columns: X if applicable.

Model Characteristic	Model1	Model2	Model3	…
Manufacturer/Brand				
Technology Type (See Technology Codes table above)				
Package Includes Hub (for Smart LEDs only)				
Base Type (See Base Codes table above)				
Bulb Style (See Style Codes table above)				
Reflector/Spotlight/Flood Style (If applicable; see style codes above)				
Model Number				
Barcode				
Quantity in Pack				
# of Packages				
Package Location [Aisle=A; Endcap=E; Free Standing Display=FS; Pallet=P; Fenceline=F; Other-OT]				
* Full/Original Price (If discounted, record price before discount. If not discounted, record product price here)				
* Discounted Price (If on sale/discounted)				
Discount Provider (if discounted) [R=Retailer; U=Utility; M=Manufacturer; O=Other; DK= don't know]				
Color Name [Soft White=SW; Warm White=WW; Cool White=CW; Bright White=BW; Daylight=D; Enhanced Spectrum=ES; Colored= CR; Other=OT] or Smart LEDs [Multi-colored=MC, Standard=SD]				
Lumens				
Wattage				
Color Temperature (or Color Temperature Range for Smart LEDs)				
Color Rendering Index (If LED)				
Rated Life				
3-way?				
Dimmable?				
Energy Star?				
Vintage Style Lamp?				
Rough/Vibration Service Incandescent?				

*** IF ONLY ONE PRICE SHOWN**: Try to determine whether it's a discounted price/sale price or if it's a full-priced lamp. If sale price, record value in "Discounted price." If full price, record value in "Original Price."

10.6 Appendix F: Net-to-gross methodology

As part of the 2019 online consumer survey, the evaluation team designed a series questions to better understand consumer price elasticities with respect to the probability of purchasing LED lamps over an alternative technology (incandescent or halogen reflector, candelabra, or globe lamps). The NTGR was then calculated as the product of the difference in the probability of purchasing a LED with a program discount from the probability of purchasing a LED without the program discount over the probability of purchasing a LED with a program discount, as shown in Equation 10-1.

Equation 10-1. NTGR at the aggregate level

$$NTG_l = \frac{\big(P(buy\ LED \mid program) - P(buy\ LED \mid no\ program)\big)}{P(buy\ LED \mid program)}$$

where l =lamp style, and P = probability

10.6.1 Developing the Lamp Price Elasticity Model

To better understand how price drives a consumer's decision to purchase an LED over an alternative technology, the evaluation team developed a lamp purchasing game that was deployed using the online consumer survey. The respondent played the game for each of the lamp styles (reflector, candelabra, or globe) that they indicated they purchased. If the respondent did not purchase any of the lamp styles, then they were only shown the lamp purchasing game for the reflector lamps. In each iteration of the game, the respondent was shown two images—one of an LED and another of an incandescent/halogen lamp in the same lamp style. Along with these images, the respondent was shown the respective price of each lamp and then asked to select which technology they would choose. The respondent was also shown the same set of images with the only difference being the price of the LED. In one case, the price of the LED included the program discount, and in the other case, the price did not include the program discount, although the respondent was not told that one price included a discount. The order of the rounds of the game were randomized, so some respondents were shown the price of the LED with the program discount first while others were shown the price of the LED without the program discount first. In both cases, the price of the incandescent/halogen lamp was held constant.

The prices that the respondents were shown were based on the average prices in each retail channel as determined from shelf stocking survey data. Each respondent was shown two sets of prices, one set at a time, for each lamp style they purchased, reflecting program and non-program prices, randomized to reflect actual purchases across the market. Figure 10-10 shows the total number of responses for each combination of lamp style and set of prices that were shown. Respondents that were asked questions for two different lamp styles are represented twice in the number of responses, and those asked questions for three different lamp styles are represented three times.

Figure 10-10. Survey prices and number of responses by lamp style, lamp technology, and retail channel

Lamp Style	Retail Channel	Number of Responses	Price of LED | Program	Price of LED | No Program	Price of Alternative
Reflector	**Discount**	324	$ 0.50	$ 1.35	$ 1.20
Reflector	**Grocery**	326	$ 3.80	$ 3.70	$ 4.05
Reflector	**Hardware**	172	$ 0.60	$ 9.15	$ 5.85
Reflector	**Home Improvement**	511	$ 5.65	$ 6.40	$ 6.00
Globe	**Discount**	237	$ 0.50	$ 1.00	$ 1.00
Globe	**Home Improvement**	304	$ 2.90	$ 4.65	$ 3.25
Candelabra	**Discount**	217	$ 0.25	$ 1.85	$ 0.55
Candelabra	**Home Improvement**	307	$ 4.15	$ 3.05	$ 0.95

To convert responses from the lamp purchasing game into set of price elasticity curves, the evaluation team calculated a logistic regression for each lamp style based on the set of discrete consumer choices to determine the natural log of the odds of choosing an LED over the alternative technology as a function of the price of an LED and the price of the alternative technology, defined below in Equation 10-2. Table 10-1 shows the coefficients of this regression. Responses to each lamp style game were aggregated across retail channel price levels to provide variance in price-level responses for the regression.

Equation 10-2. The logit function

$$ln\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2$$

where: $\ln\left(\frac{P}{1-P}\right)$ = natural log of the odds of choosing an LED, X_1 = price of the LED, and X_2 = price of the alternative technology

Table 10-1. Coefficient results of the logistic regression

Lamp	β_0	β_1	β_2
Reflector	0.924	-0.129	0.144
Globe	1.176	-0.460	0.525
Candelabra	0.543	-0.393	1.623

This logistic regression can be transformed to interpret the results as the probability of choosing an LED over the alternative, as show in Equation 10-3. Figure 10-11 shows the probability curves of adopting an LED as function of the price of LED, holding the price of the alternative technology constant. These curves show how as the price of LED increases, the probability of choosing the LED over the alternative declines. While this trend holds true for all three lamp styles, the reflector lamps show a more inelastic shape compared to

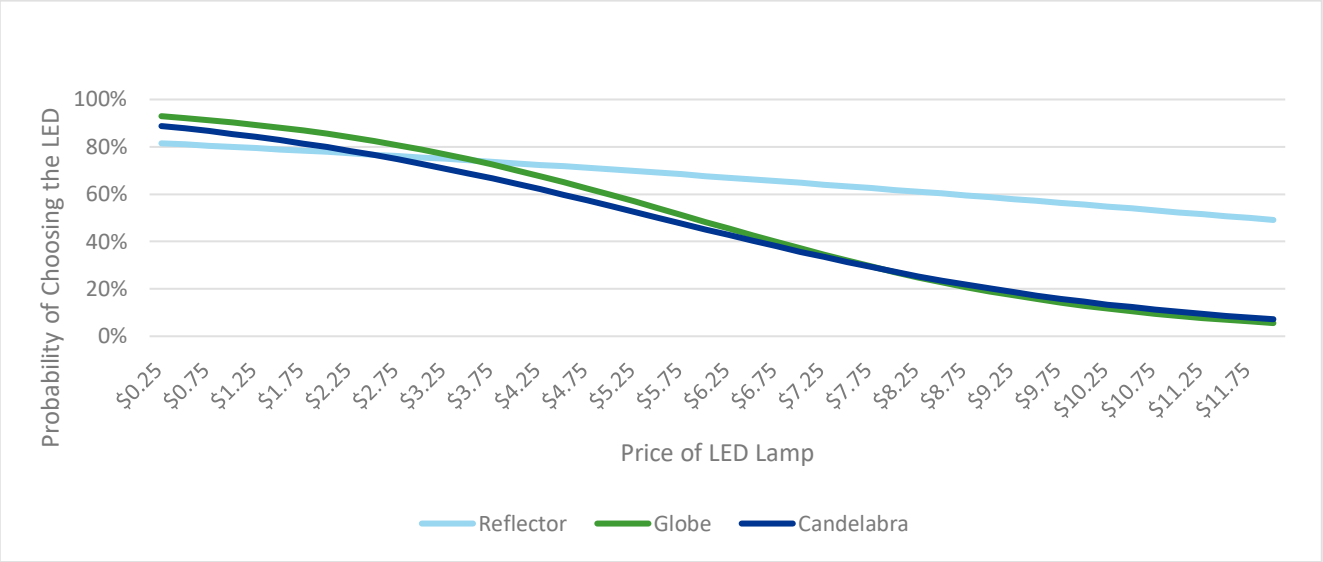
globes and candelabra. This indicates that the price of the LED is less influential in the consumer's decision to purchase an LED reflector over an incandescent or halogen reflector compared to that of a globe or candelabra.

Equation 10-3. Calculating probability from logit function

$$P = \frac{1}{1 + e^{-(\beta_0 + \beta_1 X_1 + \beta_2 X_2)}}$$

where: P = probability of choosing a LED, X_1 = price of the LED, and X_2 = price of the alternative technology

Figure 10-11. The probability of choosing an LED over the alternative,* by lamp style



*Alternative prices held constant: Reflector = $4.09, Globe = $2.89, and Candelabra = $1.00

10.6.2 NTGR sensitivity analysis

Methodology

In Section 6.4 we calculated the NTGR for each of the evaluated technologies. We used the price elasticity model to calculate the probability of a program LED purchase, and a non-program LED purchase. The NTGR was calculated as the difference of these probabilities, divided by the probability of a program purchase.

Three prices informed the NTGR calculation. We used the average program lamp price, average non-program LED price, and average non-program incandescent/halogen price, for each technology type, as inputs to the price elasticity model. Incandescent and halogen lamps were considered as the inefficient alternative to LED lamps. We used the results of the shelf survey to estimate the distributions of lamps on the shelves of retail stores across California.

The shelf survey is administered as a stratified random sample of the population of retail stores in California, with strata defined by IOU and store channel. We generalized our results across all three PAs to increase the sample size and robustness of our results. Within each channel, we estimated three prices for each technology type. These channel-specific prices were then combined into a weighted average price for each technology type, using consumer purchases as weights for non-program lamps, and program sales as the

weights for program lamps. In this way, we calculated three average prices for each technology type. The channel-weighted average prices for each technology type were intended to represent the average price which an average consumer would experience, considering consumer purchasing patterns.

Market prices

To further increase the generalizability of our results, we performed a supplementary NTGR sensitivity analysis, which compared the NTGR results when the price elasticity model was informed by the 25th percentile price, median price, and 75th percentile price for each technology type. The price distributions used for the sensitivity analysis are estimates of the population price distributions and are not corrected for consumer purchasing patterns.

The program price drops significantly at the 25th percentile for candelabras and globes. The bottom quartile of the program candelabra and globe distributions were entirely represented by shipments to discount stores. As discussed in 6.4**,** prices alone are insufficient to represent the effect of program in discount stores. Shipments to discount stores often exceeded the sales volume of each store, so many of these lamps did not reach the consumers. In addition to flooding the market in this channel, most consumers do not purchase their lamps in discount stores.

Table 10-2. Estimated price distribution for reflectors

Product Type	Program Discounted	Min	25th Percentile	50th Percentile	75th Percentile	Max
Alternative	Non-discounted	$0.99	$2.00	$3.99	$6.19	$19.99
LED	Discounted	$0.49	$0.50	$0.50	$3.27	$17.99
LED	Non-discounted	$0.49	$2.98	$4.18	$5.82	$49.99

Table 10-3. Estimated price distribution for candelabras

Product Type	Program Discounted	Min	25th Percentile	50th Percentile	75th Percentile	Max
Alternative	Non-discounted	$0.40	$0.60	$1.12	$1.80	$5.50
LED	Discounted	$0.25	$0.25	$2.50	$2.50	$4.61
LED	Non-discounted	$0.99	$3.24	$3.98	$5.46	$19.99

Table 10-4. Estimated price distribution for globes

Product Type	Program Discounted	Min	25th Percentile	50th Percentile	75th Percentile	Max
Alternative	Non-discounted	$0.99	$1.70	$2.66	$3.90	$8.99
LED	Discounted	$0.49	$0.50	$0.50	$0.50	$4.00
LED	Non-discounted	$2.00	$3.86	$4.76	$4.98	$19.99

NTGR results

We used the estimated price distributions to calculate the NTGR, at the 25th percentile, median, and 75th percentile price for each technology type. The NTGR was calculated as outlined in the **net savings section**. The results below are intended to represent the price sensitivity of the NTGR.

The candelabra NTGR is greatest when calculated using the 25th percentile prices. This is largely because inexpensive program lamps were shipped to discount stores. The 25th percentile prices are not representative of the overall lighting market because they consist entirely of program lamps sold in discount stores. Most consumer purchases took place in other channels, specifically, home improvement and membership club stores.

The reflector and globe NTGRs are greatest when calculated using the median price. The lower NTGR in the third quartile can be explained by the dramatic increase in alternative lamp prices between in the third quartile for these two technology types. Expensive alternative lamps minimize the effect of the program as consumers are already influenced to purchase the less expensive non-program LED.

Table 10-5. Low, medium, and high-price scenarios: probabilities of LED selection and NTGRs

Technology Type	Measurement	25th Percentile NTGR	50th Percentile NTGR	75th Percentile NTGR
Reflector	Without-Program LED Probability	70%	72%	74%
	With Program LED Probability	76%	81%	80%
	NTGR	**8.3%**	**10.5%**	**7.2%**
Candelabra	Without-Program LED Probability	56%	69%	79%
	With Program LED Probability	81%	80%	92%
	NTGR	**30.4%**	**13.7%**	**14.6%**
Globe	Without-Program LED Probability	57%	59%	72%
	With Program LED Probability	86%	91%	95%
	NTGR	**33.7%**	**34.9%**	**24.7%**

10.7 Appendix G: CREED sales data

10.7.1 Introduction

Developed by Apex Analytics, the Consortium for Retail Energy Efficiency Data (CREED) serves as a consortium of PAs, retail stores, and manufacturers working together to collect the necessary data to better plan and evaluate energy efficiency programs.[36] LightTracker is CREED's first initiative, focused on acquiring full-category lighting data, including incandescent, halogen, CFL, and LED bulb types, for all distribution channels in the entire United States. As a consortium, CREED speaks as one voice for PAs nationwide as they request, collect, and report on the sales data needed by the energy efficiency community. The Full Category Sales report (LightTracker) created by CREED relies on many data sources. There are two primary data sources which are purchased from data vendors (Nielsen and IRI), and secondary data available publicly from different sources (see below). The Point-of-Sale (POS) dataset is used to report actual scanned sales from available retail stores, and the Panel dataset is used to fill-in the remaining retail stores' sales estimates.

10.7.2 Proprietary data sources

POS dataset

The POS dataset includes lighting sales data for grocery, drug, dollar, discount, and mass merchandiser distribution channels. These data represent actual sales that are scanned at the cash register for participating retail stores. Since there are a larger number of smaller chains and independent locations within the grocery channel, the data vendors have defined the grocery channel to stores that do over $2 million annually in sales, meaning the smallest locations are omitted from the dataset.[37] The raw data is aggregated at the state level and is reported at a product-level. For example, the dataset provides the number of units of a specific UPC purchased in any given state in the calendar year.

Panel dataset

The Panel data represent the remaining retail channels, including home improvement, club, hardware, online, and smaller grocery/bodega stores (not included in the POS). The Panel data are largely derived from the National Consumer Panel (NCP), which represents a panel of approximately 100,000 residential households – including over 6,000 in California – that are provided a handheld scanner for their homes and instructed to scan every purchase they make that has a bar code. The use of a scanner avoids potential "recall bias," which is prevalent in self-report methods that ask about lighting purchases. The NCP data is aggregated at the state-level and at a category of bulb type-level (e.g., the total number of LEDs purchased in California).

Combining the datasets

The Apex team combines the POS and panel data, and then verifies and calibrates (as needed) based on additional secondary data sources, including:

- U.S. Census Bureau import data (CFL and LED imports)
- ENERGY STAR shipment data (released by the U.S. Environmental Protection Agency)
- North American Electrical Manufacturers Association shipment data

[36] For further details on CREED, please see https://www.creedlighttracker.com/

[37] CREED addresses the omission of these smaller, independent grocery stores by capturing the estimated sales in the Panel dataset.

- General population surveys, lighting saturation studies, and other secondary data collection made publicly available through evaluation reports

10.7.3 Data cleaning

Although the dataset includes detailed records of lighting data purchases, the Apex team devotes a considerable effort to ensure data integrity and inclusion of all the necessary bulb attributes. For example, not all records were populated with some of the more critical variables such as bulb type, style, and wattage or the data had clearly erroneous values (e.g., 60-watt LEDs).

After thorough review and quality control of the dataset, the Apex team reclassified, standardized, and populated missing records, created additional variables, and performed general enhancements to the data. To populate missing records, validate existing records, and include additional bulb attributes, the Apex Team created a proprietary Universal Product Code (UPC) database with approximately 36,000 lamps from five sources:

- Manufacturer product databases provided to LightTracker
- Product catalogs downloaded from manufacturer web sites via Python-based web scraping
- Product offerings downloaded from retail store websites
- Automated lookups of online UPC databases (such as www.upcitemdb.com)
- ENERGY STAR databases available online (such as https://www.energystar.gov/productfinder/product/certified-light-bulbs)

LightTracker then merged the bulb database with the POS/Panel data, populating fields based on a hierarchy of data sources believed to be most reliable. Prioritization was typically based in the following order: manufacturer specifications, UPC lookups, original data provider (IRI and Nielsen) database values. The Apex team also conducted manual web lookups on individual lamps to determine final assignments.

In addition, the Apex team investigated the bulb assignment and the quantity of lamps per package by examining the average price per unit and identifying outliers in terms of per bulb prices. This process helped us identify misclassification of certain bulb types (e.g., lamps that were flagged as low-cost LEDs but were really LED nightlights, so needed to be moved under "other"), as well as bulb counts that represented box shipments (e.g., a package identified as having 36 lamps was really a 6-pack of LEDs that was shipped with 6 packages per box). The sales model is restricted to screw-based lamps, so any lamps classified as type "other" were not included in the model.

10.7.4 2018 California and U.S. lamp sales

Apex Analytics compiled CREED sales data for California in 2018. The sales data included point of sales (POS) data for select retail stores from discount, drug, grocery, mass merchandise, and select membership club channels (POS estimate). The data also included a panel estimate of sales from other channels in the market, which included home improvement, hardware, remaining stores not included in the POS dataset, and online stores (non-POS estimate). Table 10-6 shows a breakdown of total lamp sales in California and U.S. by technology and lamp shape for the POS and non-POS estimates as well as the combined total sales from the POS and non-POS datasets.

Table 10-6. California replacement lamp sales estimates, 2018

Technology	CA and Total U.S. Sales	POS Estimate	Non-POS Estimate	Total Sales
LED	California	10,068,054	42,065,748	52,133,804
	Total U.S.	181,843,743	527,801,926	709,645,668
CFL	California	137,746	6,170,106	6,307,853
	Total U.S.	2,307,284	40,221,766	42,529,050
Halogen	California	3,919,455	11,749,004	15,668,459
	Total U.S.	158,480,603	303,542,034	462,022,635
Incandescent	California	6,877,046	3,017,142	9,894,188
	Total U.S.	140,963,230	46,150,645	187,113,874
Total Lamps	California	21,002,302	63,002,000	84,004,304
	Total U.S.	483,594,848	917,716,352	1,401,311,232

Table 10-7 shows a breakdown of total lamp sales in California by technology and lamp shape for the POS and non-POS estimates as well as the combined total sales from the POS and non-POS datasets.

Table 10-7. California replacement lamp sales estimates, 2018

Technology	Lamp Shape	Total Sales by Lamp Style	Total Sales
LED	A-lamp	40,219,152	52,133,804
	Reflector	5,094,092	
	Candelabra	3,802,522	
	Globe	1,985,778	
CFL	A-lamp/ Spiral	6,250,764	6,307,853
	Reflector	46,762	
	Candelabra	726	
	Globe	9,599	
Halogen	A-lamp	9,724,834	15,668,459
	Reflector	971,934	
	Candelabra	2,877,379	
	Globe	1,754,697	
Incandescent	A-lamp	3,891,496	9,894,188
	Reflector	724,896	
	Candelabra	3,337,381	
	Globe	1,679,904	
Total Sales		**82,371,916**	**84,004,304**

Table 10-8 shows POS sales estimates for A-Line lamps in California by lumen bin.

Table 10-8. California A-Line sales by lumen bin (POS only), 2018

Technology	Lumen Range	Sales
LED Sales	0-309	270,442
	310-449	326,428
	450-749	1,568,249
	750-1049	4,009,754
	1050-1489	647,316
	1490-2600	477,030
	2601-3300	-
	>3300	-
	Total LED	**7,299,220**
CFL Sales	0-309	-
	310-449	79
	450-749	3,878
	750-1049	64,129
	1050-1489	11,435
	1490-2600	45,158
	2601-3300	-
	Total CFL	**124,679**
Halogen Sales	0-309	43,914
	310-449	474,871
	450-749	640,309
	750-1049	1,018,837
	1050-1489	826,563
	1490-2600	462,055
	2601-3300	-
	>3300	-
	Total Halogen	**3,466,550**
Incandescent Sales	0-309	308,947
	310-449	286,602
	450-749	437,471
	750-1049	360,082
	1050-1489	166,976
	1490-2600	516,572
	2601-3300	64,864
	>3300	54,100
	Total Incandescent	**2,195,615**
Total All Technologies		**13,086,064**

Table 10-9 shows the list of retail stores that were included in the POS dataset.

Table 10-9. List of participating retail stores by channel (provided by Nielsen), 2018

Retail Store	Channel	Store Location
Dollar General	Discount	CA and U.S.
Family Dollar	Discount	CA and U.S.
CVS	Drug	CA and U.S.
Rite Aid	Drug	CA and U.S.
Walgreens	Drug	CA and U.S.
Albertsons	Grocery	CA and U.S.
Bel Air Markets	Grocery	CA
Cardenas Markets	Grocery	CA and U.S.
City Market	Grocery	CA and U.S.
El Super	Grocery	CA
Food 4 Less	Grocery	CA and U.S.
Food Maxx Stores	Grocery	CA and U.S.
Gelsons	Grocery	CA
IGA	Grocery	CA and U.S.
Kroger	Grocery	CA and U.S.
Lucky Store	Grocery	CA
Nob Hill	Grocery	CA
Raley's Supermarkets	Grocery	CA and U.S.
Ralphs	Grocery	CA
Ray's Food Place	Grocery	CA and U.S.
Safeway	Grocery	CA and U.S.
Save Mart	Grocery	CA and U.S.
Smart & Final	Grocery	CA and U.S.
Stater Bros Market	Grocery	CA
Vons	Grocery	CA and U.S.
Whole Foods	Grocery	CA and U.S.
Kmart	Mass Merchandise	CA and U.S.
Target	Mass Merchandise	CA and U.S.
Walmart	Mass Merchandise	CA and U.S.
Sam's Club	Membership Club	CA and U.S.
Cardinal Health	Drug	Non-CA
Hyvee Drugstores	Drug	Non-CA
Kinney Drugs	Drug	Non-CA
Acme Market	Grocery	Non-CA
America's Food Basket	Grocery	Non-CA
Bashas'	Grocery	Non-CA
Bi Lo	Grocery	Non-CA
Big Y	Grocery	Non-CA
Brookshire	Grocery	Non-CA
Carlie C's	Grocery	Non-CA
Coborn's Cash Wise	Grocery	Non-CA
Cosentinos	Grocery	Non-CA

Retail Store	Channel	Store Location
Cub Foods	Grocery	Non-CA
Demoulas	Grocery	Non-CA
Dierbergs	Grocery	Non-CA
Dillon	Grocery	Non-CA
El Rancho Supermarket	Grocery	Non-CA
Family Fare Supermarket	Grocery	Non-CA
Fareway	Grocery	Non-CA
Festival Foods	Grocery	Non-CA
Fiesta Mart	Grocery	Non-CA
Food City	Grocery	Non-CA
Food Co	Grocery	Non-CA
Food Lion	Grocery	Non-CA
Foodtown	Grocery	Non-CA
Fred Meyer	Grocery	Non-CA
Fresco Y Mas	Grocery	Non-CA
Fresh Brands	Grocery	Non-CA
Fry's	Grocery	Non-CA
Fulmer Supermarket	Grocery	Non-CA
Giant Eagle	Grocery	Non-CA
Giant Food	Grocery	Non-CA
Greers	Grocery	Non-CA
Gristedes	Grocery	Non-CA
Hannaford	Grocery	Non-CA
Hardings	Grocery	Non-CA
Harps	Grocery	Non-CA
Harris Teeter Inc	Grocery	Non-CA
Harveys Supermarket	Grocery	Non-CA
HEB	Grocery	Non-CA
Heinens	Grocery	Non-CA
Homeland	Grocery	Non-CA
Houchens	Grocery	Non-CA
Hyvee	Grocery	Non-CA
Indiana Grocery	Grocery	Non-CA
Ingles	Grocery	Non-CA
Jay C Food Store	Grocery	Non-CA
Jewel Osco	Grocery	Non-CA
King Kullen	Grocery	Non-CA
King Sooper	Grocery	Non-CA
Kings	Grocery	Non-CA
Lewis Food Town	Grocery	Non-CA
Lowes	Grocery	Non-CA
Lunds & Byerlys	Grocery	Non-CA
Maceys Market	Grocery	Non-CA

Retail Store	Channel	Store Location
Market Basket	Grocery	Non-CA
Market Place	Grocery	Non-CA
Martins	Grocery	Non-CA
Meijer	Grocery	Non-CA
Nash Finch	Grocery	Non-CA
Niemann Foods	Grocery	Non-CA
Piggly Wiggly	Grocery	Non-CA
Price Chopper	Grocery	Non-CA
Price Rite	Grocery	Non-CA
Publix	Grocery	Non-CA
Quality Foods	Grocery	Non-CA
Ramey Super Market	Grocery	Non-CA
Randalls	Grocery	Non-CA
Redners	Grocery	Non-CA
Ridley's Food	Grocery	Non-CA
Riesbeck Food Markets	Grocery	Non-CA
Roche Bros	Grocery	Non-CA
Rosauers	Grocery	Non-CA
Roundys	Grocery	Non-CA
Rouses	Grocery	Non-CA
Save A Lot	Grocery	Non-CA
Schnuck Markets	Grocery	Non-CA
Shaws Supermarkets	Grocery	Non-CA
Shop Rite	Grocery	Non-CA
Shoppers Food	Grocery	Non-CA
Smiths Food & Drug	Grocery	Non-CA
Stop & Shop	Grocery	Non-CA
Super One	Grocery	Non-CA
Tom Thumb	Grocery	Non-CA
Tops	Grocery	Non-CA
Town & Country Supermarket	Grocery	Non-CA
United Supermarket	Grocery	Non-CA
Wegmans	Grocery	Non-CA
Weis	Grocery	Non-CA
Winn Dixie	Grocery	Non-CA
BJ's	Membership Club	Non-CA

10.8 Appendix H: Lighting stock shelf surveys

In this section, we present the results of the Winter 2018-19 lighting shelf stocking surveys. We refer to the results in this data collection effort as 2018 in the figures and tables below. From late October 2018 to early March 2019, the evaluation team conducted lighting stock shelf surveys in retail stores in PG&E, SCE and SDG&E service territories that received shipments of PA-discounted lamps in 2018. To view the survey instrument, please see Appendix E. For comparative purposes we also present results from the Winter 2015-2016 lighting shelf stocking surveys in the tables and figures below (referred to as 2015).

As the data below demonstrate, the lighting market changed dramatically between 2015 and 2018. LEDs now dominate lamp stock and comprise the majority of lamps stocked in retail stores overall among all lamp styles, among A-lamps, and among the lamp styles evaluated as part of this study (reflectors, candelabras, and globes). Additionally, LED lamp prices have declined in the above mentioned lamp styles. Both of these factors help explain why consumers overwhelmingly prefer LEDs as seen in the results from the 2019 Consumer Survey (see Section 6 and Appendix J).

10.8.1 Share of Lamps Stocked

Shelf survey staff evaluated the lamps available on retail store shelves. Figure 10-12 shows the percent of all lamps stocked overall.

Figure 10-12. Percent of all lamps stocked: overall, 2015 and 2018

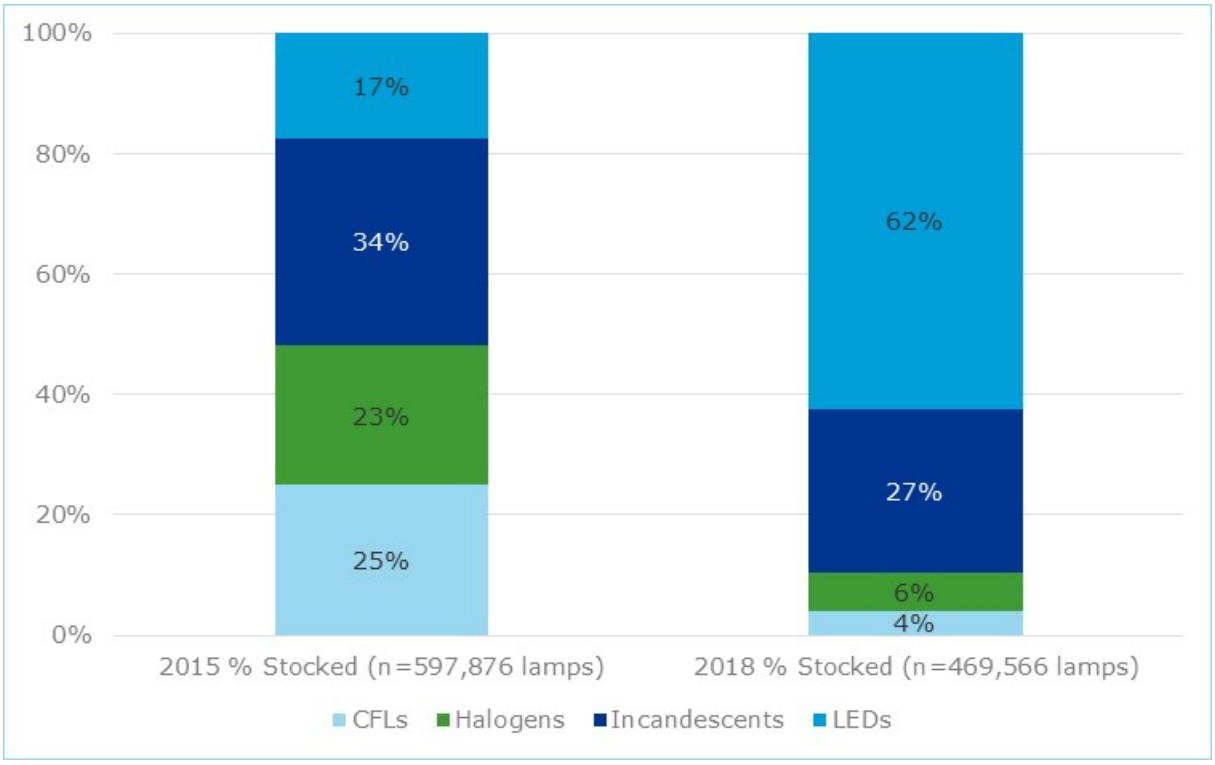


Figure 10-13 shows the percent of A-Lamps stocked overall.

Figure 10-13. Percent of A-Lamps and spiral stocked: overall, 2015 and 2018

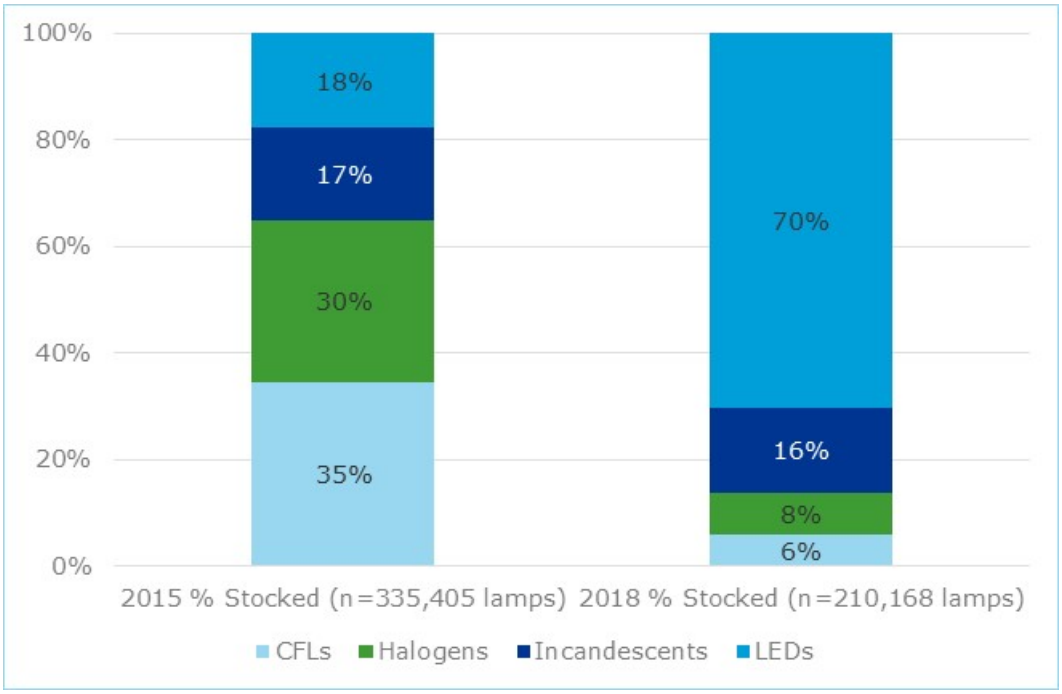


Figure 10-14 shows the percent of halogens and incandescent lamps by EISA status overall.

Figure 10-14. Percent of halogens/incandescent by EISA status stocked overall, 2015 and 2018

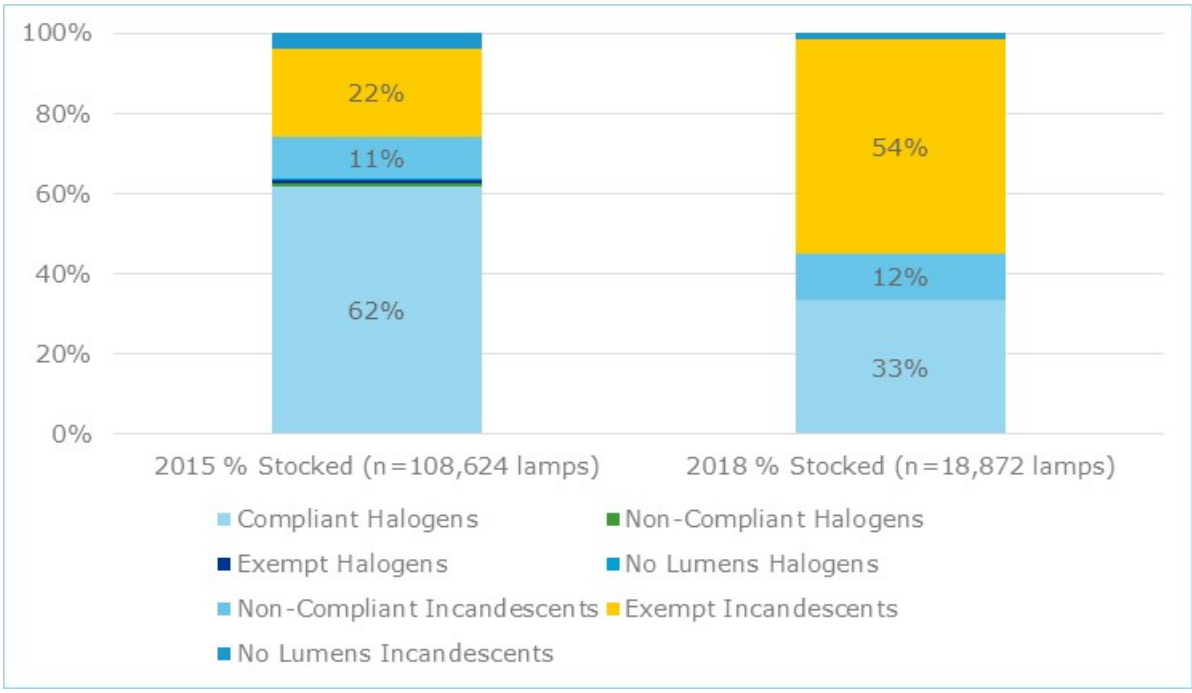


Figure 10-15 shows the percent of reflector lamps stocked overall.

Figure 10-15. Percent of reflector lamps: overall, 2015 and 2018

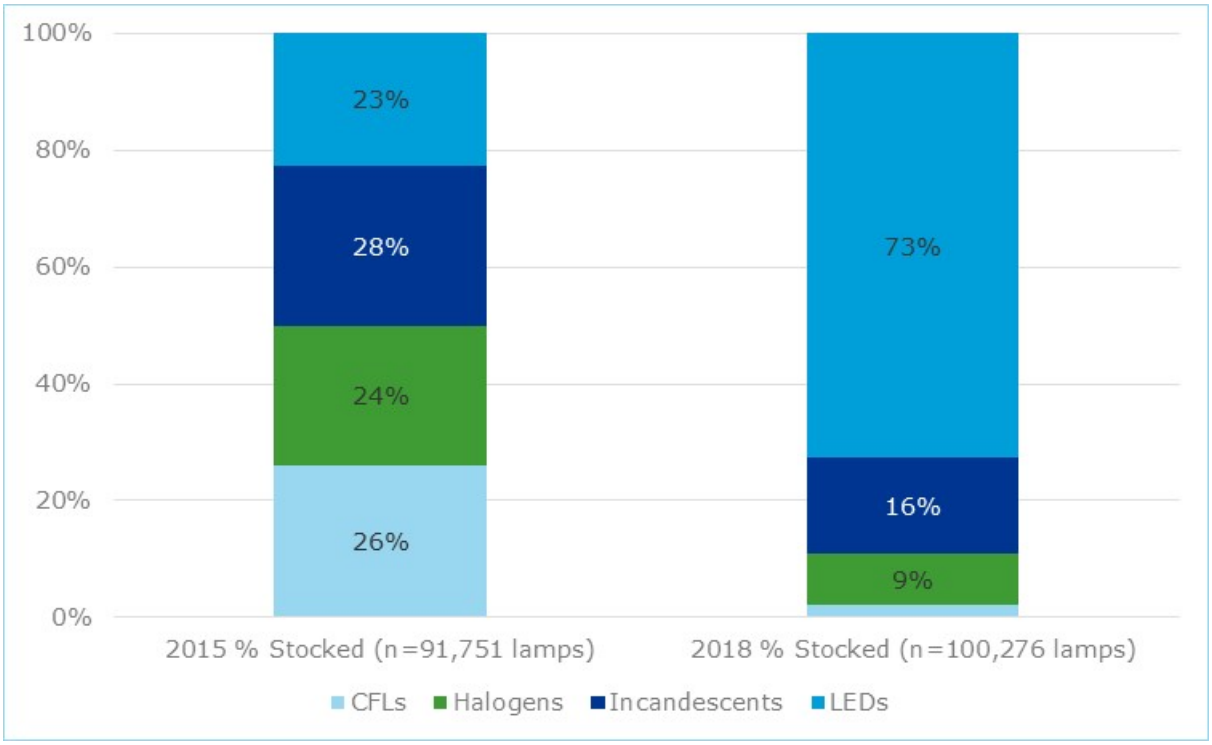


Figure 10-16 shows the percent of candelabra lamps stocked overall.

Figure 10-16. Percent of candelabra lamps: overall, 2015 and 2018

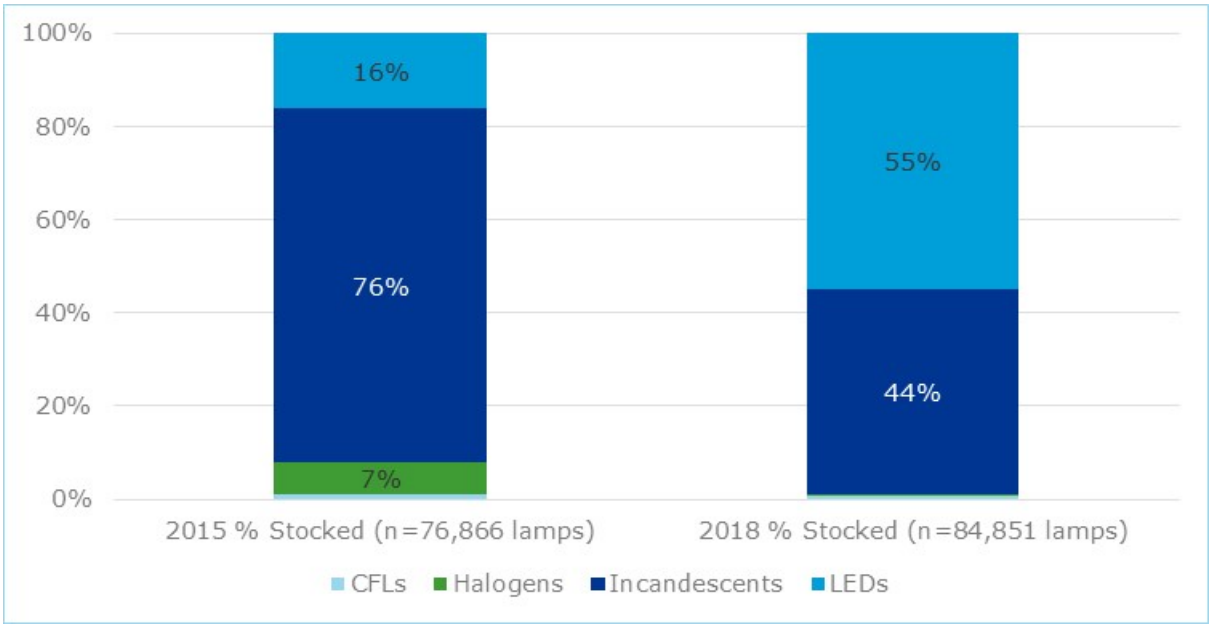


Figure 10-17 shows the percent of globe lamps stocked overall.

Figure 10-17. Percent of globe lamps: overall, 2015 and 2018

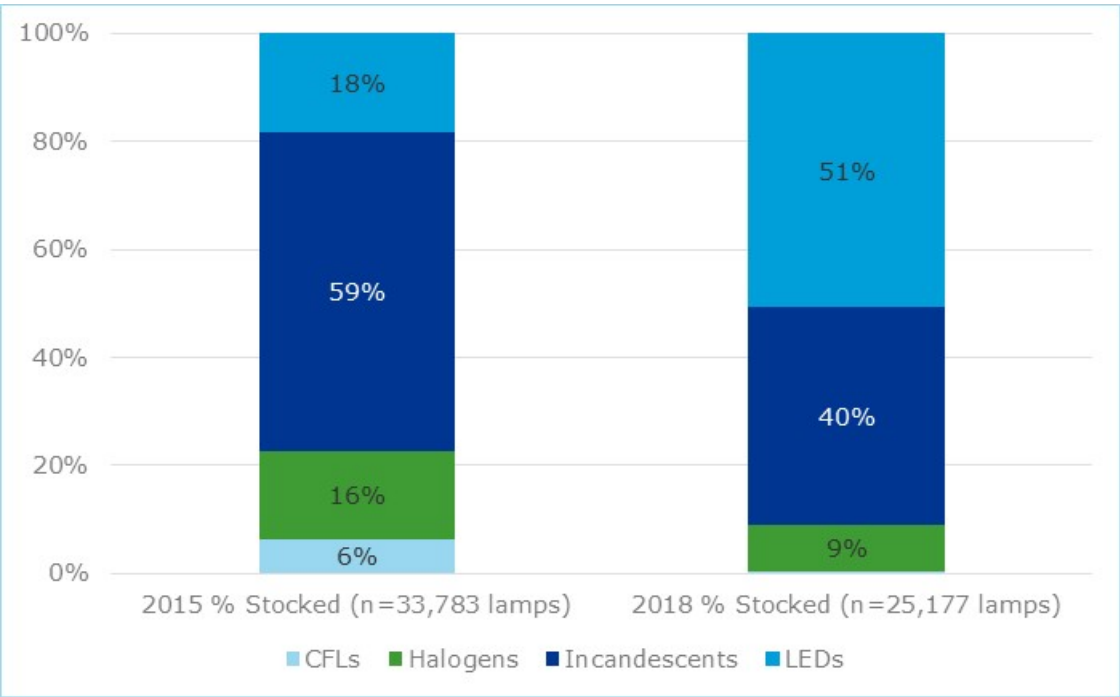


Figure 10-18 shows the percent of A-Lamps stocked in discount stores.

Figure 10-18. Percent of A-Lamps: discount, 2015 and 2018

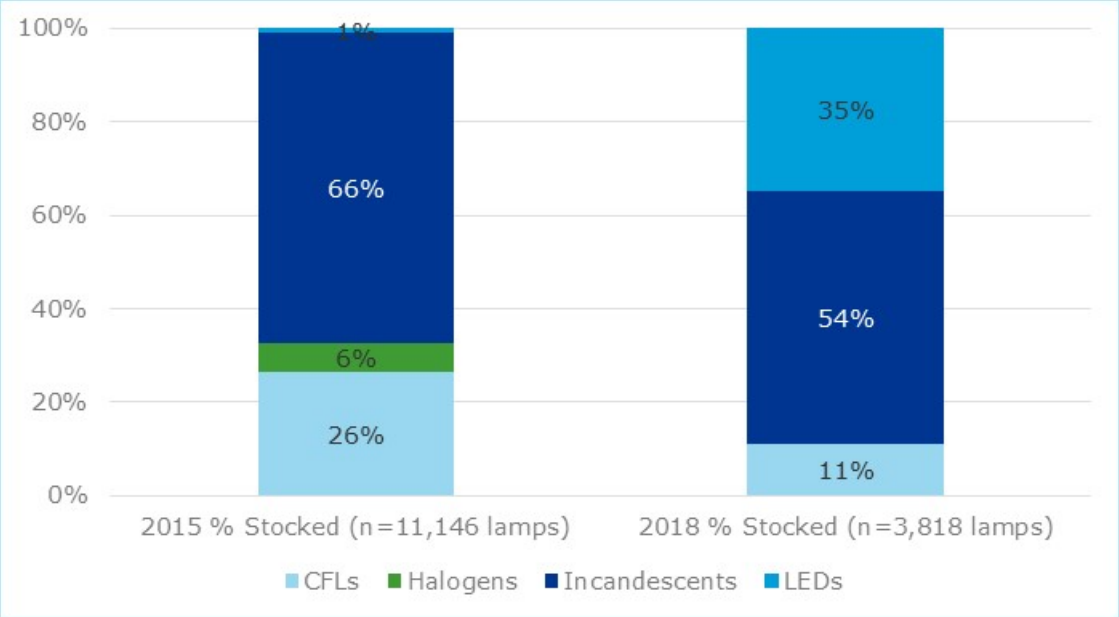


Figure 10-19 shows the percent of A-Lamps stocked in grocery stores.

Figure 10-19. Percent of A-Lamps: grocery, 2015 and 2018

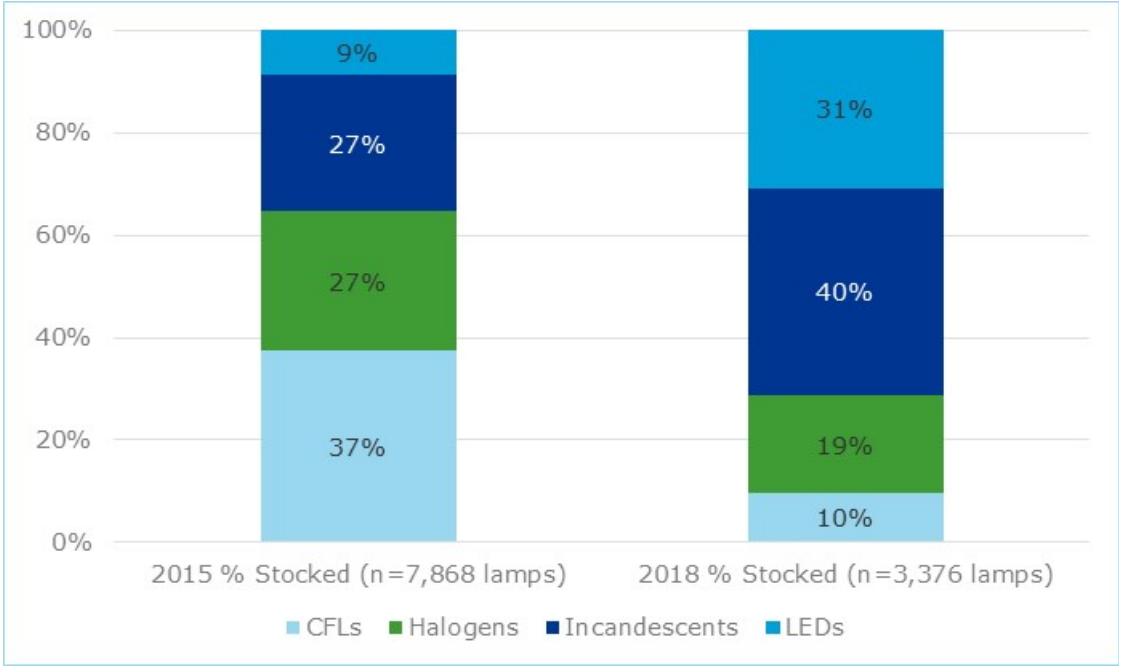


Figure 10-20 shows the percent of A-Lamps stocked in home improvement stores.

Figure 10-20. Percent of A-Lamps: home improvement, 2015 and 2018

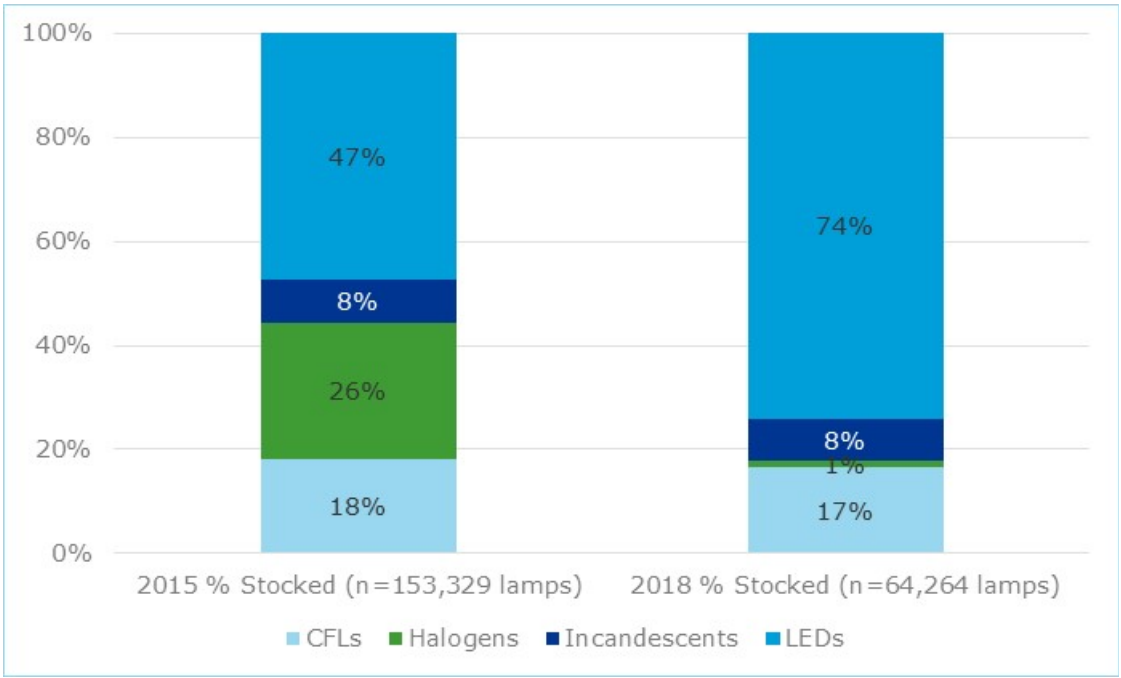


Figure 10-21 shows the percent of reflector lamps stocked in discount stores.

Figure 10-21. Percent of reflector lamps: discount, 2015 and 2018

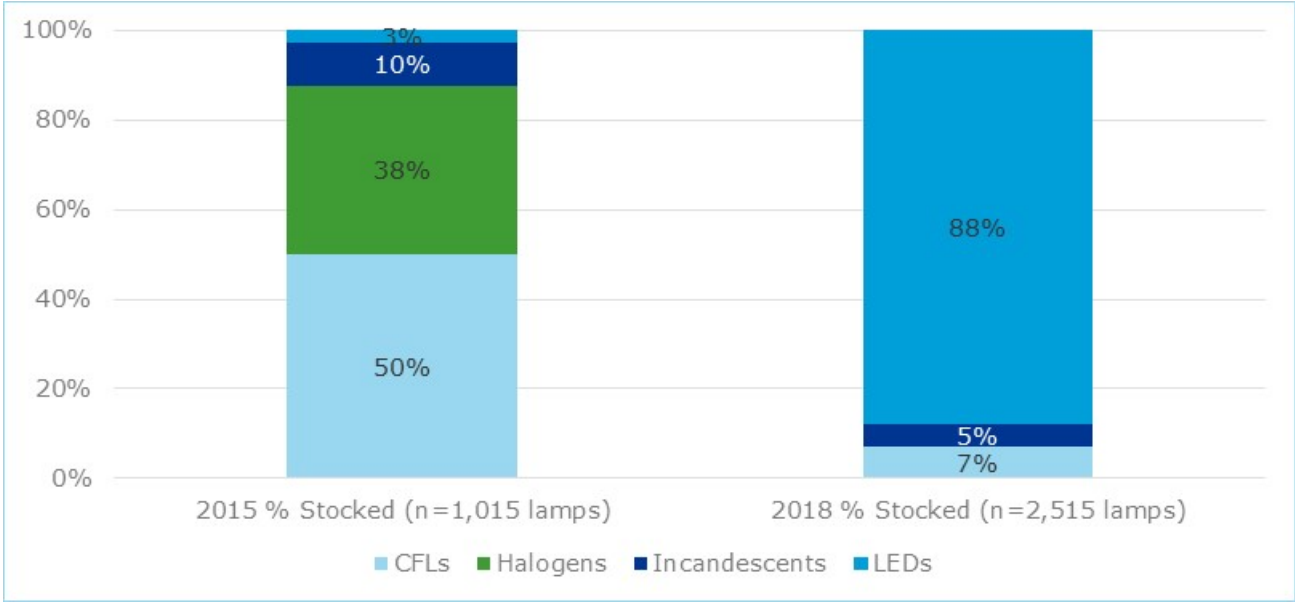


Figure 10-22 shows the percent of reflector lamps stocked in grocery stores.

Figure 10-22. Percent of reflector lamps: grocery, 2015 and 2018

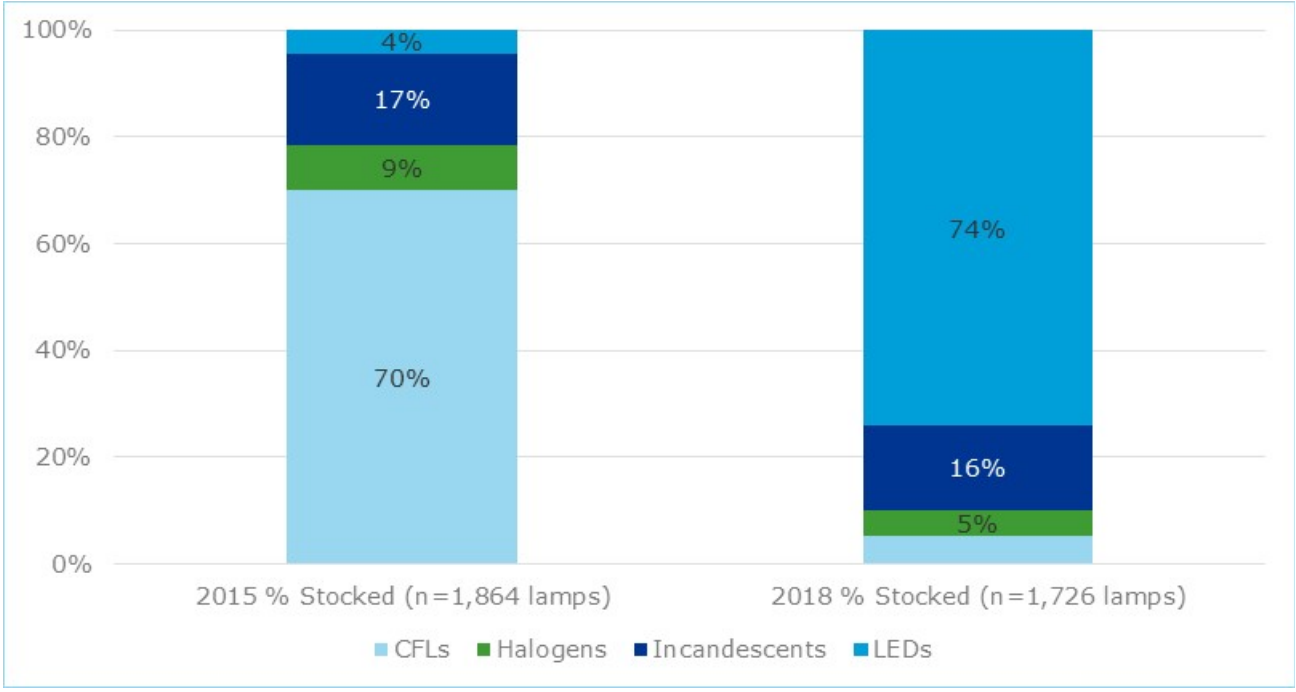


Figure 10-23 shows the percent of reflector lamps stocked in home improvement stores.

Figure 10-23. Percent of reflector lamps: home improvement, 2015 and 2018

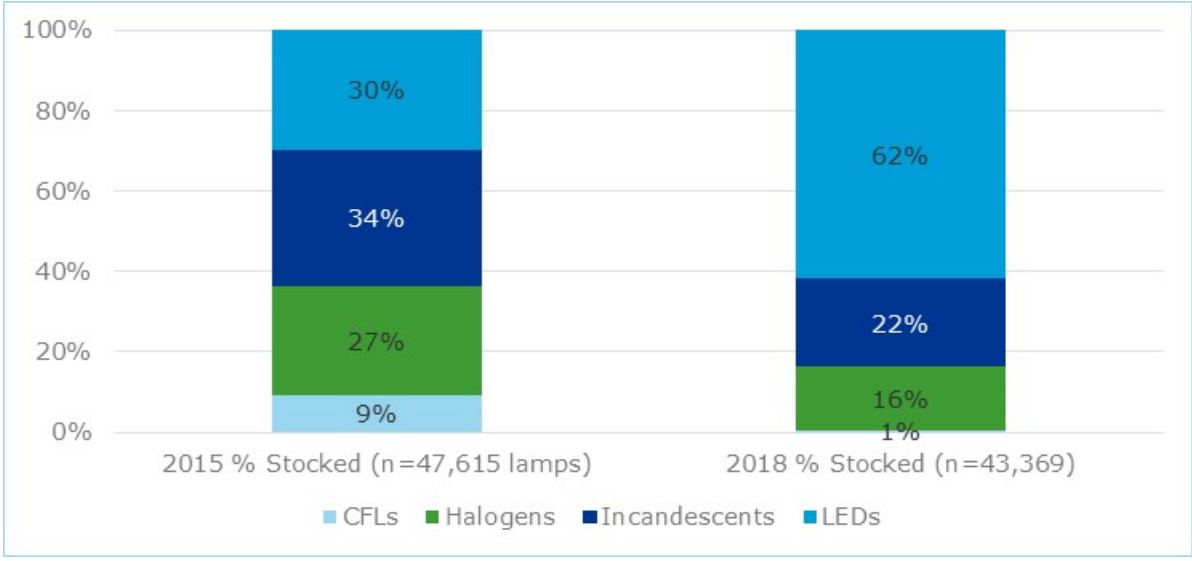


Figure 10-24 shows the percent of candelabra lamps stocked in discount stores.

Figure 10-24. Percent of candelabra lamps: discount, 2015 and 2018

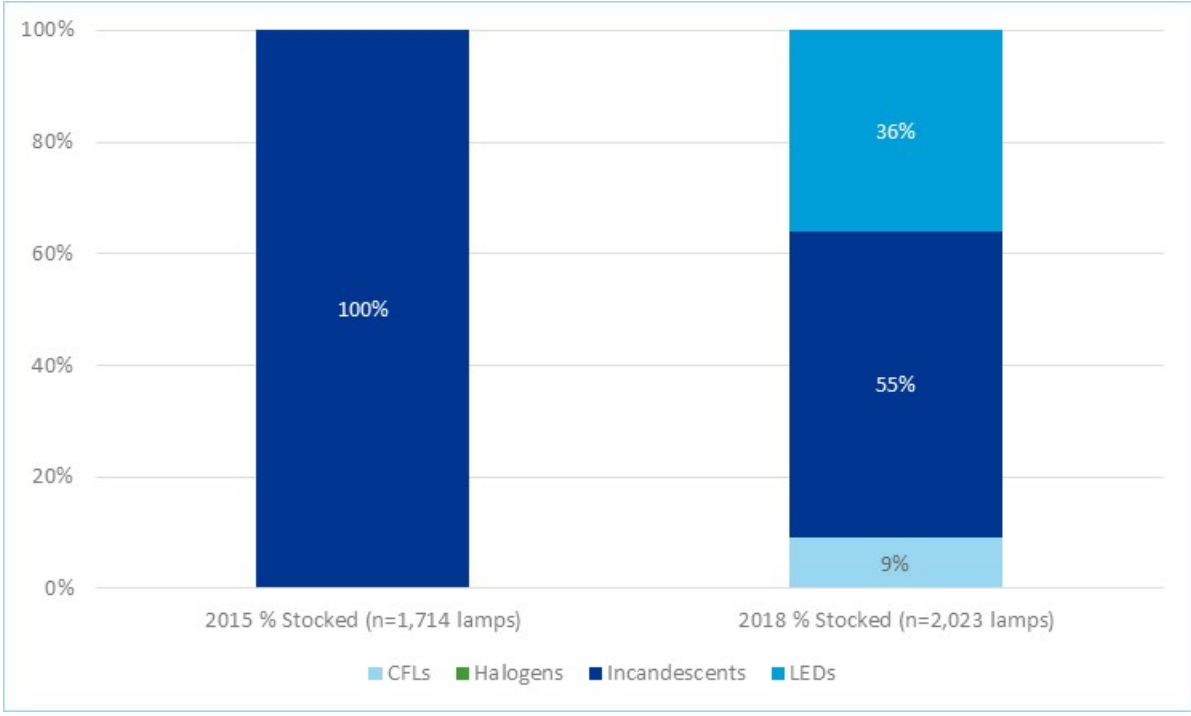


Figure 10-25 shows the percent of candelabra lamps stocked in grocery stores.

Figure 10-25. Percent of candelabra lamps: grocery, 2015 and 2018

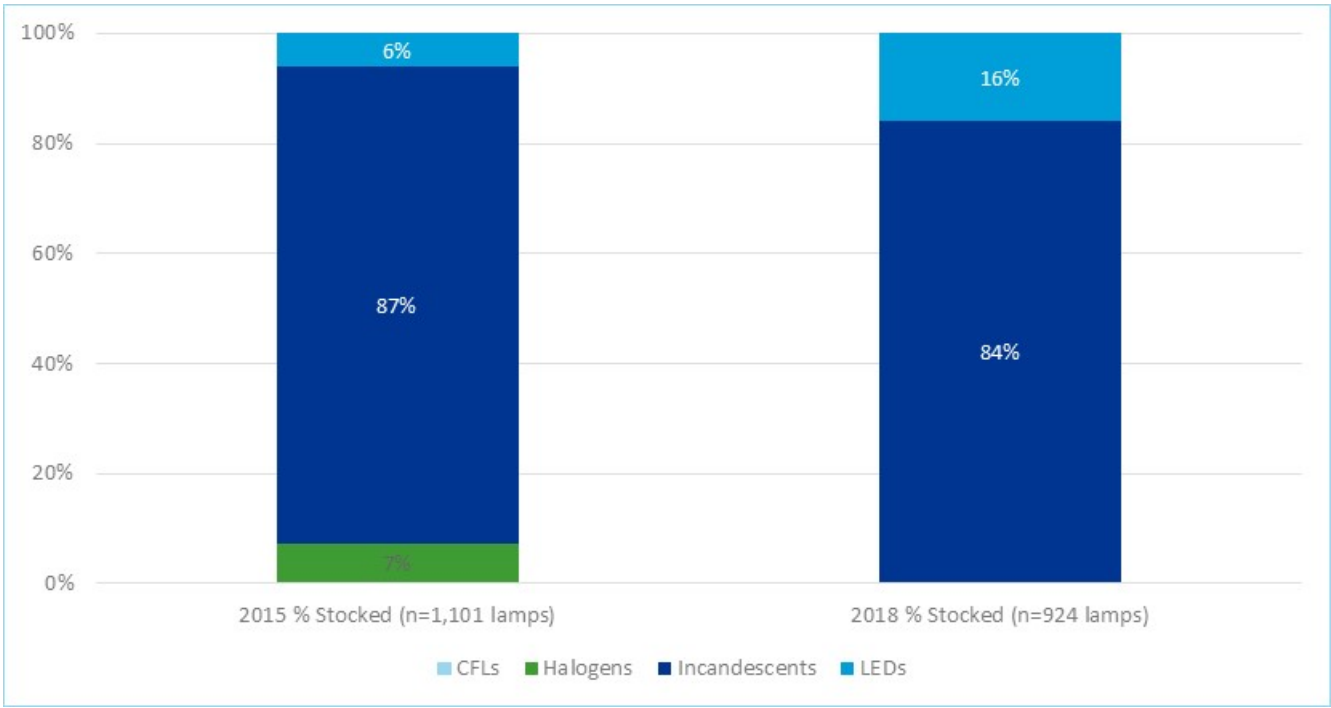


Figure 10-26 shows the percent of candelabra lamps stocked in home improvement stores.

Figure 10-26. Percent of candelabra lamps: home improvement, 2015 and 2018

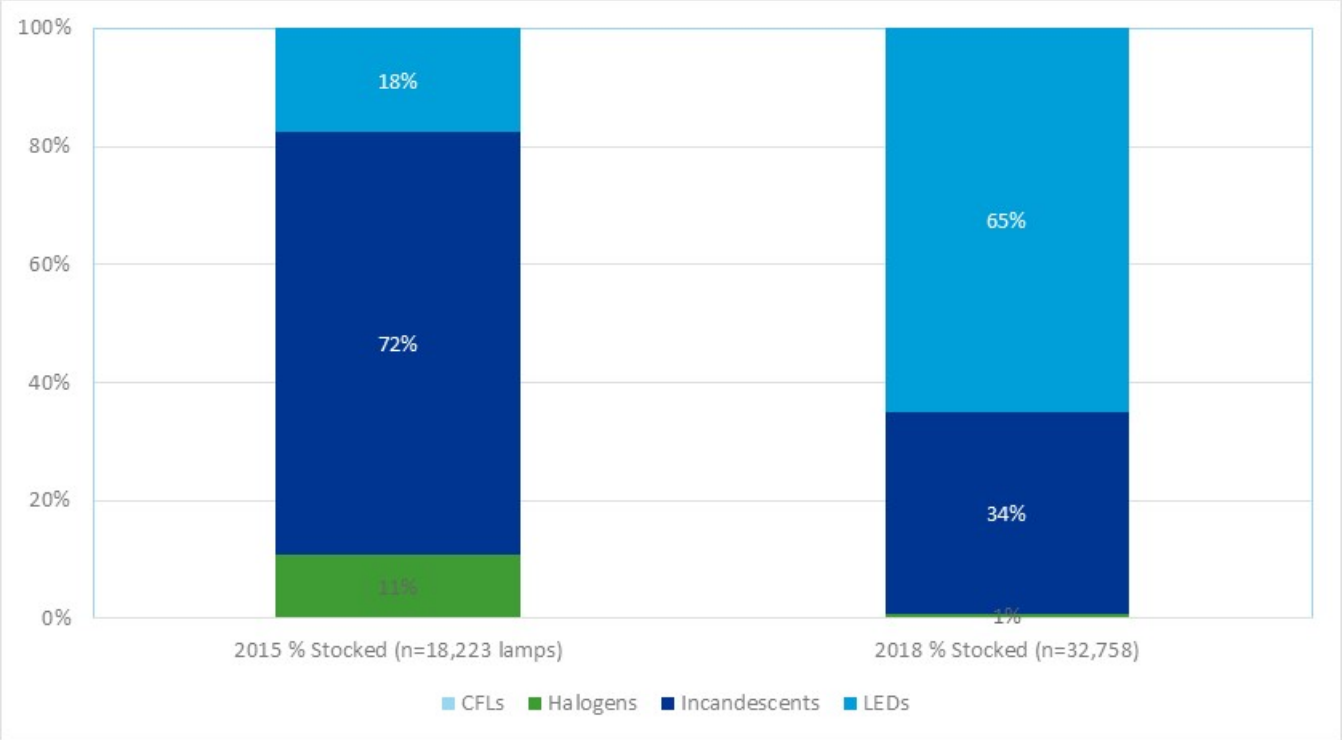


Figure 10-27 shows the percent of globe lamps stocked in discount stores.

Figure 10-27. Percent of globe lamps: discount, 2015 and 2018

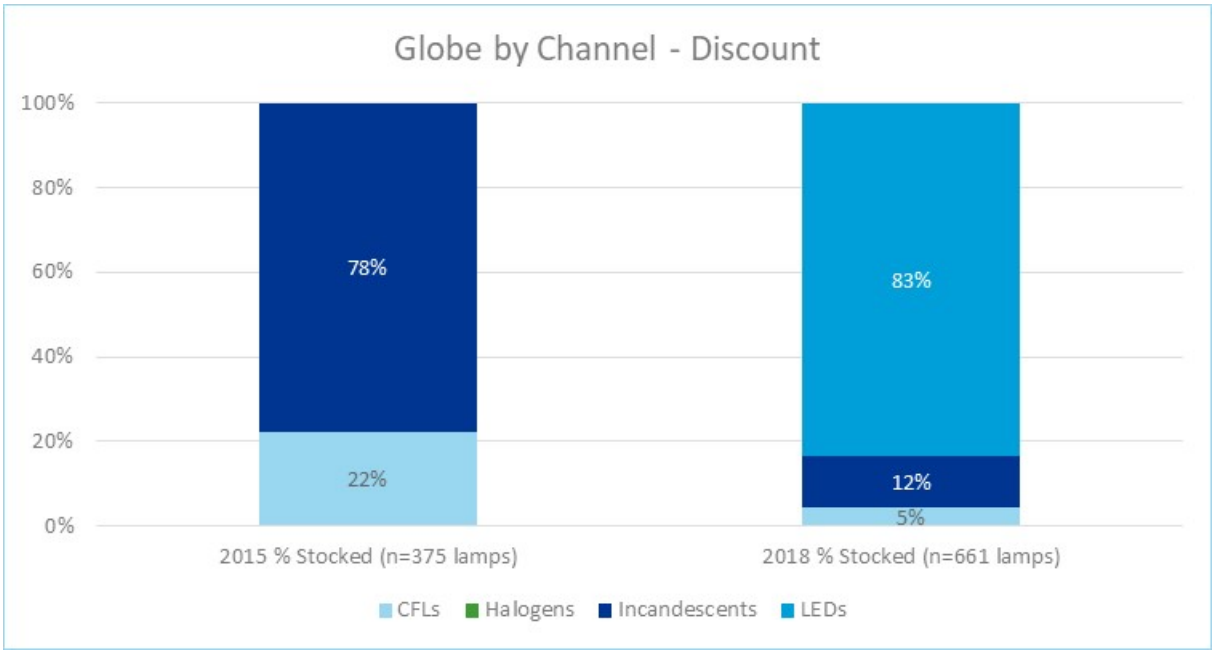


Figure 10-28 shows the percent of globe lamps stocked in grocery stores.

Figure 10-28. Percent of globe lamps: grocery, 2015 and 2018

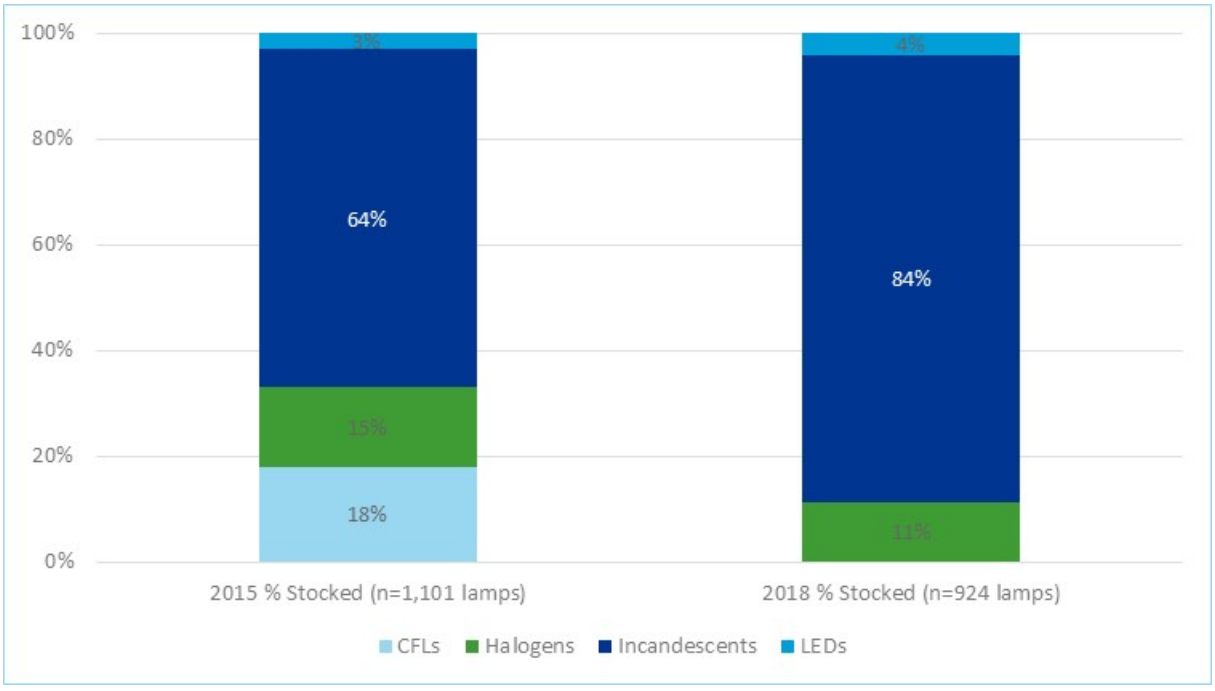
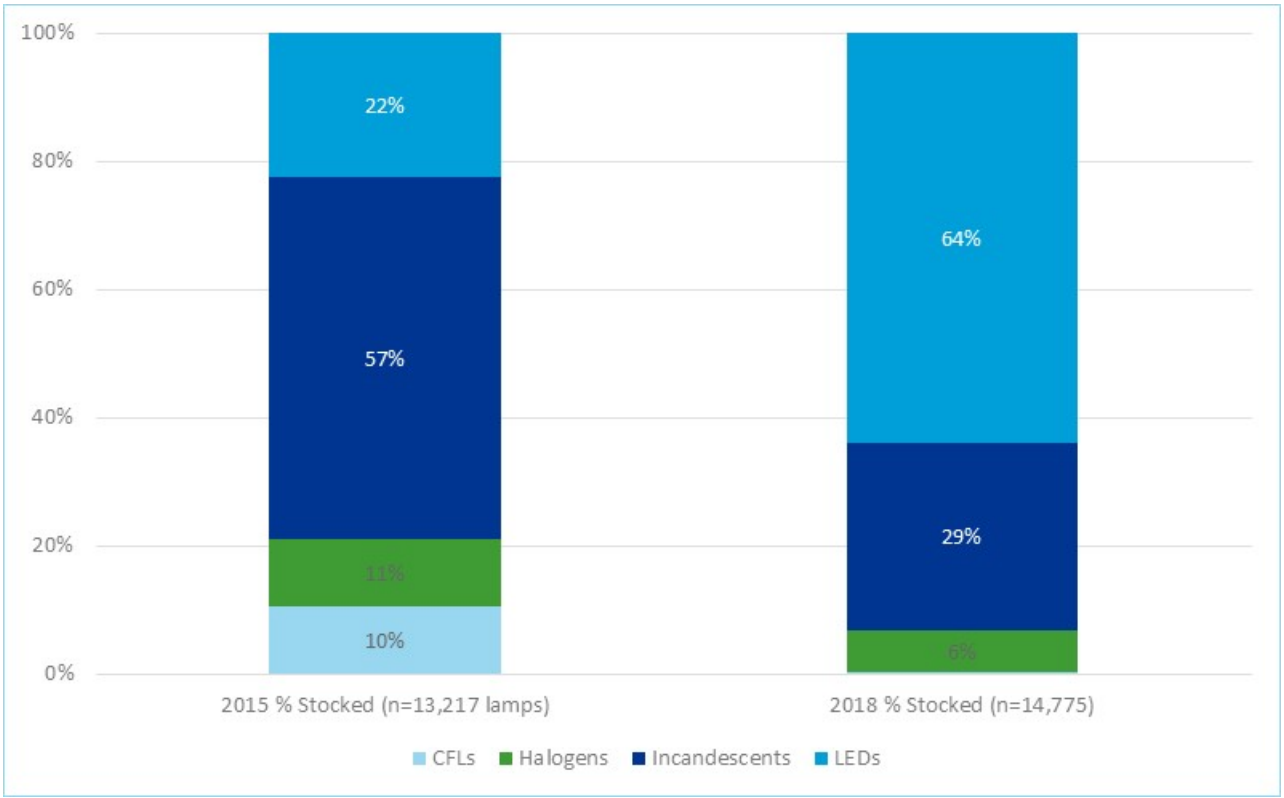


Figure 10-29 shows the percent of globe lamps stocked in home improvement stores.

Figure 10-29. Percent of globe lamps: home improvement, 2015 and 2018



10.8.2 Average price

Shelf survey staff evaluated the lamps available on retail store shelves. Figure 10-30 shows the average price per A-Lamp overall.

Figure 10-30. Average price per A-Lamp: overall, 2015 and 2018

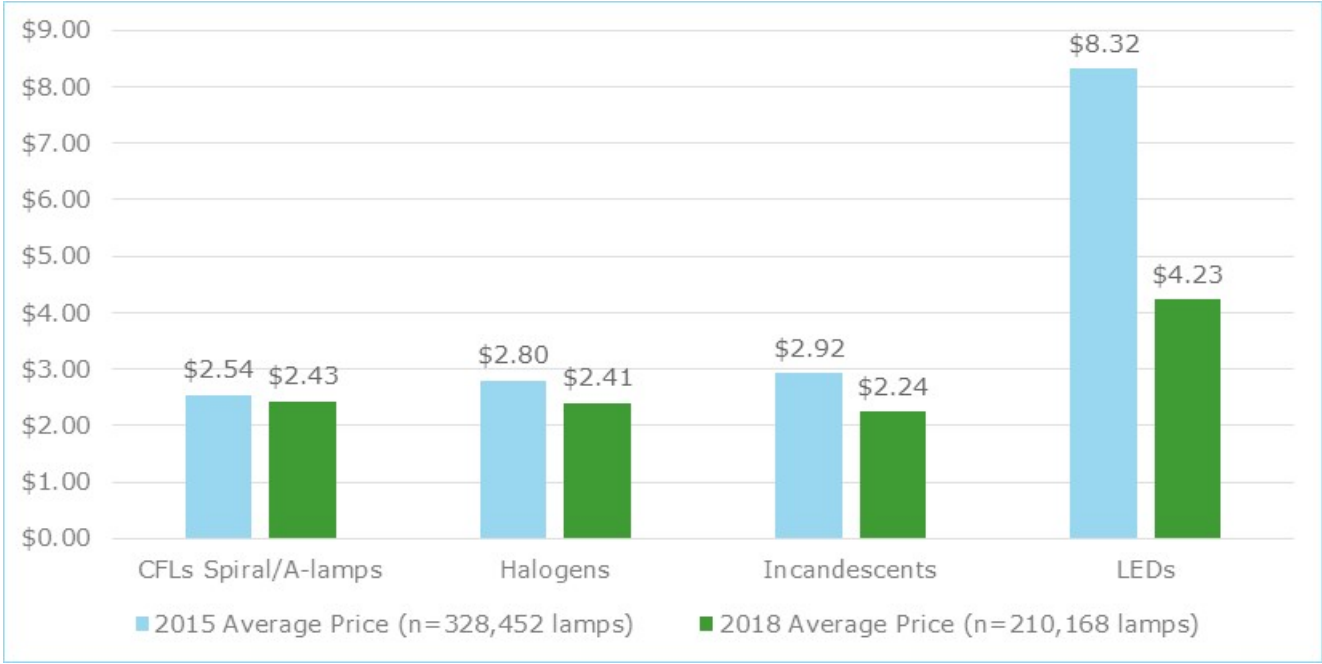


Figure 10-31 shows the average price per reflector lamp overall.

Figure 10-31. Average price per reflector lamp: overall, 2015 and 2018

Figure 10-32 shows the average price per candelabra lamp overall.

Figure 10-32. Average price per candelabra lamp: overall, 2015 and 2018

Figure 10-33 shows the average price per globe lamp overall.

Figure 10-33. Average price per globe lamp: overall, 2015 and 2018

Figure 10-34 shows the average price per A-Lamp in discount stores.

Figure 10-34. Average price per A-Lamp: discount, 2015 and 2018

Figure 10-35 shows the average price per A-Lamp in grocery stores.

Figure 10-35. Average price per A-Lamp: grocery, 2015 and 2018

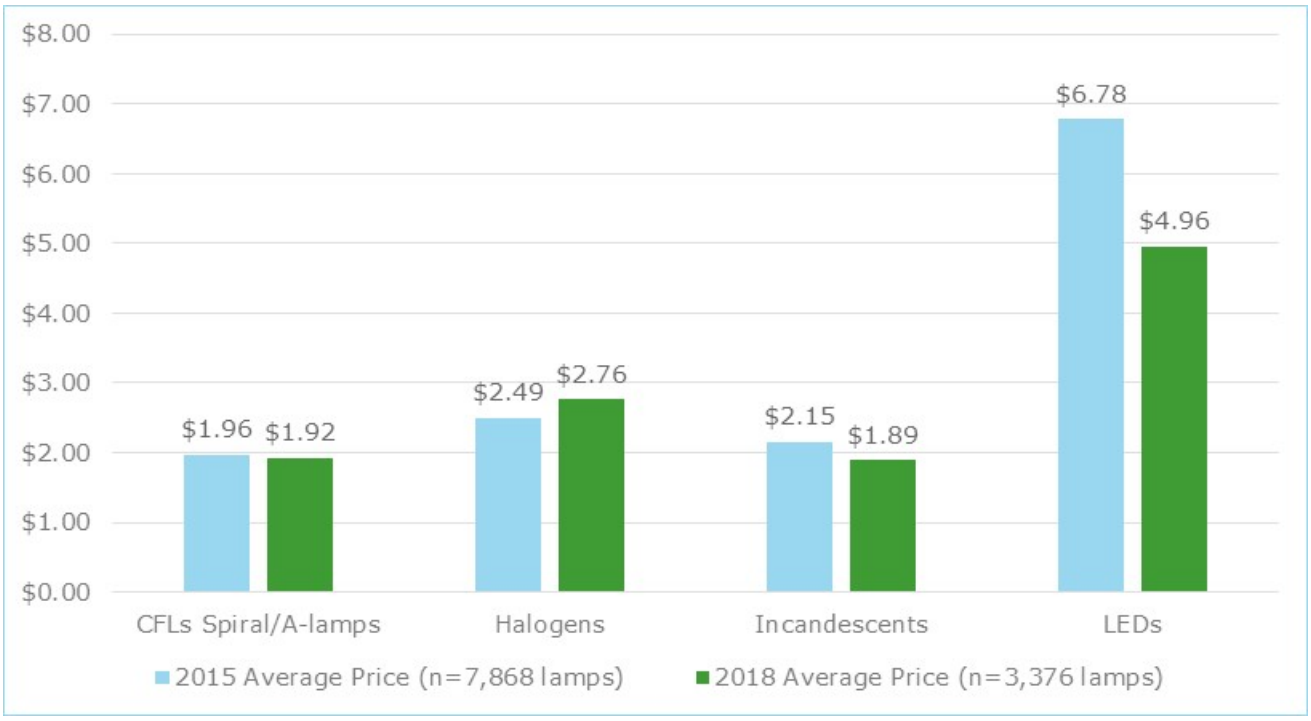


Figure 10-36 shows the average price per A-Lamp in home improvement stores.

Figure 10-36. Average price per A-Lamp: home improvement, 2015 and 2018

Figure 10-37 shows the average price per reflector lamp in discount stores.

Figure 10-37. Average price per reflector lamp: discount, 2015 and 2018

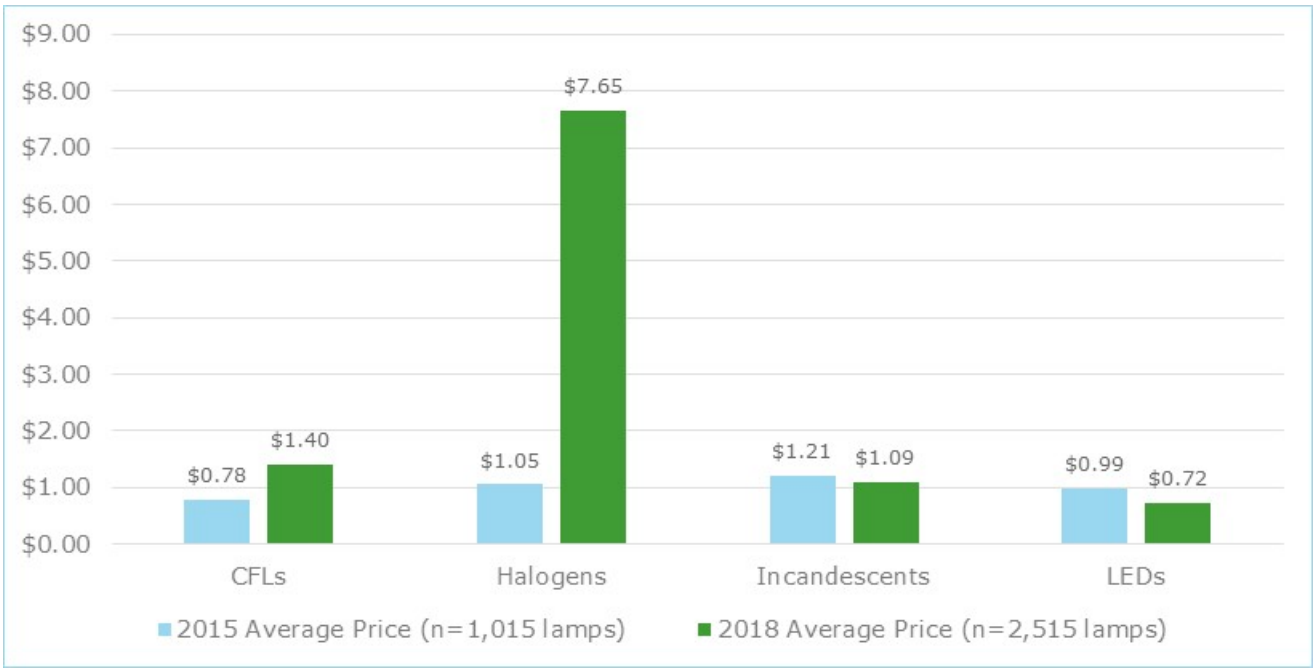


Figure 10-38 shows the average price per reflector lamp in grocery stores.

Figure 10-38. Average price per reflector lamp: grocery, 2015 and 2018

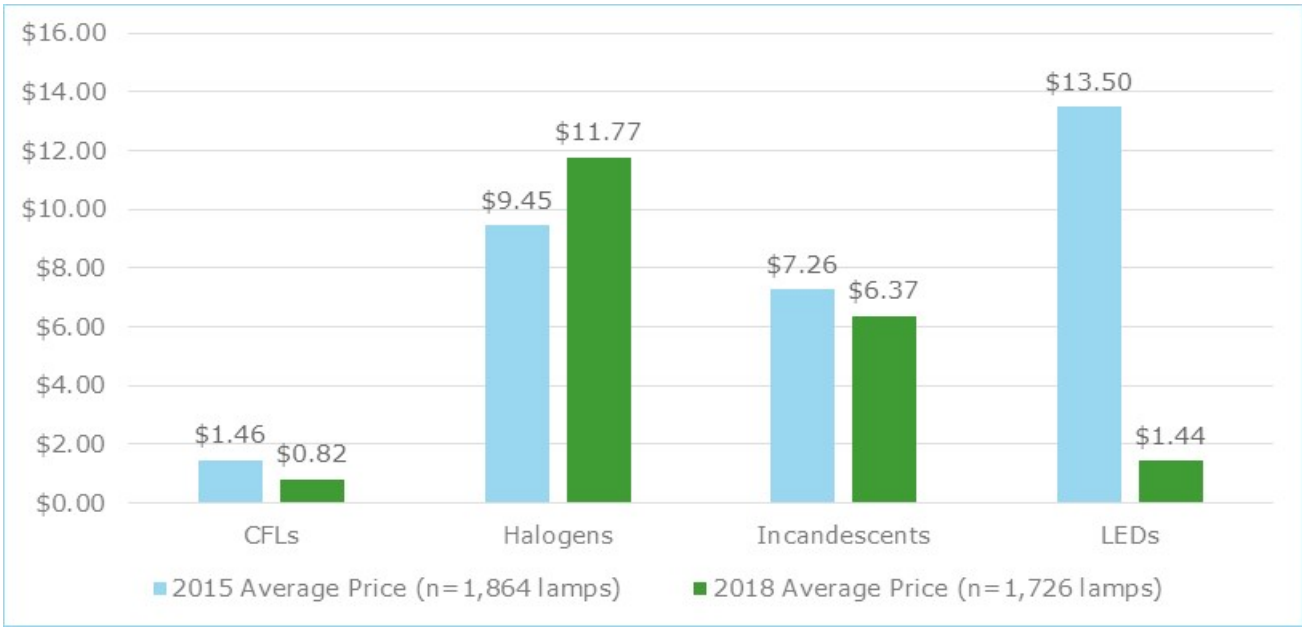


Figure 10-39 shows the average price per reflector lamp in home improvement stores.

Figure 10-39. Average price per reflector lamp: home improvement, 2015 and 2018

Figure 10-40 shows the average price per candelabra lamp in discount stores.

Figure 10-40. Average price per candelabra lamp: discount, 2015 and 2018

Figure 10-41 shows the average price per candelabra lamp in grocery stores.

Figure 10-41. Average price per candelabra lamp: grocery, 2015 and 2018

Figure 10-42 shows the average price per candelabra lamp in home improvement stores.

Figure 10-42. Average price per candelabra lamp: home improvement, 2015 and 2018

Figure 10-43 shows the average price per globe lamp in discount stores.

Figure 10-43. Average price per globe lamp: discount, 2015 and 2018

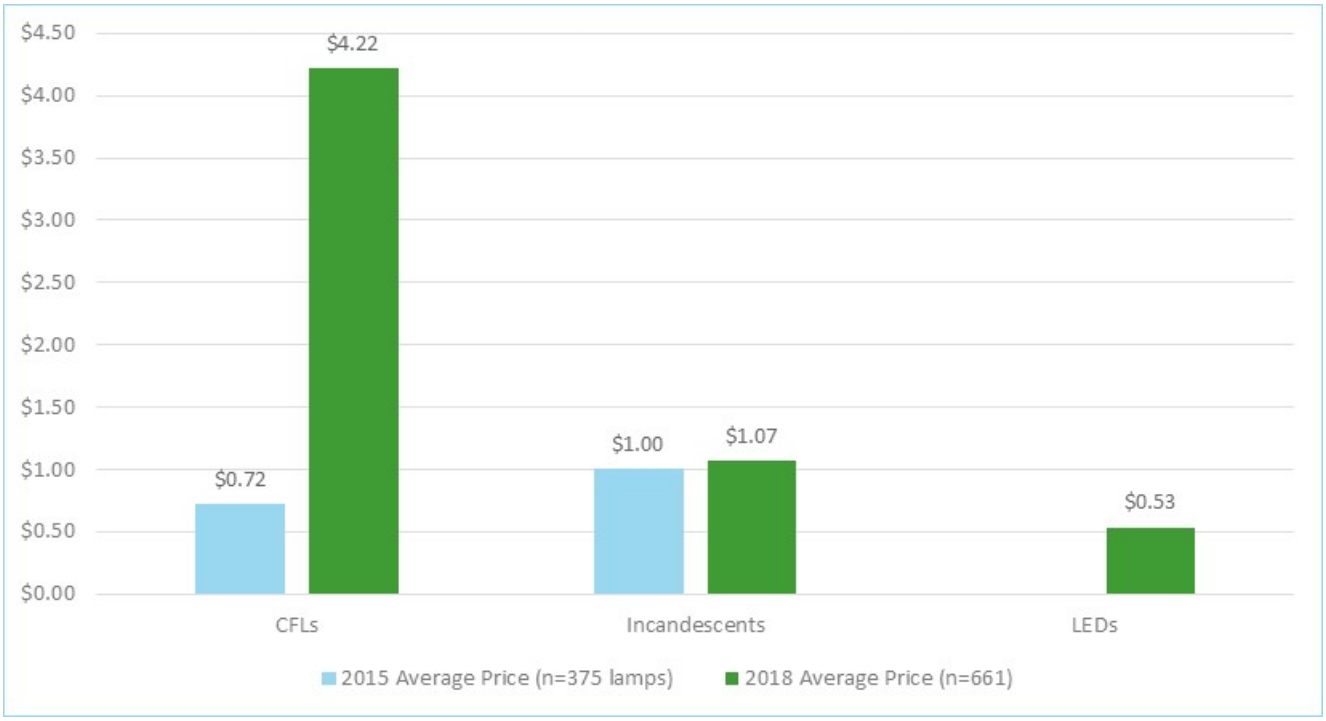


Figure 10-44 shows the average price per globe lamp in grocery stores.

Figure 10-44. Average price per globe lamp: grocery, 2015 and 2018

Figure 10-45 shows the average price per globe lamp in home improvement stores.

Figure 10-45. Average price per globe lamp: home improvement, 2015 and 2018

10.9 Appendix I: Lighting retail-store telephone survey results

In this section, we present the results of the 2019 store manager survey. From September to November 2019, the evaluation team conducted telephone surveys with grocery and discount stores in PGE, SCE, and SDG&E service territories that received shipments of PA-discounted lamps in 2018. For further details on the targeted versus completed surveys as well as research objectives, please see Section 3.3. To view the survey instrument, please see Appendix E. For information on estimated annual lamp sales by PA and channel, please see Section 4.1.5.[38]

The 2019 store manager survey was conducted as a Computer Assisted Telephone Interviewing (CATI) survey. Pacific Market Research (PMR) utilized multiple experienced interviewers and ran several data checks with DNV GL to ensure accurate and efficient administration of the survey. As additional verification, DNV GL attempted to reach 171 retail store representatives, including all 141 representatives that initially stated their store did not sell light bulbs and 30 representatives who were not able to complete the CATI survey with PMR. In some cases, representatives who reported that they did not sell light bulbs were converted to stores that did sell light bulbs after interviewers asked a follow-up battery of questions and received confirmation of light bulb sales. Of the 112 store representatives that were successfully reached and initially said they did not sell light bulbs, DNV GL confirmed 83 stores did not sell light bulbs and 29 stores did actually sell light bulbs.

10.9.1 Lamp sales

Interviewers asked respondents whether their store sells light bulbs. All big box stores were assumed to sell light bulbs, and thus interviewers did not ask these big box store representatives whether they sell lights bulbs or whether they sold light bulbs in the last three years. Throughout this section, all big box stores were assumed to sell LEDs and LED reflectors, and all big box stores, except for Costco, were assumed to sell CFLs, incandescent, halogen, and linear fluorescent lamps.

Table 10-10 shows the number of stores that currently sell light bulbs by PA and channel.

[38] Sales estimates were derived from question 2 of the lighting retail store telephone survey: "By your estimate, how many light bulbs does your store sell in an average week?"

Table 10-10. Number of stores that currently sell light bulbs by PA and channel, 2019

PA	Channel	Yes	No	Total
PGE	BIG BOX	20	0	20
	CHAIN DISCOUNT	20	0	20
	CHAIN GROCERY	15	2	17
	IND DISCOUNT	2	0	2
	IND GROCERY	22	8	30
	OTHER	25	0	25
	PGE Total	**104**	**10**	**114**
SCE	BIG BOX	20	0	20
	CHAIN DISCOUNT	32	8	40
	CHAIN GROCERY	29	6	35
	IND DISCOUNT	42	5	47
	IND GROCERY	92	39	131
	OTHER	15	0	15
	SCE Total	**230**	**58**	**288**
SDGE	BIG BOX	15	0	15
	CHAIN DISCOUNT	13	7	20
	CHAIN GROCERY	3	1	4
	IND DISCOUNT	8	5	13
	IND GROCERY	74	45	119
	OTHER	10	0	10
	SDG&E Total	**123**	**58**	**181**
Overall	**Overall**	**457**	**126**	**583**

Table 10-11 shows the weighted percent of stores that currently sell light bulbs by PA and channel.

Table 10-11. Percent of stores that sell light bulbs by PA and channel, 2019

PA	Channel	Yes	No	Total
PGE	BIG BOX	100%	0%	100%
	CHAIN DISCOUNT	100%	0%	100%
	CHAIN GROCERY	88%	12%	100%
	IND DISCOUNT	100%	0%	100%
	IND GROCERY	73%	27%	100%
	OTHER	100%	0%	100%
	PGE Total	**94%**	**6%**	**100%**
SCE	BIG BOX	100%	0%	100%
	CHAIN DISCOUNT	80%	20%	100%

PA	Channel	Yes	No	Total
	CHAIN GROCERY	83%	17%	100%
	IND DISCOUNT	89%	11%	100%
	IND GROCERY	70%	30%	100%
	OTHER	100%	0%	100%
	SCE Total	**81%**	**19%**	**100%**
SDG&E	BIG BOX	100%	0%	100%
	CHAIN DISCOUNT	65%	35%	100%
	CHAIN GROCERY	75%	25%	100%
	IND DISCOUNT	62%	38%	100%
	IND GROCERY	62%	38%	100%
	OTHER	100%	0%	100%
	SDG&E Total	**67%**	**33%**	**100%**
Overall	**Overall**	**80%**	**20%**	**100%**

Interviewers asked those survey respondents who said that their store currently does not sell light bulbs whether their store has sold light bulbs in the past three years. Table 10-12 shows the number of respondents who said that their stores have sold light bulbs in the past three years.

Table 10-12. Number of stores that have sold light bulbs in past three years by PA and channel, 2019

PA	Channel	Yes	No	Total
PGE	CHAIN DISCOUNT	0	0	0
	CHAIN GROCERY	0	2	2
	IND DISCOUNT	0	0	0
	IND GROCERY	0	8	8
	PGE Total	**0**	**10**	**10**
SCE	CHAIN DISCOUNT	2	6	8
	CHAIN GROCERY	1	5	6
	IND DISCOUNT	0	5	5
	IND GROCERY	4	35	39
	SCE Total	**7**	**51**	**58**
SDG&E	CHAIN DISCOUNT	2	5	7
	CHAIN GROCERY	0	1	1
	IND DISCOUNT	1	4	5
	IND GROCERY	4	41	45
	SDG&E Total	**7**	**51**	**58**
Overall	**Overall**	**14**	**112**	**126**

Table 10-13 shows the weighted percent of stores that did not sell light bulbs in 2019, but have sold light bulbs in the past three years by PA and channel.

Table 10-13. Percent of stores that have sold light bulbs in past three years by PA and channel, 2019

PA	Channel	Yes	No	Total
PGE	CHAIN DISCOUNT	0%	0%	0%
	CHAIN GROCERY	0%	100%	100%
	IND DISCOUNT	0%	0%	0%
	IND GROCERY	0%	100%	100%
	PGE Total	**0%**	**100%**	**100%**
SCE	CHAIN DISCOUNT	25%	75%	100%
	CHAIN GROCERY	17%	83%	100%
	IND DISCOUNT	0%	100%	100%
	IND GROCERY	10%	90%	100%
	SCE Total	**12%**	**88%**	**100%**
SDG&E	CHAIN DISCOUNT	29%	71%	100%
	CHAIN GROCERY	0%	100%	100%
	IND DISCOUNT	20%	80%	100%
	IND GROCERY	9%	91%	100%
	SDG&E Total	**12%**	**88%**	**100%**
Overall	**Overall**	**11%**	**89%**	**100%**

10.9.2 Lamp sales by lamp technology

Interviewers asked respondents what type of light bulbs they sell or have sold in the past three years. Table 10-14 shows the number of stores that sell LEDs by PA and channel.

Table 10-14. Number of stores that sell LEDs by PA and channel, 2019

PA	Channel	Yes	No	Don't Know	Refused	Total
PGE	BIG BOX	20	0	0	0	20
	CHAIN DISCOUNT	19	1	0	0	20
	CHAIN GROCERY	11	4	0	0	15
	IND DISCOUNT	2	0	0	0	2
	IND GROCERY	22	0	0	0	22
	OTHER	25	0	0	0	25
	PGE Total	**99**	**5**	**0**	**0**	**104**
SCE	BIG BOX	20	0	0	0	20
	CHAIN DISCOUNT	29	5	0	0	34
	CHAIN GROCERY	22	5	3	0	30
	IND DISCOUNT	40	1	1	0	42
	IND GROCERY	87	8	1		96
	OTHER	15	0	0	0	15
	SCE Total	**213**	**19**	**5**	**0**	**237**
SDGE	BIG BOX	15	0	0	0	15
	CHAIN DISCOUNT	14	1	0	0	15
	CHAIN GROCERY	2	0	1	0	3
	IND DISCOUNT	8	1	0	0	9
	IND GROCERY	66	8	3	1	78
	OTHER	10	0	0	0	10
	SDG&E Total	**115**	**10**	**4**	**1**	**130**
Overall	**Overall**	**427**	**34**	**9**	**1**	**471**

Table 10-15 shows the weighted percent of stores that sell LEDs by PA and channel.

Table 10-15. Percent of stores that sell LEDs by PA and channel, 2019

PA	Channel	Yes	No	Don't Know	Refused	Total
PGE	BIG BOX	100%	0%	0%	0%	100%
	CHAIN DISCOUNT	95%	5%	0%	0%	100%
	CHAIN GROCERY	73%	27%	0%	0%	100%
	IND DISCOUNT	100%	0%	0%	0%	100%
	IND GROCERY	100%	0%	0%	0%	100%
	OTHER	100%	0%	0%	0%	100%
	PGE Total	**96%**	**4%**	**0%**	**0%**	**100%**
SCE	BIG BOX	100%	0%	0%	0%	100%
	CHAIN DISCOUNT	85%	15%	0%	0%	100%
	CHAIN GROCERY	73%	17%	10%	0%	100%
	IND DISCOUNT	95%	2%	2%	0%	100%
	IND GROCERY	91%	8%	1%	0%	100%
	OTHER	100%	0%	0%	0%	100%
	SCE Total	**90%**	**8%**	**2%**	**0%**	**100%**
SDG&E	BIG BOX	100%	0%	0%	0%	100%
	CHAIN DISCOUNT	93%	7%	0%	0%	100%
	CHAIN GROCERY	67%	0%	33%	0%	100%
	IND DISCOUNT	89%	11%	0%	0%	100%
	IND GROCERY	85%	10%	4%	1%	100%
	OTHER	100%	0%	0%	0%	100%
	SDG&E Total	**88%**	**8%**	**3%**	**1%**	**100%**
Overall	**Overall**	**91%**	**7%**	**2%**	**0%**	**100%**

Table 10-16 shows the number of stores that sell LED Reflectors by PA and channel.

Table 10-16. Number of stores that sell LED Reflectors by PA and channel, 2019

PA	Channel	Yes	No	Don't Know	Refused	Total
PGE	BIG BOX	20	0	0	0	20
	CHAIN DISCOUNT	11	7	2	0	20
	CHAIN GROCERY	2	10	3	0	15
	IND DISCOUNT	2	0	0	0	2
	IND GROCERY	9	11	2	0	22
	OTHER	23	2	0	0	25
	PGE Total	**67**	**30**	**7**	**0**	**104**
SCE	BIG BOX	20	0	0	0	20
	CHAIN DISCOUNT	13	21	0	0	34
	CHAIN GROCERY	9	15	6	0	30
	IND DISCOUNT	22	17	3	0	42
	IND GROCERY	37	46	13	0	96
	OTHER	13	1	1	0	15
	SCE Total	**114**	**100**	**23**	**0**	**237**
SDGE	BIG BOX	15	0	0	0	15
	CHAIN DISCOUNT	3	7	5	0	15
	CHAIN GROCERY	2	1	0	0	3
	IND DISCOUNT	4	5	0	0	9
	IND GROCERY	33	39	5	1	78
	OTHER	8	1	0	1	10
	SDG&E Total	**65**	**53**	**10**	**2**	**130**
Overall	**Overall**	**246**	**183**	**40**	**2**	**471**

Table 10-17 shows the weighted percent of stores that sell LED Reflectors by PA and channel.

Table 10-17. Percent of stores that sell LED reflectors by PA and channel, 2019

PA	Channel	Yes	No	Don't Know	Refused	Total
PGE	BIG BOX	100%	0%	0%	0%	100%
	CHAIN DISCOUNT	55%	35%	10%	0%	100%
	CHAIN GROCERY	13%	67%	20%	0%	100%
	IND DISCOUNT	100%	0%	0%	0%	100%
	IND GROCERY	41%	50%	9%	0%	100%
	OTHER	92%	8%	0%	0%	100%
	PGE Total	**72%**	**23%**	**5%**	**0%**	**100%**
SCE	BIG BOX	100%	0%	0%	0%	100%
	CHAIN DISCOUNT	38%	62%	0%	0%	100%
	CHAIN GROCERY	30%	50%	20%	0%	100%
	IND DISCOUNT	52%	40%	7%	0%	100%
	IND GROCERY	39%	48%	14%	0%	100%
	OTHER	87%	7%	7%	0%	100%
	SCE Total	**51%**	**39%**	**9%**	**0%**	**100%**
SDG&E	BIG BOX	100%	0%	0%	0%	100%
	CHAIN DISCOUNT	20%	47%	33%	0%	100%
	CHAIN GROCERY	67%	33%	0%	0%	100%
	IND DISCOUNT	44%	56%	0%	0%	100%
	IND GROCERY	42%	50%	6%	1%	100%
	OTHER	80%	10%	0%	10%	100%
	SDG&E Total	**49%**	**42%**	**7%**	**1%**	**100%**
Overall	**Overall**	**56%**	**36%**	**8%**	**0%**	**100%**

Table 10-18 shows the number of stores that sell CFLs by PA and channel.

Table 10-18. Number of stores that sell CFLs by PA and channel, 2019

PA	Channel	Yes	No	Don't Know	Refused	Total
PGE	BIG BOX	19	1	0	0	20
	CHAIN DISCOUNT	8	10	2	0	20
	CHAIN GROCERY	6	5	4	0	15
	IND DISCOUNT	2	0	0	0	2
	IND GROCERY	8	12	2	0	22
	OTHER	17	8	0	0	25
	PGE Total	**60**	**36**	**8**	**0**	**104**
SCE	BIG BOX	19	1	0	0	20
	CHAIN DISCOUNT	16	16	2	0	34
	CHAIN GROCERY	9	16	5	0	30
	IND DISCOUNT	19	20	3	0	42
	IND GROCERY	41	38	17	0	96
	OTHER	10	5	0	0	15
	SCE Total	**114**	**96**	**27**	**0**	**237**
SDGE	BIG BOX	15	0	0	0	15
	CHAIN DISCOUNT	5	9	1	0	15
	CHAIN GROCERY	0	3	0	0	3
	IND DISCOUNT	2	7	0	0	9
	IND GROCERY	24	47	6	1	78
	OTHER	7	2	0	1	10
	SDG&E Total	**53**	**68**	**7**	**2**	**130**
Overall	**Overall**	**227**	**200**	**42**	**2**	**471**

Table 10-19 shows the weighted percent of stores that sell CFLs by PA and channel.

Table 10-19. Percent of stores that sell CFLs by PA and channel, 2019

PA	Channel	Yes	No	Don't Know	Refused	Total
PGE	BIG BOX	95%	5%	0%	0%	100%
	CHAIN DISCOUNT	40%	50%	10%	0%	100%
	CHAIN GROCERY	40%	33%	27%	0%	100%
	IND DISCOUNT	100%	0%	0%	0%	100%
	IND GROCERY	36%	55%	9%	0%	100%
	OTHER	68%	32%	0%	0%	100%
	PGE Total	**64%**	**30%**	**6%**	**0%**	**100%**
SCE	BIG BOX	95%	5%	0%	0%	100%
	CHAIN DISCOUNT	47%	47%	6%	0%	100%
	CHAIN GROCERY	30%	53%	17%	0%	100%
	IND DISCOUNT	45%	48%	7%	0%	100%
	IND GROCERY	43%	40%	18%	0%	100%
	OTHER	67%	33%	0%	0%	100%
	SCE Total	**51%**	**38%**	**11%**	**0%**	**100%**
SDG&E	BIG BOX	100%	0%	0%	0%	100%
	CHAIN DISCOUNT	33%	60%	7%	0%	100%
	CHAIN GROCERY	0%	100%	0%	0%	100%
	IND DISCOUNT	22%	78%	0%	0%	100%
	IND GROCERY	31%	60%	8%	1%	100%
	OTHER	70%	20%	0%	10%	100%
	SDG&E Total	**41%**	**52%**	**6%**	**1%**	**100%**
Overall	**Overall**	**52%**	**40%**	**8%**	**0%**	**100%**

Table 10-20 shows the number of stores that sell other lamp technologies by PA and channel.

Table 10-20. Number of stores that sell other lamp technologies by PA and channel, 2019

PA	Channel	Linear fluorescent	Incand./ halogens	Incand./ halogens and linear fluorescent	Technology not specified	No	Don't Know	Refused	Total
PGE	BIG BOX	0	0	19	0	1	0	0	20
	CHAIN DISCOUNT	0	7	0	0	12	1	0	20
	CHAIN GROCERY	1	2	0	0	8	4	0	15
	IND DISCOUNT	0	1	0	0	1	0	0	2
	IND GROCERY	0	8	1	0	11	2	0	22
	OTHER	1	20	2	0	2	0	0	25
	PGE Total	**2**	**38**	**22**	**0**	**35**	**7**	**0**	**104**
SCE	BIG BOX	0	0	19	0	1	0	0	20
	CHAIN DISCOUNT	0	16	0	0	18	0	0	34
	CHAIN GROCERY	1	6	0	0	21	2	0	30
	IND DISCOUNT	0	25	0	0	17	0	0	42
	IND GROCERY	0	27	0	2	51	16	0	96
	OTHER	1	13	0	0	1	0	0	15
	SCE Total	**2**	**87**	**19**	**2**	**109**	**18**	**0**	**237**
SDGE	BIG BOX	0	0	15	0	0	0	0	15
	CHAIN DISCOUNT	0	5	0	0	9	1	0	15
	CHAIN GROCERY	0	0	0	0	3	0	0	3
	IND DISCOUNT	0	3	0	0	6	0	0	9
	IND GROCERY	0	22	0	3	47	5	1	78
	OTHER	0	8	0	0	1	0	1	10
	SDG&E Total	**0**	**38**	**15**	**3**	**66**	**6**	**2**	**130**
Overall	**Overall**	**4**	**163**	**56**	**5**	**210**	**31**	**2**	**471**

Table 10-21 shows the weighted percent of stores that sell other lamp technologies by PA and channel.

Table 10-21. Percent of stores that sell other lamp technologies by PA and channel, 2019

PA	Channel	Linear fluoresc.	Incand./ halogens	Incand./ halogens and linear fluorescent	Technology not specified	No	Don't Know	Refused	Total
PGE	BIG BOX	0%	0%	95%	0%	5%	0%	0%	100%
	CHAIN DISCOUNT	0%	35%	0%	0%	60%	5%	0%	100%
	CHAIN GROCERY	7%	13%	0%	0%	53%	27%	0%	100%
	IND DISCOUNT	0%	50%	0%	0%	50%	0%	0%	100%
	IND GROCERY	0%	36%	5%	0%	50%	9%	0%	100%
	OTHER	4%	80%	8%	0%	8%	0%	0%	100%
	PGE Total	**2%**	**36%**	**29%**	**0%**	**28%**	**5%**	**0%**	**100%**
SCE	BIG BOX	0%	0%	95%	0%	5%	0%	0%	100%
	CHAIN DISCOUNT	0%	47%	0%	0%	53%	0%	0%	100%
	CHAIN GROCERY	3%	20%	0%	0%	70%	7%	0%	100%
	IND DISCOUNT	0%	60%	0%	0%	40%	0%	0%	100%
	IND GROCERY	0%	28%	0%	2%	53%	17%	0%	100%
	OTHER	7%	87%	0%	0%	7%	0%	0%	100%
	SCE Total	**1%**	**34%**	**14%**	**1%**	**43%**	**7%**	**0%**	**100%**
SDG&E	BIG BOX	0%	0%	100%	0%	0%	0%	0%	100%
	CHAIN DISCOUNT	0%	33%	0%	0%	60%	7%	0%	100%
	CHAIN GROCERY	0%	0%	0%	0%	100%	0%	0%	100%
	IND DISCOUNT	0%	33%	0%	0%	67%	0%	0%	100%
	IND GROCERY	0%	28%	0%	4%	60%	6%	1%	100%
	OTHER	0%	80%	0%	0%	10%	0%	10%	100%
	SDG&E Total	**0%**	**29%**	**11%**	**2%**	**51%**	**5%**	**1%**	**100%**
Overall	**Overall**	**1%**	**33%**	**17%**	**1%**	**41%**	**6%**	**0%**	**100%**

10.9.3 Lamp stocking practices

Interviewers asked respondents whether their stores have a back stock of light bulbs in storage that are not displayed for sales. Table 10-22 shows the number of stores that have a back stock of light bulbs in storage.

Table 10-22. Number of stores that have back stock of light bulbs by PA and channel, 2019

PA	Channel	Yes	No	Don't Know	Refused	Total
PGE	BIG BOX	20	0	0	0	20
	CHAIN DISCOUNT	6	14	0	0	20
	CHAIN GROCERY	0	15	0	0	15
	IND DISCOUNT	0	2	0	0	2
	IND GROCERY	9	12	0	0	21
	OTHER	9	16	0	0	25
	PGE Total	**44**	**59**	**0**	**0**	**103**
SCE	BIG BOX	20	0	0	0	20
	CHAIN DISCOUNT	11	23	0	0	34
	CHAIN GROCERY	7	23	0	0	30
	IND DISCOUNT	24	18	0	0	42
	IND GROCERY	54	39	1	0	94
	OTHER	9	6	0	0	15
	SCE Total	**125**	**109**	**1**	**0**	**235**
SDGE	BIG BOX	15	0	0	0	15
	CHAIN DISCOUNT	4	10	1	0	15
	CHAIN GROCERY	1	2	0	0	3
	IND DISCOUNT	3	6	0	0	9
	IND GROCERY	36	38	2	1	77
	OTHER	6	3	0	1	10
	SDG&E Total	**65**	**59**	**3**	**2**	**129**
Overall	**Overall**	**234**	**227**	**4**	**2**	**467**

Table 10-23 shows the weighted percent of stores that have a back stock of light bulbs in storage.

Table 10-23. Percent of stores that have back stock of light bulbs by PA and channel, 2019

PA	Channel	Yes	No	Don't Know	Refused	Total
PGE	BIG BOX	100%	0%	0%	0%	100%
	CHAIN DISCOUNT	30%	70%	0%	0%	100%
	CHAIN GROCERY	0%	100%	0%	0%	100%
	IND DISCOUNT	0%	100%	0%	0%	100%
	IND GROCERY	43%	57%	0%	0%	100%
	OTHER	36%	64%	0%	0%	100%
	PGE Total	**49%**	**51%**	**0%**	**0%**	**100%**
SCE	BIG BOX	100%	0%	0%	0%	100%
	CHAIN DISCOUNT	32%	68%	0%	0%	100%
	CHAIN GROCERY	23%	77%	0%	0%	100%
	IND DISCOUNT	57%	43%	0%	0%	100%
	IND GROCERY	57%	41%	1%	0%	100%
	OTHER	60%	40%	0%	0%	100%
	SCE Total	**56%**	**44%**	**0%**	**0%**	**100%**
SDG&E	BIG BOX	100%	0%	0%	0%	100%
	CHAIN DISCOUNT	27%	67%	7%	0%	100%
	CHAIN GROCERY	67%	33%	0%	0%	100%
	IND DISCOUNT	33%	67%	0%	0%	100%
	IND GROCERY	47%	49%	3%	1%	100%
	OTHER	60%	30%	0%	10%	100%
	SDG&E Total	**51%**	**45%**	**2%**	**1%**	**100%**
Overall	**Overall**	**53%**	**46%**	**1%**	**0%**	**100%**

Interviewers asked respondents what their stores do with any excess light bulbs that they cannot sell in a reasonable amount of time. Table 10-24 shows what stores do with excess light bulbs, in number of stores, by PA and channel.

Table 10-24. Process for excess light bulbs, in percent of stores, by PA and channel, 2019

PA	Channel	Has Excess Bulbs	Does Not Have Excess Bulbs	Don't Know	Refused	Total
PGE	BIG BOX	6	14	0	0	20
	CHAIN DISCOUNT	8	11	1	0	20
	CHAIN GROCERY	4	11	0	0	15
	IND DISCOUNT	1	1	0	0	2
	IND GROCERY	8	13	0	0	21
	OTHER	11	14	0	0	25
	PGE Total	**38**	**64**	**1**	**0**	**103**
SCE	BIG BOX	9	11	0	0	20
	CHAIN DISCOUNT	11	23	0	0	34
	CHAIN GROCERY	12	18	0	0	30
	IND DISCOUNT	12	29	0	1	42
	IND GROCERY	53	41	1	0	95
	OTHER	3	11	1	0	15
	SCE Total	**100**	**133**	**2**	**1**	**236**
SDGE	BIG BOX	6	8	1	0	15
	CHAIN DISCOUNT	8	7	0	0	15
	CHAIN GROCERY	0	3	0	0	3
	IND DISCOUNT	5	4	0	0	9
	IND GROCERY	26	44	1	2	73
	OTHER	3	6	0	1	10
	SDG&E Total	**48**	**72**	**2**	**3**	**125**
Overall	**Overall**	**186**	**269**	**5**	**4**	**464**

Table 10-25 shows what stores do with excess light bulbs, in weighted percent of stores, by PA and channel.

Table 10-25. Process for excess light bulbs, in percent of stores, by PA and channel, 2019

PA	Channel	Has Excess Bulbs	Does Not Have Excess Bulbs	Don't Know	Refused	Total
PGE	BIG BOX	30%	70%	0%	0%	100%
	CHAIN DISCOUNT	40%	55%	5%	0%	100%
	CHAIN GROCERY	27%	73%	0%	0%	100%
	IND DISCOUNT	50%	50%	0%	0%	100%
	IND GROCERY	38%	62%	0%	0%	100%
	OTHER	44%	56%	0%	0%	100%
	PGE Total	**37%**	**62%**	**1%**	**0%**	**100%**
SCE	BIG BOX	45%	55%	0%	0%	100%
	CHAIN DISCOUNT	32%	68%	0%	0%	100%
	CHAIN GROCERY	40%	60%	0%	0%	100%
	IND DISCOUNT	29%	69%	0%	2%	100%
	IND GROCERY	56%	43%	1%	0%	100%
	OTHER	20%	73%	7%	0%	100%
	SCE Total	**42%**	**57%**	**1%**	**0%**	**100%**
SDG&E	BIG BOX	40%	53%	7%	0%	100%
	CHAIN DISCOUNT	53%	47%	0%	0%	100%
	CHAIN GROCERY	0%	100%	0%	0%	100%
	IND DISCOUNT	56%	44%	0%	0%	100%
	IND GROCERY	36%	60%	1%	3%	100%
	OTHER	30%	60%	0%	10%	100%
	SDG&E Total	**39%**	**57%**	**2%**	**2%**	**100%**
Overall	**Overall**	**40%**	**58%**	**1%**	**1%**	**100%**

Table 10-26 shows what stores do with excess light bulbs, in number of stores, by PA and channel.

Table 10-26. Process for handling excess light bulbs, in number of stores, by PA and channel, 2019[39]

PA	Channel	Bulbs Remain on Store Floor	Keep Excess Bulbs in Back	Send Bulbs Back to Corporate Warehouse	Send Bulbs to Different Store	Discount Price	Give Them Away or Donate	Recycle Them	Send Bulbs Back to Vendor	Total
PGE	BIG BOX	1	1	2	1	0	1	0	2	6
	CHAIN DISCOUNT	0	1	3	1	1	0	1	1	8
	CHAIN GROCERY	0	0	0	1	2	0	1	0	4
	IND DISCOUNT	0	0	1	0	0	0	0	0	1
	IND GROCERY	0	1	2	1	2	2	0	0	8
	OTHER	2	3	0	4	3	0	1	1	11
	PGE Total	**3**	**6**	**8**	**8**	**8**	**3**	**3**	**4**	**38**
SCE	BIG BOX	1	2	2	1	3	1	0	3	9
	CHAIN DISCOUNT	4	2	4	0	1	0	0	0	11
	CHAIN GROCERY	0	0	6	4	2	1	1	0	12
	IND DISCOUNT	3	2	1	0	2	4	0	0	12
	IND GROCERY	14	10	3	2	7	22	1	2	53
	OTHER	0	0	1	1	1	0	0	0	3
	SCE Total	**22**	**16**	**17**	**8**	**16**	**28**	**2**	**5**	**100**
SDGE	BIG BOX	0	2	2	0	0	0	2	2	6
	CHAIN DISCOUNT	4	0	1	3	1	0	1	0	8
	CHAIN GROCERY	0	0	0	0	0	0	0	0	0
	IND DISCOUNT	1	0	0	0	3	1	0	0	5
	IND GROCERY	7	7	1	1	1	12	0	0	26
	OTHER	1	0	1	0	0	1	0	0	3
	SDG&E Total	**13**	**9**	**5**	**4**	**5**	**14**	**3**	**2**	**48**
Overall	**Overall**	**38**	**31**	**30**	**20**	**29**	**45**	**8**	**11**	**186**

[39] Total column is the number of respondents who gave one or more response for what they do with excess bulbs. In some cases, respondents gave more than one response.

Table 10-27 shows what stores do with excess light bulbs, in number of stores, by PA and channel.

Table 10-27. Process for handling for excess light bulbs, in number of stores, by PA and channel, 2019[40]

PA	Channel	Bulbs Remain on Store Floor	Keep Excess Bulbs in Back	Send Bulbs Back to Corporate Warehouse	Send Bulbs to Different Store	Discount Price	Give Them Away or Donate	Recycle Them	Send Bulbs Back to Vendor
PGE	BIG BOX	17%	17%	33%	17%	0%	17%	0%	33%
	CHAIN DISCOUNT	0%	13%	38%	13%	13%	0%	13%	13%
	CHAIN GROCERY	0%	0%	0%	25%	50%	0%	25%	0%
	IND DISCOUNT	0%	0%	100%	0%	0%	0%	0%	0%
	IND GROCERY	0%	13%	25%	13%	25%	25%	0%	0%
	OTHER	18%	27%	0%	36%	27%	0%	9%	9%
	PGE Total	**10%**	**17%**	**21%**	**22%**	**19%**	**7%**	**7%**	**13%**
SCE	BIG BOX	11%	22%	22%	11%	33%	11%	0%	33%
	CHAIN DISCOUNT	36%	18%	36%	0%	9%	0%	0%	0%
	CHAIN GROCERY	0%	0%	50%	33%	17%	8%	8%	0%
	IND DISCOUNT	25%	17%	8%	0%	17%	33%	0%	0%
	IND GROCERY	26%	19%	6%	4%	13%	42%	2%	4%
	OTHER	0%	0%	33%	33%	33%	0%	0%	0%
	SCE Total	**21%**	**16%**	**18%**	**8%**	**17%**	**27%**	**2%**	**7%**
SDG&E	BIG BOX	0%	33%	33%	0%	0%	0%	33%	33%
	CHAIN DISCOUNT	50%	0%	13%	38%	13%	0%	13%	0%
	CHAIN GROCERY	0%	0%	0%	0%	0%	0%	0%	0%
	IND DISCOUNT	20%	0%	0%	0%	60%	20%	0%	0%
	IND GROCERY	27%	27%	4%	4%	4%	46%	0%	0%
	OTHER	33%	0%	33%	0%	0%	33%	0%	0%
	SDG&E Total	**27%**	**20%**	**10%**	**8%**	**10%**	**31%**	**6%**	**4%**
Overall	**Overall**	**20%**	**17%**	**17%**	**11%**	**16%**	**23%**	**4%**	**8%**

[40] Percentages may be greater than 100% because respondents could give multiple responses to this question.

10.9.4 Survey respondent positions

At the close of each survey, interviewers asked respondents for their position. Table 10-28 shows the number of respondents who were managers, cashiers/clerks, and stockers by PA and channel.

Table 10-28. Position of respondents, in number of stores, by PA and channel, 2019

PA	Channel	Owner	Manager	Assistant Manager	Store Employee	Did Not Ask	Refused	Total
PGE	BIG BOX	0	6	3	11	0	0	20
	CHAIN DISCOUNT	0	10	4	5	0	1	20
	CHAIN GROCERY	0	12	3	2	0	0	17
	IND DISCOUNT	0	2	0	0	0	0	2
	IND GROCERY	0	18	2	9	1	0	30
	OTHER	3	16	2	4	0	0	25
	PGE Total	**3**	**64**	**14**	**31**	**1**	**1**	**114**
SCE	BIG BOX	0	10	2	8	0	0	20
	CHAIN DISCOUNT	0	23	14	3	0	1	41
	CHAIN GROCERY	0	30	0	4	0	0	34
	IND DISCOUNT	14	23	1	9	0	0	47
	IND GROCERY	34	54	8	28	3	4	131
	OTHER	5	8	0	2	0	0	15
	SCE Total	**53**	**148**	**25**	**54**	**3**	**5**	**288**
SDGE	BIG BOX	0	8	0	7	0	0	15
	CHAIN DISCOUNT	0	14	5	1	0	0	20
	CHAIN GROCERY	0	3	0	1	0	0	4
	IND DISCOUNT	2	8	0	3	0	0	13
	IND GROCERY	9	60	4	41	1	4	119
	OTHER	0	8	0	2	0	0	10
	SDG&E Total	**11**	**101**	**9**	**55**	**1**	**4**	**181**
Overall	**Overall**	**67**	**313**	**48**	**140**	**5**	**10**	**583**

Table 10-29 shows the weighted percent of respondents who were managers, cashiers/clerks, and stockers by PA and channel.

Table 10-29. Position of respondents, in percent of stores, by PA and channel, 2019

PA	Channel	Owner	Manager	Assistant Manager	Store Employee	Did Not Ask	Refused	Total
PGE	BIG BOX	0%	30%	15%	55%	0%	0%	100%
	CHAIN DISCOUNT	0%	50%	20%	25%	0%	5%	100%
	CHAIN GROCERY	0%	71%	18%	12%	0%	0%	100%
	IND DISCOUNT	0%	100%	0%	0%	0%	0%	100%
	IND GROCERY	0%	60%	7%	30%	3%	0%	100%
	OTHER	12%	64%	8%	16%	0%	0%	100%
	PGE Total	**3%**	**54%**	**12%**	**29%**	**1%**	**1%**	**100%**
SCE	BIG BOX	0%	50%	10%	40%	0%	0%	100%
	CHAIN DISCOUNT	0%	56%	34%	7%	0%	3%	100%
	CHAIN GROCERY	0%	88%	0%	12%	0%	0%	100%
	IND DISCOUNT	30%	49%	2%	19%	0%	0%	100%
	IND GROCERY	26%	41%	6%	21%	2%	3%	100%
	OTHER	33%	53%	0%	13%	0%	0%	100%
	SCE Total	**17%**	**52%**	**9%**	**20%**	**1%**	**2%**	**100%**
SDG&E	BIG BOX	0%	53%	0%	47%	0%	0%	100%
	CHAIN DISCOUNT	0%	70%	25%	5%	0%	0%	100%
	CHAIN GROCERY	0%	75%	0%	25%	0%	0%	100%
	IND DISCOUNT	15%	62%	0%	23%	0%	0%	100%
	IND GROCERY	8%	50%	3%	34%	1%	3%	100%
	OTHER	0%	80%	0%	20%	0%	0%	100%
	SDG&E Total	**6%**	**55%**	**5%**	**31%**	**1%**	**2%**	**100%**
Overall	**Overall**	**11%**	**53%**	**8%**	**25%**	**1%**	**2%**	**100%**

10.10 Appendix J: Online consumer survey banner tables

TABLE OF CONTENTS

Banner 1 - Main Weight

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

California Home Lighting Survey

S1/S2 Electricity Provider

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11940156	5724326	4624519	1570990	6501620	5438536	1976833	9349805	613518	2993405	1486744	6846489	613518
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unweighted Total	1765	570	881	308	912	853	822	723	220	512	520	513	220
PGE	5724326	5724326	-	-	2461795	3262531	1237693	4325237	161396	1439126	686570	3437233	161396
	48%	100%			38%	60%	63%	46%	26%	48%	46%	50%	26%
						E	HI	I		M	M	M	
SCE	4624519	-	4624519	-	3596072	1028448	379940	3945536	299043	1169197	603695	2552584	299043
	39%		100%		55%	19%	19%	42%	49%	39%	41%	37%	49%
					F			G	G				JKL
SDGE	1570990	-	-	1570990	430401	1140589	346897	1071489	152604	375913	192803	849670	152604
	13%			100%	7%	21%	18%	11%	25%	13%	13%	12%	25%
						E	H		GH				JKL
Other	20321	-	-	-	13352	6969	12304	7542	475	9168	3676	7002	475
	*%				*%	*%	1%	*%	*%	*%	*%	*%	*%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Climate Zone

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11940156	5724326	4624519	1570990	6501620	5438536	1976833	9349805	613518	2993405	1486744	6846489	613518
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unweighted Total	1765	570	881	308	912	853	822	723	220	512	520	513	220
Inland/Desert	6501620	2461795	3596072	430401	6501620	-	1102763	4966682	432175	1623055	866229	3580161	432175
	54%	43%	78%	27%	100%		56%	53%	70%	54%	58%	52%	70%
		D	BD						GH				JKL
Mild	5438536	3262531	1028448	1140589	-	5438536	874070	4383123	181343	1370350	620515	3266328	181343
	46%	57%	22%	73%		100%	44%	47%	30%	46%	42%	48%	30%
		C		BC			I	I		M	M	M	

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CARE/FERA Participation Status

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11940156 100%	5724326 100%	4624519 100%	1570990 100%	6501620 100%	5438536 100%	1976833 100%	9349805 100%	613518 100%	2993405 100%	1486744 100%	6846489 100%	613518 100%
Unweighted Total	1765	570	881	308	912	853	822	723	220	512	520	513	220
Participant	1976833 17%	1237693 22% C	379940 8%	346897 22% C	1102763 17%	874070 16%	1976833 100%	-	-	557873 19%	279502 19%	1139458 17%	-
Non-Participant	9349805 78%	4325237 76%	3945536 85% BD	1071489 68%	4966682 76%	4383123 81%	-	9349805 100%	-	2435532 81%	1207242 81%	5707031 83%	-
Net Meter	613518 5%	161396 3%	299043 6%	152604 10% B	432175 7%	181343 3%	-	-	613518 100%	-	-	-	613518 100%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Usage Class

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11940156	5724326	4624519	1570990	6501620	5438536	1976833	9349805	613518	2993405	1486744	6846489	613518
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unweighted Total	1765	570	881	308	912	853	822	723	220	512	520	513	220
Low	2993405	1439126	1169197	375913	1623055	1370350	557873	2435532	-	2993405	-	-	-
	25%	25%	25%	24%	25%	25%	28%	26%		100%			
Medium	1486744	686570	603695	192803	866229	620515	279502	1207242	-	-	1486744	-	-
	12%	12%	13%	12%	13%	11%	14%	13%			100%		
High	6846489	3437233	2552584	849670	3580161	3266328	1139458	5707031	-	-	-	6846489	-
	57%	60%	55%	54%	55%	60%	58%	61%				100%	
Net Meter	613518	161396	299043	152604	432175	181343	-	-	613518	-	-	-	613518
	5%	3%	6%	10%	7%	3%			100%				100%
				B									

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

S3 Can you please confirm that _____ is the zip code of your primary home?

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11940156 100%	5724326 100%	4624519 100%	1570990 100%	6501620 100%	5438536 100%	1976833 100%	9349805 100%	613518 100%	2993405 100%	1486744 100%	6846489 100%	613518 100%
Unweighted Total	1765	570	881	308	912	853	822	723	220	512	520	513	220
Yes	11240557 94%	5392832 94% D	4448061 96% D	1385836 88%	6136430 94%	5104127 94%	1899420 96%	8743427 94%	597710 97% H	2690279 90%	1420860 96% J	6531708 95% J	597710 97% J
No	695733 6%	331494 6%	172592 4%	185154 12% BC	365190 6%	330543 6%	77413 4%	602512 6% I	15808 3%	299260 10% KLM	65884 4%	314781 5%	15808 3%
Don't Know	3866 *%	-	3866 *%	-	-	3866 *%	-	3866 *%	-	3866 *%	-	-	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

LP2 Have you ever purchased any LED light bulbs?

BASE = ALL CALIFORNIA ZIP CODE RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11940156 100%	5724326 100%	4624519 100%	1570990 100%	6501620 100%	5438536 100%	1976833 100%	9349805 100%	613518 100%	2993405 100%	1486744 100%	6846489 100%	613518 100%
Unweighted Total	1765	570	881	308	912	853	822	723	220	512	520	513	220
Yes	11413347 96%	5458705 95%	4465484 97%	1468837 93%	6232798 96%	5180549 95%	1813220 92%	9004210 96% G	595918 97% G	2776309 93%	1396220 94%	6644900 97% JK	595918 97% JK
No	358449 3%	197182 3%	65603 1%	95663 6% C	170447 3%	188002 3%	153410 8% HI	187438 2%	17600 3%	165760 6% L	70268 5% L	104821 2%	17600 3%
Don’t know	168360 1%	68439 1%	93431 2%	6490 *%	98375 2%	69985 1%	10203 1%	158157 2%	-	51337 2%	20256 1%	96768 1%	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

LP3 Have you purchased any light bulbs in California for your home since January 1, 2018?

BASE = ALL CALIFORNIA ZIP CODE RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11940156 100%	5724326 100%	4624519 100%	1570990 100%	6501620 100%	5438536 100%	1976833 100%	9349805 100%	613518 100%	2993405 100%	1486744 100%	6846489 100%	613518 100%
Unweighted Total	1765	570	881	308	912	853	822	723	220	512	520	513	220
Yes	11251610 94%	5526560 97% CD	4270391 92%	1434338 91%	6044556 93%	5207054 96%	1824343 92%	8825657 94%	601610 98% GH	2722026 91%	1408663 95% J	6519310 95% J	601610 98% JKL
No	580155 5%	153466 3%	295194 6% B	131494 8% B	385545 6%	194609 4%	132035 7% I	436212 5% I	11908 2%	200058 7% M	64853 4%	303336 4%	11908 2%
Don’t know	108391 1%	44300 1%	58934 1%	5157 *%	71518 1%	36873 1%	20455 1%	87936 1%	-	71321 2% L	13227 1%	23843 *%	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

LP4 How many light bulbs did you purchase since January 1, 2018? Please provide a count of individual bulbs purchased, not packages.

BASE = PURCHASED ANY LIGHT BULBS IN CALIFORNIA FOR HOME SINCE JANUARY 1, 2018 [LP3]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11251610 100%	5526560 100%	4270391 100%	1434338 100%	6044556 100%	5207054 100%	1824343 100%	8825657 100%	601610 100%	2722026 100%	1408663 100%	6519310 100%	601610 100%
Unweighted Total	1662	536	841	279	856	806	763	682	217	466	486	493	217
1-5	1536777 14%	749764 14%	525504 12%	255732 18%	714409 12%	822368 16%	392712 22% HI	1089918 12%	54147 9%	696371 26% KLM	242585 17% LM	543674 8%	54147 9%
6-9	2012973 18%	956365 17%	770099 18%	286509 20%	1063074 18%	949899 18%	325781 18%	1585175 18%	102017 17%	545872 20%	261152 19%	1103932 17%	102017 17%
10-19	3457177 31%	1592342 29%	1511198 35% D	351009 24%	2009357 33%	1447820 28%	546238 30%	2718346 31%	192594 32%	725903 27%	397882 28%	2140798 33%	192594 32%
20 or more	3299239 29%	1693319 31%	1153761 27%	441291 31%	1745669 29%	1553570 30%	482064 26%	2631739 30%	185436 31%	502049 18%	377120 27% J	2234635 34% JK	185436 31% J
Don't Know	945444 8%	534770 10%	309830 7%	99797 7%	512047 8%	433397 8%	77548 4%	800478 9% G	67418 11% G	251830 9%	129924 9%	496272 8%	67418 11%
Mean	19.04	22.31	15.91	15.98	16.77	21.69	16.57	19.64	18.22	17.96	15.70	20.27	18.22
Median	12.00	12.00	10.00	10.00	10.00	12.00	10.00	12.00	12.00	9.00	12.00	12.00	12.00
Maximum	2168.00	1000.00	2168.00	120.00	140.00	2168.00	2168.00	1000.00	200.00	1000.00	112.00	2168.00	200.00

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL1 Of the [LP4] light bulbs you've purchased since January 1, 2018, did you buy any reflector or flood bulbs?

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11940156 100%	5724326 100%	4624519 100%	1570990 100%	6501620 100%	5438536 100%	1976833 100%	9349805 100%	613518 100%	2993405 100%	1486744 100%	6846489 100%	613518 100%
Unweighted Total	1765	570	881	308	912	853	822	723	220	512	520	513	220
Yes	5652411 47%	2690935 47%	2275489 49%	678057 43%	3022423 46%	2629987 48%	856178 43%	4447391 48%	348841 57% GH	997448 33%	696683 47% J	3609439 53% J	348841 57% JK
No	4862018 41%	2325479 41%	1753477 38%	771719 49% C	2629759 40%	2232259 41%	978144 49% HI	3706902 40% I	176973 29%	1571425 52% KLM	597393 40% M	2516227 37%	176973 29%
Don’t know	1425727 12%	707912 12%	595553 13%	121214 8%	849438 13%	576290 11%	142511 7%	1195512 13% G	87704 14% G	424532 14%	192668 13%	720823 11%	87704 14%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL2-1 What type of reflector bulbs were they?

BASE = BOUGHT ANY REFLECTOR OR FLOOD BULBS [RL1]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	5652411	2690935	2275489	678057	3022423	2629987	856178	4447391	348841	997448	696683	3609439	348841
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unweighted Total	834	247	458	127	425	409	377	336	121	179	240	294	121
LED	4286053	2023766	1722349	532009	2153149	2132905	582578	3428662	274813	674681	498802	2837757	274813
	76%	75%	76%	78%	71%	81% E	68%	77% G	79% G	68%	72%	79% J	79% J
Incandescent/ Halogen	1071284	542245	397843	131196	570408	500876	231613	793393	46278	203093	119999	701913	46278
	19%	20%	17%	19%	19%	19%	27% HI	18%	13%	20%	17%	19%	13%
CFL	1030614	489619	446710	94286	631692	398922	195170	775760	59684	187461	139877	643591	59684
	18%	18%	20%	14%	21%	15%	23%	17%	17%	19%	20%	18%	17%
Don’t know	219830	99479	72535	47816	120873	98957	44632	160854	14343	61559	18095	125832	14343
	4%	4%	3%	7%	4%	4%	5%	4%	4%	6%	3%	3%	4%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL2-2 What type of reflector bulbs were they?

BASE = BOUGHT ANY REFLECTOR OR FLOOD BULBS [RL1]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	5652411	2690935	2275489	678057	3022423	2629987	856178	4447391	348841	997448	696683	3609439	348841
TOTAL RESPONDING	5432581	2591456	2202953	630241	2901550	2531030	811546	4286537	334498	935889	678588	3483606	334498
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unweighted Total	804	234	447	121	409	395	363	323	118	171	232	283	118
LED	4286053	2023766	1722349	532009	2153149	2132905	582578	3428662	274813	674681	498802	2837757	274813
	79%	78%	78%	84%	74%	84% E	72%	80% G	82% G	72%	74%	81%	82%
Incandescent/ Halogen	1071284	542245	397843	131196	570408	500876	231613	793393	46278	203093	119999	701913	46278
	20%	21%	18%	21%	20%	20%	29% HI	19%	14%	22%	18%	20%	14%
CFL	1030614	489619	446710	94286	631692	398922	195170	775760	59684	187461	139877	643591	59684
	19%	19%	20%	15%	22%	16%	24%	18%	18%	20%	21%	18%	18%
Don’t know	219830	99479	72535	47816	120873	98957	44632	160854	14343	61559	18095	125832	14343

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL3-1 Where did you purchase these reflector bulbs?

BASE = BOUGHT ANY REFLECTOR OR FLOOD BULBS [RL1] / SELECTED ANY TECHNOLOGY [RL2]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	5432581 100%	2591456 100%	2202953 100%	630241 100%	2901550 100%	2531030 100%	811546 100%	4286537 100%	334498 100%	935889 100%	678588 100%	3483606 100%	334498 100%
Unweighted Total	804	234	447	121	409	395	363	323	118	171	232	283	118
[NET] Large Home Improvement	3788155 70%	1883316 73%	1515208 69%	384329 61%	2147809 74%	1640346 65%	517654 64%	2993191 70%	277310 83% GH	635420 68%	432764 64%	2442661 70%	277310 83% JKL
Home Depot or Lowe’s	3714332 68%	1836758 71%	1495178 68%	377094 60%	2117341 73%	1596991 63%	504001 62%	2936205 68%	274126 82% GH	596737 64%	405076 60%	2438394 70% K	274126 82% JKL
Other Large Home Improvement Store	157769 3%	128306 5%	22228 1%	7235 1%	54437 2%	103332 4%	20023 2%	134561 3%	3185 1%	43896 5%	38888 6% LM	71800 2%	3185 1%
Membership Club (Costco or Sam's Club)	1320480 24%	485640 19%	669596 30% B	165244 26%	822058 28%	498422 20%	190116 23%	1049752 24%	80612 24%	274810 29%	182584 27%	782473 22%	80612 24%
[NET] Retail Store Website	1064686 20%	570319 22%	382377 17%	109362 17%	394746 14%	669941 26% E	121294 15%	905947 21% I	37446 11%	172888 18%	96610 14%	757742 22% M	37446 11%
Online Purchase from Online Retailer	1024317 19%	568978 22%	367039 17%	85673 14%	375356 13%	648961 26% E	98292 12%	889055 21% GI	36971 11%	155996 17%	95269 14%	736081 21% M	36971 11%
Retail Store Website	64066 1%	20590 1%	17159 1%	23689 4%	39856 1%	24211 1%	24347 3%	38769 1%	951 *%	16892 2%	5314 1%	40910 1%	951 *%
Mass Merchandise (Wal-Mart or Target)	670741 12%	317198 12%	282645 13%	70898 11%	381650 13%	289091 11%	124287 15% I	530412 12% I	16043 5%	147144 16% M	92556 14% M	414998 12% M	16043 5%
Small Hardware Store	585872 11%	363731 14%	171282 8%	50858 8%	232857 8%	353015 14%	44788 6%	519298 12% G	21786 7%	74303 8%	69194 10%	420589 12%	21786 7%
Discount Store	231288 4%	20028 1%	195752 9% BD	15509 2%	189198 7% F	42090 2%	35146 4% I	195191 5% I	951 *%	44789 5% M	45339 7% M	140209 4% M	951 *%
[NET] Grocery Store	192281 4%	111257 4%	53148 2%	27876 4%	96106 3%	96175 4%	21577 3%	147247 3%	23457 7% G	8423 1%	16685 2%	143716 4%	23457 7% JK

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL3-1 Where did you purchase these reflector bulbs?

BASE = BOUGHT ANY REFLECTOR OR FLOOD BULBS [RL1] / SELECTED ANY TECHNOLOGY [RL2]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Grocery Store	185877	104852	53148	27876	89701	96175	21577	147247	17052	8423	16685	143716	17052
	3%	4%	2%	4%	3%	4%	3%	3%	5%	1%	2%	4%	5%
Convenience Store	49098	25654	23444	-	34026	15072	-	42693	6405	-	8372	34321	6405
	1%	1%	1%		1%	1%		1%	2%		1%	1%	2%
Lighting and Electronics Store	71071	6719	55781	8571	62341	8730	8485	61635	951	1040	16155	52925	951
	1%	*%	3%	1%	2%	*%	1%	1%	*%	*%	2%	2%	*%
Drug Store	55996	23422	25306	7269	50794	5202	6243	49754	-	20076	8500	27420	-
	1%	1%	1%	1%	2%	*%	1%	1%		2%	1%	1%	
Other [SPECIFY NAME OF STORE]	52193	24158	11200	14208	17297	34897	10986	37238	3969	19909	17458	10857	3969
	1%	1%	1%	2%	1%	1%	1%	1%	1%	2%	3%	*%	1%
Don’t know	31222	22828	3656	4738	8417	22805	21854	5707	3660	2029	3679	21854	3660
	1%	1%	*%	1%	*%	1%	3% H	*%	1%	*%	1%	1%	1%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL3-2 Where did you purchase these reflector bulbs?

BASE = BOUGHT ANY REFLECTOR OR FLOOD BULBS [RL1] / SELECTED ANY TECHNOLOGY [RL2]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	5432581	2591456	2202953	630241	2901550	2531030	811546	4286537	334498	935889	678588	3483606	334498
TOTAL RESPONDING	5401359 100%	2568628 100%	2199298 100%	625504 100%	2893134 100%	2508226 100%	789692 100%	4280830 100%	330838 100%	933861 100%	674909 100%	3461752 100%	330838 100%
Unweighted Total	793	230	442	119	406	387	357	321	115	170	231	277	115
[NET] Large Home Improvement	3788155 70%	1883316 73%	1515208 69%	384329 61%	2147809 74%	1640346 65%	517654 66%	2993191 70%	277310 84% GH	635420 68%	432764 64%	2442661 71%	277310 84% JKL
Home Depot or Lowe’s	3714332 69%	1836758 72%	1495178 68%	377094 60%	2117341 73%	1596991 64%	504001 64%	2936205 69%	274126 83% GH	596737 64%	405076 60%	2438394 70% K	274126 83% JKL
Other Large Home Improvement Store	157769 3%	128306 5%	22228 1%	7235 1%	54437 2%	103332 4%	20023 3%	134561 3%	3185 1%	43896 5%	38888 6% LM	71800 2%	3185 1%
Membership Club (Costco or Sam's Club)	1320480 24%	485640 19%	669596 30% B	165244 26%	822058 28%	498422 20%	190116 24%	1049752 25%	80612 24%	274810 29%	182584 27%	782473 23%	80612 24%
[NET] Retail Store Website	1064686 20%	570319 22%	382377 17%	109362 17%	394746 14%	669941 27% E	121294 15%	905947 21% I	37446 11%	172888 19%	96610 14%	757742 22% M	37446 11%
Online Purchase from Online Retailer	1024317 19%	568978 22%	367039 17%	85673 14%	375356 13%	648961 26% E	98292 12%	889055 21% GI	36971 11%	155996 17%	95269 14%	736081 21% M	36971 11%
Retail Store Website	64066 1%	20590 1%	17159 1%	23689 4%	39856 1%	24211 1%	24347 3%	38769 1%	951 *%	16892 2%	5314 1%	40910 1%	951 *%
Mass Merchandise (Wal-Mart or Target)	670741 12%	317198 12%	282645 13%	70898 11%	381650 13%	289091 12%	124287 16% I	530412 12% I	16043 5%	147144 16% M	92556 14% M	414998 12% M	16043 5%
Small Hardware Store	585872 11%	363731 14%	171282 8%	50858 8%	232857 8%	353015 14%	44788 6%	519298 12% G	21786 7%	74303 8%	69194 10%	420589 12%	21786 7%
Discount Store	231288 4%	20028 1%	195752 9% BD	15509 2%	189198 7% F	42090 2%	35146 4% I	195191 5% I	951 *%	44789 5% M	45339 7% M	140209 4% M	951 *%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL3-2 Where did you purchase these reflector bulbs?

BASE = BOUGHT ANY REFLECTOR OR FLOOD BULBS [RL1] / SELECTED ANY TECHNOLOGY [RL2]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
[NET] Grocery Store	192281 4%	111257 4%	53148 2%	27876 4%	96106 3%	96175 4%	21577 3%	147247 3%	23457 7% G	8423 1%	16685 2%	143716 4%	23457 7% JK
Grocery Store	185877 3%	104852 4%	53148 2%	27876 4%	89701 3%	96175 4%	21577 3%	147247 3%	17052 5%	8423 1%	16685 2%	143716 4%	17052 5%
Convenience Store	49098 1%	25654 1%	23444 1%	-	34026 1%	15072 1%	-	42693 1%	6405 2%	-	8372 1%	34321 1%	6405 2%
Lighting and Electronics Store	71071 1%	6719 *%	55781 3%	8571 1%	62341 2%	8730 *%	8485 1%	61635 1%	951 *%	1040 *%	16155 2%	52925 2%	951 *%
Drug Store	55996 1%	23422 1%	25306 1%	7269 1%	50794 2%	5202 *%	6243 1%	49754 1%	-	20076 2%	8500 1%	27420 1%	-
Other [SPECIFY NAME OF STORE]	52193 1%	24158 1%	11200 1%	14208 2%	17297 1%	34897 1%	10986 1%	37238 1%	3969 1%	19909 2%	17458 3%	10857 *%	3969 1%
Don’t know	31222	22828	3656	4738	8417	22805	21854	5707	3660	2029	3679	21854	3660

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL4_MEANS Number of reflector bulbs purchased

Mean number of purchases reported

BASE = BOUGHT ANY REFLECTOR OR FLOOD BULBS [RL1] / SELECTED ANY TECHNOLOGY [RL2]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	5432581	2591456	2202953	630241	2901550	2531030	811546	4286537	334498	935889	678588	3483606	334498
Unweighted Total	804	234	447	121	409	395	363	323	118	171	232	283	118
Total Reflector bulbs purchased	11.90	13.15	10.86	10.49	11.66	12.17	10.37	12.16	12.13	10.54	10.77	12.47	12.13
Total LED Reflector	9.30	10.33	8.48	8.03	8.94	9.73	6.19	9.80 G	10.33 G	8.22	7.22	9.91 K	10.33
NET Home Depot/Lowe's / Other Large Home Improvement	6.84	7.52	5.56	8.61	6.57	7.17	5.57	6.87	8.41 G	6.68	5.56	6.89	8.41 K
Home Depot or Lowe’s	6.74	7.34	5.54	8.64	6.42	7.13	5.55	6.75	8.38 G	6.50	5.50	6.78	8.38
Other Large Home Improvement Store	8.18	8.51	6.65	7.20	9.15	7.43	4.38	9.11	10.36	7.93	6.25	9.86	10.36
Membership Club (Costco or Sam's Club)	11.04	17.43 CD	7.94	7.93	11.44	10.39	10.51	11.06	11.92	17.15 KL	9.92	9.64	11.92
Mass Merchandise (Wal-Mart or Target)	3.44	4.92 C	1.88	3.15	3.41	3.48	3.59	3.44	2.41	3.48	2.31	3.78	2.41
Small Hardware Store	10.09	10.90 D	9.48	4.03	11.57	9.37	4.99	10.39 G	7.78	5.72	2.72	11.37 K	7.78 K
NET Convenience Store/Grocery Store	3.40	3.21	3.65	3.35	3.40	3.39	3.45	3.81	1.99	6.00 M	3.00	3.60	1.99
Convenience Store	1.84	1.75	2.00	-	1.75	2.00	-	2.00	1.00	-	-	2.00	1.00
Grocery Store	3.37	2.58	4.84	3.35	2.90	4.03	3.45	3.58	2.47	6.00 M	3.00	3.33	2.47
Discount Store	12.81	8.46	14.73	3.64	17.01 F	1.71	5.49	14.92	20.00	11.18	12.72	13.27	20.00
Lighting and Electronics Store	17.60	47.09	14.92	4.00	18.57	5.94	15.24	18.00	12.50	-	29.55	15.14	12.50
Drug Store	1.45	1.00	2.02	-	1.44	4.00	4.00	1.44	-	2.00	4.00	1.00	-
NET Online Purchase / Retail Store Website	11.55	13.84	9.96	8.39	7.62	14.02	6.89	12.13	11.82	5.06	7.88	13.92 J	11.82

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL4_MEANS Number of reflector bulbs purchased

Mean number of purchases reported

BASE = BOUGHT ANY REFLECTOR OR FLOOD BULBS [RL1] / SELECTED ANY TECHNOLOGY [RL2]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Online Purchase from Online Retailer	11.65	13.84	9.86	9.10	7.39	14.25	7.47	12.12	11.88	4.28	7.79	14.13 J	11.88
Retail Store Website	7.30	-	11.24	2.00	11.69 F	2.14	2.12	10.50	4.00	12.00	2.38	2.00	4.00
Other	10.33	10.00	18.78	2.20	12.86	9.64	25.30	8.51	4.00	2.00	13.02	25.30	4.00
Total Incandescent/Halogen Reflector	1.19	1.51	0.88	0.99	1.02	1.38	1.78 I	1.12	0.61	1.14	2.11 M	1.08	0.61
NET Home Depot/Lowe's / Other Large Home Improvement	4.28	5.29	3.23	3.38	3.53	5.04	4.30	4.33	3.52	3.87	7.16	3.90	3.52
Home Depot or Lowe’s	4.30	5.56	3.16	3.38	3.49	5.26	4.20	4.40	3.52	3.71	7.99 JL	3.89	3.52
Other Large Home Improvement Store	3.91	3.77	5.00	-	5.00	3.77	4.00	3.90	-	4.00	3.61	4.00	-
Membership Club (Costco or Sam's Club)	9.74	12.46	4.29	6.00	4.76	18.22	5.59	11.99	7.33	3.49	27.54	5.60	7.33
Mass Merchandise (Wal-Mart or Target)	3.52	5.32	2.22	2.56	4.86	1.35	6.15	2.82	2.00	3.19	1.62	4.05	2.00
Small Hardware Store	5.49	6.85	4.41	4.14	4.31	6.71	2.74	6.01 G	4.55	4.08	4.07	6.06	4.55
NET Convenience Store/Grocery Store	7.15	7.17	10.16	2.00	7.45	7.04	3.08	9.05	2.15	2.00	15.00	7.01	2.15
Convenience Store	3.27	1.00	5.00	-	3.27	-	-	5.00	1.00	-	5.00	-	1.00
Grocery Store	7.12	8.00	7.56	2.00	7.41	7.04	3.08	8.30	4.00	2.00	10.00	7.01	4.00
Discount Store	2.75	1.00	3.74 B	1.26	3.30	1.16	1.24	3.74 G	-	3.95	3.02	1.14	-
Lighting and Electronics Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Drug Store	5.71	-	5.71	-	2.00	10.00	5.71	-	-	2.00	-	10.00	-
NET Online Purchase / Retail Store Website	4.20	1.97	6.09	2.38	6.65	2.39	3.36	6.34 I	1.32	4.81	6.37	3.86	1.32

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL4_MEANS Number of reflector bulbs purchased

Mean number of purchases reported

BASE = BOUGHT ANY REFLECTOR OR FLOOD BULBS [RL1] / SELECTED ANY TECHNOLOGY [RL2]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Online Purchase from Online Retailer	5.04	1.00	6.09	-	6.70	2.38	4.53	6.38	1.32	4.72	3.39	8.30	1.32
Retail Store Website	2.72	8.00	-	2.38	6.00	2.39	2.39	6.00	-	6.00	8.00	2.00	-
Other	-	-	-	-	-	-	-	-	-	-	-	-	-
Total CFL Reflector	1.41	1.32	1.50	1.46	1.71	1.06	2.40 H	1.24	1.20	1.17	1.44	1.48	1.20
NET Home Depot/Lowe's / Other Large Home Improvement	5.66	6.74	3.96	8.00 C	5.77	5.48	9.94	4.53	6.99	3.43	5.02	6.08	6.99 J
Home Depot or Lowe’s	5.70	6.80	3.94	8.00 C	5.79	5.53	10.29	4.52	6.99	3.52	5.02	6.08	6.99 J
Other Large Home Improvement Store	3.85	2.00	4.66	-	4.67	2.06	2.05	5.00	-	2.00	4.98 J	-	-
Membership Club (Costco or Sam's Club)	6.93	4.55	10.22 B	6.00	8.80	4.40	5.64	7.94	2.43	7.96	6.62 LM	4.66	2.43
Mass Merchandise (Wal-Mart or Target)	4.23	5.93 D	3.21	1.88	3.73	4.70	2.92	4.60	2.86	4.29	3.26	4.54	2.86
Small Hardware Store	3.72	1.86	4.23	4.00	3.61	4.22	4.09	3.63	4.00	1.58	4.37 J	4.18	4.00 J
NET Convenience Store/Grocery Store	2.65	0.87	13.24	3.75	6.03	0.06	5.68	2.57	-	8.00 L	13.55 L	1.20	-
Convenience Store	5.00	-	5.00	-	5.00	-	-	5.00	-	-	5.00	-	-
Grocery Store	2.15	0.87	9.19	3.75	4.89	0.06	5.68	2.07	-	8.00 L	9.11 L	1.20	-
Discount Store	10.97	3.15	12.67 B	-	11.70 F	1.92	3.27	12.83	1.00	1.42	4.67	13.76	1.00
Lighting and Electronics Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Drug Store	3.25	1.00	2.10	6.00	3.86	1.36	1.36	3.86	-	1.00	2.00	5.67	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL4_MEANS Number of reflector bulbs purchased

Mean number of purchases reported

BASE = BOUGHT ANY REFLECTOR OR FLOOD BULBS [RL1] / SELECTED ANY TECHNOLOGY [RL2]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
NET Online Purchase / Retail Store Website	5.78	5.36	7.39	4.97	5.17	6.08	5.50	5.58	12.00	1.83	3.02	6.05	12.00
Online Purchase from Online Retailer	5.82	5.36	7.15	-	5.29	6.09	5.52	5.58	12.00	1.83	2.38	6.22	12.00 K
Retail Store Website	4.97	-	5.00	4.97	2.31	6.00	4.97	-	-	-	5.00	4.97	-
Other	2.00	2.00	-	-	2.00	2.00	2.00	2.00	-	2.00	-	2.00	-
No Answer	31222 1%	22828 1%	3656 *%	4738 1%	8417 *%	22805 1%	21854 3%	5707 *%	3660 1%	2029 *%	3679 1%	21854 1%	3660 1%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL4_TOT Number of reflector bulbs purchased

Total

VOLUMETRIC BASE = TOTAL NUMBER OF REFLECTOR BULBS PURCHASED [RL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Total Reflector bulbs purchased	64280363 100%	33787934 100%	23891668 100%	6558624 100%	33746144 100%	30534219 100%	8191714 100%	52073982 100%	4014667 100%	9841866 100%	7271752 100%	43152078 100%	4014667 100%
Total LED Reflector	50256089 78%	26537675 79%	18651855 78%	5024422 77%	25852075 77%	24404014 80%	4886396 60%	41953218 81% G	3416476 85%	7679584 78%	4869478 67%	34290552 79%	3416476 85%
NET Home Depot/Lowe's / Other Large Home Improvement	19677833 31%	10646922 32%	6400980 27%	2619327 40%	10253747 30%	9424086 31%	1892380 23%	15843417 30%	1942036 48% GH	3163781 32% K	1661597 23%	12910420 30%	1942036 48% KL
Home Depot or Lowe’s	18966209 30%	10051160 30%	6322623 26%	2581822 39%	9903647 29%	9062562 30%	1813784 22%	15243375 29%	1909051 48% GH	2848248 29%	1539347 21%	12669564 29%	1909051 48% JKL
Other Large Home Improvement Store	711624 1%	595762 2% CD	78357 *%	37505 1%	350100 1%	361524 1%	78596 1%	600042 1%	32986 1%	315533 3%	122250 2%	240856 1%	32986 1%
Membership Club (Costco or Sam's Club)	12345277 19%	6369172 19%	4742193 20%	1233912 19%	7901531 23%	4443746 15%	1594257 19%	9860306 19%	890714 22%	3087338 31% L	1536043 21%	6831182 16%	890714 22%
Mass Merchandise (Wal-Mart or Target)	1034214 2%	674559 2%	230334 1%	129321 2%	633121 2%	401093 1%	270416 3% HI	735847 1% I	27950 1%	199688 2% M	109323 2%	697252 2%	27950 1%
Small Hardware Store	4422186 7%	3018758 9% D	1308576 5% D	94852 1%	1648840 5%	2773347 9% E	84108 1%	4206945 8% GI	131133 3% G	106050 1%	125193 2%	4059811 9% JKM	131133 3% J
NET Convenience Store/Grocery Store	340550 1%	143378 *%	131686 1%	65485 1%	178117 1%	162433 1%	58119 1%	243728 *%	38703 1%	38054 *%	21794 *%	241999 1% K	38703 1% K
Convenience Store	75047 *%	44904 *%	30143 *%	-	44904 *%	30143 *%	-	68642 *%	6405 *%	-	-	68642 *%	6405 *%
Grocery Store	265503 *%	98475 *%	101543 *%	65485 1%	133213 *%	132289 *%	58119 1%	175086 *%	32298 1%	38054 *%	21794 *%	173357 *%	32298 1%
Discount Store	1695270 3%	158106 *%	1492390 6% BD	44774 1%	1633318 5% F	61952 *%	164113 2%	1521651 3% I	9507 *%	291418 3% M	221878 3% M	1172467 3% M	9507 *%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL4_TOT Number of reflector bulbs purchased

Total

VOLUMETRIC BASE = TOTAL NUMBER OF REFLECTOR BULBS PURCHASED [RL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Lighting and Electronics Store	1148205 2%	316391 1%	816769 3%	15045 *%	1118714 3%	29492 *%	113484 1%	1022838 2%	11883 *%	-	335216 5%	801106 2%	11883 *%
Drug Store	49489 *%	19249 *%	30239 *%	-	48976 *% F	513 *%	513 *%	48976 *% G	-	29727 *%	513 *%	19249 *%	-
NET Online Purchase / Retail Store Website	9218471 14%	5118490 15%	3290753 14%	798716 12%	2348405 7%	6870066 22% E	595782 7%	8274015 16% G	348674 9%	744731 8%	681224 9%	7443843 17% J	348674 9%
Online Purchase from Online Retailer	9009455 14%	5118490 15%	3106157 13%	779552 12%	2167611 6%	6841844 22% E	574185 7%	8090399 16% G	344871 9%	566371 6%	673534 9%	7424679 17% J	344871 9%
Retail Store Website	209016 *%	-	184597 1% D	19163 *%	180794 1% F	28222 *%	21597 *%	183616 *%	3803 *%	178360 2% K	7690 *%	19163 *%	3803 *%
Other	324595 1%	72648 *%	207935 1%	22990 *%	87307 *%	237288 1%	113223 1%	195494 *%	15877 *%	18798 *%	176697 2% J	113223 *%	15877 *%
Total Incandescent/Halogen Reflector	6426674 10%	3866108 11%	1941539 8%	619027 9%	2953274 9%	3473400 11%	1409152 17% I	4815502 9%	202019 5%	1068266 11%	1427365 20% M	3729024 9%	202019 5%
NET Home Depot/Lowe's / Other Large Home Improvement	2842032 4%	1757710 5%	749271 3%	335051 5%	1175126 3%	1666906 5%	707509 9% HI	2011609 4%	122914 3%	428615 4%	592711 8% LM	1697793 4%	122914 3%
Home Depot or Lowe’s	2562731 4%	1520270 4%	707410 3%	335051 5%	1133266 3%	1429466 5%	674127 8% HI	1765690 3%	122914 3%	395233 4%	536321 7% LM	1508264 3%	122914 3%
Other Large Home Improvement Store	279300 *%	237440 1%	41860 *%	-	41860 *%	237440 1%	33381 *%	245919 *%	-	33381 *%	56390 1%	189529 *%	-
Membership Club (Costco or Sam's Club)	791891 1%	650816 2%	83584 *%	57490 1%	243729 1%	548161 2%	153909 2%	627524 1%	10457 *%	108452 1%	501551 7%	171431 *%	10457 *%
Mass Merchandise (Wal-Mart or Target)	719588 1%	444694 1%	231281 1%	43613 1%	613706 2%	105882 *%	264912 3% HI	453726 1% I	951 *%	185489 2% KM	38332 1% M	494816 1%	951 *%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL4_TOT Number of reflector bulbs purchased

Total

VOLUMETRIC BASE = TOTAL NUMBER OF REFLECTOR BULBS PURCHASED [RL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Small Hardware Store	1048213 2%	596668 2%	355316 1%	96229 1%	417681 1%	630532 2%	72008 1%	936659 2% GI	39546 1%	121906 1%	75583 1%	811178 2%	39546 1%
NET Convenience Store/Grocery Store	567798 1%	385463 1%	163172 1% D	19163 *%	160560 *%	407238 1%	40877 *%	504639 1%	22282 1%	2081 *%	125581 2% LM	417855 1% J	22282 1%
Convenience Store	48265 *%	6405 *%	41860 *%	-	48265 *%	-	-	41860 *%	6405 *%	-	41860 1%	-	6405 *%
Grocery Store	519533 1%	379058 1% C	121312 1%	19163 *%	112295 *%	407238 1%	40877 *%	462779 1% I	15877 *%	2081 *%	83721 1%	417855 1% J	15877 *%
Discount Store	182068 *%	11685 *%	153400 1% B	16983 *%	162369 *% F	19700 *%	32403 *%	149666 *%	-	79619 1% L	80381 1% L	22069 *%	-
Lighting and Electronics Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Drug Store	11098 *%	-	11098 *%	-	2081 *%	9017 *%	11098 *%	-	-	2081 *%	-	9017 *%	-
NET Online Purchase / Retail Store Website	263987 *%	19072 *%	194417 1% B	50498 1%	178022 1%	85965 *%	126437 2%	131679 *%	5871 *%	140024 1% KLM	13226 *%	104866 *%	5871 *%
Online Purchase from Online Retailer	202762 *%	8345 *%	194417 1% B	-	165851 *%	36911 *%	77384 1%	119508 *%	5871 *%	127853 1% KLM	2499 *%	66540 *%	5871 *%
Retail Store Website	61225 *%	10727 *%	-	50498 1%	12171 *%	49054 *%	49054 1%	12171 *%	-	12171 *%	10727 *%	38327 *%	-
Other	-	-	-	-	-	-	-	-	-	-	-	-	-
Total CFL Reflector	7597600 12%	3384151 10%	3298273 14%	915176 14%	4940794 15%	2656806 9%	1896166 23% HI	5305262 10%	396172 10%	1094016 11%	974909 13%	5132502 12%	396172 10%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL4_TOT Number of reflector bulbs purchased

Total

VOLUMETRIC BASE = TOTAL NUMBER OF REFLECTOR BULBS PURCHASED [RL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
NET Home Depot/Lowe's / Other Large Home Improvement	3949303 6%	2088575 6%	1218561 5% C	642167 10% C	2507462 7%	1441841 5%	1245614 15% H	2382907 5%	320782 8%	291234 3%	518284 7% J	2819004 7%	320782 8% J
Home Depot or Lowe’s	3896504 6%	2080230 6%	1174107 5% C	642167 10% C	2463521 7%	1432983 5%	1234675 15% H	2341047 4%	320782 8%	280808 3%	475911 7% J	2819004 7%	320782 8% J
Other Large Home Improvement Store	52799 *%	8345 *%	44454 *% B	-	43941 *% F	8858 *%	10939 *%	41860 *%	-	10426 *%	42373 1% J	-	-
Membership Club (Costco or Sam's Club)	671174 1%	222628 1%	391057 2% BD	57490 1%	490134 1% F	181041 1%	178791 2% HI	481593 1%	10790 *%	501949 5% KLM	72861 1% LM	85573 *%	10790 *%
Mass Merchandise (Wal-Mart or Target)	832139 1%	503148 1%	286569 1%	42421 1%	357118 1%	475020 2%	115333 1% I	704114 1% I	12692 *%	216641 2% LM	107298 1% M	495507 1%	12692 *%
Small Hardware Store	336014 1%	34065 *%	263623 1% B	38327 1% B	265465 1% F	70549 *%	71261 1%	260951 1% I	3803 *%	26583 *%	55331 1% JM	250297 1%	3803 *%
NET Convenience Store/Grocery Store	225529 *%	57748 *%	136609 1%	31171 *%	222823 1%	2705 *%	11028 *%	214501 *%	-	8323 *%	127677 2%	89528 *%	-
Convenience Store	41860 *%	-	41860 *%	-	41860 *%	-	-	41860 *%	-	-	41860 1%	-	-
Grocery Store	183668 *%	57748 *%	94749 *%	31171 *%	180963 1%	2705 *%	11028 *%	172640 *%	-	8323 *%	85817 1% J	89528 *%	-
Discount Store	837500 1%	42993 *%	794506 3% B	-	826610 2% F	10889 *%	46644 1% I	790380 2% I	475 *%	13034 *% M	48193 1% JM	775797 2% JM	475 *%
Lighting and Electronics Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Drug Store	67235 *%	4173 *%	19449 *% B	43613 1% C	60357 *% F	6878 *%	6878 *%	60357 *%	-	4173 *%	16744 *% L	46318 *% J	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL4_TOT Number of reflector bulbs purchased

Total

VOLUMETRIC BASE = TOTAL NUMBER OF REFLECTOR BULBS PURCHASED [RL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
NET Online Purchase / Retail Store Website	644922 1%	397036 1%	187898 1%	59987 1%	189804 1%	455118 1%	207852 3%	389439 1%	47630 1%	11059 *%	28520 *%	557713 1% K	47630 1% K
Online Purchase from Online Retailer	578849 1%	397036 1%	181813 1%	-	181222 1%	397628 1%	141780 2%	389439 1%	47630 1%	11059 *%	22435 *%	497726 1% K	47630 1% K
Retail Store Website	66072 *%	-	6085 *%	59987 1% C	8582 *%	57490 *% E	66072 1%	-	-	-	6085 *%	59987 *%	-
Other	33786 *%	33786 *%	-	-	21020 *%	12766 *%	12766 *%	21020 *%	-	21020 *%	-	12766 *%	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL4_LED Number of reflector bulbs purchased

LED

VOLUMETRIC BASE = TOTAL NUMBER OF LED REFLECTOR BULBS PURCHASED [RL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Total LED Reflector	50256089 100%	26537675 100%	18651855 100%	5024422 100%	25852075 100%	24404014 100%	4886396 100%	41953218 100%	3416476 100%	7679584 100%	4869478 100%	34290552 100%	3416476 100%
NET Home Depot/Lowe's / Other Large Home Improvement	19677833 39%	10646922 40%	6400980 34%	2619327 52%	10253747 40%	9424086 39%	1892380 39%	15843417 38%	1942036 57%	3163781 41%	1661597 34%	12910420 38%	1942036 57% K
Home Depot or Lowe’s	18966209 38%	10051160 38%	6322623 34%	2581822 51%	9903647 38%	9062562 37%	1813784 37%	15243375 36%	1909051 56% H	2848248 37%	1539347 32%	12669564 37%	1909051 56% K
Other Large Home Improvement Store	711624 1%	595762 2% CD	78357 *%	37505 1%	350100 1%	361524 1%	78596 2%	600042 1%	32986 1%	315533 4%	122250 3% L	240856 1%	32986 1%
Membership Club (Costco or Sam's Club)	12345277 25%	6369172 24%	4742193 25%	1233912 25%	7901531 31%	4443746 18%	1594257 33%	9860306 24%	890714 26%	3087338 40% L	1536043 32%	6831182 20%	890714 26%
Mass Merchandise (Wal-Mart or Target)	1034214 2%	674559 3%	230334 1%	129321 3%	633121 2%	401093 2%	270416 6% HI	735847 2% I	27950 1%	199688 3% M	109323 2% M	697252 2% M	27950 1%
Small Hardware Store	4422186 9%	3018758 11% D	1308576 7% D	94852 2%	1648840 6%	2773347 11% E	84108 2%	4206945 10% GI	131133 4%	106050 1%	125193 3%	4059811 12% JKM	131133 4% J
NET Convenience Store/Grocery Store	340550 1%	143378 1%	131686 1%	65485 1%	178117 1%	162433 1%	58119 1%	243728 1%	38703 1%	38054 *%	21794 *%	241999 1%	38703 1%
Convenience Store	75047 *%	44904 *%	30143 *%	-	44904 *%	30143 *%	-	68642 *%	6405 *%	-	-	68642 *%	6405 *%
Grocery Store	265503 1%	98475 *%	101543 1%	65485 1%	133213 1%	132289 1%	58119 1%	175086 *%	32298 1%	38054 *%	21794 *%	173357 1%	32298 1%
Discount Store	1695270 3%	158106 1%	1492390 8% BD	44774 1%	1633318 6% F	61952 *%	164113 3%	1521651 4% I	9507 *%	291418 4% M	221878 5% M	1172467 3% M	9507 *%
Lighting and Electronics Store	1148205 2%	316391 1%	816769 4%	15045 *%	1118714 4%	29492 *%	113484 2%	1022838 2%	11883 *%	-	335216 7%	801106 2%	11883 *%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL4_LED Number of reflector bulbs purchased

LED

VOLUMETRIC BASE = TOTAL NUMBER OF LED REFLECTOR BULBS PURCHASED [RL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Drug Store	49489 *% 	19249 *% 	30239 *% 	-	48976 *% F	513 *% 	513 *% 	48976 *% G	-	29727 *% 	513 *% 	19249 *% 	-
NET Online Purchase / Retail Store Website	9218471 18% 	5118490 19% 	3290753 18% 	798716 16% 	2348405 9% 	6870066 28% E	595782 12% 	8274015 20% 	348674 10% 	744731 10% 	681224 14% 	7443843 22% J	348674 10%
Online Purchase from Online Retailer	9009455 18% 	5118490 19% 	3106157 17% 	779552 16% 	2167611 8% 	6841844 28% E	574185 12% 	8090399 19% 	344871 10% 	566371 7% 	673534 14% 	7424679 22% J	344871 10%
Retail Store Website	209016 *% 	-	184597 1% D	19163 *% 	180794 1% F	28222 *% 	21597 *% 	183616 *% 	3803 *% 	178360 2% K	7690 *% 	19163 *% 	3803 *%
Other	324595 1% 	72648 *% 	207935 1% 	22990 *% 	87307 *% 	237288 1% 	113223 2% HI	195494 *% 	15877 *% 	18798 *% 	176697 4% JL	113223 *% 	15877 *%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL4_IH Number of reflector bulbs purchased

Incandescent/Halogen

VOLUMETRIC BASE = TOTAL NUMBER OF INCANDESCENT/HALOGEN REFLECTOR BULBS PURCHASED [RL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Total Incandescent/Halogen Reflector	6426674 100%	3866108 100%	1941539 100%	619027 100%	2953274 100%	3473400 100%	1409152 100%	4815502 100%	202019 100%	1068266 100%	1427365 100%	3729024 100%	202019 100%
NET Home Depot/Lowe's / Other Large Home Improvement	2842032 44%	1757710 45%	749271 39%	335051 54%	1175126 40%	1666906 48%	707509 50%	2011609 42%	122914 61%	428615 40%	592711 42%	1697793 46%	122914 61%
Home Depot or Lowe’s	2562731 40%	1520270 39%	707410 36%	335051 54%	1133266 38%	1429466 41%	674127 48%	1765690 37%	122914 61%	395233 37%	536321 38%	1508264 40%	122914 61%
Other Large Home Improvement Store	279300 4%	237440 6%	41860 2%	-	41860 1%	237440 7%	33381 2%	245919 5%	-	33381 3%	56390 4%	189529 5%	-
Membership Club (Costco or Sam's Club)	791891 12%	650816 17%	83584 4%	57490 9%	243729 8%	548161 16%	153909 11%	627524 13%	10457 5%	108452 10%	501551 35%	171431 5%	10457 5%
Mass Merchandise (Wal-Mart or Target)	719588 11%	444694 12%	231281 12%	43613 7%	613706 21% F	105882 3%	264912 19% I	453726 9% I	951 *%	185489 17% KM	38332 3% M	494816 13%	951 *%
Small Hardware Store	1048213 16%	596668 15%	355316 18%	96229 16%	417681 14%	630532 18%	72008 5%	936659 19% G	39546 20% G	121906 11%	75583 5%	811178 22% K	39546 20% K
NET Convenience Store/Grocery Store	567798 9%	385463 10%	163172 8% D	19163 3%	160560 5%	407238 12%	40877 3%	504639 10%	22282 11%	2081 *%	125581 9%	417855 11% J	22282 11%
Convenience Store	48265 1%	6405 *%	41860 2%	-	48265 2%	-	-	41860 1%	6405 3%	-	41860 3%	-	6405 3%
Grocery Store	519533 8%	379058 10% C	121312 6% D	19163 3%	112295 4%	407238 12%	40877 3%	462779 10% G	15877 8% G	2081 *%	83721 6%	417855 11% J	15877 8%
Discount Store	182068 3%	11685 *%	153400 8% B	16983 3%	162369 5% F	19700 1%	32403 2%	149666 3%	-	79619 7%	80381 6% L	22069 1%	-
Lighting and Electronics Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Drug Store	11098 *%	-	11098 1%	-	2081 *%	9017 *%	11098 1%	-	-	2081 *%	-	9017 *%	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL4_IH Number of reflector bulbs purchased

Incandescent/Halogen

VOLUMETRIC BASE = TOTAL NUMBER OF INCANDESCENT/HALOGEN REFLECTOR BULBS PURCHASED [RL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
NET Online Purchase / Retail Store Website	263987 4%	19072 *%	194417 10% B	50498 8%	178022 6%	85965 2%	126437 9%	131679 3%	5871 3%	140024 13% KLM	13226 1%	104866 3%	5871 3%
Online Purchase from Online Retailer	202762 3%	8345 *%	194417 10% B	-	165851 6%	36911 1%	77384 5%	119508 2%	5871 3%	127853 12% KL	2499 *%	66540 2% K	5871 3%
Retail Store Website	61225 1%	10727 *%	-	50498 8%	12171 *%	49054 1%	49054 3%	12171 *%	-	12171 1%	10727 1%	38327 1%	-
Other	-	-	-	-	-	-	-	-	-	-	-	-	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL4_CFL Number of reflector bulbs purchased

CFL

VOLUMETRIC BASE = TOTAL NUMBER OF CFL REFLECTOR BULBS PURCHASED [RL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Total CFL Reflector	7597600 100%	3384151 100%	3298273 100%	915176 100%	4940794 100%	2656806 100%	1896166 100%	5305262 100%	396172 100%	1094016 100%	974909 100%	5132502 100%	396172 100%
NET Home Depot/Lowe's / Other Large Home Improvement	3949303 52%	2088575 62%	1218561 37%	642167 70% C	2507462 51%	1441841 54%	1245614 66%	2382907 45%	320782 81%	291234 27%	518284 53% J	2819004 55%	320782 81% J
Home Depot or Lowe’s	3896504 51%	2080230 61%	1174107 36%	642167 70% C	2463521 50%	1432983 54%	1234675 65%	2341047 44%	320782 81% H	280808 26%	475911 49% J	2819004 55%	320782 81% J
Other Large Home Improvement Store	52799 1%	8345 *%	44454 1% B	-	43941 1%	8858 *%	10939 1%	41860 1%	-	10426 1%	42373 4% J	-	-
Membership Club (Costco or Sam's Club)	671174 9%	222628 7%	391057 12% D	57490 6%	490134 10%	181041 7%	178791 9% I	481593 9%	10790 3%	501949 46% KLM	72861 7% L	85573 2%	10790 3%
Mass Merchandise (Wal-Mart or Target)	832139 11%	503148 15% D	286569 9%	42421 5%	357118 7%	475020 18% E	115333 6%	704114 13% G	12692 3%	216641 20% KLM	107298 11%	495507 10%	12692 3%
Small Hardware Store	336014 4%	34065 1%	263623 8%	38327 4% B	265465 5%	70549 3%	71261 4%	260951 5% I	3803 1%	26583 2%	55331 6% JM	250297 5%	3803 1%
NET Convenience Store/Grocery Store	225529 3%	57748 2%	136609 4%	31171 3%	222823 5%	2705 *%	11028 1%	214501 4%	-	8323 1%	127677 13%	89528 2%	-
Convenience Store	41860 1%	-	41860 1%	-	41860 1%	-	-	41860 1%	-	-	41860 4%	-	-
Grocery Store	183668 2%	57748 2%	94749 3%	31171 3%	180963 4%	2705 *%	11028 1%	172640 3%	-	8323 1%	85817 9%	89528 2%	-
Discount Store	837500 11%	42993 1%	794506 24% B	-	826610 17% F	10889 *%	46644 2% I	790380 15% GI	475 *%	13034 1% M	48193 5% JM	775797 15% JM	475 *%
Lighting and Electronics Store	-	-	-	-	-	-	-	-	-	-	-	-	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL4_CFL Number of reflector bulbs purchased

CFL

VOLUMETRIC BASE = TOTAL NUMBER OF CFL REFLECTOR BULBS PURCHASED [RL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Drug Store	67235 1%	4173 *%	19449 1% B	43613 5% C	60357 1%	6878 *%	6878 *%	60357 1%	-	4173 *%	16744 2% L	46318 1% J	-
NET Online Purchase / Retail Store Website	644922 8%	397036 12%	187898 6%	59987 7%	189804 4%	455118 17%	207852 11%	389439 7%	47630 12% H	11059 1%	28520 3%	557713 11% K	47630 12% K
Online Purchase from Online Retailer	578849 8%	397036 12%	181813 6%	-	181222 4%	397628 15%	141780 7%	389439 7%	47630 12% H	11059 1%	22435 2%	497726 10% K	47630 12% K
Retail Store Website	66072 1%	-	6085 *%	59987 7% C	8582 *%	57490 2% E	66072 3%	-	-	-	6085 1%	59987 1%	-
Other	33786 *%	33786 1%	-	-	21020 *%	12766 *%	12766 1%	21020 *%	-	21020 2%	-	12766 *%	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL5 How many of the LED reflector bulbs you purchased are currently installed at your home (either indoors or outdoors)?

BASE = 1 OR MORE LED REFLECTOR BULBS PURCHASED [RL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	4233961 100%	1987964 100%	1710797 100%	527271 100%	2133319 100%	2100642 100%	561384 100%	3400948 100%	271629 100%	659018 100%	481029 100%	2822285 100%	271629 100%
Unweighted Total	617	170	345	100	303	314	268	254	95	129	173	220	95
None	46158 1%	24766 1%	11810 1%	9582 2%	32035 2%	14123 1%	15163 3%	24590 1%	6405 2%	18120 3%	12051 3%	9582 *%	6405 2%
[NET] 1 or more	4066691 96%	1906835 96%	1652105 97%	499821 95%	2067848 97%	1998843 95%	539150 96%	3266286 96%	261255 96%	633568 96%	445728 93%	2726140 97%	261255 96%
1	241627 6%	110063 6%	96090 6%	35473 7%	117561 6%	124065 6%	51453 9%	175355 5%	14819 5%	117273 18% KLM	41487 9%	68047 2%	14819 5%
2	797027 19%	471116 24% D	264499 15%	56110 11%	299062 14%	497965 24% E	124344 22%	622318 18%	50365 19%	110823 17%	93864 20%	541975 19%	50365 19%
3-5	852788 20%	302944 15%	409792 24%	140051 27%	445246 21%	407541 19%	125062 22%	668758 20%	58968 22%	147350 22%	84695 18%	561774 20%	58968 22%
6-9	806144 19%	238398 12%	436932 26% B	130814 25% B	486833 23%	319311 15%	83263 15%	686346 20%	36535 13%	91229 14%	91817 19%	586564 21%	36535 13%
10-19	749908 18%	431076 22%	202600 12%	113605 22%	373550 18%	376357 18%	97783 17%	601996 18%	50129 18%	56388 9%	97122 20% J	546269 19% J	50129 18%
20 or more	619198 15%	353238 18% D	242191 14% D	23769 5%	345595 16%	273603 13%	57244 10%	511514 15%	50440 19%	110504 17% K	36743 8%	421511 15%	50440 19% K
Don't Know	121113 3%	56363 3%	46882 3%	17868 3%	33437 2%	87676 4%	7071 1%	110072 3%	3969 1%	7330 1%	23250 5%	86564 3%	3969 1%
Mean	9.82	11.14	8.76	8.33	9.87	9.76	7.70	10.05	11.37	8.13	8.62	10.27	11.37

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL6_1 Of the remaining LED reflector bulbs you purchased and have not yet installed, how many bulbs do you plan to install at your home within the next year (either indoors or outdoors)?

BASE = LED REFLECTOR BULBS YET TO BE INSTALLED / QUANTITY CURRENTLY INSTALLED PROVIDED [RL5]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	1354685 100%	635446 100%	544814 100%	174426 100%	607370 100%	747315 100%	150635 100%	1125782 100%	78268 100%	239859 100%	161673 100%	874886 100%	78268 100%
Unweighted Total	181	54	102	25	93	88	71	84	26	43	47	65	26
None	90547 7%	72454 11%	8511 2%	9582 5%	1649 *% E	88898 12%	15772 10%	74775 7%	-	23082 10%	10501 6%	56964 7%	-
[NET] 1 or more	1264138 93%	562991 89%	536302 98%	164844 95%	605721 100% F	658417 88%	134863 90%	1051007 93%	78268 100% GH	216776 90%	151172 94%	817922 93%	78268 100% L
1	171654 13%	66609 10%	72920 13%	32125 18%	103470 17%	68184 9%	38031 25%	126470 11%	7154 9%	52765 22% K	6716 4%	105019 12%	7154 9%
2	273856 20%	106225 17%	112627 21%	55003 32%	134871 22%	138985 19%	33654 22%	226119 20%	14083 18%	39694 17%	55130 34%	164948 19%	14083 18%
3	123885 9%	13741 2%	74406 14%	35738 20% B	63819 11%	60066 8%	10519 7%	108922 10%	4445 6%	13265 6%	8095 5%	98081 11%	4445 6%
4	98254 7%	91509 14% C	4036 1%	2709 2%	36741 6%	61514 8%	18039 12%	64696 6%	15519 20% H	14003 6%	3807 2%	64925 7%	15519 20% K
5 or more	382864 28%	214493 34%	147945 27%	20425 12%	148915 25%	233948 31%	19434 13%	343653 31% G	19776 25%	64498 27%	21727 13%	276862 32% K	19776 25%
Don't Know	213625 16%	70414 11%	124367 23%	18844 11%	117906 19%	95720 13%	15186 10%	181148 16%	17292 22%	32551 14%	55696 34% JL	108086 12%	17292 22%
Mean	3.85	4.08	3.88	2.95	3.69	3.98	3.02	3.94	4.39	4.30	3.21	3.78	4.39

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL5/RL6-1 Sum of LED reflector bulbs currently installed or planned for installation within the next year.

BASE = 1 OR MORE LED REFLECTOR BULBS PURCHASED [RL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	4233961 100%	1987964 100%	1710797 100%	527271 100%	2133319 100%	2100642 100%	561384 100%	3400948 100%	271629 100%	659018 100%	481029 100%	2822285 100%	271629 100%
Unweighted Total	617	170	345	100	303	314	268	254	95	129	173	220	95
None	14123 *%	4173 *%	369 *%	9582 2%	-	14123 1%	14123 3%	-	-	4541 1%	-	9582 *%	-
[NET] 1 or more	3885100 92%	1857015 93%	1539179 90%	480977 91%	1981977 93%	1903123 91%	525004 94%	3109728 91%	250368 92%	614595 93% K	402084 84%	2618054 93% K	250368 92% K
1	121293 3%	67011 3%	30705 2%	23577 4%	39729 2%	81564 4%	33750 6%	80662 2%	6880 3%	74901 11% LM	21950 5%	17561 1%	6880 3%
2	665607 16%	384979 19% D	230825 13%	44500 8%	282585 13%	383021 18%	105627 19%	524433 15%	35546 13%	113702 17%	61754 13%	454605 16%	35546 13%
3-5	703395 17%	284847 14%	317461 19%	101086 19%	386706 18%	316689 15%	131269 23%	511898 15%	60228 22%	153387 23%	85974 18%	403806 14%	60228 22%
6-9	895179 21%	345408 17%	404414 24%	145358 28%	471163 22%	424016 20%	81217 14%	771262 23%	42700 16%	92141 14%	79346 16%	680992 24%	42700 16%
10-19	788353 19%	363065 18%	292082 17%	130579 25%	450391 21%	337962 16%	104698 19%	644412 19%	39242 14%	56388 9%	122015 25% JM	570708 20% J	39242 14%
20 or more	711273 17%	411705 21% D	263691 15%	35877 7%	351403 16%	359870 17%	68443 12%	577060 17%	65771 24% G	124075 19% K	31045 6%	490382 17% K	65771 24% K
Don't Know	334738 8%	126777 6%	171249 10%	36712 7%	151343 7%	183396 9%	22257 4%	291220 9%	21261 8%	39882 6%	78945 16% JLM	194650 7%	21261 8%
Mean	11.18	12.58	10.07	9.42	11.03	11.32	8.31	11.53 G	13.00 G	9.84	9.84	11.52	13.00

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RL5/RL6-2 Installation Rate (Percentage of LED reflector bulbs purchased that are currently installed or planned for installation.)

BASE = 1 OR MORE LED REFLECTOR BULBS PURCHASED [RL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	4233961 100%	1987964 100%	1710797 100%	527271 100%	2133319 100%	2100642 100%	561384 100%	3400948 100%	271629 100%	659018 100%	481029 100%	2822285 100%	271629 100%
Unweighted Total	617	170	345	100	303	314	268	254	95	129	173	220	95
100%	3587793 85%	1693866 85%	1427262 83%	458736 87%	1836502 86%	1751291 83%	504485 90%	2837385 83%	245923 91%	534054 81%	354253 74%	2453563 87% K	245923 91% JK
51-99%	118477 3%	80941 4%	20868 1%	16668 3%	39051 2%	79426 4%	8950 2%	109051 3%	475 *%	28704 4% M	31975 7% LM	57322 2%	475 *%
0-50%	192953 5%	86380 4%	91418 5%	15156 3%	106424 5%	86529 4%	25692 5%	163292 5%	3969 1%	56379 9% M	15855 3%	116751 4%	3969 1%
Don't Know	334738 8%	126777 6%	171249 10%	36712 7%	151343 7%	183396 9%	22257 4%	291220 9%	21261 8%	39882 6%	78945 16% JLM	194650 7%	21261 8%
Mean	96.36	96.59	95.95	96.69	96.31	96.41	95.90	96.21	99.14 G	93.15	96.00	96.90	99.14 JK

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL1 Of the [LP4] light bulbs you've purchased since January 1, 2018, did you buy any candelabra bulbs?

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11940156 100%	5724326 100%	4624519 100%	1570990 100%	6501620 100%	5438536 100%	1976833 100%	9349805 100%	613518 100%	2993405 100%	1486744 100%	6846489 100%	613518 100%
Unweighted Total	1765	570	881	308	912	853	822	723	220	512	520	513	220
Yes	3310486 28%	1681819 29%	1172223 25%	450666 29%	1794510 28%	1515975 28%	625841 32%	2475907 26%	208738 34% H	642668 21%	493490 33% J	1965591 29% J	208738 34% J
No	7362049 62%	3360881 59%	2984483 65%	1003190 64%	3995246 61%	3366804 62%	1243749 63% I	5788876 62% I	329424 54%	1986568 66% KM	837381 56%	4208676 61%	329424 54%
Don’t know	1267621 11%	681626 12%	467813 10%	117134 7%	711864 11%	555757 10%	107243 5%	1085022 12% G	75356 12% G	364169 12%	155873 10%	672222 10%	75356 12%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL2-1 What type of candelabra bulbs were they?

BASE = BOUGHT ANY CANDELABRA BULBS [CL1]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	3310486	1681819	1172223	450666	1794510	1515975	625841	2475907	208738	642668	493490	1965591	208738
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unweighted Total	524	169	278	75	287	237	253	198	73	115	155	181	73
LED	2240319	1171703	727060	341080	1087629	1152690	381825	1686835	171659	311361	309771	1447529	171659
	68%	70%	62%	76%	61%	76%	61%	68%	82%	48%	63%	74%	82%
						E			GH		J	J	JK
Incandescent/ Halogen	1076794	570023	390325	111144	632387	444407	215838	836260	24696	267132	178173	606793	24696
	33%	34%	33%	25%	35%	29%	34%	34%	12%	42%	36%	31%	12%
							I	I		M	M	M	
CFL	245719	185172	45672	14876	92831	152888	50124	187182	8414	20445	32238	184622	8414
	7%	11%	4%	3%	5%	10%	8%	8%	4%	3%	7%	9%	4%
		C											
Don’t know	98400	37539	42276	18585	69854	28546	39336	54144	4920	57683	22412	13385	4920
	3%	2%	4%	4%	4%	2%	6%	2%	2%	9%	5%	1%	2%
							H			L	L		

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL2-2 What type of candelabra bulbs were they?

BASE = BOUGHT ANY CANDELABRA BULBS [CL1]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	3310486	1681819	1172223	450666	1794510	1515975	625841	2475907	208738	642668	493490	1965591	208738
TOTAL RESPONDING	3212085 100%	1644280 100%	1129947 100%	432081 100%	1724657 100%	1487429 100%	586504 100%	2421763 100%	203818 100%	584985 100%	471077 100%	1952206 100%	203818 100%
Unweighted Total	505	163	268	72	275	230	243	192	70	105	151	179	70
LED	2240319 70%	1171703 71%	727060 64%	341080 79%	1087629 63%	1152690 77% E	381825 65%	1686835 70%	171659 84% GH	311361 53%	309771 66%	1447529 74% J	171659 84% JK
Incandescent/ Halogen	1076794 34%	570023 35%	390325 35%	111144 26%	632387 37%	444407 30%	215838 37% I	836260 35% I	24696 12%	267132 46% LM	178173 38% M	606793 31% M	24696 12%
CFL	245719 8%	185172 11%	45672 4%	14876 3%	92831 5%	152888 10%	50124 9%	187182 8%	8414 4%	20445 3%	32238 7%	184622 9%	8414 4%
Don’t know	98400	37539	42276	18585	69854	28546	39336	54144	4920	57683	22412	13385	4920

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL3-1 Where did you purchase these candelabra bulbs?

BASE = BOUGHT ANY CANDELABRA BULBS [CL1] / SELECTED ANY TECHNOLOGY [CL2]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	3212085 100%	1644280 100%	1129947 100%	432081 100%	1724657 100%	1487429 100%	586504 100%	2421763 100%	203818 100%	584985 100%	471077 100%	1952206 100%	203818 100%
Unweighted Total	505	163	268	72	275	230	243	192	70	105	151	179	70
[NET] Large Home Improvement	1873882 58%	962086 59%	673632 60%	238164 55%	1085556 63%	788327 53%	351118 60%	1366770 56%	155995 77% GH	304808 52%	284351 60%	1128728 58%	155995 77% JKL
Home Depot or Lowe’s	1814371 56%	902702 55%	673504 60%	238164 55%	1052585 61%	761786 51%	335433 57%	1322943 55%	155995 77% GH	287001 49%	268898 57%	1102477 56%	155995 77% JKL
Other Large Home Improvement Store	71332 2%	67235 4%	4097 *%	-	40619 2%	30714 2%	19857 3%	47507 2%	3969 2%	21980 4%	19132 4%	26251 1%	3969 2%
[NET] Retail Store Website	535229 17%	393080 24% C	61692 5%	80456 19% C	200535 12%	334694 23% E	73119 12%	445151 18% I	16959 8%	50630 9%	56883 12%	410757 21% JM	16959 8%
Online Purchase from Online Retailer	496223 15%	364356 22% C	61692 5%	70174 16%	175283 10%	320940 22% E	53362 9%	425902 18% G	16959 8%	41156 7%	56183 12%	381926 20% JM	16959 8%
Retail Store Website	39006 1%	28724 2%	-	10282 2%	25252 1%	13754 1%	19757 3% H	19249 1%	-	9475 2%	701 *%	28831 1%	-
Mass Merchandise (Wal-Mart or Target)	487016 15%	248490 15%	179283 16%	53941 12%	310385 18%	176631 12%	134338 23% HI	340295 14%	12383 6%	157956 27% KLM	74203 16% M	242475 12%	12383 6%
Membership Club (Costco or Sam's Club)	436484 14%	197240 12%	134077 12%	105167 24%	205760 12%	230724 16%	115407 20% H	282598 12%	38479 19%	55599 10%	44411 9%	297995 15%	38479 19%
Small Hardware Store	219936 7%	186297 11% CD	32591 3%	1048 *%	91447 5%	128489 9%	20671 4%	194820 8% I	4445 2%	6319 1%	44033 9% JM	165139 8% JM	4445 2%
Lighting and Electronics Store	125208 4%	51061 3%	64090 6%	9582 2%	55875 3%	69334 5%	13918 2%	110340 5%	951 *%	1409 *%	13828 3%	109021 6% JM	951 *%
Discount Store	104706 3%	26422 2%	48320 4%	29963 7%	48394 3%	56312 4%	27556 5%	70745 3%	6405 3%	45629 8% L	27126 6% L	25546 1%	6405 3%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL3-1 Where did you purchase these candelabra bulbs?

BASE = BOUGHT ANY CANDELABRA BULBS [CL1] / SELECTED ANY TECHNOLOGY [CL2]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
[NET] Grocery Store	88708 3%	83570 5% C	5138 *%	-	24259 1%	64449 4%	18107 3%	66632 3%	3969 2%	5213 1%	128 *%	79398 4% K	3969 2%
Grocery Store	88708 3%	83570 5% C	5138 *%	-	24259 1%	64449 4%	18107 3%	66632 3%	3969 2%	5213 1%	128 *%	79398 4% K	3969 2%
Convenience Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Drug Store	70501 2%	69672 4% C	128 *%	701 *%	22990 1%	47510 3%	3869 1%	66632 3%	-	-	3869 1%	66632 3%	-
Other [SPECIFY NAME OF STORE]	92043 3%	58785 4%	29014 3%	4244 1%	8987 1%	83055 6% E	13934 2%	73865 3%	4244 2%	7732 1%	5020 1%	75047 4%	4244 2%
Don’t know	22445 1%	12304 1%	10142 1%	-	22445 1%	-	14073 2% H	8372 *%	-	5302 1%	8372 2%	8771 *%	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL3-2 Where did you purchase these candelabra bulbs?

BASE = BOUGHT ANY CANDELABRA BULBS [CL1] / SELECTED ANY TECHNOLOGY [CL2]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	3212085	1644280	1129947	432081	1724657	1487429	586504	2421763	203818	584985	471077	1952206	203818
TOTAL RESPONDING	3189640 100%	1631977 100%	1119805 100%	432081 100%	1702211 100%	1487429 100%	572431 100%	2413391 100%	203818 100%	579683 100%	462705 100%	1943434 100%	203818 100%
Unweighted Total	501	161	266	72	271	230	240	191	70	104	150	177	70
[NET] Large Home Improvement	1873882 59%	962086 59%	673632 60%	238164 55%	1085556 64%	788327 53%	351118 61%	1366770 57%	155995 77% GH	304808 53%	284351 61%	1128728 58%	155995 77% JKL
Home Depot or Lowe’s	1814371 57%	902702 55%	673504 60%	238164 55%	1052585 62%	761786 51%	335433 59%	1322943 55%	155995 77% GH	287001 50%	268898 58%	1102477 57%	155995 77% JKL
Other Large Home Improvement Store	71332 2%	67235 4%	4097 *%	-	40619 2%	30714 2%	19857 3%	47507 2%	3969 2%	21980 4%	19132 4%	26251 1%	3969 2%
[NET] Retail Store Website	535229 17%	393080 24% C	61692 6%	80456 19% C	200535 12%	334694 23% E	73119 13%	445151 18% I	16959 8%	50630 9%	56883 12%	410757 21% JM	16959 8%
Online Purchase from Online Retailer	496223 16%	364356 22% C	61692 6%	70174 16%	175283 10%	320940 22% E	53362 9%	425902 18% G	16959 8%	41156 7%	56183 12%	381926 20% JM	16959 8%
Retail Store Website	39006 1%	28724 2%	-	10282 2%	25252 1%	13754 1%	19757 3% H	19249 1%	-	9475 2%	701 *%	28831 1%	-
Mass Merchandise (Wal-Mart or Target)	487016 15%	248490 15%	179283 16%	53941 12%	310385 18%	176631 12%	134338 23% HI	340295 14%	12383 6%	157956 27% LM	74203 16% M	242475 12%	12383 6%
Membership Club (Costco or Sam's Club)	436484 14%	197240 12%	134077 12%	105167 24%	205760 12%	230724 16%	115407 20% H	282598 12%	38479 19%	55599 10%	44411 10%	297995 15%	38479 19%
Small Hardware Store	219936 7%	186297 11% CD	32591 3%	1048 *%	91447 5%	128489 9%	20671 4%	194820 8% I	4445 2%	6319 1%	44033 10% JM	165139 8% JM	4445 2%
Lighting and Electronics Store	125208 4%	51061 3%	64090 6%	9582 2%	55875 3%	69334 5%	13918 2%	110340 5%	951 *%	1409 *%	13828 3%	109021 6% JM	951 *%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL3-2 Where did you purchase these candelabra bulbs?

BASE = BOUGHT ANY CANDELABRA BULBS [CL1] / SELECTED ANY TECHNOLOGY [CL2]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Discount Store	104706 3%	26422 2%	48320 4%	29963 7%	48394 3%	56312 4%	27556 5%	70745 3%	6405 3%	45629 8% L	27126 6% L	25546 1%	6405 3%
[NET] Grocery Store	88708 3%	83570 5% C	5138 *%	-	24259 1%	64449 4%	18107 3%	66632 3%	3969 2%	5213 1%	128 *%	79398 4% K	3969 2%
Grocery Store	88708 3%	83570 5% C	5138 *%	-	24259 1%	64449 4%	18107 3%	66632 3%	3969 2%	5213 1%	128 *%	79398 4% K	3969 2%
Convenience Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Drug Store	70501 2%	69672 4% C	128 *%	701 *%	22990 1%	47510 3%	3869 1%	66632 3%	-	-	3869 1%	66632 3%	-
Other [SPECIFY NAME OF STORE]	92043 3%	58785 4%	29014 3%	4244 1%	8987 1%	83055 6% E	13934 2%	73865 3%	4244 2%	7732 1%	5020 1%	75047 4%	4244 2%
Don’t know	22445	12304	10142	-	22445	-	14073	8372	-	5302	8372	8771	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL4_MEANS Number of candelabra bulbs purchased

Mean number of purchases reported

BASE = BOUGHT ANY CANDELABRA BULBS [CL1] / SELECTED ANY TECHNOLOGY [CL2]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	3212085	1644280	1129947	432081	1724657	1487429	586504	2421763	203818	584985	471077	1952206	203818
Unweighted Total	505	163	268	72	275	230	243	192	70	105	151	179	70
Total Candelabra bulbs purchased	8.49	9.86 C	6.02	9.82 C	7.26	9.90 E	7.22	8.91	7.06	5.21	7.11	9.94 JKM	7.06
Total LED Candelabra	5.82	6.43 C	4.00	8.32 C	4.85	6.94 E	5.32	5.92	6.15	3.16	3.84	7.06 JK	6.15 J
NET Home Depot/Lowe's / Other Large Home Improvement	5.72	5.35	5.37	8.29 B	5.11	6.44	6.42	5.59	5.53	6.26	5.41	5.69	5.53
Home Depot or Lowe’s	5.77	5.45	5.35	8.29 B	5.27	6.36	6.52	5.64	5.47	5.96	5.50	5.84	5.47
Other Large Home Improvement Store	3.87	4.01	2.44	-	1.10	9.34	1.72	4.33	2.00	10.00	3.64	0.00	2.00
Membership Club (Costco or Sam's Club)	7.22	5.41	8.96	8.06	8.68	5.95	6.98	7.39	6.63	6.50	8.61	7.26	6.63
Mass Merchandise (Wal-Mart or Target)	5.13	6.08	3.09	3.77	7.02	3.07	4.09	5.62	1.32	3.04	3.46	6.29	1.32
Small Hardware Store	7.44	8.22	3.09	-	5.14	9.49	1.44	8.45 G	2.32	2.75	3.47	8.60	2.32
NET Convenience Store/Grocery Store	3.91	3.88	4.00	-	4.00	3.89	3.89	-	4.00	2.40	4.00	4.50	4.00
Convenience Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Grocery Store	3.91	3.88	4.00	-	4.00	3.89	3.89	-	4.00	2.40	4.00	4.50	4.00
Discount Store	5.28	3.50	6.15	5.00	5.67	4.90	5.00	5.91	2.00	6.45	5.00	5.00	2.00
Lighting and Electronics Store	2.58	2.72	2.43	2.00	8.97 F	1.97	2.71	2.53	4.50	5.00	4.36	2.09	4.50
Drug Store	8.77	8.77	-	-	8.77	-	1.00	10.00	-	-	1.00	10.00	-
NET Online Purchase / Retail Store Website	10.31	9.29	8.72	15.36	11.04	9.95	8.73	10.31	15.08	7.87	5.83	10.62	15.08 K
Online Purchase from Online Retailer	10.65	9.62	8.72	16.38	12.12	10.02	8.90	10.65	15.08	7.87	5.83	11.05	15.08 K

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL4_MEANS Number of candelabra bulbs purchased

Mean number of purchases reported

BASE = BOUGHT ANY CANDELABRA BULBS [CL1] / SELECTED ANY TECHNOLOGY [CL2]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Retail Store Website	5.33	4.00	-	8.00	4.00	8.00	8.00	4.00	-	-	-	5.33	-
Other	12.63	17.38 C	2.45	3.00	5.02	13.32	6.16	14.34	3.00	1.00	7.07	14.18	3.00
Total Incandescent/Halogen Candelabra	2.23	2.69	1.88	1.39	2.13	2.33	1.59 I	2.51 GI	0.68	1.99 M	2.02 M	2.50 M	0.68
NET Home Depot/Lowe's / Other Large Home Improvement	5.66	6.71 C	4.38	5.12	5.68	5.64	4.68	5.96	4.42	4.04	4.46	6.59 JK	4.42
Home Depot or Lowe’s	5.53	6.55	4.38	5.12	5.55	5.51	4.68	5.81	4.42	4.04	3.98	6.51 K	4.42
Other Large Home Improvement Store	8.24	8.24	-	-	7.68	10.00	-	8.24	-	-	8.66	8.00	-
Membership Club (Costco or Sam's Club)	6.16	5.90	6.82	-	6.46	5.00	6.61	5.74	-	6.00	5.65	10.00 K	-
Mass Merchandise (Wal-Mart or Target)	3.36	3.18	3.89	2.47	3.71	2.67	2.85	3.53	4.00	3.39	4.48	2.82	4.00
Small Hardware Store	4.33	5.23 C	2.24	-	4.47	4.10	3.62	4.62	-	2.50	2.87	5.19	-
NET Convenience Store/Grocery Store	6.00	6.00	-	-	-	6.00	-	6.00	-	-	-	6.00	-
Convenience Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Grocery Store	6.00	6.00	-	-	-	6.00	-	6.00	-	-	-	6.00	-
Discount Store	4.18	4.00	4.61	2.00	5.23	3.56	2.00	4.35	-	3.56	5.23	-	-
Lighting and Electronics Store	7.03	-	7.98	2.00	8.00	2.60	2.60	8.00	-	10.00	-	7.01	-
Drug Store	-	-	-	-	-	-	-	-	-	-	-	-	-
NET Online Purchase / Retail Store Website	9.31	9.44	8.45	6.00	4.21	11.35 E	3.61	9.77	1.00	6.76	7.47 M	10.26	1.00
Online Purchase from Online Retailer	9.31	9.44	8.45	6.00	4.21	11.35 E	3.61	9.77	1.00	6.76	7.47 M	10.26	1.00
Retail Store Website	-	-	-	-	-	-	-	-	-	-	-	-	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL4_MEANS Number of candelabra bulbs purchased

Mean number of purchases reported

BASE = BOUGHT ANY CANDELABRA BULBS [CL1] / SELECTED ANY TECHNOLOGY [CL2]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Other	3.00	-	3.00	-	-	3.00	-	3.00	-	3.00	-	-	-
Total CFL Candelabra	0.44	0.74	0.14	0.10	0.28	0.63	0.31	0.49	0.23	0.05	1.25 J	0.39	0.23
NET Home Depot/Lowe's / Other Large Home Improvement	5.84	5.89	5.52	3.78	4.07	6.74	3.33	6.42	5.50	2.96	40.20 L	3.50	5.50
Home Depot or Lowe’s	5.93	5.99	5.52	3.78	3.81	6.91	2.70	6.42	5.50	5.78	40.20 L	3.38	5.50
Other Large Home Improvement Store	4.51	4.51	-	-	6.00	2.00	4.51	-	-	2.00	-	6.00	-
Membership Club (Costco or Sam's Club)	3.67	-	4.08	3.00	6.00	3.61	3.18	4.00	-	-	6.00	3.61	-
Mass Merchandise (Wal-Mart or Target)	3.48	5.14	1.48	1.00	3.48	-	5.35	3.19	-	1.00	4.88	4.92	-
Small Hardware Store	4.62	5.00	-	2.00	2.00	5.00	-	4.62	-	-	4.62	-	-
NET Convenience Store/Grocery Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Convenience Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Grocery Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Discount Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Lighting and Electronics Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Drug Store	4.00	-	4.00	-	-	4.00	4.00	-	-	-	4.00	-	-
NET Online Purchase / Retail Store Website	8.11	9.00	3.38	-	9.00	3.38	2.00	9.00	6.00	-	9.00	2.00	6.00
Online Purchase from Online Retailer	8.11	9.00	3.38	-	9.00	3.38	2.00	9.00	6.00	-	9.00	2.00	6.00
Retail Store Website	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	6.00	-	6.00	-	6.00	-	6.00	-	-	-	-	6.00	-
No Answer	22445 1%	12304 1%	10142 1%	-	22445 1%	-	14073 2%	8372 *%	-	5302 1%	8372 2%	8771 *%	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL4_TOT Number of candelabra bulbs purchased

Total

VOLUMETRIC BASE = TOTAL NUMBER OF CANDELABRA BULBS PURCHASED [CL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Total Candelabra bulbs purchased	27077166 100%	16087816 100%	6740534 100%	4241612 100%	12354931 100%	14722235 100%	4135042 100%	21503076 100%	1439048 100%	3021648 100%	3289621 100%	19326849 100%	1439048 100%
Total LED Candelabra	18574201 69%	10498342 65%	4476992 66%	3596965 85%	8253568 67%	10320633 70%	3045032 74%	14275917 66%	1253252 87%	1834017 61%	1775368 54%	13711564 71%	1253252 87% K
NET Home Depot/Lowe's / Other Large Home Improvement	7106357 26%	3392042 21%	2439042 36% B	1275273 30%	3435898 28%	3670459 25%	1334393 32% H	5084409 24%	687556 48% GH	1157150 38% L	934239 28%	4327412 22%	687556 48% KL
Home Depot or Lowe’s	6932228 26%	3227902 20%	2429053 36% B	1275273 30% B	3402845 28%	3529382 24%	1326620 32% H	4925990 23%	679618 47% GH	1020805 34%	904393 27%	4327412 22%	679618 47% KL
Other Large Home Improvement Store	174130 1%	164141 1%	9989 *%	-	33053 *%	141077 1%	7773 *%	158419 1%	7938 1%	136345 5% K	29847 1%	-	7938 1%
Membership Club (Costco or Sam's Club)	2951214 11%	944064 6%	1159749 17%	847401 20% B	1644537 13%	1306677 9%	707251 17%	1988693 9%	255270 18%	278911 9%	253842 8%	2163191 11%	255270 18%
Mass Merchandise (Wal-Mart or Target)	1067842 4%	829285 5% D	147594 2%	90963 2%	761466 6% F	306376 2%	221209 5% I	840763 4% I	5871 *%	110526 4% M	124405 4%	827040 4% M	5871 *%
Small Hardware Store	878352 3%	823134 5% C	55218 1%	-	285536 2%	592816 4%	18677 *%	849360 4% GI	10315 1%	15336 1%	51319 2%	801382 4% JM	10315 1%
NET Convenience Store/Grocery Store	86344 *%	65793 *%	20551 *%	-	20038 *%	66305 *% E	70467 2% I	-	15877 1%	12507 *% K	513 *%	57447 *% K	15877 1% JL
Convenience Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Grocery Store	86344 *%	65793 *%	20551 *%	-	20038 *%	66305 *% E	70467 2% I	-	15877 1%	12507 *% K	513 *%	57447 *% K	15877 1% JL
Discount Store	405627 1%	44725 *%	218092 3% B	142810 3% B	215437 2%	190190 1%	127732 3% HI	265086 1% I	12810 1%	181365 6% KLM	83721 3% LM	127732 1%	12810 1%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL4_TOT Number of candelabra bulbs purchased

Total

VOLUMETRIC BASE = TOTAL NUMBER OF CANDELABRA BULBS PURCHASED [CL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Lighting and Electronics Store	192576 1%	138912 1%	32599 *%	19163 *%	58197 *%	134379 1%	34237 1% I	154060 1%	4278 *%	5202 *%	60321 2%	122775 1%	4278 *% J
Drug Store	195534 1%	195534 1%	-	-	195534 2%	-	3040 *%	192493 1%	-	-	3040 *%	192493 1%	-
NET Online Purchase / Retail Store Website	4599016 17%	3043428 19% C	346966 5%	1208623 28% C	1600696 13%	2998320 20%	453146 11%	3897325 18%	248545 17%	69155 2%	228484 7%	4052832 21% JK	248545 17% J
Online Purchase from Online Retailer	4445366 16%	2966430 18% C	346966 5%	1131970 27% C	1523699 12%	2921667 20%	376493 9%	3820328 18% G	248545 17%	69155 2%	228484 7%	3899182 20% JK	248545 17% J
Retail Store Website	153650 1%	76997 *%	-	76653 2%	76997 1%	76653 1%	76653 2%	76997 *%	-	-	-	153650 1%	-
Other	1091339 4%	1021426 6% CD	57182 1%	12731 *%	36229 *%	1055109 7% E	74879 2% I	1003728 5% I	12731 1%	3866 *%	35483 1% J	1039259 5% JKM	12731 1%
Total Incandescent/Halogen Candelabra	7096991 26%	4385119 27% D	2105903 31% D	600667 14%	3630816 29%	3466176 24%	909945 22% I	6047763 28% I	139283 10%	1156271 38% M	934883 28% M	4866555 25% M	139283 10%
NET Home Depot/Lowe's / Other Large Home Improvement	3528820 13%	2103551 13%	944434 14%	480835 11%	2141077 17% F	1387743 9%	534889 13% I	2886877 13% I	107054 7%	468171 15% M	476829 14% M	2476766 13% M	107054 7%
Home Depot or Lowe’s	3280103 12%	1854835 12%	944434 14%	480835 11%	1965008 16% F	1315095 9%	534889 13% I	2638160 12% I	107054 7%	468171 15% M	382108 12% M	2322771 12% M	107054 7%
Other Large Home Improvement Store	248716 1%	248716 2%	-	-	176068 1% F	72648 *%	-	248716 1%	-	-	94722 3% L	153995 1%	-
Membership Club (Costco or Sam's Club)	119739 *%	82663 1%	37075 1%	-	99895 1% F	19843 *%	62452 2% H	57287 *%	-	38054 1%	63991 2% JL	17694 *%	-
Mass Merchandise (Wal-Mart or Target)	807777 3%	264451 2%	446446 7% BD	91578 2%	595624 5% F	212153 1%	185109 4% HI	590914 3%	31754 2%	352013 12% KLM	168022 5% LM	255988 1%	31754 2%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL4_TOT Number of candelabra bulbs purchased

Total

VOLUMETRIC BASE = TOTAL NUMBER OF CANDELABRA BULBS PURCHASED [CL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Small Hardware Store	212154 1%	179152 1% C	33002 *%	-	139318 1% F	72836 *%	50855 1%	161299 1%	-	1843 *%	49510 2% J	160801 1% J	-
NET Convenience Store/Grocery Store	284294 1%	284294 2%	-	-	-	284294 2%	-	284294 1%	-	-	-	284294 1%	-
Convenience Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Grocery Store	284294 1%	284294 2%	-	-	-	284294 2%	-	284294 1%	-	-	-	284294 1%	-
Discount Store	116522 *%	54538 *% D	59182 1% BD	2802 *%	54252 *%	62270 *%	4019 *%	112503 1% G	-	62270 2%	54252 2%	-	-
Lighting and Electronics Store	423346 2%	-	404183 6% D	19163 *%	395087 3% F	28260 *%	28260 1%	395087 2%	-	3686 *%	-	419660 2% J	-
Drug Store	-	-	-	-	-	-	-	-	-	-	-	-	-
NET Online Purchase / Retail Store Website	1592742 6%	1416470 9% CD	169983 3% D	6288 *%	205563 2%	1387179 9% E	44361 1% I	1547905 7% GI	475 *%	218636 7% M	122278 4% M	1251352 6% M	475 *%
Online Purchase from Online Retailer	1592742 6%	1416470 9% CD	169983 3% D	6288 *%	205563 2%	1387179 9% E	44361 1% I	1547905 7% GI	475 *%	218636 7% M	122278 4% M	1251352 6% M	475 *%
Retail Store Website	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	11598 *%	-	11598 *%	-	-	11598 *%	-	11598 *%	-	11598 *%	-	-	-
Total CFL Candelabra	1405973 5%	1204355 7%	157639 2%	43980 1%	470547 4%	935427 6%	180065 4%	1179395 5%	46513 3%	31360 1%	579371 18% JLM	748730 4%	46513 3%
NET Home Depot/Lowe's / Other Large Home Improvement	1051735 4%	987320 6%	52325 1%	12091 *%	246832 2%	804903 5%	105765 3%	902309 4%	43661 3%	16496 1%	447624 14% J	543954 3% J	43661 3%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL4_TOT Number of candelabra bulbs purchased

Total

VOLUMETRIC BASE = TOTAL NUMBER OF CANDELABRA BULBS PURCHASED [CL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Home Depot or Lowe’s	1001379 4%	936963 6%	52325 1%	12091 *%	204821 2%	796558 5%	55408 1%	902309 4%	43661 3%	8151 *%	447624 14% J	501942 3% J	43661 3%
Other Large Home Improvement Store	50357 *%	50357 *%	-	-	42011 *%	8345 *%	50357 1%	-	-	8345 *%	-	42011 *%	-
Membership Club (Costco or Sam's Club)	92683 *%	-	63938 1%	28745 1%	3651 *%	89032 1% E	32396 1%	60287 *%	-	-	3651 *%	89032 *% K	-
Mass Merchandise (Wal-Mart or Target)	141130 1%	114490 1% D	25592 *%	1048 *%	141130 1%	-	28972 1%	112158 1%	-	14863 *%	22942 1%	103324 1%	-
Small Hardware Store	38420 *%	36324 *%	-	2096 *%	2096 *%	36324 *%	-	38420 *%	-	-	38420 1%	-	-
NET Convenience Store/Grocery Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Convenience Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Grocery Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Discount Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Lighting and Electronics Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Drug Store	513 *%	-	513 *%	-	-	513 *%	513 *%	-	-	-	513 *%	-	-
NET Online Purchase / Retail Store Website	70877 *%	66221 *% C	4655 *%	-	66221 1% F	4655 *%	1803 *%	66221 *% G	2852 *%	-	66221 2% LM	1803 *%	2852 *%
Online Purchase from Online Retailer	70877 *%	66221 *% C	4655 *%	-	66221 1% F	4655 *%	1803 *%	66221 *% G	2852 *%	-	66221 2% LM	1803 *%	2852 *%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL4_TOT Number of candelabra bulbs purchased

Total

VOLUMETRIC BASE = TOTAL NUMBER OF CANDELABRA BULBS PURCHASED [CL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Retail Store Website	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	10617 *%	-	10617 *%	-	10617 *%	-	10617 *%	-	-	-	-	10617 *%	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL4_LED Number of candelabra bulbs purchased

LED

VOLUMETRIC BASE = TOTAL NUMBER OF LED CANDELABRA BULBS PURCHASED [CL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Total LED Candelabra	18574201 100%	10498342 100%	4476992 100%	3596965 100%	8253568 100%	10320633 100%	3045032 100%	14275917 100%	1253252 100%	1834017 100%	1775368 100%	13711564 100%	1253252 100%
NET Home Depot/Lowe's / Other Large Home Improvement	7106357 38%	3392042 32%	2439042 54% B	1275273 35%	3435898 42%	3670459 36%	1334393 44%	5084409 36%	687556 55% H	1157150 63% L	934239 53% L	4327412 32%	687556 55% L
Home Depot or Lowe’s	6932228 37%	3227902 31%	2429053 54% B	1275273 35%	3402845 41%	3529382 34%	1326620 44%	4925990 35%	679618 54% H	1020805 56% L	904393 51% L	4327412 32%	679618 54% L
Other Large Home Improvement Store	174130 1%	164141 2%	9989 *%	-	33053 *%	141077 1%	7773 *%	158419 1%	7938 1%	136345 7% K	29847 2%	-	7938 1%
Membership Club (Costco or Sam's Club)	2951214 16%	944064 9%	1159749 26%	847401 24% B	1644537 20%	1306677 13%	707251 23%	1988693 14%	255270 20%	278911 15%	253842 14%	2163191 16%	255270 20%
Mass Merchandise (Wal-Mart or Target)	1067842 6%	829285 8% D	147594 3%	90963 3%	761466 9% F	306376 3%	221209 7% I	840763 6% I	5871 *%	110526 6% M	124405 7%	827040 6% M	5871 *%
Small Hardware Store	878352 5%	823134 8% C	55218 1%	-	285536 3%	592816 6%	18677 1%	849360 6% GI	10315 1%	15336 1%	51319 3%	801382 6% JM	10315 1%
NET Convenience Store/Grocery Store	86344 *%	65793 1%	20551 *%	-	20038 *%	66305 1% E	70467 2% I	-	15877 1%	12507 1% K	513 *%	57447 *% K	15877 1% JL
Convenience Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Grocery Store	86344 *%	65793 1%	20551 *%	-	20038 *%	66305 1% E	70467 2% I	-	15877 1%	12507 1% K	513 *%	57447 *% K	15877 1% JL
Discount Store	405627 2%	44725 *%	218092 5% B	142810 4% B	215437 3%	190190 2%	127732 4% I	265086 2% I	12810 1%	181365 10% KLM	83721 5% LM	127732 1%	12810 1%
Lighting and Electronics Store	192576 1%	138912 1%	32599 1%	19163 1%	58197 1%	134379 1%	34237 1% I	154060 1%	4278 *%	5202 *%	60321 3%	122775 1%	4278 *%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL4_LED Number of candelabra bulbs purchased

LED

VOLUMETRIC BASE = TOTAL NUMBER OF LED CANDELABRA BULBS PURCHASED [CL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Drug Store	195534	195534	-	-	195534	-	3040	192493	-	-	3040	192493	-
	1%	2%			2%		*%	1%			*%	1%	
NET Online Purchase / Retail Store Website	4599016	3043428	346966	1208623	1600696	2998320	453146	3897325	248545	69155	228484	4052832	248545
	25%	29%	8%	34%	19%	29%	15%	27%	20%	4%	13%	30%	20%
		C		C								JK	J
Online Purchase from Online Retailer	4445366	2966430	346966	1131970	1523699	2921667	376493	3820328	248545	69155	228484	3899182	248545
	24%	28%	8%	31%	18%	28%	12%	27%	20%	4%	13%	28%	20%
		C		C				G				JK	J
Retail Store Website	153650	76997	-	76653	76997	76653	76653	76997	-	-	-	153650	-
	1%	1%		2%	1%	1%	3%	1%				1%	
Other	1091339	1021426	57182	12731	36229	1055109	74879	1003728	12731	3866	35483	1039259	12731
	6%	10%	1%	*%	*%	10%	2%	7%	1%	*%	2%	8%	1%
		CD				E	I	I			J	JKM	

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL4_IH Number of candelabra bulbs purchased

Incandescent/Halogen

VOLUMETRIC BASE = TOTAL NUMBER OF INCANDESCENT/HALOGEN CANDELABRA BULBS PURCHASED [CL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Total Incandescent/Halogen Candelabra	7096991 100%	4385119 100%	2105903 100%	600667 100%	3630816 100%	3466176 100%	909945 100%	6047763 100%	139283 100%	1156271 100%	934883 100%	4866555 100%	139283 100%
NET Home Depot/Lowe's / Other Large Home Improvement	3528820 50%	2103551 48%	944434 45%	480835 80% BC	2141077 59% F	1387743 40%	534889 59%	2886877 48%	107054 77% H	468171 40%	476829 51%	2476766 51%	107054 77% JKL
Home Depot or Lowe’s	3280103 46%	1854835 42%	944434 45%	480835 80% BC	1965008 54%	1315095 38%	534889 59%	2638160 44%	107054 77% H	468171 40%	382108 41%	2322771 48%	107054 77% JKL
Other Large Home Improvement Store	248716 4%	248716 6%	-	-	176068 5% F	72648 2%	-	248716 4%	-	-	94722 10% L	153995 3%	-
Membership Club (Costco or Sam's Club)	119739 2%	82663 2%	37075 2%	-	99895 3% F	19843 1%	62452 7% H	57287 1%	-	38054 3%	63991 7% JL	17694 *%	-
Mass Merchandise (Wal-Mart or Target)	807777 11%	264451 6%	446446 21% B	91578 15% B	595624 16% F	212153 6%	185109 20% H	590914 10%	31754 23%	352013 30% KL	168022 18% L	255988 5%	31754 23%
Small Hardware Store	212154 3%	179152 4% C	33002 2%	-	139318 4%	72836 2%	50855 6% H	161299 3%	-	1843 *%	49510 5% J	160801 3% J	-
NET Convenience Store/Grocery Store	284294 4%	284294 6%	-	-	-	284294 8%	-	284294 5%	-	-	-	284294 6%	-
Convenience Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Grocery Store	284294 4%	284294 6%	-	-	-	284294 8%	-	284294 5%	-	-	-	284294 6%	-
Discount Store	116522 2%	54538 1% D	59182 3% D	2802 *%	54252 1%	62270 2%	4019 *%	112503 2% G	-	62270 5%	54252 6%	-	-
Lighting and Electronics Store	423346 6%	-	404183 19% D	19163 3%	395087 11% F	28260 1%	28260 3%	395087 7%	-	3686 *%	-	419660 9% J	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL4_IH Number of candelabra bulbs purchased

Incandescent/Halogen

VOLUMETRIC BASE = TOTAL NUMBER OF INCANDESCENT/HALOGEN CANDELABRA BULBS PURCHASED [CL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Drug Store	-	-	-	-	-	-	-	-	-	-	-	-	-
NET Online Purchase / Retail Store Website	1592742 22%	1416470 32% CD	169983 8% D	6288 1%	205563 6%	1387179 40% E	44361 5% I	1547905 26% GI	475 *%	218636 19% M	122278 13% M	1251352 26% M	475 *%
Online Purchase from Online Retailer	1592742 22%	1416470 32% CD	169983 8% D	6288 1%	205563 6%	1387179 40% E	44361 5% I	1547905 26% GI	475 *%	218636 19% M	122278 13% M	1251352 26% M	475 *%
Retail Store Website	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	11598 *%	-	11598 1%	-	-	11598 *%	-	11598 *%	-	11598 1%	-	-	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL4_CFL Number of candelabra bulbs purchased

CFL

VOLUMETRIC BASE = TOTAL NUMBER OF CFL CANDELABRA BULBS PURCHASED [CL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Total CFL Candelabra	1405973 100%	1204355 100%	157639 100%	43980 100%	470547 100%	935427 100%	180065 100%	1179395 100%	46513 100%	31360 100%	579371 100%	748730 100%	46513 100%
NET Home Depot/Lowe's / Other Large Home Improvement	1051735 75%	987320 82%	52325 33%	12091 27%	246832 52%	804903 86%	105765 59%	902309 77%	43661 94%	16496 53%	447624 77%	543954 73%	43661 94%
Home Depot or Lowe’s	1001379 71%	936963 78%	52325 33%	12091 27%	204821 44%	796558 85%	55408 31%	902309 77%	43661 94%	8151 26%	447624 77%	501942 67% J	43661 94%
Other Large Home Improvement Store	50357 4%	50357 4%	-	-	42011 9%	8345 1%	50357 28%	-	-	8345 27%	-	42011 6%	-
Membership Club (Costco or Sam's Club)	92683 7%	-	63938 41%	28745 65% C	3651 1%	89032 10% E	32396 18%	60287 5%	-	-	3651 1%	89032 12% K	-
Mass Merchandise (Wal-Mart or Target)	141130 10%	114490 10% D	25592 16%	1048 2%	141130 30%	-	28972 16%	112158 10%	-	14863 47% KL	22942 4%	103324 14% K	-
Small Hardware Store	38420 3%	36324 3%	-	2096 5%	2096 *%	36324 4%	-	38420 3%	-	-	38420 7%	-	-
NET Convenience Store/Grocery Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Convenience Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Grocery Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Discount Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Lighting and Electronics Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Drug Store	513 *%	-	513 *%	-	-	513 *%	513 *%	-	-	-	513 *%	-	-
NET Online Purchase / Retail Store Website	70877 5%	66221 5%	4655 3%	-	66221 14% F	4655 *%	1803 1%	66221 6% G	2852 6%	-	66221 11% L	1803 *%	2852 6%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL4_CFL Number of candelabra bulbs purchased

CFL

VOLUMETRIC BASE = TOTAL NUMBER OF CFL CANDELABRA BULBS PURCHASED [CL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Online Purchase from Online Retailer	70877 5%	66221 5%	4655 3%	-	66221 14% F	4655 *%	1803 1%	66221 6% G	2852 6%	-	66221 11% L	1803 *%	2852 6%
Retail Store Website	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	10617 1%	-	10617 7%	-	10617 2%	-	10617 6%	-	-	-	-	10617 1%	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL5_1 How many of the LED candelabra bulbs you purchased are currently installed at your home (either indoors or outdoors)?

BASE = 1 OR MORE LED CANDELABRA BULBS PURCHASED [CL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	2225983 100%	1159137 100%	725291 100%	341080 100%	1080558 100%	1145425 100%	374753 100%	1679571 100%	171659 100%	306059 100%	302506 100%	1445759 100%	171659 100%
Unweighted Total	348	105	192	50	178	170	161	128	59	64	101	124	59
None	31796 1%	-	31096 4%	701 *%	23936 2%	7860 1%	829 *%	30968 2%	-	22596 7%	9201 3%	-	-
[NET] 1 or more	2186918 98%	1159137 100% C	694195 96%	333110 98%	1049353 97%	1137565 99%	373925 100%	1641334 98%	171659 100%	283463 93%	293305 97%	1438490 99% J	171659 100% J
1-2	407797 18%	153807 13%	171148 24%	82842 24%	165642 15%	242154 21%	58857 16%	328070 20%	20870 12%	54944 18%	78905 26% M	253078 18%	20870 12%
3-5	764204 34%	431718 37% D	274960 38% D	57051 17%	429495 40%	334709 29%	138619 37%	547030 33%	78555 46%	121376 40%	79069 26%	485204 34%	78555 46% K
6-9	407030 18%	173163 15%	139370 19%	94497 28%	229824 21%	177206 15%	85623 23%	278994 17%	42413 25%	82044 27% L	111599 37% L	170975 12%	42413 25%
10 or more	607887 27%	400449 35% C	108717 15%	98720 29%	224392 21%	383495 33%	90826 24%	487240 29%	29821 17%	25100 8%	23733 8%	529233 37% JKM	29821 17%
Don't Know	7269 *%	-	-	7269 2%	7269 1%	-	-	7269 *%	-	-	-	7269 1%	-
Mean	7.40	7.96	5.47	9.62 C	6.95	7.81	6.70	7.62	6.79	4.77	5.01	8.53 JK	6.79

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL6_1 Of the remaining LED candelabra bulbs you purchased and have not yet installed, how many bulbs do you plan to install at your home within the next year (either indoors or outdoors)?

BASE = LED CANDELABRA BULBS YET TO BE INSTALLED / QUANTITY CURRENTLY INSTALLED PROVIDED [CL5]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	469553 100%	221705 100%	161456 100%	86391 100%	188733 100%	280820 100%	105885 100%	330080 100%	33588 100%	91183 100%	62725 100%	282057 100%	33588 100%
Unweighted Total	81	26	44	11	34	47	41	27	13	22	26	20	13
None	74912 16%	8981 4%	53621 33% B	12311 14%	61096 32% F	13816 5%	15953 15%	58959 18%	-	11565 13%	4380 7%	58967 21%	-
[NET] 1 or more	315636 67%	189367 85%	83299 52%	42970 50%	98238 52%	217397 77%	65554 62%	225147 68%	24935 74%	62674 69%	57000 91%	171027 61%	24935 74%
1	69784 15%	60109 27%	6966 4%	2709 3%	9719 5%	60065 21%	13095 12%	50010 15%	6678 20%	8714 10%	7009 11%	47382 17%	6678 20%
2	75348 16%	17805 8%	54466 34%	3077 4%	50730 27%	24617 9%	18920 18%	43806 13%	12622 38%	27011 30%	27562 44% L	8152 3%	12622 38% L
3 or more	170504 36%	111453 50%	21867 14%	37185 43%	37789 20%	132715 47%	33539 32%	131331 40%	5634 17%	26948 30%	22429 36%	115492 41%	5634 17%
Don't Know	79005 17%	23358 11%	24537 15%	31110 36%	29399 16%	49606 18%	24378 23%	45974 14%	8653 26%	16944 19%	1345 2%	52063 18%	8653 26%
Mean	3.38	4.00	2.30	3.82	2.67	3.87	3.42	3.46	2.37	3.10	3.63	3.51	2.37

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL5/CL6-1 Sum of LED candelabra bulbs currently installed or planned for installation within the next year.

BASE = 1 OR MORE LED CANDELABRA BULBS PURCHASED [CL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	2225983 100%	1159137 100%	725291 100%	341080 100%	1080558 100%	1145425 100%	374753 100%	1679571 100%	171659 100%	306059 100%	302506 100%	1445759 100%	171659 100%
Unweighted Total	348	105	192	50	178	170	161	128	59	64	101	124	59
None	4567 *%	-	3866 1%	701 *%	701 *%	3866 *%	701 *%	3866 *%	-	3866 1%	701 *%	-	-
[NET] 1 or more	2135142 96%	1135779 98%	696888 96%	302000 89%	1043189 97%	1091953 95%	349674 93%	1622462 97%	163006 95%	285248 93%	300460 99%	1386428 96%	163006 95%
1-2	348498 16%	140211 12%	155077 21%	53210 16%	152266 14%	196232 17%	39652 11%	291945 17%	16901 10%	41387 14%	68258 23% M	221952 15%	16901 10%
3-5	758135 34%	410589 35%	284229 39% D	62841 18%	437367 40%	320768 28%	119151 32%	561379 33%	77605 45%	128311 42%	89703 30%	462516 32%	77605 45%
6-9	379581 17%	136071 12%	135151 19%	108360 32% B	192777 18%	186804 16%	86673 23%	256938 15%	35970 21%	68778 22%	104765 35% L	170067 12%	35970 21%
10 or more	648928 29%	448909 39% C	122431 17%	77588 23%	260779 24%	388149 34%	104198 28%	512200 30%	32530 19%	46773 15%	37734 12%	531892 37% JKM	32530 19%
Don't Know	86274 4%	23358 2%	24537 3%	38379 11% B	36668 3%	49606 4%	24378 7%	53242 3%	8653 5%	16944 6%	1345 *%	59332 4%	8653 5%
Mean	8.01	8.70	6.01	10.06 C	7.46	8.54	7.63	8.19	7.02	5.78	5.76	9.08 JK	7.02

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CL5/CL6-2 Installation Rate (Percentage of LED candelabra bulbs purchased that are currently installed or planned for installation.)

BASE = 1 OR MORE LED CANDELABRA BULBS PURCHASED [CL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	2225983 100%	1159137 100%	725291 100%	341080 100%	1080558 100%	1145425 100%	374753 100%	1679571 100%	171659 100%	306059 100%	302506 100%	1445759 100%	171659 100%
Unweighted Total	348	105	192	50	178	170	161	128	59	64	101	124	59
100%	1967982 88%	1041887 90%	640039 88%	285581 84%	958528 89%	1009455 88%	315646 84%	1493300 89%	159037 93%	273008 89%	287875 95%	1248062 86%	159037 93%
51-99%	140578 6%	79657 7%	56111 8%	4809 1%	78954 7%	61623 5%	13154 4%	123455 7%	3969 2%	5302 2%	8906 3%	122400 8% JM	3969 2%
0-50%	31149 1%	14235 1%	4603 1%	12311 4%	6408 1%	24741 2%	21575 6% H	9574 1%	-	10805 4%	4380 1%	15965 1%	-
Don't Know	86274 4%	23358 2%	24537 3%	38379 11% B	36668 3%	49606 4%	24378 7%	53242 3%	8653 5%	16944 6%	1345 *%	59332 4%	8653 5%
Mean	97.76	97.88	97.96	96.86	98.16	97.38	95.35	98.14	99.19	96.98	98.51	97.59	99.19

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL1 Of the [LP4] light bulbs you've purchased since January 1, 2018, did you buy any globe bulbs?

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11940156 100%	5724326 100%	4624519 100%	1570990 100%	6501620 100%	5438536 100%	1976833 100%	9349805 100%	613518 100%	2993405 100%	1486744 100%	6846489 100%	613518 100%
Unweighted Total	1765	570	881	308	912	853	822	723	220	512	520	513	220
Yes	3609807 30%	1841679 32%	1265485 27%	495640 32%	2057157 32%	1552650 29%	688186 35% H	2725278 29%	196343 32%	1005713 34%	443335 30%	1964415 29%	196343 32%
No	7089946 59%	3198895 56%	2928903 63%	949877 60%	3782193 58%	3307753 61%	1154497 58%	5585691 60%	349757 57%	1634036 55%	866523 58%	4239629 62% J	349757 57%
Don’t know	1240403 10%	683751 12%	430131 9%	125473 8%	662270 10%	578133 11%	134150 7%	1038836 11% G	67418 11%	353656 12%	176885 12%	642445 9%	67418 11%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL2-1 What type of globe bulbs were they?

BASE = BOUGHT ANY GLOBE BULBS [CL1]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	3609807	1841679	1265485	495640	2057157	1552650	688186	2725278	196343	1005713	443335	1964415	196343
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unweighted Total	541	191	261	88	291	250	267	212	62	162	151	166	62
LED	2416296	1225046	843992	340256	1325877	1090419	436348	1837023	142925	656689	287930	1328753	142925
	67%	67%	67%	69%	64%	70%	63%	67%	73%	65%	65%	68%	73%
Incandescent/ Halogen	743645	400976	257286	85383	414358	329287	146511	557870	39264	217245	107937	379199	39264
	21%	22%	20%	17%	20%	21%	21%	20%	20%	22%	24%	19%	20%
CFL	551627	248821	264950	37856	419560	132067	131080	401011	19537	169116	59729	303245	19537
	15%	14%	21% D	8%	20% F	9%	19%	15%	10%	17%	13%	15%	10%
Don’t know	141751	42819	38485	60447	64167	77584	41860	87709	12182	51115	23767	54686	12182
	4%	2%	3%	12% BC	3%	5%	6%	3%	6%	5%	5%	3%	6%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL2-2 What type of globe bulbs were they?

BASE = BOUGHT ANY GLOBE BULBS [CL1]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	3609807	1841679	1265485	495640	2057157	1552650	688186	2725278	196343	1005713	443335	1964415	196343
TOTAL RESPONDING	3468056 100%	1798860 100%	1227000 100%	435193 100%	1992990 100%	1475065 100%	646326 100%	2637569 100%	184161 100%	954598 100%	419568 100%	1909729 100%	184161 100%
Unweighted Total	512	182	250	79	276	236	251	202	59	151	141	161	59
LED	2416296 70%	1225046 68%	843992 69%	340256 78%	1325877 67%	1090419 74%	436348 68%	1837023 70%	142925 78%	656689 69%	287930 69%	1328753 70%	142925 78%
Incandescent/ Halogen	743645 21%	400976 22%	257286 21%	85383 20%	414358 21%	329287 22%	146511 23%	557870 21%	39264 21%	217245 23%	107937 26%	379199 20%	39264 21%
CFL	551627 16%	248821 14%	264950 22% D	37856 9%	419560 21% F	132067 9%	131080 20%	401011 15%	19537 11%	169116 18%	59729 14%	303245 16%	19537 11%
Don’t know	141751	42819	38485	60447	64167	77584	41860	87709	12182	51115	23767	54686	12182

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL3-1 Where did you purchase these globe bulbs?

BASE = BOUGHT ANY GLOBE BULBS [GL1] / SELECTED ANY TECHNOLOGY [GL2]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	3468056 100%	1798860 100%	1227000 100%	435193 100%	1992990 100%	1475065 100%	646326 100%	2637569 100%	184161 100%	954598 100%	419568 100%	1909729 100%	184161 100%
Unweighted Total	512	182	250	79	276	236	251	202	59	151	141	161	59
[NET] Large Home Improvement	2064336 60%	994363 55%	777470 63%	285502 66%	1202699 60%	861637 58%	378120 59%	1565979 59%	120237 65%	528515 55%	254134 61%	1161451 61%	120237 65%
Home Depot or Lowe’s	2013215 58%	946429 53%	776312 63%	283473 65%	1196992 60%	816223 55%	371449 57%	1525738 58%	116029 63%	495045 52%	241593 58%	1160549 61%	116029 63%
Other Large Home Improvement Store	78435 2%	58616 3%	17791 1%	2029 *%	33021 2%	45414 3%	15443 2%	58784 2%	4208 2%	48333 5% L	16220 4%	9673 1%	4208 2%
Mass Merchandise (Wal-Mart or Target)	472708 14%	362498 20% CD	80080 7%	30130 7%	265885 13%	206823 14%	204789 32% HI	255536 10%	12383 7%	166032 17% M	76384 18% M	217910 11%	12383 7%
Membership Club (Costco or Sam's Club)	456152 13%	286867 16%	133277 11%	36008 8%	308280 15%	147872 10%	83366 13%	356245 14%	16541 9%	105465 11%	43777 10%	290369 15%	16541 9%
[NET] Retail Store Website	431531 12%	168271 9%	221788 18%	41472 10%	273784 14%	157746 11%	70655 11%	342619 13%	18257 10%	94627 10%	38142 9%	280506 15%	18257 10%
Online Purchase from Online Retailer	396317 11%	142639 8%	221788 18% BD	31890 7%	254535 13%	141782 10%	54691 8%	323370 12%	18257 10%	94627 10%	38142 9%	245292 13%	18257 10%
Retail Store Website	35214 1%	25632 1%	-	9582 2%	19249 1%	15965 1%	15965 2% H	19249 1%	-	-	-	35214 2%	-
Small Hardware Store	324019 9%	161264 9%	116706 10%	46049 11%	164923 8%	159096 11%	21265 3%	291391 11% G	11362 6%	87413 9%	32336 8%	192907 10%	11362 6%
Discount Store	84684 2%	22859 1%	52243 4%	9582 2%	59815 3%	24869 2%	34347 5%	50337 2%	-	44845 5%	16872 4%	22967 1%	-
Lighting and Electronics Store	80659 2%	58063 3%	22596 2%	-	25544 1%	55114 4%	7002 1%	73657 3%	-	22596 2%	3679 1%	54384 3%	-
[NET] Grocery Store	72524 2%	61771 3%	10753 1%	-	21119 1%	51405 3%	9889 2%	55754 2%	6880 4%	7080 1%	11182 3%	47382 2%	6880 4%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL3-1 Where did you purchase these globe bulbs?

BASE = BOUGHT ANY GLOBE BULBS [GL1] / SELECTED ANY TECHNOLOGY [GL2]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Grocery Store	71183 2%	60430 3%	10753 1%	-	21119 1%	50064 3%	8549 1%	55754 2%	6880 4%	7080 1%	9841 2%	47382 2%	6880 4%
Convenience Store	1341 *%	1341 *%	-	-	-	1341 *%	1341 *%	-	-	-	1341 *%	-	-
Drug Store	27190 1%	22699 1%	4491 *%	-	-	27190 2%	9690 1%	17501 1%	-	17869 2%	2938 1%	6383 *%	-
Other [SPECIFY NAME OF STORE]	58924 2%	26401 1%	18532 2%	13992 3%	15904 1%	43020 3%	18400 3%	40524 2%	-	43530 5% KL	2628 1%	12766 1%	-
Don’t know	35623 1%	10062 1%	22152 2%	3410 1%	26962 1%	8662 1%	9927 2%	18542 1%	7154 4%	15904 2%	4380 1%	8186 *%	7154 4%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL3-2 Where did you purchase these globe bulbs?

BASE = BOUGHT ANY GLOBE BULBS [GL1] / SELECTED ANY TECHNOLOGY [GL2]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	3468056	1798860	1227000	435193	1992990	1475065	646326	2637569	184161	954598	419568	1909729	184161
TOTAL RESPONDING	3432432 100%	1788798 100%	1204849 100%	431784 100%	1966029 100%	1466404 100%	636398 100%	2619027 100%	177007 100%	938694 100%	415189 100%	1901542 100%	177007 100%
Unweighted Total	502	180	244	77	270	232	246	200	56	149	139	158	56
[NET] Large Home Improvement	2064336 60%	994363 56%	777470 65%	285502 66%	1202699 61%	861637 59%	378120 59%	1565979 60%	120237 68%	528515 56%	254134 61%	1161451 61%	120237 68%
Home Depot or Lowe’s	2013215 59%	946429 53%	776312 64%	283473 66%	1196992 61%	816223 56%	371449 58%	1525738 58%	116029 66%	495045 53%	241593 58%	1160549 61%	116029 66%
Other Large Home Improvement Store	78435 2%	58616 3%	17791 1%	2029 *%	33021 2%	45414 3%	15443 2%	58784 2%	4208 2%	48333 5% L	16220 4%	9673 1%	4208 2%
Mass Merchandise (Wal-Mart or Target)	472708 14%	362498 20% CD	80080 7%	30130 7%	265885 14%	206823 14%	204789 32% HI	255536 10%	12383 7%	166032 18% M	76384 18% M	217910 11%	12383 7%
Membership Club (Costco or Sam's Club)	456152 13%	286867 16%	133277 11%	36008 8%	308280 16%	147872 10%	83366 13%	356245 14%	16541 9%	105465 11%	43777 11%	290369 15%	16541 9%
[NET] Retail Store Website	431531 13%	168271 9%	221788 18%	41472 10%	273784 14%	157746 11%	70655 11%	342619 13%	18257 10%	94627 10%	38142 9%	280506 15%	18257 10%
Online Purchase from Online Retailer	396317 12%	142639 8%	221788 18% BD	31890 7%	254535 13%	141782 10%	54691 9%	323370 12%	18257 10%	94627 10%	38142 9%	245292 13%	18257 10%
Retail Store Website	35214 1%	25632 1%	-	9582 2%	19249 1%	15965 1%	15965 3% H	19249 1%	-	-	-	35214 2%	-
Small Hardware Store	324019 9%	161264 9%	116706 10%	46049 11%	164923 8%	159096 11%	21265 3%	291391 11% G	11362 6%	87413 9%	32336 8%	192907 10%	11362 6%
Discount Store	84684 2%	22859 1%	52243 4%	9582 2%	59815 3%	24869 2%	34347 5%	50337 2%	-	44845 5%	16872 4%	22967 1%	-
Lighting and Electronics Store	80659 2%	58063 3%	22596 2%	-	25544 1%	55114 4%	7002 1%	73657 3%	-	22596 2%	3679 1%	54384 3%	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL3-2 Where did you purchase these globe bulbs?

BASE = BOUGHT ANY GLOBE BULBS [GL1] / SELECTED ANY TECHNOLOGY [GL2]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
[NET] Grocery Store	72524 2%	61771 3%	10753 1%	-	21119 1%	51405 4%	9889 2%	55754 2%	6880 4%	7080 1%	11182 3%	47382 2%	6880 4%
Grocery Store	71183 2%	60430 3%	10753 1%	-	21119 1%	50064 3%	8549 1%	55754 2%	6880 4%	7080 1%	9841 2%	47382 2%	6880 4%
Convenience Store	1341 *%	1341 *%	-	-	-	1341 *%	1341 *%	-	-	-	1341 *%	-	-
Drug Store	27190 1%	22699 1%	4491 *%	-	-	27190 2%	9690 2%	17501 1%	-	17869 2%	2938 1%	6383 *%	-
Other [SPECIFY NAME OF STORE]	58924 2%	26401 1%	18532 2%	13992 3%	15904 1%	43020 3%	18400 3%	40524 2%	-	43530 5% KL	2628 1%	12766 1%	-
Don’t know	35623	10062	22152	3410	26962	8662	9927	18542	7154	15904	4380	8186	7154

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL4_MEANS Number of globe bulbs purchased

Mean number of purchases reported

BASE = BOUGHT ANY GLOBE BULBS [GL1] / SELECTED ANY TECHNOLOGY [GL2]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	3468056	1798860	1227000	435193	1992990	1475065	646326	2637569	184161	954598	419568	1909729	184161
Unweighted Total	512	182	250	79	276	236	251	202	59	151	141	161	59
Total Globe bulbs purchased	7.52	7.75	7.14	6.97	7.80	7.14	8.56	7.26	7.56	6.33	6.50	8.32	7.56
Total LED Globe	5.27	5.64	4.33	5.70	5.10	5.50	5.97	5.03	6.35	4.05	4.38	5.97	6.35 JK
NET Home Depot/Lowe's / Other Large Home Improvement	5.79	6.52	4.41	5.42	5.69	5.90	7.21 H	5.19	9.20 H	4.30	5.00	6.31	9.20 JK
Home Depot or Lowe’s	5.72	6.44	4.38	5.41	5.69	5.75	7.27 H	5.10	8.89 H	3.92	5.12	6.31	8.89 JK
Other Large Home Improvement Store	6.07	7.53	1.03	6.00	2.33	8.11	4.50	5.51	16.00 GH	5.98	3.72	-	16.00 K
Membership Club (Costco or Sam's Club)	11.47	11.29	11.41	12.81	12.61	10.02	12.16	11.65 I	4.22	6.99	8.05	14.43	4.22
Mass Merchandise (Wal-Mart or Target)	5.72	5.29	6.06	7.94	5.70	5.76	4.55	7.09	4.00	5.28	6.60	5.76	4.00
Small Hardware Store	4.26	5.33	2.70	3.44	2.98	5.64	5.21	4.12	6.01	2.45	4.63	4.67	6.01
NET Convenience Store/Grocery Store	4.97	4.91	5.37	-	4.91	5.82	5.68	-	4.28	5.68	-	-	4.28
Convenience Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Grocery Store	4.97	4.91	5.37	-	4.91	5.82	5.68	-	4.28	5.68	-	-	4.28
Discount Store	6.61	1.00	8.19	-	7.79	1.48	1.00	8.19	-	6.61	-	-	-
Lighting and Electronics Store	7.86	9.71	2.79	-	3.60	9.40	-	7.86	-	2.79	6.00	10.00 J	-
Drug Store	5.23	-	5.23	-	-	5.23	5.23	-	-	6.00	3.00	-	-
NET Online Purchase / Retail Store Website	7.24	7.73	5.74	10.51	8.82	5.03	8.06	7.26	4.33	6.47	7.15	7.66	4.33
Online Purchase from Online Retailer	7.79	8.63	5.74	13.36	9.61	5.34	9.44	7.72	4.33	6.47	7.15	8.55	4.33

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL4_MEANS Number of globe bulbs purchased

Mean number of purchases reported

BASE = BOUGHT ANY GLOBE BULBS [GL1] / SELECTED ANY TECHNOLOGY [GL2]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Retail Store Website	1.67	2.00	-	1.00	2.00	1.00	1.00	2.00	-	-	-	1.67	-
Other	5.45	2.64	2.21	13.76	1.59	7.13	3.37	6.07	-	5.63	6.00	4.00	-
Total Incandescent/Halogen Globe	1.24	1.34	1.29	0.72	1.38	1.06	1.36	1.25	0.74	1.26	1.31	1.27	0.74
NET Home Depot/Lowe's / Other Large Home Improvement	5.00	6.18	4.27	3.77	5.50	4.24	4.00	5.54	2.62	2.85	4.17	7.06 JM	2.62
Home Depot or Lowe’s	4.95	6.09	4.24	3.77	5.44	4.20	3.72	5.54	2.62	2.85	4.17	6.96 JM	2.62
Other Large Home Improvement Store	2.91	2.00	10.00	-	2.00	10.00	2.91	-	-	-	-	2.91	-
Membership Club (Costco or Sam's Club)	5.48	4.66	8.75	-	5.48	-	7.19	5.32	4.00	3.00	12.00 L	5.00	4.00
Mass Merchandise (Wal-Mart or Target)	3.72	3.66	5.23 D	1.44	4.35	3.14	4.09	3.46	4.21	4.65	4.69	3.25	4.21
Small Hardware Store	3.36	2.64	3.89	3.00	2.26	4.31	2.20	3.52	-	2.27	3.89 J	4.63	-
NET Convenience Store/Grocery Store	5.21	6.11	0.05	-	0.00	6.10	9.39	5.10	-	-	1.40	6.00	-
Convenience Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Grocery Store	5.21	6.11	0.05	-	0.00	6.10	9.39	5.10	-	-	1.40	6.00	-
Discount Store	11.47	5.92	19.11	3.00	17.06	3.12	4.88	19.19	-	23.86	0.06	5.41	-
Lighting and Electronics Store	4.64	5.00	4.00	-	5.00	4.00	5.00	4.00	-	4.00	-	5.00	-
Drug Store	4.20	5.00	3.94	-	-	4.20	4.74	4.00	-	4.00	4.74	-	-
NET Online Purchase / Retail Store Website	3.46	3.00	3.92	-	4.16	2.83	3.75	3.35	4.00	3.16	5.00	3.75	4.00
Online Purchase from Online Retailer	3.38	2.64	3.92	-	4.16	2.42	2.00	3.35	4.00	3.16	5.00	2.00	4.00
Retail Store Website	4.00	4.00	-	-	-	4.00	4.00	-	-	-	-	4.00	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL4_MEANS Number of globe bulbs purchased

Mean number of purchases reported

BASE = BOUGHT ANY GLOBE BULBS [GL1] / SELECTED ANY TECHNOLOGY [GL2]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Other	-	-	-	-	-	-	-	-	-	-	-	-	-
Total CFL Globe	1.00	0.77	1.51	0.55	1.31	0.58	1.23	0.98	0.47	1.02	0.81	1.08	0.47
NET Home Depot/Lowe's / Other Large Home Improvement	6.10	4.94	7.13	8.49	5.17	9.14	5.47	6.34	7.48	4.54	4.19	6.68	7.48
Home Depot or Lowe’s	6.11	4.95	7.12	8.49	5.17	9.23	5.47	6.34	7.48	4.54	4.14	6.68	7.48
Other Large Home Improvement Store	5.05	4.00	16.00	-	-	5.05	5.05	-	-	-	5.05	-	-
Membership Club (Costco or Sam's Club)	7.77	7.14	11.04	4.00	7.76	7.89	7.08	7.87	-	11.85	-	6.62	-
Mass Merchandise (Wal-Mart or Target)	3.63	3.54	4.32	2.73	4.03	3.13	3.54	3.79	3.00	3.93	4.05	2.73	3.00
Small Hardware Store	2.75	-	4.71	0.90	4.35	0.81	12.17	0.94	4.00	0.15	2.00	13.30	4.00
NET Convenience Store/Grocery Store	4.45	1.00	5.00	-	5.00	1.00	1.00	5.00	-	-	4.45	-	-
Convenience Store	1.00	1.00	-	-	-	1.00	1.00	-	-	-	1.00	-	-
Grocery Store	5.00	-	5.00	-	5.00	-	-	5.00	-	-	5.00	-	-
Discount Store	4.82	-	4.82	-	4.88	2.00	2.74	5.00	-	2.74	5.00	-	-
Lighting and Electronics Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Drug Store	1.09	1.09	-	-	-	1.09	2.00	1.00	-	1.00	2.00	-	-
NET Online Purchase / Retail Store Website	6.19	-	6.19	-	6.19	-	2.00	6.31	6.00	14.00	-	3.93	6.00
Online Purchase from Online Retailer	6.19	-	6.19	-	6.19	-	2.00	6.31	6.00	14.00	-	3.93	6.00
Retail Store Website	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	6.00	-	6.00	-	6.00	-	-	6.00	-	6.00	-	-	-
No Answer	35623 1%	10062 1%	22152 2%	3410 1%	26962 1%	8662 1%	9927 2%	18542 1%	7154 4%	15904 2%	4380 1%	8186 *%	7154 4%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL4_TOT Number of globe bulbs purchased

Total

VOLUMETRIC BASE = TOTAL NUMBER OF GLOBE BULBS PURCHASED [GL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Total Globe bulbs purchased	25804805 100%	13864438 100%	8601994 100%	3009284 100%	15327680 100%	10477125 100%	5446353 100%	19020627 100%	1337825 100%	5944726 100%	2698340 100%	15823914 100%	1337825 100%
Total LED Globe	18100160 70%	10088665 73%	5221562 61%	2460844 82%	10034614 65%	8065547 77%	3801085 70%	13175846 69%	1123230 84%	3805338 64%	1818000 67%	11353592 72%	1123230 84%
NET Home Depot/Lowe's / Other Large Home Improvement	8676297 34%	4795343 35%	2378935 28%	1172930 39%	4567047 30%	4109250 39%	1842906 34%	5955826 31%	877565 66% GH	1757037 30%	896400 33%	5145296 33%	877565 66% JKL
Home Depot or Lowe’s	8259904 32%	4406625 32%	2363431 27%	1160759 39%	4510580 29%	3749323 36%	1817530 33%	5632144 30%	810230 61% GH	1467891 25%	836488 31%	5145296 33%	810230 61% JKL
Other Large Home Improvement Store	416393 2%	388718 3% CD	15504 *%	12171 *%	56466 *%	359927 3% E	25377 *%	323681 2% G	67335 5% GH	289146 5%	59912 2%	-	67335 5% K
Membership Club (Costco or Sam's Club)	3678615 14%	2100071 15%	1210505 14%	368038 12%	2260509 15%	1418106 14%	851196 16% I	2774398 15% I	53021 4%	559669 9%	285176 11% M	2780748 18% M	53021 4%
Mass Merchandise (Wal-Mart or Target)	1187762 5%	753900 5% C	265841 3%	168021 6%	754100 5%	433661 4%	486802 9% HI	685082 4% I	15877 1%	431356 7% LM	300123 11% LM	440406 3% M	15877 1%
Small Hardware Store	1057207 4%	730187 5%	203457 2%	123563 4%	382907 2%	674299 6% E	57380 1%	931548 5% G	68279 5% G	128087 2%	73429 3%	787412 5%	68279 5%
NET Convenience Store/Grocery Store	67541 *%	57431 *% C	10110 *%	-	62633 *% F	4909 *%	38119 1%	-	29422 2%	38119 1%	-	-	29422 2%
Convenience Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Grocery Store	67541 *%	57431 *% C	10110 *%	-	62633 *% F	4909 *%	38119 1%	-	29422 2%	38119 1%	-	-	29422 2%
Discount Store	284747 1%	9475 *%	275272 3% B	-	272842 2%	11905 *%	9475 *%	275272 1%	-	284747 5%	-	-	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL4_TOT Number of globe bulbs purchased

Total

VOLUMETRIC BASE = TOTAL NUMBER OF GLOBE BULBS PURCHASED [GL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Lighting and Electronics Store	548218 2%	495896 4% C	52322 1%	-	66664 *%	481555 5%	-	548218 3%	-	52322 1%	22074 1%	473822 3% J	-
Drug Store	2596 *%	-	2596 *%	-	-	2596 *%	2596 *%	-	-	2212 *%	384 *%	-	-
NET Online Purchase / Retail Store Website	2310774 9%	1093561 8%	781489 9%	435724 14%	1642645 11%	668129 6%	472081 9%	1759626 9%	79066 6%	306685 5%	224647 8%	1700376 11%	79066 6%
Online Purchase from Online Retailer	2262694 9%	1055063 8%	781489 9%	426142 14%	1604146 10%	658547 6%	462500 8%	1721127 9%	79066 6%	306685 5%	224647 8%	1652295 10%	79066 6%
Retail Store Website	48080 *%	38499 *%	-	9582 *%	38499 *%	9582 *%	9582 *%	38499 *%	-	-	-	48080 *%	-
Other	286404 1%	52801 *%	41034 *%	192569 6%	25267 *%	261136 2%	40529 1%	245875 1%	-	245105 4%	15767 1%	25532 *%	-
Total Incandescent/Halogen Globe	4268394 17%	2403584 17%	1555712 18%	309098 10%	2709576 18%	1558817 15%	865155 16%	3271995 17%	131244 10%	1180369 20%	545115 20% M	2411665 15%	131244 10%
NET Home Depot/Lowe's / Other Large Home Improvement	1840594 7%	974142 7%	625535 7%	240917 8%	1223248 8%	617346 6%	282380 5%	1477452 8%	80762 6%	302516 5%	252856 9% J	1204461 8%	80762 6%
Home Depot or Lowe’s	1817574 7%	960138 7%	616519 7%	240917 8%	1209244 8%	608330 6%	259360 5%	1477452 8%	80762 6%	302516 5%	252856 9% J	1181440 7%	80762 6%
Other Large Home Improvement Store	23021 *%	14004 *%	9017 *%	-	14004 *%	9017 *%	23021 *%	-	-	-	-	23021 *%	-
Membership Club (Costco or Sam's Club)	384208 1%	260789 2%	123420 1%	-	384208 3%	-	63093 1%	305239 2%	15877 1%	31530 1%	100465 4% L	236337 1% J	15877 1%
Mass Merchandise (Wal-Mart or Target)	679127 3%	590417 4% CD	79571 1% D	9138 *%	379502 2%	299625 3%	283611 5% HI	376787 2%	18729 1%	180020 3%	88078 3% M	392300 2%	18729 1%
Small Hardware Store	250631 1%	63727 *%	156606 2% B	30298 1% B	77965 1%	172666 2% E	19817 *%	230813 1% G	-	78943 1% L	64055 2% JL	107633 1%	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL4_TOT Number of globe bulbs purchased

Total

VOLUMETRIC BASE = TOTAL NUMBER OF GLOBE BULBS PURCHASED [GL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
NET Convenience Store/Grocery Store	298087 1%	297702 2% C	384 *%	-	-	298087 3%	13793 *%	284294 1%	-	-	13793 1%	284294 2%	-
Convenience Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Grocery Store	298087 1%	297702 2% C	384 *%	-	-	298087 3%	13793 *%	284294 1%	-	-	13793 1%	284294 2%	-
Discount Store	579054 2%	103896 1%	446413 5%	28745 1%	515919 3%	63135 1%	133154 2%	445900 2%	-	454246 8%	513 *%	124296 1%	-
Lighting and Electronics Store	50474 *%	35009 *%	15464 *%	-	35009 *%	15464 *%	35009 1%	15464 *%	-	15464 *%	-	35009 *%	-
Drug Store	22425 *%	6704 *%	15721 *% B	-	-	22425 *%	6961 *%	15464 *%	-	15464 *%	6961 *%	-	-
NET Online Purchase / Retail Store Website	163794 1%	71196 1%	92598 1% B	-	93725 1%	70069 1%	27336 1%	120581 1%	15877 1% GH	102187 2% KL	18395 1% L	27336 *%	15877 1% L
Online Purchase from Online Retailer	138262 1%	45664 *%	92598 1% B	-	93725 1%	44537 *%	1803 *%	120581 1% G	15877 1% H	102187 2% KL	18395 1%	1803 *%	15877 1%
Retail Store Website	25532 *%	25532 *%	-	-	-	25532 *%	25532 *%	-	-	-	-	25532 *%	-
Other	-	-	-	-	-	-	-	-	-	-	-	-	-
Total CFL Globe	3436251 13%	1372189 10%	1824721 21%	239342 8%	2583490 17%	852761 8%	780113 14%	2572787 14%	83351 6%	959018 16%	335225 12%	2058657 13%	83351 6%
NET Home Depot/Lowe's / Other Large Home Improvement	1760378 7%	737001 5%	843667 10%	179710 6%	1141705 7%	618673 6%	467978 9%	1255609 7%	36791 3%	201702 3%	127993 5%	1393892 9% J	36791 3%
Home Depot or Lowe’s	1752964 7%	731638 5%	841617 10%	179710 6%	1141705 7%	611259 6%	460564 8%	1255609 7%	36791 3%	201702 3%	120579 4%	1393892 9% J	36791 3%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL4_TOT Number of globe bulbs purchased

Total

VOLUMETRIC BASE = TOTAL NUMBER OF GLOBE BULBS PURCHASED [GL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Other Large Home Improvement Store	7414 *%	5364 *%	2050 *%	-	-	7414 *%	7414 *%	-	-	-	7414 *%	-	-
Membership Club (Costco or Sam's Club)	537279 2%	320555 2% D	187650 2% D	29075 1%	484003 3% F	53276 1%	60354 1%	476926 3% G	-	180572 3%	-	356708 2%	-
Mass Merchandise (Wal-Mart or Target)	404753 2%	296976 2% D	88057 1%	19720 1%	251024 2%	153729 1%	203363 4% HI	189482 1%	11908 1%	260511 4% LM	60884 2% L	71451 *%	11908 1% L
Small Hardware Store	64580 *%	-	53743 1%	10837 *%	55892 *%	8688 *%	36999 1% H	16744 *%	10837 1% H	1475 *%	16744 1% L	35524 *%	10837 1% JL
NET Convenience Store/Grocery Store	43201 *%	1341 *%	41860 *%	-	41860 *%	1341 *%	1341 *%	41860 *%	-	-	43201 2%	-	-
Convenience Store	1341 *%	1341 *%	-	-	-	1341 *%	1341 *%	-	-	-	1341 *%	-	-
Grocery Store	41860 *%	-	41860 *%	-	41860 *%	-	-	41860 *%	-	-	41860 2%	-	-
Discount Store	87579 *%	-	87579 1%	-	86842 1% F	737 *%	3858 *%	83721 *%	-	3858 *%	83721 3%	-	-
Lighting and Electronics Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Drug Store	16316 *%	16316 *%	-	-	-	16316 *%	2682 *%	13634 *%	-	13634 *%	2682 *%	-	-
NET Online Purchase / Retail Store Website	432984 2%	-	432984 5%	-	432984 3%	-	3539 *%	405630 2%	23815 2%	208087 4% L	-	201082 1%	23815 2%
Online Purchase from Online Retailer	432984 2%	-	432984 5%	-	432984 3%	-	3539 *%	405630 2%	23815 2%	208087 4% L	-	201082 1%	23815 2%
Retail Store Website	-	-	-	-	-	-	-	-	-	-	-	-	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL4_TOT Number of globe bulbs purchased

Total

VOLUMETRIC BASE = TOTAL NUMBER OF GLOBE BULBS PURCHASED [GL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Other	89180	-	89180	-	89180	-	-	89180	-	89180	-	-	-
	*%		1%		1%			*%		2%			

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL4_LED Number of globe bulbs purchased

LED

VOLUMETRIC BASE = TOTAL NUMBER OF LED GLOBE BULBS PURCHASED [GL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Total LED Globe	18100160 100%	10088665 100%	5221562 100%	2460844 100%	10034614 100%	8065547 100%	3801085 100%	13175846 100%	1123230 100%	3805338 100%	1818000 100%	11353592 100%	1123230 100%
NET Home Depot/Lowe's / Other Large Home Improvement	8676297 48%	4795343 48%	2378935 46%	1172930 48%	4567047 46%	4109250 51%	1842906 48%	5955826 45%	877565 78% GH	1757037 46%	896400 49%	5145296 45%	877565 78% JKL
Home Depot or Lowe’s	8259904 46%	4406625 44%	2363431 45%	1160759 47%	4510580 45%	3749323 46%	1817530 48%	5632144 43%	810230 72% GH	1467891 39%	836488 46%	5145296 45%	810230 72% JK
Other Large Home Improvement Store	416393 2%	388718 4% CD	15504 *%	12171 *%	56466 1%	359927 4% E	25377 1%	323681 2% G	67335 6% GH	289146 8%	59912 3%	-	67335 6% K
Membership Club (Costco or Sam's Club)	3678615 20%	2100071 21%	1210505 23%	368038 15%	2260509 23%	1418106 18%	851196 22% I	2774398 21% I	53021 5%	559669 15%	285176 16% M	2780748 24% M	53021 5%
Mass Merchandise (Wal-Mart or Target)	1187762 7%	753900 7%	265841 5%	168021 7%	754100 8%	433661 5%	486802 13% HI	685082 5% I	15877 1%	431356 11% LM	300123 17% LM	440406 4% M	15877 1%
Small Hardware Store	1057207 6%	730187 7%	203457 4%	123563 5%	382907 4%	674299 8% E	57380 2%	931548 7% G	68279 6%	128087 3%	73429 4%	787412 7%	68279 6%
NET Convenience Store/Grocery Store	67541 *%	57431 1% C	10110 *%	-	62633 1% F	4909 *%	38119 1%	-	29422 3%	38119 1%	-	-	29422 3%
Convenience Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Grocery Store	67541 *%	57431 1% C	10110 *%	-	62633 1% F	4909 *%	38119 1%	-	29422 3%	38119 1%	-	-	29422 3%
Discount Store	284747 2%	9475 *%	275272 5% B	-	272842 3%	11905 *%	9475 *%	275272 2%	-	284747 7%	-	-	-
Lighting and Electronics Store	548218 3%	495896 5% C	52322 1%	-	66664 1%	481555 6%	-	548218 4%	-	52322 1%	22074 1%	473822 4% J	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL4_LED Number of globe bulbs purchased

LED

VOLUMETRIC BASE = TOTAL NUMBER OF LED GLOBE BULBS PURCHASED [GL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Drug Store	2596 *%	-	2596 *%	-	-	2596 *%	2596 *%	-	-	2212 *%	384 *%	-	-
NET Online Purchase / Retail Store Website	2310774 13%	1093561 11%	781489 15%	435724 18%	1642645 16%	668129 8%	472081 12%	1759626 13%	79066 7%	306685 8%	224647 12%	1700376 15%	79066 7%
Online Purchase from Online Retailer	2262694 13%	1055063 10%	781489 15%	426142 17%	1604146 16%	658547 8%	462500 12%	1721127 13%	79066 7%	306685 8%	224647 12%	1652295 15%	79066 7%
Retail Store Website	48080 *%	38499 *%	-	9582 *%	38499 *%	9582 *%	9582 *%	38499 *%	-	-	-	48080 *%	-
Other	286404 2%	52801 1%	41034 1%	192569 8%	25267 *%	261136 3%	40529 1%	245875 2%	-	245105 6%	15767 1%	25532 *%	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL4_IH Number of globe bulbs purchased

Incandescent/Halogen

VOLUMETRIC BASE = TOTAL NUMBER OF INCANDESCENT/HALOGEN GLOBE BULBS PURCHASED [GL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Total Incandescent/Halogen Globe	4268394 100%	2403584 100%	1555712 100%	309098 100%	2709576 100%	1558817 100%	865155 100%	3271995 100%	131244 100%	1180369 100%	545115 100%	2411665 100%	131244 100%
NET Home Depot/Lowe's / Other Large Home Improvement	1840594 43%	974142 41%	625535 40%	240917 78% BC	1223248 45%	617346 40%	282380 33%	1477452 45%	80762 62% G	302516 26%	252856 46% J	1204461 50% J	80762 62% J
Home Depot or Lowe’s	1817574 43%	960138 40%	616519 40%	240917 78% BC	1209244 45%	608330 39%	259360 30%	1477452 45%	80762 62% G	302516 26%	252856 46% J	1181440 49% J	80762 62% J
Other Large Home Improvement Store	23021 1%	14004 1%	9017 1%	-	14004 1%	9017 1%	23021 3%	-	-	-	-	23021 1%	-
Membership Club (Costco or Sam's Club)	384208 9%	260789 11%	123420 8%	-	384208 14%	-	63093 7%	305239 9%	15877 12% G	31530 3%	100465 18% L	236337 10% J	15877 12%
Mass Merchandise (Wal-Mart or Target)	679127 16%	590417 25% CD	79571 5%	9138 3%	379502 14%	299625 19%	283611 33% HI	376787 12%	18729 14%	180020 15%	88078 16%	392300 16%	18729 14%
Small Hardware Store	250631 6%	63727 3%	156606 10% B	30298 10% B	77965 3%	172666 11% E	19817 2%	230813 7% G	-	78943 7%	64055 12% JL	107633 4%	-
NET Convenience Store/Grocery Store	298087 7%	297702 12% C	384 *%	-	-	298087 19%	13793 2%	284294 9%	-	-	13793 3%	284294 12%	-
Convenience Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Grocery Store	298087 7%	297702 12% C	384 *%	-	-	298087 19%	13793 2%	284294 9%	-	-	13793 3%	284294 12%	-
Discount Store	579054 14%	103896 4%	446413 29%	28745 9% B	515919 19%	63135 4%	133154 15%	445900 14%	-	454246 38%	513 *%	124296 5%	-
Lighting and Electronics Store	50474 1%	35009 1%	15464 1%	-	35009 1%	15464 1%	35009 4%	15464 *%	-	15464 1%	-	35009 1%	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL4_IH Number of globe bulbs purchased

Incandescent/Halogen

VOLUMETRIC BASE = TOTAL NUMBER OF INCANDESCENT/HALOGEN GLOBE BULBS PURCHASED [GL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Drug Store	22425 1%	6704 *%	15721 1% B	-	-	22425 1%	6961 1%	15464 *%	-	15464 1%	6961 1%	-	-
NET Online Purchase / Retail Store Website	163794 4%	71196 3%	92598 6% B	-	93725 3%	70069 4%	27336 3%	120581 4%	15877 12% GH	102187 9% KL	18395 3% L	27336 1%	15877 12% JL
Online Purchase from Online Retailer	138262 3%	45664 2%	92598 6% B	-	93725 3%	44537 3%	1803 *%	120581 4% G	15877 12% H	102187 9% KL	18395 3%	1803 *%	15877 12% J
Retail Store Website	25532 1%	25532 1%	-	-	-	25532 2%	25532 3%	-	-	-	-	25532 1%	-
Other	-	-	-	-	-	-	-	-	-	-	-	-	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL4_CFL Number of globe bulbs purchased

CFL

VOLUMETRIC BASE = TOTAL NUMBER OF CFL GLOBE BULBS PURCHASED [GL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Total CFL Globe	3436251 100%	1372189 100%	1824721 100%	239342 100%	2583490 100%	852761 100%	780113 100%	2572787 100%	83351 100%	959018 100%	335225 100%	2058657 100%	83351 100%
NET Home Depot/Lowe's / Other Large Home Improvement	1760378 51%	737001 54%	843667 46%	179710 75%	1141705 44%	618673 73%	467978 60%	1255609 49%	36791 44%	201702 21%	127993 38%	1393892 68% J	36791 44%
Home Depot or Lowe’s	1752964 51%	731638 53%	841617 46%	179710 75%	1141705 44%	611259 72%	460564 59%	1255609 49%	36791 44%	201702 21%	120579 36%	1393892 68% J	36791 44%
Other Large Home Improvement Store	7414 *%	5364 *%	2050 *%	-	-	7414 1%	7414 1%	-	-	-	7414 2%	-	-
Membership Club (Costco or Sam's Club)	537279 16%	320555 23% CD	187650 10%	29075 12%	484003 19% F	53276 6%	60354 8%	476926 19% G	-	180572 19%	-	356708 17%	-
Mass Merchandise (Wal-Mart or Target)	404753 12%	296976 22% CD	88057 5%	19720 8%	251024 10%	153729 18%	203363 26% H	189482 7%	11908 14% H	260511 27% L	60884 18% L	71451 3%	11908 14% L
Small Hardware Store	64580 2%	-	53743 3%	10837 5%	55892 2%	8688 1%	36999 5% H	16744 1%	10837 13% GH	1475 *%	16744 5% JL	35524 2%	10837 13% JL
NET Convenience Store/Grocery Store	43201 1%	1341 *%	41860 2%	-	41860 2%	1341 *%	1341 *%	41860 2%	-	-	43201 13%	-	-
Convenience Store	1341 *%	1341 *%	-	-	-	1341 *%	1341 *%	-	-	-	1341 *%	-	-
Grocery Store	41860 1%	-	41860 2%	-	41860 2%	-	-	41860 2%	-	-	41860 12%	-	-
Discount Store	87579 3%	-	87579 5%	-	86842 3% F	737 *%	3858 *%	83721 3%	-	3858 *%	83721 25%	-	-
Lighting and Electronics Store	-	-	-	-	-	-	-	-	-	-	-	-	-
Drug Store	16316 *%	16316 1%	-	-	-	16316 2%	2682 *%	13634 1%	-	13634 1%	2682 1%	-	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL4_CFL Number of globe bulbs purchased

CFL

VOLUMETRIC BASE = TOTAL NUMBER OF CFL GLOBE BULBS PURCHASED [GL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
NET Online Purchase / Retail Store Website	432984 13%	-	432984 24%	-	432984 17%	-	3539 *%	405630 16%	23815 29%	208087 22% L	-	201082 10%	23815 29% L
Online Purchase from Online Retailer	432984 13%	-	432984 24%	-	432984 17%	-	3539 *%	405630 16%	23815 29%	208087 22% L	-	201082 10%	23815 29% L
Retail Store Website	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	89180 3%	-	89180 5%	-	89180 3%	-	-	89180 3%	-	89180 9%	-	-	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL5_1 How many of the LED globe bulbs you purchased are currently installed at your home (either indoors or outdoors)?

BASE = 1 OR MORE LED GLOBE BULBS PURCHASED [GL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	2392576 100%	1210764 100%	840673 100%	334137 100%	1304435 100%	1088140 100%	422200 100%	1833344 100%	137032 100%	645044 100%	283550 100%	1326949 100%	137032 100%
Unweighted Total	351	123	175	52	183	168	167	141	43	105	95	108	43
None	50713 2%	14764 1%	35949 4%	-	31608 2%	19106 2%	10556 3%	35474 2%	4684 3%	22902 4%	16744 6% L	6383 *%	4684 3%
[NET] 1 or more	2308501 96%	1175646 97%	798986 95%	326868 98%	1253101 96%	1055400 97%	406834 96%	1773288 97%	128379 94%	608508 94%	260087 92%	1311528 99% K	128379 94%
1-2	588901 25%	314400 26%	227423 27%	47078 14%	371856 29%	217045 20%	95636 23%	474787 26%	18478 13%	225213 35% KLM	59175 21%	286035 22%	18478 13%
3-5	705293 29%	288053 24%	263327 31%	153913 46% B	378530 29%	326764 30%	136031 32%	520248 28%	49014 36%	186546 29%	90192 32%	379541 29%	49014 36%
6-9	445802 19%	181288 15%	186296 22%	78218 23%	199904 15%	245898 23%	66345 16%	348484 19%	30972 23%	99648 15%	67185 24%	247996 19%	30972 23%
10 or more	568505 24%	391905 32% CD	121939 15%	47659 14%	302811 23%	265694 24%	108822 26%	429769 23%	29914 22%	97101 15%	43533 15%	397957 30% JK	29914 22%
Don't Know	33361 1%	20354 2%	5739 1%	7269 2%	19727 2%	13634 1%	4810 1%	24582 1%	3969 3%	13634 2%	6719 2%	9038 1%	3969 3%
Mean	6.66	7.39	5.26	6.73	6.88	6.40	7.92	6.33	7.28	4.88	5.24	7.77 J	7.28 JK

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL6 Of the remaining LED globe bulbs you purchased and have not yet installed, how many bulbs do you plan to install at your home within the next year (either indoors or outdoors)?

BASE = LED GLOBE BULBS YET TO BE INSTALLED / QUANTITY CURRENTLY INSTALLED PROVIDED [GL5]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	678063	359969	216433	101661	281346	396717	123122	515624	39317	227481	75049	336216	39317
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unweighted Total	96	37	46	13	39	57	45	39	12	36	22	26	12
None	126341	83459	19041	23842	27863	98479	9070	112112	5159	24882	18694	77607	5159
	19%	23%	9%	23%	10%	25%	7%	22%	13%	11%	25%	23%	13%
[NET] 1 or more	452303	221395	157682	73226	202082	250221	89342	341189	21771	167051	53728	209752	21771
	67%	62%	73%	72%	72%	63%	73%	66%	55%	73%	72%	62%	55%
1	130938	28360	68357	34220	76066	54872	22434	97381	11123	69449	11370	38996	11123
	19%	8%	32%	34%	27%	14%	18%	19%	28%	31%	15%	12%	28%
2	150885	60785	59986	30114	81516	69369	11108	135533	4244	35244	10149	101248	4244
	22%	17%	28%	30%	29%	17%	9%	26%	11%	15%	14%	30%	11%
3 or more	170480	132249	29339	8892	44500	125981	55800	108275	6405	62358	32209	69508	6405
	25%	37%	14%	9%	16%	32%	45% HI	21%	16%	27%	43%	21%	16%
Don't Know	99418	55115	39710	4593	51402	48017	24710	62322	12386	35548	2628	48856	12386
	15%	15%	18%	5%	18%	12%	20%	12%	32%	16%	4%	15%	32% K
Mean	1.97	2.09	2.15	1.30	2.09	1.90	2.82	1.79	1.92	2.09	2.90	1.66	1.92

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL5/GL6-1 Sum of LED globe bulbs currently installed or planned for installation within the next year.

BASE = 1 OR MORE LED GLOBE BULBS PURCHASED [GL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	2392576 100%	1210764 100%	840673 100%	334137 100%	1304435 100%	1088140 100%	422200 100%	1833344 100%	137032 100%	645044 100%	283550 100%	1326949 100%	137032 100%
Unweighted Total	351	123	175	52	183	168	167	141	43	105	95	108	43
None	27811 1%	10591 1%	17220 2%	-	16744 1%	11067 1%	6383 2%	16744 1%	4684 3%	-	16744 6% L	6383 *%	4684 3%
[NET] 1 or more	2231985 93%	1124703 93%	778005 93%	322275 96%	1216563 93%	1015422 93%	386297 91%	1729696 94%	115993 85%	595862 92%	257459 91%	1262672 95%	115993 85%
1-2	469597 20%	259268 21%	172798 21%	37531 11%	302673 23%	166924 15%	73768 17%	384029 21% I	11800 9%	191374 30% KLM	44061 16%	222362 17%	11800 9%
3-5	704117 29%	261400 22%	284388 34%	158329 47% B	414894 32%	289223 27%	108807 26%	547795 30%	47515 35%	160858 25%	99790 35%	395955 30%	47515 35%
6-9	478429 20%	214690 18%	189228 23%	74512 22%	203523 16%	274906 25%	90993 22%	360708 20%	26729 20%	132526 21%	57066 20%	262108 20%	26729 20%
10 or more	579842 24%	389346 32% CD	131591 16%	51903 16%	295473 23%	284369 26%	112730 27%	437163 24%	29949 22%	111104 17%	56543 20%	382246 29%	29949 22%
Don't Know	132780 6%	75469 6%	45449 5%	11862 4%	71128 5%	61651 6%	29520 7%	86904 5%	16355 12%	49182 8%	9347 3%	57895 4%	16355 12%
Mean	7.20	7.88	5.89	7.21	7.24	7.16	8.99 H	6.76	7.76	5.77	6.00	8.08	7.76

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GL5/GL6-2 Installation Rate (Percentage of LED globe bulbs purchased that are currently installed or planned for installation.)

BASE = 1 OR MORE LED GLOBE BULBS PURCHASED [GL4]

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	2392576 100%	1210764 100%	840673 100%	334137 100%	1304435 100%	1088140 100%	422200 100%	1833344 100%	137032 100%	645044 100%	283550 100%	1326949 100%	137032 100%
Unweighted Total	351	123	175	52	183	168	167	141	43	105	95	108	43
100%	1962762 82%	1003081 83%	685905 82%	266773 80%	1090215 84%	872546 80%	356801 85%	1494413 82%	111548 81%	527722 82%	241727 85%	1081764 82%	111548 81%
51-99%	256395 11%	109771 9%	91122 11%	55502 17%	115229 9%	141166 13%	27178 6%	224773 12% I	4445 3%	57261 9%	13782 5%	180907 14% KM	4445 3%
0-50%	40639 2%	22442 2%	18197 2%	-	27863 2%	12776 1%	8701 2%	27254 1%	4684 3%	10879 2%	18694 7% L	6383 *%	4684 3%
Don't Know	132780 6%	75469 6%	45449 5%	11862 4%	71128 5%	61651 6%	29520 7%	86904 5%	16355 12%	49182 8%	9347 3%	57895 4%	16355 12%
Mean	95.80	96.45	94.39	96.92	95.53	96.13	96.70	95.66	94.97	96.51	92.16	96.34	94.97

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Reflector Purchasing Game

Weighted Table

BASE = ALL RESPONDENTS ASKED

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	9179146 100%	4276533 100%	3754488 100%	1135282 100%	5081471 100%	4097675 100%	1387816 100%	7302756 100%	488573 100%	2225494 100%	1108662 100%	5356417 100%	488573 100%
Unweighted Total	1333	415	687	227	686	647	600	559	174	382	382	395	174
Grocery	2184391 24%	1064895 25%	883158 24%	232663 20%	1129124 22%	1055267 26%	356195 26% I	1744641 24%	83555 17%	621464 28% M	266962 24%	1212411 23%	83555 17%
Discount	2351867 26%	879663 21%	1075240 29% B	393098 35% B	1404671 28%	947196 23%	355371 26%	1874970 26%	121526 25%	742098 33% KLM	278794 25%	1209450 23%	121526 25%
Hardware	1229229 13%	626556 15%	444342 12%	158331 14%	625783 12%	603446 15%	187536 14% I	1012788 14% I	28905 6%	278040 12% M	186684 17% M	735600 14% M	28905 6%
Home Improvement	3413659 37%	1705419 40%	1351748 36%	351190 31%	1921893 38%	1491766 36%	488714 35%	2670357 37%	254588 52% GH	583892 26%	376223 34% J	2198956 41% J	254588 52% JKL

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Reflector Purchasing Game

Unweighted Table

BASE = ALL RESPONDENTS ASKED

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	1333 100%	415 100%	687 100%	227 100%	686 100%	647 100%	600 100%	559 100%	174 100%	382 100%	382 100%	395 100%	174 100%
Unweighted Total	1333	415	687	227	686	647	600	559	174	382	382	395	174
Grocery	326 24%	108 26%	155 23%	61 27%	158 23%	168 26%	150 25%	141 25%	35 20%	118 31% KLM	86 23%	87 22%	35 20%
Discount	324 24%	103 25%	159 23%	61 27%	177 26%	147 23%	140 23%	142 25%	42 24%	116 30% KL	84 22%	82 21%	42 24%
Hardware	172 13%	58 14%	85 12%	29 13%	73 11%	99 15% E	81 14% I	78 14% I	13 7%	44 12%	64 17% JM	51 13% M	13 7%
Home Improvement	511 38%	146 35%	288 42% BD	76 33%	278 41% F	233 36%	229 38%	198 35%	84 48% GH	104 27%	148 39% J	175 44% J	84 48% JK

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Price1

BASE = ALL RESPONDENTS ASKED

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	9179146 100%	4276533 100%	3754488 100%	1135282 100%	5081471 100%	4097675 100%	1387816 100%	7302756 100%	488573 100%	2225494 100%	1108662 100%	5356417 100%	488573 100%
Unweighted Total	1333	415	687	227	686	647	600	559	174	382	382	395	174
$9.15	2184391 24%	1064895 25%	883158 24%	232663 20%	1129124 22%	1055267 26%	356195 26% I	1744641 24%	83555 17%	621464 28% M	266962 24%	1212411 23%	83555 17%
$1.35	2351867 26%	879663 21%	1075240 29% B	393098 35% B	1404671 28%	947196 23%	355371 26%	1874970 26%	121526 25%	742098 33% KLM	278794 25%	1209450 23%	121526 25%
$6.40	1229229 13%	626556 15%	444342 12%	158331 14%	625783 12%	603446 15%	187536 14% I	1012788 14% I	28905 6%	278040 12% M	186684 17% M	735600 14% M	28905 6%
$3.70	3413659 37%	1705419 40%	1351748 36%	351190 31%	1921893 38%	1491766 36%	488714 35%	2670357 37%	254588 52% GH	583892 26%	376223 34% J	2198956 41% J	254588 52% JKL

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Price2

BASE = ALL RESPONDENTS ASKED

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	9179146 100%	4276533 100%	3754488 100%	1135282 100%	5081471 100%	4097675 100%	1387816 100%	7302756 100%	488573 100%	2225494 100%	1108662 100%	5356417 100%	488573 100%
Unweighted Total	1333	415	687	227	686	647	600	559	174	382	382	395	174
$5.85	2184391 24%	1064895 25%	883158 24%	232663 20%	1129124 22%	1055267 26%	356195 26% I	1744641 24%	83555 17%	621464 28% M	266962 24%	1212411 23%	83555 17%
$1.20	2351867 26%	879663 21%	1075240 29% B	393098 35% B	1404671 28%	947196 23%	355371 26%	1874970 26%	121526 25%	742098 33% KLM	278794 25%	1209450 23%	121526 25%
$6.00	1229229 13%	626556 15%	444342 12%	158331 14%	625783 12%	603446 15%	187536 14% I	1012788 14% I	28905 6%	278040 12% M	186684 17% M	735600 14% M	28905 6%
$4.05	3413659 37%	1705419 40%	1351748 36%	351190 31%	1921893 38%	1491766 36%	488714 35%	2670357 37%	254588 52% GH	583892 26%	376223 34% J	2198956 41% J	254588 52% JKL

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Price3

BASE = ALL RESPONDENTS ASKED

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	9179146 100%	4276533 100%	3754488 100%	1135282 100%	5081471 100%	4097675 100%	1387816 100%	7302756 100%	488573 100%	2225494 100%	1108662 100%	5356417 100%	488573 100%
Unweighted Total	1333	415	687	227	686	647	600	559	174	382	382	395	174
$0.60	2184391 24%	1064895 25%	883158 24%	232663 20%	1129124 22%	1055267 26%	356195 26% I	1744641 24%	83555 17%	621464 28% M	266962 24%	1212411 23%	83555 17%
$0.50	2351867 26%	879663 21%	1075240 29% B	393098 35% B	1404671 28%	947196 23%	355371 26%	1874970 26%	121526 25%	742098 33% KLM	278794 25%	1209450 23%	121526 25%
$5.65	1229229 13%	626556 15%	444342 12%	158331 14%	625783 12%	603446 15%	187536 14% I	1012788 14% I	28905 6%	278040 12% M	186684 17% M	735600 14% M	28905 6%
$3.80	3413659 37%	1705419 40%	1351748 36%	351190 31%	1921893 38%	1491766 36%	488714 35%	2670357 37%	254588 52% GH	583892 26%	376223 34% J	2198956 41% J	254588 52% JKL

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Price4

BASE = ALL RESPONDENTS ASKED

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	9179146 100%	4276533 100%	3754488 100%	1135282 100%	5081471 100%	4097675 100%	1387816 100%	7302756 100%	488573 100%	2225494 100%	1108662 100%	5356417 100%	488573 100%
Unweighted Total	1333	415	687	227	686	647	600	559	174	382	382	395	174
$5.85	2184391 24%	1064895 25%	883158 24%	232663 20%	1129124 22%	1055267 26%	356195 26% I	1744641 24%	83555 17%	621464 28% M	266962 24%	1212411 23%	83555 17%
$1.20	2351867 26%	879663 21%	1075240 29% B	393098 35% B	1404671 28%	947196 23%	355371 26%	1874970 26%	121526 25%	742098 33% KLM	278794 25%	1209450 23%	121526 25%
$6.00	1229229 13%	626556 15%	444342 12%	158331 14%	625783 12%	603446 15%	187536 14% I	1012788 14% I	28905 6%	278040 12% M	186684 17% M	735600 14% M	28905 6%
$4.05	3413659 37%	1705419 40%	1351748 36%	351190 31%	1921893 38%	1491766 36%	488714 35%	2670357 37%	254588 52% GH	583892 26%	376223 34% J	2198956 41% J	254588 52% JKL

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Candelabra Purchasing Game

Weighted Table

BASE = ALL RESPONDENTS ASKED

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	3310486 100%	1681819 100%	1172223 100%	450666 100%	1794510 100%	1515975 100%	625841 100%	2475907 100%	208738 100%	642668 100%	493490 100%	1965591 100%	208738 100%
Unweighted Total	524	169	278	75	287	237	253	198	73	115	155	181	73
Discount	1454557 44%	719734 43%	506963 43%	222083 49%	717327 40%	737230 49%	284305 45% I	1117509 45% I	52743 25%	337860 53% M	217510 44% M	846444 43% M	52743 25%
Home Improvement	1855929 56%	962086 57%	665260 57%	228583 51%	1077184 60%	778745 51%	341536 55%	1358398 55%	155995 75% GH	304808 47%	275979 56%	1119147 57%	155995 75% JKL

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Candelabra Purchasing Game

Unweighted Table

BASE = ALL RESPONDENTS ASKED

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	524 100%	169 100%	278 100%	75 100%	287 100%	237 100%	253 100%	198 100%	73 100%	115 100%	155 100%	181 100%	73 100%
Unweighted Total	524	169	278	75	287	237	253	198	73	115	155	181	73
Discount	217 41%	65 38%	117 42%	33 44%	118 41%	99 42%	106 42%	87 44% I	24 33%	57 50% M	62 40%	74 41%	24 33%
Home Improvement	307 59%	104 62%	161 58%	42 56%	169 59%	138 58%	147 58%	111 56%	49 67% H	58 50%	93 60%	107 59%	49 67% J

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Price5

BASE = ALL RESPONDENTS ASKED

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	3310486 100%	1681819 100%	1172223 100%	450666 100%	1794510 100%	1515975 100%	625841 100%	2475907 100%	208738 100%	642668 100%	493490 100%	1965591 100%	208738 100%
Unweighted Total	524	169	278	75	287	237	253	198	73	115	155	181	73
$1.85	1454557 44%	719734 43%	506963 43%	222083 49%	717327 40%	737230 49%	284305 45% I	1117509 45% I	52743 25%	337860 53% M	217510 44% M	846444 43% M	52743 25%
$3.05	1855929 56%	962086 57%	665260 57%	228583 51%	1077184 60%	778745 51%	341536 55%	1358398 55%	155995 75% GH	304808 47%	275979 56%	1119147 57%	155995 75% JKL

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Price6

BASE = ALL RESPONDENTS ASKED

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	3310486 100%	1681819 100%	1172223 100%	450666 100%	1794510 100%	1515975 100%	625841 100%	2475907 100%	208738 100%	642668 100%	493490 100%	1965591 100%	208738 100%
Unweighted Total	524	169	278	75	287	237	253	198	73	115	155	181	73
$0.55	1454557 44%	719734 43%	506963 43%	222083 49%	717327 40%	737230 49%	284305 45% I	1117509 45% I	52743 25%	337860 53% M	217510 44% M	846444 43% M	52743 25%
$0.95	1855929 56%	962086 57%	665260 57%	228583 51%	1077184 60%	778745 51%	341536 55%	1358398 55%	155995 75% GH	304808 47%	275979 56%	1119147 57%	155995 75% JKL

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Price7

BASE = ALL RESPONDENTS ASKED

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	3310486 100%	1681819 100%	1172223 100%	450666 100%	1794510 100%	1515975 100%	625841 100%	2475907 100%	208738 100%	642668 100%	493490 100%	1965591 100%	208738 100%
Unweighted Total	524	169	278	75	287	237	253	198	73	115	155	181	73
$0.25	1454557 44%	719734 43%	506963 43%	222083 49%	717327 40%	737230 49%	284305 45% I	1117509 45% I	52743 25%	337860 53% M	217510 44% M	846444 43% M	52743 25%
$4.15	1855929 56%	962086 57%	665260 57%	228583 51%	1077184 60%	778745 51%	341536 55%	1358398 55%	155995 75% GH	304808 47%	275979 56%	1119147 57%	155995 75% JKL

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Price8

BASE = ALL RESPONDENTS ASKED

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	3310486 100%	1681819 100%	1172223 100%	450666 100%	1794510 100%	1515975 100%	625841 100%	2475907 100%	208738 100%	642668 100%	493490 100%	1965591 100%	208738 100%
Unweighted Total	524	169	278	75	287	237	253	198	73	115	155	181	73
$0.55	1454557 44%	719734 43%	506963 43%	222083 49%	717327 40%	737230 49%	284305 45% I	1117509 45% I	52743 25%	337860 53% M	217510 44% M	846444 43% M	52743 25%
$0.95	1855929 56%	962086 57%	665260 57%	228583 51%	1077184 60%	778745 51%	341536 55%	1358398 55%	155995 75% GH	304808 47%	275979 56%	1119147 57%	155995 75% JKL

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Globe Purchasing Game

Weighted Table

BASE = ALL RESPONDENTS ASKED

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	3609807	1841679	1265485	495640	2057157	1552650	688186	2725278	196343	1005713	443335	1964415	196343
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unweighted Total	541	191	261	88	291	250	267	212	62	162	151	166	62
Discount	1554678	855659	488881	210139	861459	693219	319274	1159299	76106	477935	190671	809966	76106
	43%	46%	39%	42%	42%	45%	46%	43%	39%	48%	43%	41%	39%
Home Improvement	2055128	986021	776604	285502	1195697	859431	368912	1565979	120237	527778	252665	1154449	120237
	57%	54%	61%	58%	58%	55%	54%	57%	61%	52%	57%	59%	61%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Globe Purchasing Game

Unweighted Table

BASE = ALL RESPONDENTS ASKED

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	541	191	261	88	291	250	267	212	62	162	151	166	62
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unweighted Total	541	191	261	88	291	250	267	212	62	162	151	166	62
Discount	237	90	110	37	122	115	118	92	27	74	70	66	27
	44%	47%	42%	42%	42%	46%	44%	43%	44%	46%	46%	40%	44%
Home Improvement	304	101	151	51	169	135	149	120	35	88	81	100	35
	56%	53%	58%	58%	58%	54%	56%	57%	56%	54%	54%	60%	56%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Price9

BASE = ALL RESPONDENTS ASKED

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	3609807	1841679	1265485	495640	2057157	1552650	688186	2725278	196343	1005713	443335	1964415	196343
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unweighted Total	541	191	261	88	291	250	267	212	62	162	151	166	62
$1.00	1554678	855659	488881	210139	861459	693219	319274	1159299	76106	477935	190671	809966	76106
	43%	46%	39%	42%	42%	45%	46%	43%	39%	48%	43%	41%	39%
$4.65	2055128	986021	776604	285502	1195697	859431	368912	1565979	120237	527778	252665	1154449	120237
	57%	54%	61%	58%	58%	55%	54%	57%	61%	52%	57%	59%	61%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Price10

BASE = ALL RESPONDENTS ASKED

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	3609807	1841679	1265485	495640	2057157	1552650	688186	2725278	196343	1005713	443335	1964415	196343
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unweighted Total	541	191	261	88	291	250	267	212	62	162	151	166	62
$1.00	1554678	855659	488881	210139	861459	693219	319274	1159299	76106	477935	190671	809966	76106
	43%	46%	39%	42%	42%	45%	46%	43%	39%	48%	43%	41%	39%
$3.25	2055128	986021	776604	285502	1195697	859431	368912	1565979	120237	527778	252665	1154449	120237
	57%	54%	61%	58%	58%	55%	54%	57%	61%	52%	57%	59%	61%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Price11

BASE = ALL RESPONDENTS ASKED

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	3609807	1841679	1265485	495640	2057157	1552650	688186	2725278	196343	1005713	443335	1964415	196343
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unweighted Total	541	191	261	88	291	250	267	212	62	162	151	166	62
$0.50	1554678	855659	488881	210139	861459	693219	319274	1159299	76106	477935	190671	809966	76106
	43%	46%	39%	42%	42%	45%	46%	43%	39%	48%	43%	41%	39%
$2.90	2055128	986021	776604	285502	1195697	859431	368912	1565979	120237	527778	252665	1154449	120237
	57%	54%	61%	58%	58%	55%	54%	57%	61%	52%	57%	59%	61%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Price12

BASE = ALL RESPONDENTS ASKED

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	3609807	1841679	1265485	495640	2057157	1552650	688186	2725278	196343	1005713	443335	1964415	196343
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unweighted Total	541	191	261	88	291	250	267	212	62	162	151	166	62
$1.00	1554678	855659	488881	210139	861459	693219	319274	1159299	76106	477935	190671	809966	76106
	43%	46%	39%	42%	42%	45%	46%	43%	39%	48%	43%	41%	39%
$3.25	2055128	986021	776604	285502	1195697	859431	368912	1565979	120237	527778	252665	1154449	120237
	57%	54%	61%	58%	58%	55%	54%	57%	61%	52%	57%	59%	61%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RG1A_1 Which bulb would you buy at the following prices?

Reflector without program

BASE = PLAYED GROCERY GAME

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	2184391 100%	1064895 100%	883158 100%	232663 100%	1129124 100%	1055267 100%	356195 100%	1744641 100%	83555 100%	621464 100%	266962 100%	1212411 100%	83555 100%
Unweighted Total	326	108	155	61	158	168	150	141	35	118	86	87	35
LED Reflector for $9.15	1161215 53%	598363 56%	424998 48%	135227 58%	643362 57%	517853 49%	210337 59%	885565 51%	65313 78% GH	346030 56%	153526 58%	596345 49%	65313 78% JKL
Incandescent/Halogen Reflector for $5.85	1023176 47%	466532 44%	458160 52%	97436 42%	485762 43%	537414 51%	145858 41% I	859076 49% I	18242 22%	275433 44% M	113435 42% M	616066 51% M	18242 22%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RG1A_2 Which bulb would you buy at the following prices?

Reflector without program

BASE = PLAYED DISCOUNT GAME

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	2351867	879663	1075240	393098	1404671	947196	355371	1874970	121526	742098	278794	1209450	121526
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unweighted Total	324	103	159	61	177	147	140	142	42	116	84	82	42
LED Reflector for $1.35	1615015	572145	712615	326388	889868	725147	190759	1323954	100302	532540	213452	768721	100302
	69%	65%	66%	83% B	63%	77%	54%	71% G	83% G	72%	77%	64%	83% L
Incandescent/Halogen Reflector for $1.20	736852	307518	362625	66710	514803	222049	164613	551016	21223	209558	65342	440729	21223
	31%	35% D	34%	17%	37%	23%	46% HI	29%	17%	28%	23%	36% M	17%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RG1A_3 Which bulb would you buy at the following prices?

Reflector without program

BASE = PLAYED HARDWARE GAME

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	1229229	626556	444342	158331	625783	603446	187536	1012788	28905	278040	186684	735600	28905
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unweighted Total	172	58	85	29	73	99	81	78	13	44	64	51	13
LED Reflector for $6.40	1012918	491184	405443	116291	508766	504152	135102	859834	17983	207465	132610	654860	17983
	82%	78%	91%	73%	81%	84%	72%	85%	62%	75%	71%	89%	62%
Incandescent/Halogen Reflector for $6.00	216310	135372	38899	42039	117017	99294	52434	152954	10922	70575	54074	80740	10922
	18%	22%	9%	27%	19%	16%	28%	15%	38%	25%	29%	11%	38%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RG1A_4 Which bulb would you buy at the following prices?

Reflector without program

BASE = PLAYED HOME IMPROVEMENT GAME

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	3413659	1705419	1351748	351190	1921893	1491766	488714	2670357	254588	583892	376223	2198956	254588
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unweighted Total	511	146	288	76	278	233	229	198	84	104	148	175	84
LED Reflector for $3.70	2643398	1313925	998193	325979	1448806	1194592	385325	2028656	229417	533985	284615	1595382	229417
	77%	77%	74%	93%	75%	80%	79%	76%	90%	91%	76%	73%	90%
				BC					GH	KL			KL
Incandescent/Halogen Reflector for $4.05	770261	391495	353554	25212	473087	297174	103389	641701	25171	49907	91608	603575	25171
	23%	23%	26%	7%	25%	20%	21%	24%	10%	9%	24%	27%	10%
		D	D				I	I			JM	JM	

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RG1B_1 Which bulb would you buy at the following prices?

Reflector with program

BASE = PLAYED GROCERY GAME

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	2184391	1064895	883158	232663	1129124	1055267	356195	1744641	83555	621464	266962	1212411	83555
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unweighted Total	326	108	155	61	158	168	150	141	35	118	86	87	35
LED Reflector for $0.60	1677636	810288	698825	165895	903564	774072	303681	1304434	69521	488396	220912	898807	69521
	77%	76%	79%	71%	80%	73%	85%	75%	83%	79%	83%	74%	83%
Incandescent/Halogen Reflector for $5.85	506755	254607	184332	66768	225560	281195	52515	440207	14034	133068	46050	313604	14034
	23%	24%	21%	29%	20%	27%	15%	25%	17%	21%	17%	26%	17%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RG1B_2 Which bulb would you buy at the following prices?

Reflector with program

BASE = PLAYED DISCOUNT GAME

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	2351867 100%	879663 100%	1075240 100%	393098 100%	1404671 100%	947196 100%	355371 100%	1874970 100%	121526 100%	742098 100%	278794 100%	1209450 100%	121526 100%
Unweighted Total	324	103	159	61	177	147	140	142	42	116	84	82	42
LED Reflector for $0.50	1729577 74%	620295 71%	771620 72%	333796 85%	941770 67%	787807 83% E	218747 62%	1420902 76% G	89928 74%	529057 71%	232887 84%	877705 73%	89928 74%
Incandescent/Halogen Reflector for $1.20	622290 26%	259367 29%	303620 28%	59302 15%	462901 33% F	159389 17%	136624 38% H	454068 24%	31598 26%	213041 29%	45906 16%	331745 27%	31598 26%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RG1B_3 Which bulb would you buy at the following prices?

Reflector with program

BASE = PLAYED HARDWARE GAME

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	1229229 100%	626556 100%	444342 100%	158331 100%	625783 100%	603446 100%	187536 100%	1012788 100%	28905 100%	278040 100%	186684 100%	735600 100%	28905 100%
Unweighted Total	172	58	85	29	73	99	81	78	13	44	64	51	13
LED Reflector for $5.65	1060239 86%	549723 88%	397790 90%	112727 71%	563286 90%	496954 82%	149485 80%	886569 88%	24186 84%	186965 67%	142964 77%	706125 96% JK	24186 84%
Incandescent/Halogen Reflector for $6.00	168989 14%	76833 12%	46552 10%	45604 29%	62497 10%	106492 18%	38051 20%	126219 12%	4719 16%	91075 33% L	43720 23% L	29475 4%	4719 16%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

RG1B_4 Which bulb would you buy at the following prices?

Reflector with program

BASE = PLAYED HOME IMPROVEMENT GAME

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	3413659	1705419	1351748	351190	1921893	1491766	488714	2670357	254588	583892	376223	2198956	254588
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unweighted Total	511	146	288	76	278	233	229	198	84	104	148	175	84
LED Reflector for $3.80	2590570	1310007	963641	311620	1350346	1240224	364680	1995961	229930	543702	277702	1539236	229930
	76%	77%	71%	89% BC	70%	83% E	75%	75%	90% GH	93% KL	74%	70%	90% KL
Incandescent/Halogen Reflector for $4.05	823089	395412	388107	39570	571547	251542	124035	674396	24658	40190	98521	659720	24658
	24%	23% D	29% D	11%	30% F	17%	25% I	25% I	10%	7%	26% JM	30% JM	10%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CG1A_1 Which bulb would you buy at the following prices?

Candelabra without program

BASE = PLAYED DISCOUNT GAME

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	1454557 100%	719734 100%	506963 100%	222083 100%	717327 100%	737230 100%	284305 100%	1117509 100%	52743 100%	337860 100%	217510 100%	846444 100%	52743 100%
Unweighted Total	217	65	117	33	118	99	106	87	24	57	62	74	24
LED Candelabra for $1.85	909887 63%	401792 56%	310927 61%	196692 89% BC	380580 53%	529308 72% E	172082 61%	693951 62%	43854 83% GH	160865 48%	130594 60%	574573 68%	43854 83% JK
Incandescent/Halogen Candelabra for $0.55	544670 37%	317941 44% D	196036 39% D	25391 11%	336747 47% F	207923 28%	112222 39% I	423559 38% I	8889 17%	176994 52% M	86916 40% M	271871 32%	8889 17%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CG1A_2 Which bulb would you buy at the following prices?

Candelabra without program

BASE = PLAYED HOME IMPROVEMENT GAME

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	1855929 100%	962086 100%	665260 100%	228583 100%	1077184 100%	778745 100%	341536 100%	1358398 100%	155995 100%	304808 100%	275979 100%	1119147 100%	155995 100%
Unweighted Total	307	104	161	42	169	138	147	111	49	58	93	107	49
LED Candelabra for $3.05	1219847 66%	653235 68%	434240 65%	132372 58%	633969 59%	585877 75% E	209745 61%	894669 66%	115433 74%	210378 69%	149647 54%	744388 67%	115433 74% K
Incandescent/Halogen Candelabra for $0.95	636082 34%	308851 32%	231020 35%	96211 42%	443214 41% F	192868 25%	131791 39%	463729 34%	40561 26%	94430 31%	126332 46% M	374758 33%	40561 26%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CG1B_1 Which bulb would you buy at the following prices?

Candelabra with program

BASE = PLAYED DISCOUNT GAME

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	1454557 100%	719734 100%	506963 100%	222083 100%	717327 100%	737230 100%	284305 100%	1117509 100%	52743 100%	337860 100%	217510 100%	846444 100%	52743 100%
Unweighted Total	217	65	117	33	118	99	106	87	24	57	62	74	24
LED Candelabra for $0.25	1216378 84%	540389 75%	458023 90%	217490 98% B	594141 83%	622237 84%	231373 81%	933212 84%	51792 98% G	252360 75%	175003 80%	737222 87%	51792 98% JK
Incandescent/Halogen Candelabra for $0.55	238179 16%	179344 25% D	48940 10%	4593 2%	123186 17%	114994 16%	52932 19% I	184297 16%	951 2%	85500 25% M	42507 20% M	109222 13%	951 2%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

CG1B_2 Which bulb would you buy at the following prices?

Candelabra with program

BASE = PLAYED DISCOUNT GAME

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	1855929 100%	962086 100%	665260 100%	228583 100%	1077184 100%	778745 100%	341536 100%	1358398 100%	155995 100%	304808 100%	275979 100%	1119147 100%	155995 100%
Unweighted Total	307	104	161	42	169	138	147	111	49	58	93	107	49
LED Candelabra for $4.15	1227671 66%	685279 71% D	433862 65%	108530 47%	620070 58%	607601 78% E	182531 53%	928221 68% G	116918 75% G	226776 74% K	133254 48%	750722 67% K	116918 75% K
Incandescent/Halogen Candelabra for $0.95	628258 34%	276807 29%	231398 35%	120053 53% B	457114 42% F	171144 22%	159005 47% HI	430177 32%	39076 25%	78032 26%	142725 52% JLM	368424 33%	39076 25%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GG1A_1 Which bulb would you buy at the following prices?

Globe without program

BASE = PLAYED DISCOCUNT GAME

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	1554678 100%	855659 100%	488881 100%	210139 100%	861459 100%	693219 100%	319274 100%	1159299 100%	76106 100%	477935 100%	190671 100%	809966 100%	76106 100%
Unweighted Total	237	90	110	37	122	115	118	92	27	74	70	66	27
LED Globe for $1.00	1171097 75%	623407 73%	371064 76%	176626 84%	641899 75%	529198 76%	252382 79%	847529 73%	71186 94% GH	380173 80%	123058 65%	596679 74%	71186 94% KL
Incandescent/Halogen Globe for $1.00	383582 25%	232251 27%	117817 24%	33513 16%	219561 25%	164021 24%	66892 21% I	311770 27% I	4920 6%	97762 20%	67613 35% M	213287 26% M	4920 6%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GG1A_2 Which bulb would you buy at the following prices?

Globe without program

BASE = PLAYED HOME IMPROVEMENT GAME

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	2055128	986021	776604	285502	1195697	859431	368912	1565979	120237	527778	252665	1154449	120237
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unweighted Total	304	101	151	51	169	135	149	120	35	88	81	100	35
LED Globe for $4.65	1402330	671167	486135	238026	694684	707646	215030	1090794	96506	395556	173022	737246	96506
	68%	68%	63%	83% C	58%	82% E	58%	70%	80% G	75%	68%	64%	80%
Incandescent/Halogen Globe for $3.25	652798	314853	290469	47476	501014	151785	153883	475185	23731	132221	79643	417203	23731
	32%	32%	37% D	17%	42% F	18%	42% I	30%	20%	25%	32%	36%	20%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GG1B_1 Which bulb would you buy at the following prices?

Globe with program

BASE = PLAYED DISCOUNT GAME

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	1554678 100%	855659 100%	488881 100%	210139 100%	861459 100%	693219 100%	319274 100%	1159299 100%	76106 100%	477935 100%	190671 100%	809966 100%	76106 100%
Unweighted Total	237	90	110	37	122	115	118	92	27	74	70	66	27
LED Globe for $0.50	1299193 84%	695521 81%	423918 87%	179754 86%	715530 83%	583663 84%	271017 85%	956515 83%	71662 94%	422587 88% K	130657 69%	674288 83%	71662 94% K
Incandescent/Halogen Globe for $1.00	255485 16%	160138 19%	64963 13%	30384 14%	145929 17%	109556 16%	48257 15%	202784 17%	4445 6%	55348 12%	60014 31% JM	135678 17%	4445 6%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

GG1B_2 Which bulb would you buy at the following prices?

Globe with program

BASE = PLAYED HOME IMPROVEMENT GAME

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	2055128	986021	776604	285502	1195697	859431	368912	1565979	120237	527778	252665	1154449	120237
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unweighted Total	304	101	151	51	169	135	149	120	35	88	81	100	35
LED Globe for $2.90	1684794	763550	658160	256082	931789	753005	286273	1297072	101449	451935	223098	908313	101449
	82%	77%	85%	90%	78%	88%	78%	83%	84%	86%	88%	79%	84%
Incandescent/Halogen Globe for $3.25	370334	222471	118444	29419	263908	106426	82639	268907	18788	75843	29567	246136	18788
	18%	23%	15%	10%	22%	12%	22%	17%	16%	14%	12%	21%	16%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

LSP1-1 Thinking of all the light bulbs installed in your home, about what percent of your sockets have LED bulbs in them?

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11940156 100%	5724326 100%	4624519 100%	1570990 100%	6501620 100%	5438536 100%	1976833 100%	9349805 100%	613518 100%	2993405 100%	1486744 100%	6846489 100%	613518 100%
Unweighted Total	1765	570	881	308	912	853	822	723	220	512	520	513	220
None of them	293692 2%	170471 3%	70273 2%	52948 3%	134016 2%	159676 3%	97514 5% HI	183246 2%	12932 2%	129865 4% L	51235 3%	99661 1%	12932 2%
1% - 25%	1511536 13%	704050 12%	577330 12%	224853 14%	708212 11%	803324 15%	272664 14%	1148464 12%	90407 15%	373577 12%	226033 15%	821518 12%	90407 15%
26% - 50%	2533503 21%	1101399 19%	1042811 23%	387769 25%	1542488 24% F	991015 18%	349417 18%	2107458 23% GI	76628 12%	518870 17%	311355 21% M	1626650 24% JM	76628 12%
51% - 75%	2041679 17%	913113 16%	781050 17%	344888 22%	1122871 17%	918808 17%	298783 15%	1600311 17%	142585 23% G	505348 17%	203699 14%	1190047 17%	142585 23% K
76% - 99%	3263934 27%	1705370 30%	1195265 26%	356296 23%	1762410 27%	1501524 28%	489436 25%	2578178 28%	196320 32%	830660 28%	445274 30%	1791680 26%	196320 32%
All of them	1684436 14%	880682 15%	641886 14%	158001 10%	815101 13%	869335 16%	348017 18% H	1250886 13%	85532 14%	436863 15%	198407 13%	963634 14%	85532 14%
Don’t know	611377 5%	249240 4%	315903 7% D	46234 3%	416522 6% F	194855 4%	121001 6% I	481261 5% I	9114 1%	198222 7% KM	50740 3%	353300 5% M	9114 1%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

LSP1-2 Thinking of all the light bulbs installed in your home, about what percent of your sockets have LED bulbs in them?

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11940156	5724326	4624519	1570990	6501620	5438536	1976833	9349805	613518	2993405	1486744	6846489	613518
TOTAL RESPONDING	11328779 100%	5475086 100%	4308616 100%	1524756 100%	6085098 100%	5243681 100%	1855832 100%	8868544 100%	604404 100%	2795183 100%	1436004 100%	6493189 100%	604404 100%
Unweighted Total	1691	541	853	291	872	819	779	694	218	479	499	495	218
None of them	293692 3%	170471 3%	70273 2%	52948 3%	134016 2%	159676 3%	97514 5% HI	183246 2%	12932 2%	129865 5% L	51235 4%	99661 2%	12932 2%
1% - 25%	1511536 13%	704050 13%	577330 13%	224853 15%	708212 12%	803324 15%	272664 15%	1148464 13%	90407 15%	373577 13%	226033 16%	821518 13%	90407 15%
26% - 50%	2533503 22%	1101399 20%	1042811 24%	387769 25%	1542488 25% F	991015 19%	349417 19% I	2107458 24% GI	76628 13%	518870 19%	311355 22% M	1626650 25% JM	76628 13%
51% - 75%	2041679 18%	913113 17%	781050 18%	344888 23%	1122871 18%	918808 18%	298783 16%	1600311 18%	142585 24% G	505348 18%	203699 14%	1190047 18%	142585 24% K
76% - 99%	3263934 29%	1705370 31%	1195265 28%	356296 23%	1762410 29%	1501524 29%	489436 26%	2578178 29%	196320 32%	830660 30%	445274 31%	1791680 28%	196320 32%
All of them	1684436 15%	880682 16%	641886 15%	158001 10%	815101 13%	869335 17%	348017 19% H	1250886 14%	85532 14%	436863 16%	198407 14%	963634 15%	85532 14%
Don’t know	611377	249240	315903	46234	416522	194855	121001	481261	9114	198222	50740	353300	9114

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

DEM1 Do you or members of your household own your home or do you rent it?

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11940156 100%	5724326 100%	4624519 100%	1570990 100%	6501620 100%	5438536 100%	1976833 100%	9349805 100%	613518 100%	2993405 100%	1486744 100%	6846489 100%	613518 100%
Unweighted Total	1765	570	881	308	912	853	822	723	220	512	520	513	220
Own/Buying	9486953 79%	4557146 80%	3669969 79%	1244819 79%	5140929 79%	4346024 80%	1184154 60%	7706847 82% G	595952 97% GH	1849756 62%	1154817 78% J	5886428 86% JK	595952 97% JKL
Rent/Lease	2314913 19%	1062235 19%	932867 20%	314509 20%	1266453 19%	1048459 19%	748684 38% HI	1548663 17% I	17566 3%	1080312 36% KLM	306474 21% LM	910561 13% M	17566 3%
Occupied without payment of rent	72450 1%	59200 1%	3668 *%	9582 1%	33840 1%	38610 1%	26429 1%	46022 *%	-	25185 1%	5668 *%	41597 1%	-
Other [SPECIFY]	65840 1%	45745 1%	18014 *%	2081 *%	60397 1%	5443 *%	17566 1%	48274 1%	-	38152 1%	19785 1% L	7904 *%	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

DEM2 How many full bathrooms do you have at your home?

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11940156 100%	5724326 100%	4624519 100%	1570990 100%	6501620 100%	5438536 100%	1976833 100%	9349805 100%	613518 100%	2993405 100%	1486744 100%	6846489 100%	613518 100%
Unweighted Total	1765	570	881	308	912	853	822	723	220	512	520	513	220
0	10510 *%	10510 *%	-	-	10510 *%	-	-	10510 *%	-	10510 *%	-	-	-
1	1638545 14%	813319 14%	581635 13%	243591 16%	754163 12%	884383 16%	484365 25% HI	1138208 12% I	15973 3%	1028049 34% KLM	207796 14% LM	386727 6%	15973 3%
2	5736168 48%	2747623 48%	2269864 49%	708464 45%	3255052 50%	2481116 46%	990229 50%	4420654 47%	325285 53%	1498391 50%	845206 57% L	3067286 45%	325285 53%
3	3064529 26%	1468720 26%	1219749 26%	366430 23%	1759027 27%	1305502 24%	332976 17%	2522829 27% G	208723 34% G	332398 11%	280128 19% J	2243279 33% JK	208723 34% JK
4 or more	956688 8%	404217 7%	335679 7%	216316 14% BC	422681 7%	534006 10%	112462 6%	798981 9%	45245 7%	25310 1%	68768 5% J	817365 12% JK	45245 7% J
Prefer not to answer	504562 4%	255792 4%	212583 5%	36188 2%	284668 4%	219894 4%	55761 3%	434479 5%	14323 2%	73562 2%	84846 6% JM	331832 5%	14323 2%
Don't know	29154 *%	24144 *%	5010 *%	-	15519 *%	13634 *%	1040 *%	24144 *%	3969 1%	25185 1%	-	-	3969 1%
Mean	2.31	2.29	2.31	2.39	2.31	2.31	2.07	2.35 G	2.50 GH	1.77	2.15 J	2.57 JK	2.50 JK

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

DEM3 How many bedrooms do you have at your home?

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11940156 100%	5724326 100%	4624519 100%	1570990 100%	6501620 100%	5438536 100%	1976833 100%	9349805 100%	613518 100%	2993405 100%	1486744 100%	6846489 100%	613518 100%
Unweighted Total	1765	570	881	308	912	853	822	723	220	512	520	513	220
0	217018 2%	150122 3% C	18415 *%	48481 3% C	51336 1%	165682 3% E	19120 1%	191493 2%	6405 1%	89778 3% M	23077 2%	97758 1%	6405 1%
1	357558 3%	169261 3%	130749 3%	57548 4%	166963 3%	190595 4%	104956 5% HI	249893 3% I	2709 *%	300698 10% KLM	40147 3% LM	14004 *%	2709 *%
2	1806872 15%	759508 13%	747010 16%	291187 19%	883792 14%	923080 17%	413505 21% HI	1349656 14% I	43711 7%	806135 27% KLM	233306 16% LM	723720 11%	43711 7%
3	4059291 34%	2102585 37%	1445904 31%	508175 32%	2215914 34%	1843377 34%	719536 36%	3123523 33%	216231 35%	1165235 39% L	615285 41% L	2062539 30%	216231 35%
4	3410301 29%	1521274 27%	1475113 32%	412866 26%	2058932 32% F	1351369 25%	476310 24%	2711805 29%	222185 36% G	399462 13%	384878 26% J	2403775 35% JK	222185 36% JK
5 or more	1502835 13%	691809 12%	594579 13%	208970 13%	813273 13%	689562 13%	174522 9%	1218659 13% G	109654 18% G	97282 3%	108670 7% J	1187229 17% JK	109654 18% JK
Prefer not to answer	502236 4%	259105 5%	199367 4%	43764 3%	268268 4%	233968 4%	67842 3%	425741 5% I	8653 1%	82361 3%	73007 5% M	338215 5% M	8653 1%
Don't know	84044 1%	70663 1%	13382 *%	-	43141 1%	40903 1%	1040 *%	79035 1%	3969 1%	52454 2% KL	8372 1%	19249 *%	3969 1%
Mean	3.30	3.26	3.37	3.19	3.39 F	3.19	3.10	3.32 G	3.64 GH	2.62	3.16 J	3.59 JK	3.64 JK

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

DEM4-1 What is the highest level of education you have completed?

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11940156 100%	5724326 100%	4624519 100%	1570990 100%	6501620 100%	5438536 100%	1976833 100%	9349805 100%	613518 100%	2993405 100%	1486744 100%	6846489 100%	613518 100%
Unweighted Total	1765	570	881	308	912	853	822	723	220	512	520	513	220
Elementary (grades 1-8)	32940 *%	16067 *%	15472 *%	1401 *%	23875 *%	9065 *%	18076 1%	14863 *%	-	14863 *%	4691 *%	13385 *%	-
Some high school (grades 9-12)	179892 2%	53014 1%	115270 2%	11608 1%	128196 2%	51696 1%	59227 3% HI	116221 1%	4445 1%	46244 2%	50747 3% LM	78457 1%	4445 1%
High school graduate	728867 6%	377202 7%	301319 7%	50346 3%	497695 8% F	231172 4%	194859 10% HI	528339 6% I	5670 1%	194164 6% M	98850 7% M	430183 6% M	5670 1%
Some college/trade/vocational school	3297884 28%	1497901 26%	1443915 31% D	351154 22%	2222695 34% F	1075188 20%	807704 41% HI	2335403 25%	154776 25%	818172 27%	361671 24%	1963265 29%	154776 25%
College graduate	4305780 36%	2045417 36%	1594130 34%	658303 42%	2281903 35%	2023877 37%	610104 31%	3460246 37% G	235430 38% G	1133366 38%	581917 39%	2355067 34%	235430 38%
Postgraduate degree	3320616 28%	1692132 30%	1122829 24%	498177 32%	1324024 20%	1996592 37% E	280832 14%	2826586 30% G	213198 35% G	743424 25%	372933 25%	1991060 29%	213198 35% JK
Don’t know	74178 1%	42594 1%	31584 1%	-	23232 *%	50946 1%	6030 *%	68148 1%	-	43173 1% L	15934 1%	15072 *%	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

DEM4-2 What is the highest level of education you have completed?

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11940156	5724326	4624519	1570990	6501620	5438536	1976833	9349805	613518	2993405	1486744	6846489	613518
TOTAL RESPONDING	11865978 100%	5681732 100%	4592935 100%	1570990 100%	6478388 100%	5387590 100%	1970803 100%	9281657 100%	613518 100%	2950232 100%	1470810 100%	6831417 100%	613518 100%
Unweighted Total	1755	564	877	308	907	848	818	717	220	508	515	512	220
Elementary (grades 1-8)	32940 *%	16067 *%	15472 *%	1401 *%	23875 *%	9065 *%	18076 1%	14863 *%	-	14863 1%	4691 *%	13385 *%	-
Some high school (grades 9-12)	179892 2%	53014 1%	115270 3%	11608 1%	128196 2%	51696 1%	59227 3% HI	116221 1%	4445 1%	46244 2%	50747 3% LM	78457 1%	4445 1%
High school graduate	728867 6%	377202 7%	301319 7%	50346 3%	497695 8% F	231172 4%	194859 10% HI	528339 6% I	5670 1%	194164 7% M	98850 7% M	430183 6% M	5670 1%
Some college/trade/vocational school	3297884 28%	1497901 26%	1443915 31% D	351154 22%	2222695 34% F	1075188 20%	807704 41% HI	2335403 25%	154776 25%	818172 28%	361671 25%	1963265 29%	154776 25%
College graduate	4305780 36%	2045417 36%	1594130 35%	658303 42%	2281903 35%	2023877 38%	610104 31%	3460246 37% G	235430 38%	1133366 38%	581917 40%	2355067 34%	235430 38%
Postgraduate degree	3320616 28%	1692132 30%	1122829 24%	498177 32%	1324024 20%	1996592 37% E	280832 14%	2826586 30% G	213198 35% G	743424 25%	372933 25%	1991060 29%	213198 35% JK
Don’t know	74178	42594	31584	-	23232	50946	6030	68148	-	43173	15934	15072	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

DEM5-1 What was your annual household income from all sources in 2018, before taxes?

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11940156 100%	5724326 100%	4624519 100%	1570990 100%	6501620 100%	5438536 100%	1976833 100%	9349805 100%	613518 100%	2993405 100%	1486744 100%	6846489 100%	613518 100%
Unweighted Total	1765	570	881	308	912	853	822	723	220	512	520	513	220
Less than $10,000 per year ($7.5K)	220783 2%	87128 2%	123420 3% D	10234 1%	131836 2%	88946 2%	61958 3%	158825 2%	-	64014 2%	35551 2%	121218 2%	-
$10,000 - $19,999 ($15K)	309341 3%	146209 3%	115873 3%	41957 3%	173162 3%	136179 3%	139979 7% H	169362 2%	-	106016 4%	33364 2%	169961 2%	-
$20,000 - $24,999 ($22.5K)	303614 3%	114606 2%	108776 2%	80232 5%	186085 3%	117529 2%	118974 6% HI	181931 2% I	2709 *%	116689 4% M	36106 2% M	148109 2%	2709 *%
$25,000 - $49,999 ($37.5K)	1354678 11%	621463 11%	566806 12%	166409 11%	869887 13%	484792 9%	483920 24% HI	828666 9%	42093 7%	561229 19% KLM	151268 10%	600088 9%	42093 7%
$50,000 - $74,999 ($62.5K)	1068387 9%	486662 9%	413237 9%	168488 11%	666059 10%	402328 7%	331691 17% H	663689 7%	73007 12%	361081 12% L	186550 13% L	447749 7%	73007 12%
$75,000 - $99,999 ($87.5K)	1025394 9%	489147 9%	423990 9%	107342 7%	687208 11% F	338186 6%	180035 9%	757594 8%	87764 14% GH	356723 12% L	136421 9%	444485 6%	87764 14% L
$100,000 - $149,999 ($125K)	1962608 16%	1009533 18%	689757 15%	256316 16%	1022237 16%	940371 17%	133009 7%	1711530 18% G	118069 19% G	443049 15%	189657 13%	1211832 18%	118069 19% K
$150,000 - $174,999 ($167.5K)	656921 6%	320085 6%	269672 6%	67164 4%	330992 5%	325929 6%	71668 4%	543980 6%	41273 7%	169247 6%	91471 6%	354930 5%	41273 7%
$175,000 - $199,999 ($187.5K)	448001 4%	240250 4%	184811 4%	22940 1%	272450 4%	175552 3%	32516 2%	390755 4% G	24731 4%	81615 3%	73170 5%	268486 4%	24731 4%
$200,000 - $249,999 ($225K)	828842 7%	412450 7%	309978 7%	106415 7%	381477 6%	447365 8%	39345 2%	743138 8% G	46360 8% G	57549 2%	61166 4%	663767 10% JK	46360 8% J
$250,000 or more ($275K)	1432493 12%	755447 13%	500612 11%	176434 11%	552988 9%	879506 16% E	45621 2%	1320996 14% G	65876 11% G	123336 4%	112145 8% J	1131136 17% JK	65876 11% J

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

DEM5-1 What was your annual household income from all sources in 2018, before taxes?

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Prefer not to answer	2329094 20%	1041344 18%	917587 20%	367059 23%	1227240 19%	1101854 20%	338117 17%	1879342 20%	111635 18%	552858 18%	379874 26% JLM	1284728 19%	111635 18%
Mean	129.04	133.96	124.83	123.54	116.48	144.31 E	70.79	141.29 G	136.96 G	92.37	115.82 J	147.05 JK	136.96 JK
Median	125.00	125.00	125.00	125.00	87.50	125.00	62.50	125.00	125.00	87.50	87.50	125.00	125.00

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

DEM5-2 What was your annual household income from all sources in 2018, before taxes?

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL RESPONDING	9611062 100%	4682981 100%	3706932 100%	1203931 100%	5274380 100%	4336682 100%	1638716 100%	7470463 100%	501883 100%	2440547 100%	1106870 100%	5561761 100%	501883 100%
Unweighted Total	1397	454	696	243	736	661	656	565	176	416	394	411	176
Less than $10,000 per year ($7.5K)	220783 2%	87128 2%	123420 3% D	10234 1%	131836 2%	88946 2%	61958 4%	158825 2%	-	64014 3%	35551 3%	121218 2%	-
$10,000 - $19,999 ($15K)	309341 3%	146209 3%	115873 3%	41957 3%	173162 3%	136179 3%	139979 9% H	169362 2%	-	106016 4%	33364 3%	169961 3%	-
$20,000 - $24,999 ($22.5K)	303614 3%	114606 2%	108776 3%	80232 7%	186085 4%	117529 3%	118974 7% HI	181931 2%	2709 1%	116689 5% M	36106 3% M	148109 3%	2709 1%
$25,000 - $49,999 ($37.5K)	1354678 14%	621463 13%	566806 15%	166409 14%	869887 16%	484792 11%	483920 30% HI	828666 11%	42093 8%	561229 23% KLM	151268 14%	600088 11%	42093 8%
$50,000 - $74,999 ($62.5K)	1068387 11%	486662 10%	413237 11%	168488 14%	666059 13%	402328 9%	331691 20% H	663689 9%	73007 15%	361081 15% L	186550 17% L	447749 8%	73007 15%
$75,000 - $99,999 ($87.5K)	1025394 11%	489147 10%	423990 11%	107342 9%	687208 13% F	338186 8%	180035 11%	757594 10%	87764 17% GH	356723 15% L	136421 12%	444485 8%	87764 17% L
$100,000 - $149,999 ($125K)	1962608 20%	1009533 22%	689757 19%	256316 21%	1022237 19%	940371 22%	133009 8%	1711530 23% G	118069 24% G	443049 18%	189657 17%	1211832 22%	118069 24%
$150,000 - $174,999 ($167.5K)	656921 7%	320085 7%	269672 7%	67164 6%	330992 6%	325929 8%	71668 4%	543980 7%	41273 8%	169247 7%	91471 8%	354930 6%	41273 8%
$175,000 - $199,999 ($187.5K)	448001 5%	240250 5%	184811 5%	22940 2%	272450 5%	175552 4%	32516 2%	390755 5% G	24731 5%	81615 3%	73170 7%	268486 5%	24731 5%
$200,000 - $249,999 ($225K)	828842 9%	412450 9%	309978 8%	106415 9%	381477 7%	447365 10%	39345 2%	743138 10% G	46360 9% G	57549 2%	61166 6%	663767 12% JK	46360 9% J
$250,000 or more ($275K)	1432493 15%	755447 16%	500612 14%	176434 15%	552988 10%	879506 20% E	45621 3%	1320996 18% G	65876 13% G	123336 5%	112145 10% J	1131136 20% JKM	65876 13% J

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

DEM5-2 What was your annual household income from all sources in 2018, before taxes?

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti-cipant	Non-Parti-cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Prefer not to answer	2329094	1041344	917587	367059	1227240	1101854	338117	1879342	111635	552858	379874	1284728	111635
Mean	129.04	133.96	124.83	123.54	116.48	144.31 E	70.79	141.29 G	136.96 G	92.37	115.82 J	147.05 JK	136.96 JK
Median	125.00	125.00	125.00	125.00	87.50	125.00	62.50	125.00	125.00	87.50	87.50	125.00	125.00

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

DEM6 Would you like to be entered into the drawing for an incentive card?

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11940156	5724326	4624519	1570990	6501620	5438536	1976833	9349805	613518	2993405	1486744	6846489	613518
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unweighted Total	1765	570	881	308	912	853	822	723	220	512	520	513	220
Yes	11334881	5433351	4408103	1475734	6230467	5104414	1902531	8851395	580955	2868733	1416908	6468284	580955
	95%	95%	95%	94%	96%	94%	96%	95%	95%	96%	95%	94%	95%
No	456917	187493	181412	85385	228755	228162	42279	382551	32088	82238	60466	282126	32088
	4%	3%	4%	5%	4%	4%	2%	4%	5%	3%	4%	4%	5%
Don’t know	148358	103482	35004	9872	42398	105960	32023	115859	475	42434	9369	96079	475
	1%	2%	1%	1%	1%	2%	2% I	1%	*%	1%	1%	1%	*%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

LANGUAGE Do you prefer to conduct the survey in English or Spanish?

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11940156	5724326	4624519	1570990	6501620	5438536	1976833	9349805	613518	2993405	1486744	6846489	613518
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Unweighted Total	1765	570	881	308	912	853	822	723	220	512	520	513	220
English	11778777	5645757	4566097	1546602	6418737	5360041	1912515	9255453	610809	2907134	1448130	6812704	610809
	99%	99%	99%	98%	99%	99%	97%	99%	100%	97%	97%	100%	100%
								G	G			JK	JK
Spanish	161379	78568	58422	24389	82883	78495	64318	94352	2709	86271	38614	33785	2709
	1%	1%	1%	2%	1%	1%	3%	1%	*%	3%	3%	*%	*%
							HI			LM	LM		

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Stratum

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11940156 100%	5724326 100%	4624519 100%	1570990 100%	6501620 100%	5438536 100%	1976833 100%	9349805 100%	613518 100%	2993405 100%	1486744 100%	6846489 100%	613518 100%
Unweighted Total	1765	570	881	308	912	853	822	723	220	512	520	513	220
1	399108 3%	392106 7%	-	-	399108 6%	-	399108 20%	-	-	-	-	399108 6%	-
2	206774 2%	201472 4%	-	-	206774 3%	-	206774 10%	-	-	206774 7%	-	-	-
3	118579 1%	118579 2%	-	-	118579 2%	-	118579 6%	-	-	-	118579 8%	-	-
4	1020214 9%	1020214 18%	-	-	1020214 16%	-	-	1020214 11%	-	-	-	1020214 15%	-
5	409887 3%	409887 7%	-	-	409887 6%	-	-	409887 4%	-	409887 14%	-	-	-
6	217059 2%	217059 4%	-	-	217059 3%	-	-	217059 2%	-	-	217059 15%	-	-
7	102478 1%	102478 2%	-	-	102478 2%	-	-	-	102478 17%	-	-	-	102478 17%
8	319152 3%	319152 6%	-	-	-	319152 6%	319152 16%	-	-	-	-	319152 5%	-
9	150216 1%	146043 3%	-	4173 *%	-	150216 3%	150216 8%	-	-	150216 5%	-	-	-
10	60340 1%	60340 1%	-	-	-	60340 1%	60340 3%	-	-	-	60340 4%	-	-
11	1705761 14%	1705761 30%	-	-	-	1705761 31%	-	1705761 18%	-	-	-	1705761 25%	-
12	681724 6%	681724 12%	-	-	-	681724 13%	-	681724 7%	-	681724 23%	-	-	-
13	297857 2%	290592 5% C	7265 *%	-	-	297857 5%	-	297857 3%	-	-	297857 20%	-	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Stratum

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
14	58918 *%	58918 1%	-	-	-	58918 1%	-	-	58918 10%	-	-	-	58918 10%
15	168095 1%	-	168095 4%	-	168095 3%	-	168095 9%	-	-	-	-	168095 2%	-
16	75947 1%	-	75947 2%	-	75947 1%	-	75947 4%	-	-	75947 3%	-	-	-
17	34076 *%	-	34076 1%	-	34076 1%	-	34076 2%	-	-	-	34076 2%	-	-
18	1777890 15%	-	1777890 38%	-	1777890 27%	-	-	1777890 19%	-	-	-	1777890 26%	-
19	832347 7%	-	832347 18%	-	832347 13%	-	-	832347 9%	-	832347 28%	-	-	-
20	443721 4%	-	443721 10%	-	443721 7%	-	-	443721 5%	-	-	443721 30%	-	-
21	261967 2%	-	261967 6%	-	261967 4%	-	-	-	261967 43%	-	-	-	261967 43%
22	64019 1%	-	64019 1%	-	-	64019 1%	64019 3%	-	-	-	-	64019 1%	-
23	26910 *%	-	26910 1%	-	-	26910 *%	26910 1%	-	-	26910 1%	-	-	-
24	10893 *%	-	10893 *%	-	-	10893 *%	10893 1%	-	-	-	10893 1%	-	-
25	542580 5%	-	542580 12%	-	-	542580 10%	-	542580 6%	-	-	-	542580 8%	-
26	235831 2%	-	231965 5%	-	-	235831 4%	-	235831 3%	-	235831 8%	-	-	-
27	110368 1%	-	107740 2%	-	-	110368 2%	-	110368 1%	-	-	110368 7%	-	-
28	37551 *%	-	37076 1%	-	-	37551 1%	-	-	37551 6%	-	-	-	37551 6%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Stratum

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
29	54941 *%	-	-	54941 3%	54941 1%	-	54941 3%	-	-	-	-	54941 1%	-
30	29130 *%	-	-	29130 2%	29130 *%	-	29130 1%	-	-	29130 1%	-	-	-
31	16113 *%	-	-	16113 1%	16113 *%	-	16113 1%	-	-	-	16113 1%	-	-
32	159913 1%	-	-	159913 10%	159913 2%	-	-	159913 2%	-	-	-	159913 2%	-
33	68970 1%	-	2029 *%	66941 4%	68970 1%	-	-	68970 1%	-	68970 2%	-	-	-
34	36681 *%	-	-	35633 2%	36681 1%	-	-	36681 *%	-	-	36681 2%	-	-
35	67730 1%	-	-	67730 4%	67730 1%	-	-	-	67730 11%	-	-	-	67730 11%
36	134143 1%	-	-	134143 9%	-	134143 2%	134143 7%	-	-	-	-	134143 2%	-
37	68896 1%	-	-	68896 4%	-	68896 1%	68896 3%	-	-	68896 2%	-	-	-
38	39501 *%	-	-	39501 3%	-	39501 1%	39501 2%	-	-	-	39501 3%	-	-
39	500673 4%	-	-	500673 32%	-	500673 9%	-	500673 5%	-	-	-	500673 7%	-
40	206773 2%	-	-	206773 13%	-	206773 4%	-	206773 2%	-	206773 7%	-	-	-
41	101556 1%	-	-	101556 6%	-	101556 2%	-	101556 1%	-	-	101556 7%	-	-
42	84874 1%	-	-	84874 5%	-	84874 2%	-	-	84874 14%	-	-	-	84874 14%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Banner 1

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11940156 100%	5724326 100%	4624519 100%	1570990 100%	6501620 100%	5438536 100%	1976833 100%	9349805 100%	613518 100%	2993405 100%	1486744 100%	6846489 100%	613518 100%
Unweighted Total	1765	570	881	308	912	853	822	723	220	512	520	513	220
Electricity Provider / PGE	5724326 48%	5724326 100%	-	-	2461795 38%	3262531 60% E	1237693 63% HI	4325237 46% I	161396 26%	1439126 48% M	686570 46% M	3437233 50% M	161396 26%
Electricity Provider / SCE	4624519 39%	-	4624519 100%	-	3596072 55% F	1028448 19%	379940 19%	3945536 42% G	299043 49% G	1169197 39%	603695 41%	2552584 37%	299043 49% JKL
Electricity Provider / SDGE	1570990 13%	-	-	1570990 100%	430401 7%	1140589 21% E	346897 18% H	1071489 11%	152604 25% GH	375913 13%	192803 13%	849670 12%	152604 25% JKL
Climate Zone / Inland/Desert	6501620 54%	2461795 43% D	3596072 78% BD	430401 27%	6501620 100%	-	1102763 56%	4966682 53%	432175 70% GH	1623055 54%	866229 58%	3580161 52%	432175 70% JKL
Climate Zone / Mild	5438536 46%	3262531 57% C	1028448 22%	1140589 73% BC	-	5438536 100%	874070 44% I	4383123 47% I	181343 30%	1370350 46% M	620515 42% M	3266328 48% M	181343 30%
Participataion Status / Participant	1976833 17%	1237693 22% C	379940 8%	346897 22% C	1102763 17%	874070 16%	1976833 100%	-	-	557873 19%	279502 19%	1139458 17%	-
Participataion Status / Non-Participant	9349805 78%	4325237 76%	3945536 85% BD	1071489 68%	4966682 76%	4383123 81%	-	9349805 100%	-	2435532 81%	1207242 81%	5707031 83%	-
Participataion Status / Net Meter	613518 5%	161396 3%	299043 6%	152604 10% B	432175 7%	181343 3%	-	-	613518 100%	-	-	-	613518 100%
Energy Usage Class / Low	2993405 25%	1439126 25%	1169197 25%	375913 24%	1623055 25%	1370350 25%	557873 28%	2435532 26%	-	2993405 100%	-	-	-
Energy Usage Class / Medium	1486744 12%	686570 12%	603695 13%	192803 12%	866229 13%	620515 11%	279502 14%	1207242 13%	-	-	1486744 100%	-	-
Energy Usage Class / High	6846489 57%	3437233 60%	2552584 55%	849670 54%	3580161 55%	3266328 60%	1139458 58%	5707031 61%	-	-	-	6846489 100%	-

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

California Home Lighting Survey

Banner 1

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
Energy Usage Class / Net Meter	613518	161396	299043	152604	432175	181343	-	-	613518	-	-	-	613518
	5%	3%	6%	10% B	7%	3%			100%				100%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

TABLE OF CONTENTS

Banner 1 - LP_WEIGHT for LP1 only

California Home Lighting Survey

LP1 Have you heard of LED light bulbs?

BASE = ALL RESPONDENTS

		Electricity Provider			Climate Zone		Participation Status			Energy Usage Class			
	Total	PGE	SCE	SDGE	Inland/ Desert	Mild	Parti- cipant	Non- Parti- cipant	Net Meter	Low	Medium	High	Net Meter
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
TOTAL	11940156 100%	5728479 100%	4622679 100%	1570872 100%	6501620 100%	5438536 100%	1976833 100%	9349805 100%	613518 100%	2993405 100%	1486744 100%	6846489 100%	613518 100%
Unweighted Total	2016	671	971	368	1042	974	926	853	237	586	608	585	237
Yes	10143310 85%	4811339 84%	4020203 87%	1293641 82%	5539610 85%	4603700 85%	1743785 88% H	7840695 84%	558830 91% H	2628303 88% K	1239907 83%	5716271 83%	558830 91% KL
[NET] No/Don't know	1796846 15%	917140 16%	602476 13%	277231 18%	962010 15%	834836 15%	233048 12%	1509110 16% GI	54688 9%	365102 12%	246837 17% JM	1130218 17% M	54688 9%
No	874972 7%	403006 7%	316280 7%	155686 10%	489088 8%	385884 7%	107466 5%	740153 8% I	27354 4%	158140 5%	94927 6%	594552 9% JM	27354 4%
Don't Know	921874 8%	514134 9%	286195 6%	121545 8%	472923 7%	448951 8%	125582 6%	768957 8% I	27335 4%	206963 7%	151910 10% M	535667 8% M	27335 4%

Comparison Groups: BCD/EF/GHI/JKLM
Independent T-Test for Means (equal variances), Independent Z-Test for Percentages (unpooled proportions)
Uppercase letters indicate significance at the 90% level.

10.11 Appendix K: Supplier interview results

Experienced DNV GL interviewers conducted eight in-depth interviews with lamp supplier representatives during December 2019. Individual respondents included eight representatives from lighting manufacturers that were familiar with their organization's participation in the California Upstream Lighting Program and could speak to the program's influence on their lamp sales and to the overall program process. The sample frame included 11 organizations that shipped discounted LED reflector, globe, and candelabra lamps through the 2018 program. The eight lamp manufacturing organizations represented that were part of these in-depth interviews accounted for 98% of the program lamps that were shipped through the 2018 California Upstream Lighting Program.

The in-depth interviews addressed the following topics:

- California Upstream Lighting Program participation
- Program influence on lamp sales
- Channel shifting
- California Upstream Lighting Program processes and documentation

10.11.1 Manufacturer disposition

Table 10-30 provides an overview of the LED lamp styles that respondents' companies sold to consumers in California in the 2018 program. All eight manufacturers sold program discounted LED reflectors and some also sold program discounted LED candelabra and globe lamps. Appendix E provides the interview guide.

Table 10-30. Lighting manufacturer disposition by lamp style sold through program, 2018

	Reflectors	Candelabras	Globe	Total
Number of manufacturers	8	5	4	**8**

10.11.2 Results

The sections below summarize interview findings regarding the California LED market. The section also presents findings regarding sales of LED lamp styles and other technologies in California, including incandescent and halogen lamps.

10.11.3 LED Sales and California Upstream Lighting Program trends

All eight manufacturer representatives were familiar with their involvement in the California Upstream Lighting Program in 2018. Interviewers asked manufacturer representatives to confirm their 2018 LED program sales in California. All eight representatives reported that their 2018 LED program lamp sales were correct according to tracking data summary tables compiled by the evaluation team.

Table 10-31 provides an overview of the total quantity of LED program lamps that the interviewed manufacturer representatives sold by in California in 2018 lamp style. We have anonymized manufacturer names.

Table 10-31. Total number of program LED lamps sold by manufacturer, 2018

Manufacturer Number	Reflectors	Candelabras	Globes	Total Lamps
Manufacturer #1	2,447,143	882,108	103,213	3,432,464
Manufacturer #2	54,144	-	-	54,144
Manufacturer #3	9,827,864	798,000	798,000	11,423,864
Manufacturer #4	3,494,190	480,000	691,840	4,666,030
Manufacturer #5	21,359	10,364	-	31,723
Manufacturer #6	5,322,485	464,600	176,200	5,963,285
Manufacturer #7	87,518	-	-	87,518
Manufacturer #8	96,695	-	-	96,695
Manufacturer Not Interviewed	428,220	98,860	-	527,080
Manufacturer Not Interviewed	13,444	-	-	13,444
Manufacturer Not Interviewed	7,200	-	-	7,200
Total	21,800,262	2,733,932	1,769,253	26,303,447
% of Total	**83%**	**10%**	**7%**	**100%**

Table 10-32 provides an overview of the percentage of LED program lamps comprised by each manufacturer in the program in 2018 by lamp style and overall.

Table 10-32. Percentage of program LED lamps sold by manufacturer, 2018

Manufacturer Number	% Reflectors	% Candelabras	% Globes	% Total Lamps
Manufacturer #1	11%	32%	6%	13%
Manufacturer #2	0%	0%	0%	0%
Manufacturer #3	45%	29%	45%	43%
Manufacturer #4	16%	18%	39%	18%
Manufacturer #5	0%	0%	0%	0%
Manufacturer #6	24%	17%	10%	23%
Manufacturer #7	0%	0%	0%	0%
Manufacturer #8	0%	0%	0%	0%

Manufacturer Number	% Reflectors	% Candelabras	% Globes	% Total Lamps
Manufacturer Not Interviewed	2%	4%	0%	2%
Manufacturer Not Interviewed	0%	0%	0%	0%
Manufacturer Not Interviewed	0%	0%	0%	0%
Total	**100%**	**100%**	**100%**	**100%**

Interviewers asked lighting manufacturer representatives if they sold any LED reflector lamps in California that did not receive discounts from the Upstream Lighting Program in 2018. Of the eight manufacturers:

- Two representatives reported that they sold LED reflector lamps in California that did not receive discounts from the Upstream Lighting Program in 2018.
- Only one of those two representatives was able to provide an estimate for the percent of their LED reflector lamp sales that went through the Upstream Lighting Program in 2019 (90%).

Interviewers asked lighting manufacturer representatives if they sold any LED candelabra lamps in California that did not receive discounts from the Upstream Lighting Program in 2018. Of the eight manufacturers:

- Two representatives reported that they sold LED candelabra lamps in California that did not receive discounts from the Upstream Lighting Program in 2018.
- Only one of those two representatives was able to provide an estimate for the percent of their LED candelabra lamp sales that went through the Upstream Lighting Program in 2019 (98%).

Interviewers asked lighting manufacturer representatives if they sold any LED globe lamps in California that did not receive discounts from the Upstream Lighting Program in 2018. Of the eight manufacturers:

- Two representatives reported that they sold LED globe lamps in California that did not receive discounts from the Upstream Lighting Program in 2018.
- Only one of those two representatives was able to provide an estimate for the percent of their LED globe lamp sales that went through the Upstream Lighting Program in 2019 (90%).

Interviewers asked lighting manufacturer representatives if they sold any non-LED (incandescent, halogen and CFL) reflector, candelabra or globe lamps in California in 2018. Of the eight manufacturers, only one representative reported that they sold non-LED reflector, candelabra, and globe lamps in California in 2018. The other seven manufacturers only sold LEDs in California in 2018.

Interviewers asked lighting manufacturer representatives if they would have sold any LED reflector lamps in California had the Upstream Lighting Program discounts not been available in 2018. Of the eight manufacturers that sold LED reflector lamps:

- Six representatives reported that they would have still sold LED reflector lamps in California in 2018 had the Upstream Lighting Program discounts not been available

Table 10-33 provides an overview of the retail store channels where the manufacturers would have sold LED reflector lamps had the program discounts not been available in California in 2018. One representative did

not provide a response to the question of where they would have sold LED reflector lamps in a no program scenario in 2018.

Table 10-33. Retail channel sales of LED reflector lamps, no program scenario, 2018

Channel	Examples stores	Yes	No	Total
Discount	99 Cents Only, Dollar Tree	1	4	5
Drug	CVS, Longs, Rite Aid, Walgreens	-	5	5
Grocery	Ralphs, Albertson's, Vons, Safeway, 7-11	1	4	5
Hardware	True Value, Ace Hardware	4	1	5
Home Improvement	Home Depot, Lowe's, Dixieline, HD Supply	1	4	5
Mass Merchandise	Walmart, Target	-	5	5
Membership Club	Costco, Sam's Club	1	4	5
Other	Fry's, Best Buy, Lamps Plus	-	5	5

Manufacturer representatives were if they would have sold any LED candelabra lamps in California had the Upstream Lighting Program discounts not been available in 2018. Of the five manufacturers that sold LED candelabra lamps, four representatives reported that they would have still sold LED candelabra lamps in 2018 had the Upstream Lighting Program discounts not been available.

Table 10-34 provides an overview of the retail store channels where the manufacturers would have sold LED candelabra lamps had the program discounts not been available in California in 2018. One representative did not provide a response to the question of where they would have sold LED candelabra lamps in a no program scenario in 2018.

Table 10-34. Retail channel sales of LED candelabra lamps, no program scenario, 2018

Channel	Examples stores	Yes	No	Total
Discount	99 Cents Only, Dollar Tree	-	3	3
Drug	CVS, Longs, Rite Aid, Walgreens	-	3	3
Grocery	Ralphs, Albertson's, Vons, Safeway, 7-11	1	2	3
Hardware	True Value, Ace Hardware	3	-	3
Home Improvement	Home Depot, Lowe's, Dixieline, HD Supply	1	2	3

Channel	Examples stores	Yes	No	Total
Mass Merchandise	Walmart, Target	-	3	3
Membership Club	Costco, Sam's Club	1	2	3
Other	Fry's, Best Buy, Lamps Plus	-	3	3

Interviewers asked lighting manufacturer representatives if they would have sold any LED globe lamps in California had the Upstream Lighting Program discounts not been available in 2018. Of the four manufacturers that sold LED globe lamps, two representatives reported that they would have still sold LED globe lamps in California in 2018 had the Upstream Lighting Program discounts not been available

Table 10-35 provides an overview of the retail store channels where the manufacturers would have sold LED globe lamps had the program discounts not been available in California in 218.

Table 10-35. Retail channel sales of LED globe lamps, no program scenario, 2018

Channel	Examples stores	Yes	No	Total
Discount	99 Cents Only, Dollar Tree	-	2	2
Drug	CVS, Longs, Rite Aid, Walgreens	-	2	2
Grocery	Ralphs, Albertson's, Vons, Safeway, 7-11	-	2	2
Hardware	True Value, Ace Hardware	2	-	2
Home Improvement	Home Depot, Lowe's, Dixieline, HD Supply	1	1	2
Mass Merchandise	Walmart, Target	-	2	2
Membership Club	Costco, Sam's Club	1	1	2
Other	Fry's, Best Buy, Lamps Plus	-	2	2

Representatives were asked if their total sales of LED reflector lamps in California would have been lower, higher, or about the same had the Upstream Lighting Program discounts not been available in 2018. All eight representatives reported that their total sales of LED reflector lamps in California would have been lower had the Upstream Lighting Program discounts not been available in 2018.

Table 10-36 provides an overview of the interviewed lighting manufacturer representatives and their reported percentage change in LED reflector sales had the program discounts not been available in California in 2018.

Table 10-36. Manufacturer change in sales of LED reflector lamps, no program scenario, 2018

Manufacturer	Unweighted % Change in Sales	Weighted % Change in Sales
Manufacturer #1	-80%	
Manufacturer #2	-100%	
Manufacturer #3	-95%	
Manufacturer #4	-100%	
Manufacturer #5	-50%	
Manufacturer #6	-95%	
Manufacturer #7	-80%	
Manufacturer #8	-5%	
Overall Average	**-76%**	**-94%**

Table 10-37 provides an overview of the manufacturers and their reported percentage change in LED reflector sales by retail channel had the program discounts not been available in California in 2018. These five manufacturer representatives previously mentioned that they would have still sold LED reflector lamps had program discounts not been available in 2018 and were able to provide an answer of how sales would have been impacted by channel had the program not been available.

Table 10-37. Retail channel change in sales of LED reflector lamps, no program scenario, 2018

Channel	Examples Stores	Number of Manufacturers	% Change in Sales
Discount	99 Cents Only, Dollar Tree	5	-80%
Drug	CVS, Longs, Rite Aid, Walgreens	5	-100%
Grocery	Ralphs, Albertson's, Vons, Safeway, 7-11	5	-80%
Hardware	True Value, Ace Hardware	5	-79%
Home Improvement	Home Depot, Lowe's, Dixieline, HD Supply	5	-72%
Mass Merchandise	Walmart, Target	5	-100%
Membership Club	Costco, Sam's Club	5	-56%
Other	Fry's, Best Buy, Lamps Plus	5	-10

Interviewers asked lighting manufacturer representatives if their total sales of LED candelabra lamps in California would have been lower, higher, or about the same had the Upstream Lighting Program discounts

not been available in 2018. Of the five manufacturers that sold LED candelabra lamps through the program, all reported that their total sales of LED candelabra lamps in California would have been lower had the Upstream Lighting Program discounts not been available in 2018. Table 10-38 provides an overview of the manufacturers and their reported percentage change of LED candelabra sales had the program discounts not been available in California in 2018.

Table 10-38. Manufacturer change in sales of LED candelabra lamps, no program scenario, 2018

Manufacturer	Unweighted % Change in Sales	Weighted % Change in Sales
Manufacturer #1	-80%	
Manufacturer #3	-93%	
Manufacturer #4	-100%	
Manufacturer #5	-50%	
Manufacturer #6	-95%	
Overall Average	**-84%**	**-90%**

Table 10-39 provides an overview of the manufacturers and their reported percentage change of LED candelabra sales by retail channel had the program discounts not been available in California in 2018. These three manufacturer representatives previously mentioned that they would have still sold LED candelabra lamps had program discounts not been available in 2018 and were able to provide an answer of how sales would have been impacted by channel had the program not been available.

Table 10-39. Retail channel change in sales of LED candelabra lamps, no program scenario, 2018

Channel	Examples Stores	Number of Manufacturers	% Change in Sales
Discount	99 Cents Only, Dollar Tree	3	-100%
Drug	CVS, Longs, Rite Aid, Walgreens	3	-100%
Grocery	Ralphs, Albertson's, Vons, Safeway, 7-11	3	-99%
Hardware	True Value, Ace Hardware	3	-78%
Home Improvement	Home Depot, Lowe's, Dixieline, HD Supply	3	-87%

Channel	Examples Stores	Number of Manufacturers	% Change in Sales
Mass Merchandise	Walmart, Target	3	-100%
Membership Club	Costco, Sam's Club	3	-60%
Other	Fry's, Best Buy, Lamps Plus	3	-100%

Interviewers asked lighting manufacturer representatives if their total sales of LED globe lamps in California would have been lower, higher, or about the same had the Upstream Lighting Program discounts not been available in 2018. All four representatives that sold LED globe lamps through the program reported that their total sales of LED globe lamps in California would have been lower had the Upstream Lighting Program discounts not been available in 2018. Table 10-40 provides an overview of the interviewed lighting manufacturer representatives and their reported percentage change of LED globe sales had the program discounts not been available in California in 2018.

Table 10-40. Manufacturer change in sales of LED globe lamps, no program scenario, 2018

	Unweighted % Change in Sales	Weighted % Change in Sales
Manufacturer #3	-100%	
Manufacturer #1	-80%	
Manufacturer #4	-100%	
Manufacturer #6	-93%	
Overall Average	**-93%**	**-98%**

Table 10-41 provides an overview of the interviewed lighting manufacturer representatives and their reported percentage change in LED globe sales by retail channel had the program discounts not been available in California in 2018. These two manufacturer representatives previously mentioned that they would have still sold LED globe lamps had program discounts not been available in 2018.

Table 10-41. Retail channel change in sales of LED globe lamps, no program scenario, 2018

Channel	Examples Stores	Number of Manufacturers	% Change in Sales
Discount	99 Cents Only, Dollar Tree	2	-100%
Drug	CVS, Longs, Rite Aid, Walgreens	2	-100%

Channel	Examples Stores	Number of Manufacturers	% Change in Sales
Grocery	Ralphs, Albertson's, Vons, Safeway, 7-11	2	-100%
Hardware	True Value, Ace Hardware	2	-71%
Home Improvement	Home Depot, Lowe's, Dixieline, HD Supply	2	-87%
Mass Merchandise	Walmart, Target	2	-100%
Membership Club	Costco, Sam's Club	2	-90%
Other	Fry's, Best Buy, Lamps Plus	2	-100%

10.11.4 Upstream Lighting Program process

Interviewers asked lighting manufacturer representatives questions about the process of participating in the 2018 California Upstream Lighting Program. All eight manufacturer representatives were familiar with their involvement in the California Upstream Lighting Program in 2018 and were then asked how long they have participated in the program. Of the eight manufacturers:

- Four representatives reported that they have participated in the California Upstream Lighting program for 15 or more years, with one representative reporting participation of more than 20 years.
- Another two representatives reported that they have participated in the California Upstream Lighting program for between 10 and 15 years.
- The other two representatives reported that they have participated in the California Upstream Lighting program for between three and 10 years.
- The average length of participation in the California Upstream Lighting Program reported was 13 years.

Interviewers asked lighting manufacturer representatives if their participation in the California Upstream Lighting Program has changed over time. Of the eight manufacturers:

- Three representatives reported that their participation in the California Upstream Lighting Program has not changed over time.
- Another four representatives reported that their participation in the California Upstream Lighting Program has changed over time with an emphasis on the program's shift to different discounted technologies and lamp styles.
- One representative reported that his participation in the California Upstream Lighting Program has changed over time in terms of the retail stores that his organization partners with.

Representatives were asked if the quantities of lamps discounted by the California Upstream Lighting Program has changed from prior years. Of the eight manufacturers:

- Six representatives reported that the quantities of lamps discounted by the California Upstream Lighting Program have decreased from prior years.
- One representative reported that the quantities of lamps discounted by the California Upstream Lighting Program have increased from prior years.
- One representative reported that the quantities of lamps discounted by the California Upstream Lighting Program have not changed from prior years

Interviewers asked representatives which program staff they communicated with while participating in the 2018 California Upstream Lighting Program. Of the eight manufacturers:

- All representatives reported that they communicated primarily with program staff at PG&E while participating in the California Upstream Lighting Program
- Five representatives also reported that they communicated with program staff at SCE while participating in the California Upstream Lighting Program
- Five representatives also reported that they communicated with program staff at SDG&E while participating in the California Upstream Lighting Program

Representatives were asked what they discussed with program staff while participating in the 2018 California Upstream Lighting Program. The manufacturers mentioned the following topics that were discussed with California Upstream Lighting Program staff in 2018:

- Program requirements (5 mentions)
- Product qualifications (4 mentions)
- Incentives and invoicing (4 mentions)
- Shipment schedules (2 mentions)
- Strategies to reach low income customers (1 mention)

Interviewers asked representatives if they were required to complete any paperwork to participate in the California Upstream Lighting Program, and all eight representatives reported that they were required to complete paperwork to participate in the program in 2018. Interviewers then asked representatives what type of paperwork was required. The manufacturers mentioned the following paperwork requirements:

- Proof of delivery (4 mentions)
- Legal contract agreement signature (3 mentions)
- Photos of products on retail store shelves (2 mentions)
- Sales data uploaded (2 mentions)

Interviewers asked representatives if program staff gave them instructions on which retail stores to ship discounted lamps to in 2018 while participating in the California Upstream Lighting Program. Many of the lighting manufacturers mentioned that they had previous relationships with specific retail stores from their longstanding participation in the Upstream Lighting Program and that their utilities did not specify to them as to which retail stores they needed to ship their lamps to in 2018. One manufacturer also noted that program staff provided instructions regarding the shipment of discounted lamps directly to hard-to-reach areas in 2018.

Representatives were if they needed to provide any documentation to program staff on how many lamps were shipped to individual retail stores in 2018 while participating in the California Upstream Lighting Program. All eight of the manufacturers mentioned that they needed to provide documentation on lamps shipped to retail stores in 2018.

Interviewers asked representatives what type of documentation was required to provide to program staff in 2018 while participating in the California Upstream Lighting Program. The manufacturers mentioned the following documentation types:

- Proof of delivery (6 mentions)
- Photos of lighting displays (3 mentions)
- Sales data for invoices (2 mentions)

Manufacturer representatives were asked if program staff gave them instructions on which retail stores to ship discounted lamps to in 2018. Many of the lighting manufacturers mentioned that they had previous relationships with specific retail stores from their longstanding participation in the Upstream Lighting Program, and that their utilities did not mandate which retail stores they needed to ship their lamps to in 2018. One manufacturer also noted that program staff provided encouragement to ship program discounted lamps to hard-to-reach areas in 2018.

Interviewers asked representatives if they needed to provide any documentation to program staff on how many lamps were shipped to individual retail stores in 2018 while participating in the California Upstream Lighting Program. All eight of the manufacturers mentioned that they needed to provide documentation on lamps shipped to retail stores in 2018.

Representatives were asked what type of documentation was required to participate in the 2018 program. The representatives mentioned the following documentation types:

- Proof of delivery (6 mentions)
- Photos of lighting displays (3 mentions)
- Sales data for invoices (2 mentions)

Representatives were asked how they determined the quantity of program discounted lamps to send to each retail store in 2018 while participating in the California Upstream Lighting Program. The manufacturers mentioned the following:

- Previous sales performance metrics (4 mentions)
- Program budget calculations (3 mentions)
- Field representative in-person visits with retail store representatives (2 mentions)

Interviewers asked lighting manufacturer representatives if their process they used to determine the quantity of program discounted lamps to send to each retail store in 2018 while participating in the California Upstream Lighting Program differed by retail store. Many manufacturer representatives stated that grocery and discount retail stores did not provide them with adequate sales data to help them determine how many Upstream Lighting Program discounted lamps to send to each retail store. The representatives mentioned the following differences to their process by retail store:

- Process was the same (3 mentions)
- Allocation based on field representative in-person visit (2 mentions)

- Chain retailer stores were more organized, and they sent better quality sales data (2 mentions)
- Hard to reach stores sold through lamps faster since there was a larger demand (1 mention)
- Discounted lamps should cost the same at all retailers (1 mention)
- Retail store sold manufacturer's lamps regardless of utility provided discount presence (1 mention)

Representatives were asked if the process they used to determine the quantity of program discounted lamps to send to each retail store differed by retail store. Many manufacturer representatives stated that grocery and discount retail stores did not provide them with adequate sales data to help them determine how many program discounted lamps to send to each retail store. The representatives mentioned the following differences to their process by retail store:

- Process was the same (3 mentions)
- Allocation based on field representative in-person visit (2 mentions)
- Chain retail stores were more organized, and they sent better quality sales data (2 mentions)
- Hard to reach stores sold through lamps faster since there was a larger demand (1 mention)
- Discounted lamps should cost the same at all retail stores (1 mention)

Interviewers asked lighting manufacturer representatives if they had any communications with retailer store representatives about shipping discounted lamps to them in 2018 while participating in the California Upstream Lighting Program. Of the eight manufacturers:

- All representatives reported that they had communications with retail store representatives about shipping discounted lamps to them in 2018 while participating in the California Upstream Lighting Program.
- One representative noted limited communications with retail store representatives because their lamps were sent to the retail store's distribution center and the retail store handled the shipping with their own individual stores directly, while the manufacturer would manage the overall rebate budget.

Representatives were asked to describe their communications about the 2018 program with retail store representatives in 2018. The manufacturers mentioned the following communications:

- Sales data from previous years (4 mentions)
- In-person utility signage and educational displays (3 mentions)
- Program requirements (2 mentions)
- Overstocking concerns (1 mention)
- Shipment schedules (1 mention)

Interviewers asked representatives if retail stores purchased program discounted lamps in 2018 directly from them and if the Upstream Lighting Program fully covered the cost of their lamps. Four of the five manufacturers that sold their lamps to grocery and discount stores confirmed that the Upstream Lighting Program fully covered the cost of their lamps in 2018, and that their retail partners did not need to purchase program lamps from the manufacturers. In other words, these grocery and discount stores received program discounted lamps at no cost in 2018. All of the other three manufacturers that sold their lamps to big box retail stores confirmed that the retail stores purchased Upstream Lighting Program discounted lamps directly from them in 2018.

As discussed in Section 4 (Measure Quantity Adjustment), about 80% of the program discounted lamps shipped in 2018 were shipped through grocery and discount retail stores. Thus, the vast majority of program lamps were sent to grocery and discount stores at no cost to those stores.

Interviewers asked representatives to describe the process of how they shipped their California Upstream Lighting Program discounted lamps to retail stores in 2018. Of the eight manufacturers:

- Three representatives reported that their California Upstream Lighting Program discounted lamps were manufactured overseas and stored in a warehouse and distributed to local retail stores in 2018.
- Three representatives reported that their California Upstream Lighting Program discounted lamps were stored in a Southern California warehouse and distributed to local retail stores by a third-party trucking firm in 2018.
- One representative reported that their California Upstream Lighting Program discounted lamps were stored in a warehouse and shipped to local retail stores on pallets by their own trucks in 2018.
- One representative reported that since they only supplied their lamps to one major retail chain, their California Upstream Lighting Program discounted lamps were stored in that chain's warehouse and distributed to individual stores at the direction of the retail chain.

Table 10-42 provides an overview of the frequency that manufacturers shipped program discounted lamps to stores in 2018 while participating in the program. One representative did not provide a response to this question.

Table 10-42. Manufacturer shipment frequency, 2018

Shipment Frequency	Daily	Quarterly	Semi-annually	Total
Manufacturer Participation	1	3	3	7

Interviewers asked representatives how they knew when to ship their California Upstream Lighting Program discounted lamps to retail stores in 2018. Of the seven manufacturers that provided shipment frequencies:

- Six representatives reported that they knew when to ship their program discounted lamps to stores based upon their previous experience with the upstream lighting program.
- One representative reported that the PA determined when to ship their California Upstream Lighting Program discounted lamps to retail stores in 2018.

Representatives were asked if retail stores requested manufacturers to ship program discounted lamps to their stores in 2018. Of the seven manufacturers that provided shipment frequencies:

- Six representatives reported that retail stores asked them to ship more program lamps to their stores.
- One representative reported that retail stores had not asked him to ship more program discounted lamps to their stores because they already had too much stock and there was also not enough program budget available for additional shipments. The retail store representative directed the manufacturer to not deliver additional lamps, which resulted in a loss of money for the manufacturer.

ABOUT DNV GL

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