Application No.:	A.23-05-010
Exhibit No.:	SCE-03 Vol. 03
Witnesses:	J. Burchfield C. Parson

(U 338-E)

2025 General Rate Case

Customer Programs and Services

Before the

Public Utilities Commission of the State of California

Rosemead, California
May 12, 2023

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I.

INTRODUCTION

This volume presents the Customer Experience Management (CEM) and Customer Programs Management (CPM) GRC activities that are mapped primarily to Southern California Edison's (SCE's) Customer Care Services Business Planning Element (BPE), a component of the Customer Interactions (CI) Business Planning Group (BPG), and whose main responsibilities are: (1) providing customers with information on rates, programs, and services to help them manage their bill and energy consumption; (2) identifying, measuring, and prioritizing customer service improvement opportunities to meet customer needs and evolving customer expectations; and (3) developing, managing, and delivering SCE's portfolio of customer programs and services. Activities within this BPE also help SCE achieve state and federal energy policy goals that rely on customer participation in SCE's rates and programs.

Moreover, through active customer participation in SCE's portfolio of customer programs and services, SCE can better deliver safe, reliable, affordable, and increasingly clean electricity to our customers and achieve the state's most ambitious public policy goals around de-carbonization.[1] The programs and services covered in this volume provide customers with useful tools to manage their electric service efficiently and effectively.

A. Content and Organization of Volume

This volume presents SCE's Test Year 2025 forecast of Operations and Maintenance (O&M) for CI activities within the Customer Care Services BPE, which includes the Customer Experience Management (CEM) and Customer Programs Management (CPM) activities. The O&M activities detailed in this volume are primarily managed by SCE's Customer Programs and Services (CP&S) Division within the Customer Service (CS) Operating Unit. Chapter II summarizes the scope of work, key drivers for the work, and regulatory mandates and policies that affect the level of O&M forecast for these activities.

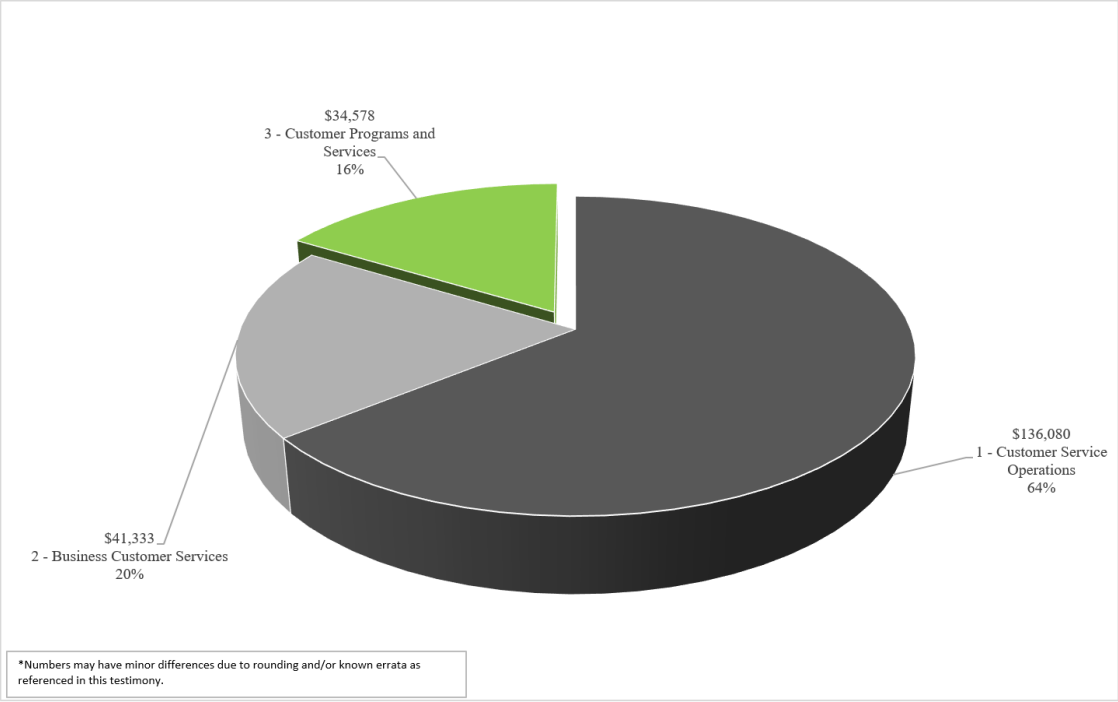
B. Summary of O&M and Capital Request

Figure I-1 shows SCE's forecast of $34.578 million of O&M expenses for the 2025 Test Year described in this volume, and the total CI Test Year forecast of $208.415 million. Table I-1 breaks down

[1] The Clean Energy and Pollution Reduction Act of 2015 (SB 350) increases California's renewable electricity procurement goal to 50 percent by 2030, doubles statewide energy efficiency savings, and authorizes utilities to undertake transportation electrification activities.

the O&M forecast shown in this volume by GRC Activity. The forecast spending supports the Customer Care Services BPE activities detailed in Chapter II.

Figure I-1
Total Customer Interactions O&M Expenses[2]
(Constant 2022 $000)



[2] This figure does not include Uncollectible expenses presented in Volume 1 in the Billing and Payments BPE. In addition, errors were identified subsequent to the finalization of financial data. Therefore, the intended financial number that is stated here in testimony does not align with the financial numbers in standardized workpapers and the RO model. An errata will be submitted to align the financial numbers in testimony, standardized workpapers, and the RO model at a future date.

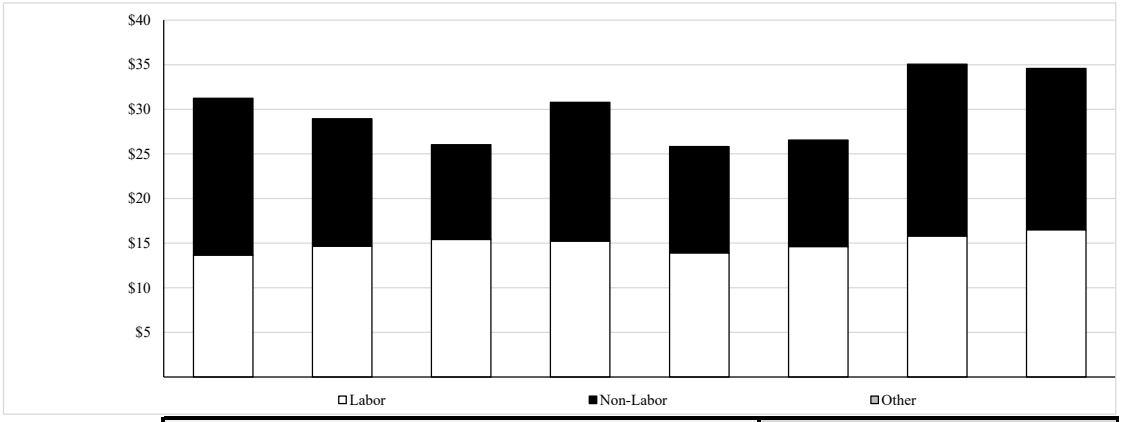
Table I-1
Customer Interactions O&M Expenses[3]
(Constant 2022 $ Million)

Line No.	Volume	BPE / GRC Activity	2025 Total
1	SCE-03, Vol. 1	Billing and Payments	
2		Billing Services	$48.150
3		Postage	$14.988
4		Credit and Payment Services	$12.896
5		Customer Contacts	
6		Customer Contact Center	$57.801
7		Escalated Complaints and Outreach	$1.542
8		**SCE-03, Volume 1 Total**	**$135.378**
9	SCE-03, Vol. 2	Business Customer Services	
10		Business Customer Service	$26.140
11		Communications, Education, and Outreach	
12		External Communications	$12.319
13		**SCE-03, Volume 2 Total**	**$38.459**
14	SCE-03, Vol. 3	Customer Care Services	
15		Customer Experience Management	$22.732
16		Customer Programs Management	$11.846
17		**SCE-03, Volume 3 Total**	**$34.578**
18		**Exhibit 3 Total**	**$208.415**

Figure I-2 shows SCE's O&M recorded costs from 2018 to 2022 and forecast for 2023 to 2025 for the CEM and CPM activities, including $34.578 million (constant 2022 dollars) in O&M expenses for Test Year 2025. The historical variances for the 2018 to 2022 recorded costs are analyzed by activity in Chapter II.

[3] This figure does not include Uncollectible expenses presented in Volume 1 in the Billing and Payments BPE.

Figure I-2
Customer Care Services O&M Expenses
Recorded 2018 to 2022 and Forecast 2023 to 2025
(Constant 2022 $000)



	Recorded					Forecast		
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Labor	$13,661	$14,661	$15,408	$15,236	$13,907	$14,618	$15,801	$16,496
Non-Labor	$17,569	$14,278	$10,635	$15,544	$11,925	$11,944	$19,262	$18,082
Other								
Total Expenses	**$31,230**	**$28,939**	**$26,043**	**$30,780**	**$25,831**	**$26,562**	**$35,064**	**$34,578**
Ratio of Labor to Total	44%	51%	59%	49%	54%	55%	45%	48%

Figure I-3 shows SCE's total capital forecast of $12.506 million for the CI BPG from 2023-2028. CI BPG capital expenditures include mailing operations capital equipment, software automation, and specialized equipment with the specific breakdown shown in Table I-2. From 2023 to 2028, the Customer Care Services BPE forecasts capital expenditures of $2.600 million as shown in Figure I-3. This forecast does not include CEM capitalized software projects which are addressed in SCE-06, Volume 2.

Figure I-3
Total Customer Interactions Capital Expenditures (2023-2028)
(Nominal $ Million)

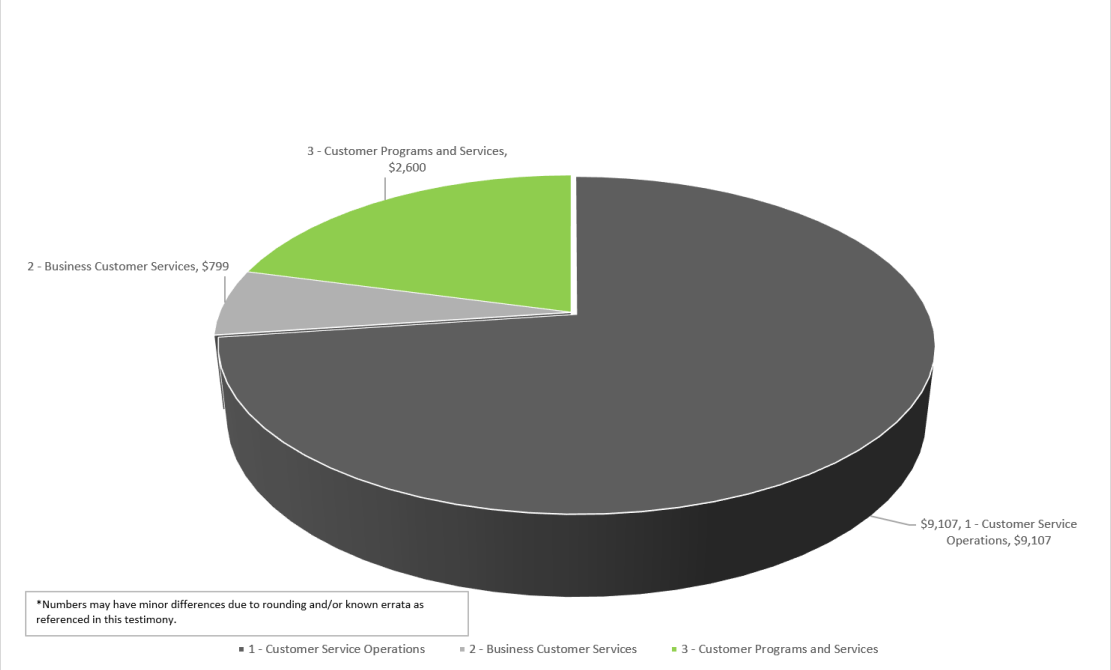


Table I-2
Customer Interactions Capital Expenditures
(Nominal $000)

Line No.	Description	2023	2024	2025	2026	2027	2028
1	Mailing Operations Capital *(Vol. 1)*	$ 5,162	$ 125	$ -	$ -	$ -	$ -
2	Software Automation - Billing *(Vol. 1)*	-	-	1,750	670	690	710
3	Specialized Equipment *(Vols. 2 and 3)*	910	390	1,295	398	201	204
4	Total	$ 6,072	$ 515	$ 3,045	$ 1,068	$ 891	$ 915

II.

CUSTOMER CARE SERVICES

A. Overview

The Customer Care Services BPE activities include managing SCE programs providing customers with the information and tools needed to manage their energy needs efficiently and effectively and utilizing customer feedback to improve how SCE delivers its services and to create new programs. This BPE includes two GRC activities: (1) CEM and (2) CPM. The CEM and CPM activities are primarily managed by SCE's CP&S Division and are summarized directly below and further detailed in Sections C.1 and C.2 of this chapter.

1. Customer Experience Management

CEM work activities include the coordination of strategies and efforts focusing on customer engagement, satisfaction, and experience. CEM also extends to other areas of SCE, such as the Customer Contact Center (CCC) and account managers. As detailed below, CEM sub-activities include (1) Customer Experience Insights and Analytics, (2) Digital Operations and Management, and (3) Customer Education and Outreach. Each of these sub-activities plays a vital role for SCE in meeting the growing needs of customers, compliance obligations, and the state's public policy goals.

a) Customer Experience Insights and Analytics

The Customer Experience Insights and Analytics group supports informed decisions to improve SCE's customer interactions. Customer experience (CX) encompasses all experiences that SCE customers have when interacting with SCE. If the experience is positive, customers are more likely to have higher satisfaction and become more fully engaged in the management of their electric service. The group gathers customer intelligence through customer research and analyses—for example, customer segmentation, digital analytics, industry benchmarking, customer feedback, customized and secondary research, customer satisfaction and other ad hoc analyses using advanced analytics techniques, and post-launch product/program evaluations—to gain insights into the needs and expectations of our customers. The group then uses these insights to establish the overall CX strategic vision, which includes developing digital and other capability roadmaps,[4] and

[4] Roadmaps lay out products, capabilities, and enhancements in a timeline format, which tie to various goals and key performance indicators (KPI) and span multiple years. These various roadmaps allow SCE to track what is planned for implementation and associated timing, as well as when benefits are expected to be achieved, both at the individual tactic level and cumulatively. Roadmaps are integral in enabling SCE to plan, organize, prioritize, and implement the many capabilities that facilitate a positive customer experience.

integrating them across SCE's customer education and outreach plans and multi-channel communication campaigns.

b) Digital Operations and Management

The Digital Operations and Management (DOM) function oversees the growth and evolution of SCE's digital channels and end-to-end digital customer experience to meet SCE's customers' online needs and expectations. The DOM group designs and optimizes SCE's digital channels (e.g., SCE.com, My SCE mobile app, etc.) using various data sets, like customer feedback and benchmarking data, to guide the prioritization and development of capabilities that allow customers to interact with SCE via digital self-service. The DOM group is also responsible for the day-to-day maintenance of SCE's digital channels, including publishing online content for customers and external stakeholders about important energy and public safety topics.

c) Customer Education and Outreach

The Customer Education and Outreach (CE&O) activities establish the foundation for SCE's communications with its diverse customer base about programs and services to help meet their energy management needs. They include the planning, creation, and optimization of multi-channel communications campaigns, websites, emails, and print materials to drive customer awareness and increased adoption of SCE rate and pricing options, as well as other programs and services that support SCE's safety and electrification goals. Many of these communications are presented in multiple languages using various customer data sets and segmentation to determine the appropriate languages and related volumes on a community-by-community basis.

2. Customer Programs Management

CPM activities include the planning, implementation, and management of rates and energy management tools and customer programs including Distributed Energy Resources (DER) programs, Decarbonization programs (such as Building Electrification (BE) programs and Transportation Electrification (TE) programs), and programs to aid SCE's customers who rely on electric-powered medical devices (including Medical Baseline Allowance program participants). The five sub-activities of CPM are summarized below.

a) Energy Management Tools

SCE's energy management tools, such as Budget Assistant, Rate Plan Comparison Tool, Choose Your Due Date, and SCE Energy Manager™, are developed, implemented, and managed within this sub-activity. These tools help customers understand their energy usage and rate

plan options to manage their energy costs. In addition, SCE provides outreach and education for certain Commission-mandated programs, such as Critical Peak Pricing.

b) DER Program Management

The DER program procures energy from behind-the-meter (BTM) resources in order to support reliability and comply with governmental mandates, including the Commission's Integrated Resource Plan and Long-Term Procurement Plan (IRP-LTPP), Local Capacity Requirements, Preferred Resources Pilot, and Aliso Canyon Energy Storage proceedings. This program includes activities from contract origination through the ongoing management of the contracts.

c) Decarbonization Activities

The activities of SCE's Decarbonization Program Office support California's climate goals. The team manages the research, analysis, education, outreach, and program development and implementation related to the electrification of buildings and transportation. The team also leads decarbonization efforts, including SCE's participation in the CPUC's Building Decarbonization rulemaking (R.19-01-011), Senate Bill (SB) 676 implementation (D.20-12-029), Submetering (D.22-08-024), Transportation Electrification (TE) Framework (D.22-11-040), and provides support for multiple commission proceedings related to decarbonization. Other activities include developing SCE's Building Electrification application (A.21-12-009), managing TE Advisory Services, and performing compliance activities associated with Charge Ready programs.

d) Customer Care

SCE's Customer Care efforts include programs such as Cool Centers and the Medical Baseline Allowance (MBL) program, as well as income qualified programs.[5] SCE provides Cool Centers to provide safe, cool places for customers during extreme climate events. SCE's MBL program provides customers who require electric-powered medical or mobility support equipment in their homes a greater allocation of the lowest-cost electricity (Baseline Allocation) each month, which reduces their overall energy costs.

e) Technology Project Management

The CS Engineering Services group manages the Technology Test Center (TTC) Lab in Irwindale, which focuses on assessment of end-use equipment and appliances for both SCE's Residential and Non-Residential customers. This includes testing of technologies being considered for

[5] SCE's income qualified programs are addressed through separate Commission proceedings.

future SCE incentive programs, such as HVAC; refrigeration & cooling; advanced lighting; building energy management controls; DR controls; water heaters; and battery storage devices.

3. Regulatory Background/Policies Driving SCE's Request

The State of California has adopted goals, and the Commission has established regulatory policies, that rely on customer participation in Commission-approved programs to be successful. To drive that customer participation, SCE strives to create a positive customer experience, of which self-service via digital channels have become a key offering. The sections below describe the key regulatory policies compelling SCE to make the investments in its customer experience and customer programs that are described in this volume.

a) Decarbonization Proceedings in Which SCE's Overall Customer Experience May Affect Participation

As noted in SCE-01, the transition from gasoline and natural gas to electric fuel sources for transportation and buildings is an essential component to meeting the State's greenhouse gas (GHG) emissions goals. The Commission plays a critical role in this transition and, in recent years, has overseen several proceedings aimed at increasing decarbonization to help achieve these goals. These decarbonization proceedings have largely been aimed at reducing GHG emissions by using electricity produced from renewable and low-carbon generation sources to replace fuels that emit more GHGs, such as internal combustion engines in vehicles and natural gas in buildings. Because these efforts rely on customer actions to be successful, SCE endeavors to encourage customer participation in programs necessary to achieve higher electrification. Providing effective and efficient enrollment processes and operational support while minimizing barriers to participation increases the number of customers involved in electrification efforts which can lead to higher GHG reductions.

(1) Building Electrification

As California strives toward 2030 decarbonization goals and 2045 carbon neutrality, the Commission has continued to set important building electrification policies that directly affect customers. In Phase 1 of the Building Decarbonization Rulemaking (R.19-01-011), the Commission established the framework for two building decarbonization pilot programs: (1) the Building Initiative for Low-Emissions Development (BUILD Program) program, and (2) the Technology and Equipment for Clean Heating (TECH Initiative) initiative. In Phase 2 of the Rulemaking, the Commission adopted a set of guiding principles for layering of incentives from various building decarbonization programs, provided guidance on data sharing, and adopted a statewide Wildfire

and Natural Disaster Resiliency Rebuild Program (WNDRR Program). The WNDRR Program provides incentives to help homeowners impacted by a natural disaster rebuild all-electric homes in alignment with the state's long-term climate and energy goals. In Phase 3 of the Rulemaking, the Commission eliminated gas line extension allowances, refunds, and discounts, which was an important step in eliminating policies, incentives, and mechanisms that contradict the State's climate objectives. As Commission building electrification policies continue to support decarbonization goals, SCE shall continuously assess adoption barriers and provide education to customer-facing employees, and increase customers' awareness about decarbonization technologies to facilitate the continued scale-up of electrification.

(2) Transportation Electrification

The California Air Resources Board's (CARB's) proposed Advanced Clean Fleet (ACF) Regulation establishes a transition to zero emission vehicles (ZEV) for drayage trucks, as well as state, local government, federal, and high-priority fleets operating in California. If adopted as drafted as of January 2023, the compliance requirements would require some transitions as soon as 2024.[6] To help better understand the potential impacts on the grid and help fleets prepare for the ACF requirements, SCE engages with other enterprises with fleets during workshops, conferences, meetings, and other appropriate opportunities. Accordingly, SCE's customer service employees (i.e., eMobility and Business Customers Services employees) must be knowledgeable to help business customers understand the proposed requirements and support ZEV planning. For example, SCE's eMobility team has already been sharing information on the proposed ACF requirements to help create awareness of requirements for the fleets, and SCE's business customer division employees have been encouraging their fleet customers to share ZEV plans with them.

(3) Other Decarbonization Proceedings

In addition to the decarbonization proceedings noted above, SCE participates in other proceedings exploring decarbonization opportunities, barriers, customer needs and program opportunities to develop feasible solutions. For example, zonal electrification opportunities are being explored to enable gas system decommissioning in the Aliso Canyon OII (I.17-02-002) and the Long Term Gas System Planning OIR (R.20-01-007). A pillar of any analysis for assessing zonal electrification opportunities is identifying the total cost to electrify a set of customers. However, data on

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[6] *See* California Air Resources Board's Proposed Advanced Clean Fleets Regulation, available at https://ww2.arb.ca.gov/rulemaking/2022/acf2022.

the customer's current state of behind-the-meter electrical infrastructure is generally unavailable (which becomes the baseline for upgrade scenarios, such as identifying the need for upgraded electric panels and utility service, or feasibility of cost-saving opportunities for load-modifying technologies like smart panels, etc.). In R.20-01-007, multiple stakeholders have cautioned against using top-down models or "rules of thumbs" to assess highly-variable customer electrical infrastructure cost needs for electrification that should be assessed at the customer-level and case-by-case.[7]

CARB's 2022 State Strategy for the State Implementation Plan (SIP) and South Coast Air Quality Management District's Final 2022 Air Quality Management Plan (AQMP) approved initial recommendations for rules for zero-emission electric water and space heaters that would benefit from field verified data on customer's actual panel upgrade and other behind-the-meter electrical infrastructure upgrade needs for building electrification. The SIP and the AQMP (which relies on the SIP's economic analysis)[8] broadly assume panel upgrades for electrification of water and space heaters will be incurred for all buildings built before 2005.[9] The SIP also recognizes the uncertainty such a broad assumption brings to the future rulemaking and the cost-effectiveness of this significant decarbonizing and market-transforming rule.[10] SCE's proposed behind-the-meter infrastructure market characterization study would improve SIP's cost-effectiveness analysis so the optimal appliance rules would be approved for SCE customers and other Californians.

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[7] *See* Sierra Club, California Environmental justice Alliance, and Natural Resources Defense Council Opening Comments on Administrative Law Judge's Ruling Directing Parties to File Comments on Staff Gas Infrastructure Decommissioning and Comments of the Utility Consumers' Action Network to the Questions Posed by the Staff Gas Infrastructure Decommissioning Proposal, both submitted in R.20-01-007 on February 24, 2023.

[8] *See* South Coast Air Quality Management District, 2022 Air Quality Management Plan, December 2022, p. IV-A-16: "For the cost effectiveness estimates of these control measures, staff will refer to the CARB analysis. All cost assumptions for CARB measures can be found in the 2022 State SIP Strategy, Appendix A: Economic.". Accessible via: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/appendix-iv-a.pdf?sfvrsn=18 (current as of April 5, 2023).

[9] *See* California Air Resources Board, Proposed 2022 State SIP Strategy Appendix A: Economic Analysis, September 2022, p. 183 ("Panel upgrades are assumed to be required in buildings constructed before 2005."). Accessible via: https://ww2.arb.ca.gov/sites/default/files/2022-09/2022_State_SIP_Strategy_App_A.pdf (current as of April 5, 2023).

[10] *See* California Air Resources Board, Proposed 2022 State SIP Strategy Appendix A: Economic Analysis, September 2022, p.182 ("Depending on various factors including the up-front cost of equipment appliances and whether electric service panel upgrades are needed, and assumptions of the speed of technology development, this regulation could lead to an increase or decrease in spending on new zero-emission water and space heaters, compared to their higher-emission counterparts.").

4. Compliance Requirements

a) Communications and Outreach to Minorities through Multiple Channels

Requirement. SCE's 2018 GRC Decision (D.19-05-020) requires that, in future GRCs, SCE "include further evidence demonstrating SCE's commitment to minority outreach and measuring its effectiveness."[11] SCE's 2021 GRC Decision (D.21-08-036) reiterates this requirement noting that it is "especially critical that SCE track and evaluate the effectiveness of its outreach efforts to minority communities."[12]

SCE Compliance. SCE is committed to communicating with its diverse communities in a manner that is relevant to individual customer needs, and in the customer's preferred language when appropriate. SCE serves one of the most diverse territories in the nation. SCE's service territory has already achieved "minority majority" status – where over half of the individuals served are Hispanic, Black, Asian, or multi-racial. Over one million customers speak a language other than English at home. SCE's goal is to reach all customers in its service territory—including customers with access and functional needs,[13] customers who do not understand English, and migrant populations—with information they can understand and trust. SCE demonstrates its commitment to reaching these communities by (1) communicating in multiple languages, (2) partnering with organizations to reach traditionally hard-to-reach populations, and (3) communicating across multiple channels.

First, with respect to communicating in multiple languages, SCE determines which communities it will target with in-language[14] outreach by looking at the prevalence of a language in a community and determine a customer's likelihood to enroll in a program. For example, because

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[11] *See* D.19-05-020, Decision on Test Year 2018 General Rate Case for SCE, May 16, 2019, OP 20; *see also* p. 139 ("Future testimony . . . should include further evidence demonstrating SCE's commitment to minority outreach and measuring its effectiveness.").

[12] *See* D.21-08-036, p. 285.

[13] Per the California Governor's Office of Emergency Services, Access and Functional Needs (AFN) individuals are or have: Physical, developmental or intellectual disabilities; Chronic conditions or injuries; Limited English proficiency; Older adults; Children; Low income, homeless and/or transportation disadvantaged (i.e., dependent on public transit); Pregnant women. *See* "Access & Functional Needs | California Governor's Office of Emergency Services" at https://www.caloes.ca.gov/office-of-the-director/policy-administration/access-functional-needs/.

[14] In-language communication refers to the sharing of information in the native non-English language of the recipient for better understanding.

over 87%[15] of our customers speak at least one of five "core languages" (English, Spanish, Vietnamese, Korean, and Mandarin/Cantonese), the majority of the residential service-related and emergency information on SCE's website, SCE.com, is provided in these five core languages. About 17%[16] of the information on SCE.com is available in multiple languages. The majority of SCE's marketing campaigns are multilingual. For example, in 2020-2021, SCE conducted five multi-channel campaigns with in-language components shown below in Table II-3.

Table II-3
SCE Multi-Channel Campaigns[17]

Campaign	Year(s)	Language(s)	Channels		Net Investment
Catalina Consumer Protections*	2020	English	Paid Social, Print	$	1,653
		Spanish	Print	$	1,312
			Totals	*$*	*2,965*
Consumer Protections	2020 & 2021	English	Digital Banner, Digital Video, Paid Search, Paid Social, Radio	$	886,990
		Arabic, Armenian, Chinese, Farsi, French, German, Japanese, Khmer, Korean , Punjabi, Russian, Spanish, Tagalog, Vietnamese	Digital Banner, Digital Video, Univision, Sponsorship, Paid Search, Paid Social, Radio	$	595,522
			Totals	*$*	*1,482,512*
COVID-19	2020	English	Digital Audio, Digital Banner, Paid Social, Radio, Paid Search	$	708,266
		Chinese, Korean, Spanish, Vietnamese	Digital Audio, Digital Banner, Paid Social, Radio	$	521,562
			Totals	*$*	*1,229,828*
Emergency Preparedness Print	2020	English	Print	$	26,635
		Chinese, Korean, Spanish, Tagalog, Vietnamese	Print	$	42,094
			Totals	*$*	*68,729*
TOU	2021	English	CTV, Digital Audio, Digital Banner, Digital Video, OOH, Paid Search, Paid Social, Radio	$	1,742,957
		Chinese, Korean, Spanish, Vietnamese	CTV, Digital Audio, Digital Banner, Digital Video, OOH, Paid Search, Paid Social	$	515,473
			Totals	*$*	*2,258,430*
			English Totals	$	3,366,501
			In-Language Totals	$	1,675,963
			Grand Totals	*$*	*5,042,464*

Second, SCE has partnered with Community Based Organizations (CBOs) that represent minority and underserved communities, like low-income, seniors, in-language, disabled, disadvantaged communities (DACs), and other traditionally hard-to-reach populations. Partnerships with

[15] This figure is based on self-reported data from customers obtained through the Customer Contact Center and current as of March 2023.

[16] This figure is based on a review of the public-facing pages of SCE.com and current as of the end of 2022.

[17] The campaigns listed in this table are not GRC funded.

CBOs are instrumental in reaching critical and hard-to-reach audiences and providing income and customer support assistance, especially to those dealing with the financial impacts of COVID-19. SCE provides a variety of tools and educational materials to SCE's partner CBOs, often with translations in multiple languages. CBOs then share the materials with their constituents, either jointly with SCE or on their own.[18]

SCE was able to reach approximately 2 million constituents through the various communication channels established by CBOs in 2021 and 2022. These communication channels include social media, e-mail, CBO websites, CBO facilitated webinars, Facebook or Instagram "live" events, and in-person events. Specifically, in 2021 and 2022, SCE and its partner CBOs (1) reached over 260,000 constituents who represent underserved and hard-to-reach communities, through digital webinar and/or outreach events; (2) made over 720,000 impressions via various social media channels (Facebook, Instagram, and Twitter); and provided communications on SCE customer care and income qualified programs like, critical care backup battery, portable power generator rebates, medical baseline, CARE/FERA, and ESA to over 1.1 million constituents via mass-emails, electronic newsletters or CBOs' websites. Additionally, in 2021 and 2022, 41% of CBOs that were paid for performance conducted outreach in DACs.

Finally, with respect to communicating across multiple channels, SCE's coordinated outreach spans across internet, television, radio, and print. Highlights from SCE's multichannel communication efforts in 2020 and 2021 include: (1) SCE delivered more than 1.1 billion total media impressions (34% of which were in languages other than English) through a combination of CTV (internet-connected TV, e.g., Hulu), Digital Audio (e.g., podcasts and streaming music), Digital Banners, Digital Video, Billboards, Paid Search and Radio; (2) SCE sent nearly 17 million direct mail communications to customers in multiple languages; and (3) SCE deployed four territory-wide media campaigns, which represented more than 20% of SCE's total media investment and which effectively reached 100% of DAC ZIP codes in SCE service territory. These multi-channel media campaigns included a variety of outreach in several channels, such as radio, billboards, print, internet display ads, and interconnected TV, among others.

SCE remains committed to communicating with diverse communities in 2025 and beyond. By (1) communicating in multiple languages, (2) partnering with CBOs to reach traditionally

[18] Refer to WP SCE-03, Vol. 03, pp. 7-8 ("SCE Community Based Organization (CBO) Partners"), for a list of CBOs that SCE partnered with in 2022.

hard-to-reach populations, and (3) communicating across multiple channels, SCE develops messages that resonate not only in-language, as well as across appropriate delivery channels (e.g., radio, print, digital, etc.), but also from a cultural perspective. Partnerships with CBOs will continue into future campaign planning and execution to help reach SCE's diverse customer base, particularly those who are traditionally hardest to reach. As further detailed below, SCE has developed and continues to refine customer segmentation frameworks and models that help determine the optimal messages and delivery channels necessary to reach SCE's diverse populations.

b) Comparison of Data from American Community Survey (ACS) and U.S. Census Bureau

Requirement. In D.21-08-036, the Commission required that SCE include in its next GRC filing "a description of how current American Community Survey data compares with more up-to-date information from the United States Census Bureau, whether SCE used the more up-to-date information, and why or why not."[19]

SCE Compliance. When conducting broader marketing campaigns, SCE's Customer Education and Outreach group uses data from the United States Census Bureau's American Community Survey (ACS) to target non-English speaking communities. The ACS data is released annually, and each annual release is of data, in the form of estimates, from a historical five-year period. Although the released data may appear to be dated, the ACS data is the most-up-to-date data available from the United States Census Bureau. The most current information available from the United States Census Bureau as of the data of this GRC submission take the form of the ACS 5-year estimates for 2017-2021 which were published on December 8, 2022.

c) Communities SCE Intends to Target with In-Language Outreach and Meeting with National Diversity Coalition

Requirement. In D.21-08-036, the Commission required SCE to include in its next GRC filing a summary of the meeting(s) held with the National Diversity Coalition (NDC) to further develop the list of CBOs SCE currently uses for Customer Communications, Education, and Outreach

[19] *See* D.21-08-036, OP 17.

(CE&O), as well as a description of the specific communities SCE intends to target with in-language outreach.[20]

SCE Compliance. SCE met with NDC multiple times in 2022 to further develop the list of CBOs it currently uses for CE&O.[21] Meeting topics included SCE Low and Moderate Income (LMI) programs (e.g., CARE, FERA) to underserved communities, Supplier Diversity, SCE/CBO partnerships and in-language outreach to minority communities, outreach and education efforts using newsletters in 19 different languages for Wildfire Safety/Public Safety Power Shutoff (PSPS), SCE eMobility (i.e., Transportation Electrification), and American Sign Language (ASL) interpreters being used for Wildfire Safety Community Meetings.

These meetings have resulted in NDC expressing a willingness to partner with SCE to identify the CBOs that are effective and to help SCE achieve further outreach in minority and underserved communities. NDC indicated they would compile and provide to SCE a list of recommended CBOs for further outreach and will provide recommendations to SCE.

With respect to specific communities SCE intends to target with in-language outreach, SCE uses the United States Census Bureau's American Community Survey (ACS) to identify core languages spoken within our service territory. This information has led SCE to translate and offer communications to customers in English and four non-English languages, which represent corresponding communities:

Table II-4
Communities SCE Targets with In-language (Non-English) Outreach

Targeted In-Language (Non-English) Communities *Over 87% of SCE's customers speak English and/or one of the non-English "core languages"*
Hispanics (Spanish)
Chinese (Mandarin/ Cantonese)
Korean
Vietnamese

[20] *See* D.21-08-036, OP 18; *see also* Conclusions of Law 126 ("SCE should meet with NDC to further develop the list of CBOs it currently utilizes for Customer CE&O, and should include a summary of the meeting(s), as well as a description of the specific communities SCE intends to target with in-language outreach, as part of its next GRC application.").

[21] Refer to WP SCE-03, Vol. 03, pp. 9-10, ("Summary of November 8, 2022 SCE-NDC Meeting") for summaries of the SCE-NDC meetings.

For in-language outreach, SCE deploys emails and letters, predominantly in English and Spanish, with links to SCE.com that further expand access to multi-language information. SCE's advertising media also reaches in-language communities based on media consumption behaviors, ethnic neighborhood geographies, radio stations, newspapers, and web browser language settings, to display printed or digital advertisements to these customers.

To amplify the impact of SCE's in-language outreach, SCE partners with CBOs to increase awareness and educate customers on SCE programs and offerings, and rate communications. SCE selects the CBOs through a Request for Proposal (RFP) process that is designed to identify the CBOs that demonstrate the ability to reach diverse and underserved communities, particularly those with in-language needs. Below is a list of the CBOs that provide outreach in languages other than English:

Table II-5
SCE In-Language CBO List

Community-Based Organizations (CBOs)	
Access California Services	Grossman Burn Foundation
Active San Gabriel Valley	High Sierra Energy Foundation
Bakersfield Arc	Inland Empire United Way
Beeyond Prepared	Inland Wellness Information Network
Big Brothers Big Sisters of the Inland Empire	Kern Fire Safe Council
Boys & Girls Club of Greater Ventura	Mixteco/Indigena Community Organizing Project
Boys & Girls Clubs of the San Gorgonio Pass	Mojave Valley United Way
BREATHE California of Los Angeles County (BREATHE LA)	Mountain Rim Fire Safe Council
Cathedral City Senior Center	Ojai Valley Fire Safe Council
Central Ventura County Fire Safe Council	People for Irvine Community Health DBA 2-1-1 Orange County
Coachella Valley Economic Partnerships	Reach Out Morongo Basin
Community Action Partnership of Kern	San Joaquin Valley Clean Energy Organization
Community Environmental Council	Service Center for Independent Life
Day One	SET for LIFE, Inc, in partnership with Happy 50+
Dayle McIntosh Center for the Disabled	Speech and Language Development Center
Disabled Resources Center, Inc. (DRC)	United Way of the Inland Valleys
East San Gabriel Valley Japanese Community Center	Veterans Legal Institute
El Concilio Family Services	Village Solutions
EXCEED	Young Visionaries Youth Leadership Academy
Foothill Unity Center, Inc.	Youth Action Project
GRID Alternatives Greater Los Angeles	

d) Photovoltaic Forecast

Requirement. D.21-08-036 directs "SCE to report how closely its current solar photovoltaic forecast compares with actual NEM solar applications received" as part of this GRC application.[22]

[22] *See* D.21-08-036, p. 310.

SCE Compliance. The forecast and actual solar NEM are presented and discussed in Section II.C.2.a)(2) below.

e) Charge Ready Program Monitoring and Reporting

Requirement: For each of the Charge Ready programs, the Commission established ongoing monitoring and reporting requirements.[23]

SCE Compliance: SCE plans to fulfill the Charge Ready-related compliance activities as specified by the Commission through its Decarbonization team as described in Section II.C.2 below. All Charge Ready programs are expected to be completed during the forecast period (2025-2028) for this GRC. SCE's CPM forecast includes funding for those compliance activities that fall beyond the closure of the individual Charge Ready programs.

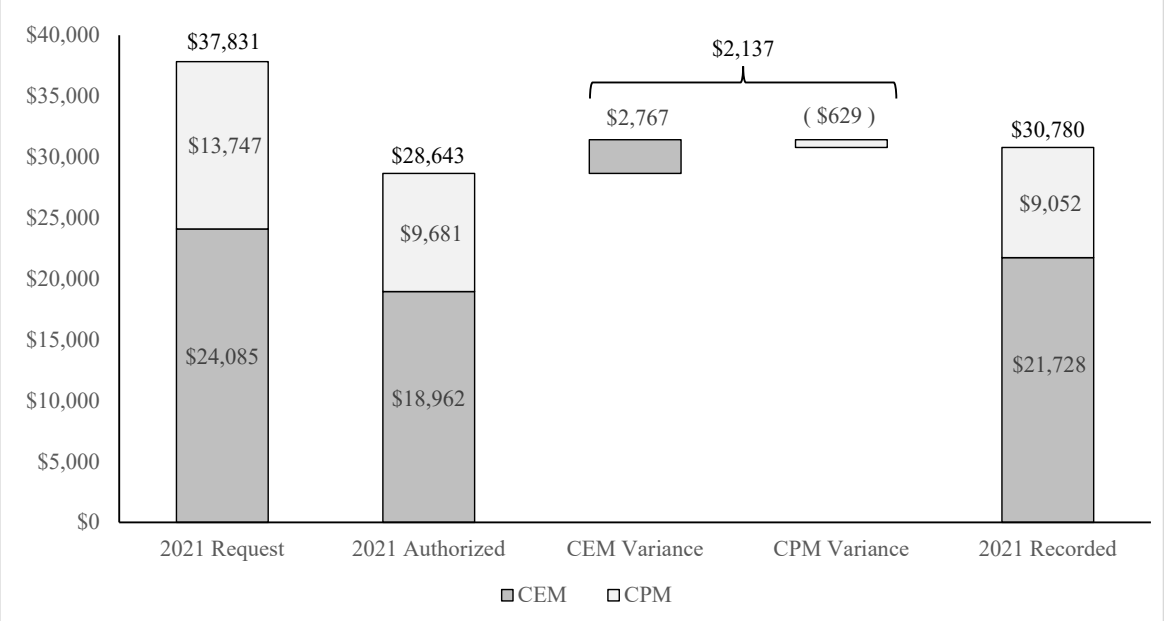
B. 2021 Decision

1. Comparison of Authorized 2021 to Recorded O&M

Figure II-4 compares the requested and authorized O&M expenses from SCE's 2021 GRC for the Customer Care Services BPE. As shown in Figure II-4, SCE's recorded O&M expenses for CEM and CPM of $30.780 million in 2021 were $2.137 million more than the authorized amount of $28.643 million. The variance arose from spending over authorized of $2.767 million for CEM and under authorized of $629,000 for CPM. Additional details regarding these variances are presented below at Sections II.C.1.b) (for CEM) and II.C.2.b) (for CPM).

[23] Refer to Table II-13 for additional details regarding the Charge Ready program compliance requirements.

Figure II-4
Customer Care Services[24]
2021 Authorized Versus 2021 Recorded O&M Expenses
(Constant 2022 $000)



2. Comparison of Authorized 2021 to Recorded Capital

The Commission authorized SCE capital expenditures totaling $266,000 for Specialized Tools and Equipment for the Technology Test Center (TTC) related to its Customer Programs Management GRC activity.[25] As explained in Section II.D.1, SCE did not record any capital expenditures in 2021 due to the absence of qualified bids. In this GRC, SCE has updated its capital forecast for the TTC in Section II.D. In this GRC, capital expenditures related to Customer Experience Management are limited to capitalized software projects summarized in Section II.D.3 and discussed in detail in SCE-06, Vol. 2.

C. O&M Forecast

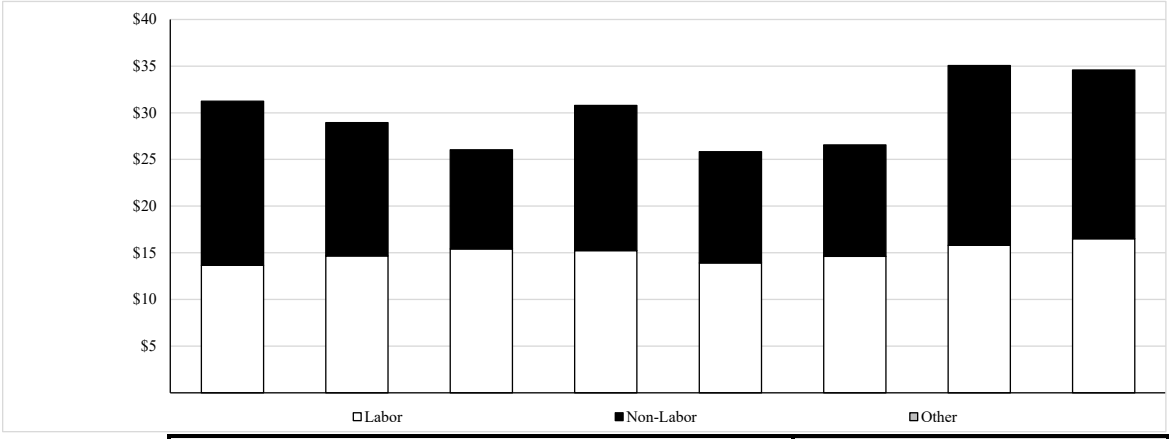
This section presents a description of, and need for, the work activities covered in this Volume. In this section, SCE also presents a comparison of 2021 authorized to recorded expenses, scope and

[24] WP SCE-07, Vol. 01, Authorized vs. Recorded.

[25] In its 2021 GRC, SCE's request for the Technology Test Center's Specialized Equipment was combined with the request for Hydraulic Services test equipment for a total of $390,000 for 2201. In D.21-08-036, the Commission adopted SCE's Specialized Equipment forecast. *See* D.21-08-036, p. 315.

forecast analysis, and the basis for the Test Year O&M forecast. Figure II-5 below presents the Customer Care Services O&M expenses recorded from 2018-2022 and forecast from 2023-2025.

Figure II-5
Customer Care Services
Recorded 2018-2022 and Forecast 2023-2025 O&M Expenses[26]
(Constant 2022 $000)



	Recorded					Forecast		
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Labor	$13,661	$14,661	$15,408	$15,236	$13,907	$14,618	$15,801	$16,496
Non-Labor	$17,569	$14,278	$10,635	$15,544	$11,925	$11,944	$19,262	$18,082
Other								
Total Expenses	**$31,230**	**$28,939**	**$26,043**	**$30,780**	**$25,831**	**$26,562**	**$35,064**	**$34,578**
Ratio of Labor to Total	44%	51%	59%	49%	54%	55%	45%	48%

1. Customer Experience Management

a) Work Description and Need for Activity

SCE's customer landscape continues to evolve, both in terms of composition and technologies available to customers, leading to shifting customer expectations. Through customer research and data analysis, CEM identified significant customer gaps and pain points and developed work activities to mitigate those concerns. To continuously improve the customer experience, CEM focuses on enhancing the customer's management of their electric service and supporting the State's energy goals while helping reduce internal operational costs (e.g., call volume). SCE's CEM strategy centers on strengthening data analytics and insights capabilities, expanding self-service capabilities

[26] WP SCE-03, Vol. 03, pp. 1-6 – O&M Detail for Customer Experience Management – and pp. 17-22 – O&M Detail for Customer Programs Management.

through digital channels, and providing customer education and outreach through multi-channel campaigns to improve the overall customer experience. This approach allows SCE to more effectively:

- Collect customer data and feedback and develop the insights that allow the entire organization to understand and act on its customers' pain points;
- Understand customer expectations and effectively manage engagement with SCE's diverse customer segments;
- Prioritize resources and investments on improvements that address customer concerns and improve operational efficiency by reducing operational costs;
- Develop and optimize interactions (namely enabled by digital self-service capabilities) that make it easier for customers to do business with SCE;
- Communicate relevant, timely data and information to SCE customers to keep them safe, informed, and engaged.

Through these efforts, SCE will be better positioned to engage with all customer segments, prioritize customer-centered investments, and improve operational efficiencies while delivering on customer expectations.

(1) Customer Experience Management Activities

The following sections present a description of the activities performed in the three key areas of CEM and their criticality to the customer.

(a) Customer Experience Insights and Analytics

The Customer Experience Insights and Analytics function plays a critical role in helping ensure that the service SCE delivers to its customers meets their expectations. The key areas of this function are (1) analyze customer intelligence to better understand customers' diverse needs and wants, (2) identify opportunities to improve customer interactions, and (3) help SCE make better business decisions.

Customer Experience Insights and Analytics uses several methods to collect customer intelligence in the form of actionable data and insights that can be used by areas across the company. For example, SCE has greatly expanded its "Voice of the Customer" (VOC) program, which surveys customers to collect feedback on 14 different experiences.[27] For each

[27] Experiences include outages, billing and payment, service planning, vegetation management, solar, CARE/FERA, obtaining credit, and other key transactions.

experience, this feedback helps SCE assess satisfaction, develop models that determine the biggest satisfaction drivers, identify and address the root causes of customer dissatisfaction, and plan and prioritize future improvements.[28] For example, SCE used this data to identify the lack of outage communication as one of the principal drivers of customer dissatisfaction related to power outages.[29] Additionally, SCE has expanded its "Close-the-Loop" program, which involves communicating directly with customers via email, SMS/text, and voice calls when negative VOC feedback is received. Close-the-Loop not only ensures that SCE is resolving individual customer issues, but also helps identify and fix root causes to avoid future calls and customer dissatisfaction.

Customer Experience Insights and Analytics also conducts customized studies and subscribes to syndicated research studies[30] that help SCE maintain a continuous pulse on customer sentiment, program performance, and communication effectiveness. SCE's primary measurement of customer experience is Net Score (NS), which measures satisfaction on specific experiences and interactions customers have with SCE. In 2022, SCE also started tracking overall customer trust towards SCE for both residential and non-residential customers and the drivers that most impact this sentiment. Additionally, SCE conducts tracking surveys for specific programs to assess customer awareness, understanding, and engagement, including Public Safety Power Shutoff (PSPS),[31] Time-of-Use, and Residential Rate Reform. SCE has also benchmarked customer satisfaction and perceptions against other large utilities through the nationwide, syndicated J.D. Power Electric Utility Satisfaction Study since 1999.

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[28] To analyze customer comments from VOC surveys, SCE uses text analytics capabilities to highlight common themes and address customer pain points. Text analytics capabilities involves the use an algorithm (natural language processing, NLP) to ingest free form text (e.g., survey comments, etc.) to identify common themes from large quantities of customer comments.

[29] SCE determined that 15% of those customers were mapped to the wrong circuit, 40% were not signed up to receive notifications, and 10% had incorrect contact information that prevented them from receiving notifications. This information was used as the basis for an action plan to address these root causes, which is being executed by SCE operational teams.

[30] The Customer Insights team subscribes to J.D. Power's syndicated Residential and Business customer studies, which allows SCE to benchmark performance relative to other utilities. The Customer Insights team also conducts "customized" studies based on ad-hoc research requests from program teams and CPUC mandated research.

[31] In 2020, the Customer Insights team began conducting an annual survey to assess the effectiveness of utility communications and outreach for wildfire safety/preparedness and associated PSPS activities. The study is conducted in 19 different languages to measure and track improvements in customer awareness of SCE's efforts to mitigate wildfires, prepare customers, and the effectiveness of SCE to notify customers of PSPS events.

Customer Experience Insights and Analytics conducts propensity modeling activities[32] to better understand the likelihood of customer adoption of programs and services. For example, SCE recently built customer segmentation frameworks for residential and non-residential customers, which were completed in 2021 and 2023, respectively. A customer segmentation framework groups customers into distinct segments based on demographics, behaviors, and attitudes. Each segment has a unique profile of characteristics and propensities that represent the diverse attributes of the customer base. SCE uses these segments to anticipate customer reactions and behaviors and understand customer pain points within various customer experiences. SCE can then make recommendations for how to best engage with a particular segment in a targeted and cost-effective way. For example, in 2022, the residential segmentation framework was used to create a targeted plan for migrating customers to Paperless Billing, which reduced operational costs and has potential to improve the customer experience.[33]

Finally, Customer Experience Insights and Analytics employs strategic methods, like journey mapping,[34] to improve customer interactions and design new customer experiences. By utilizing customer data, customer feedback, operational metrics, employee interviews, primary and secondary research, and industry benchmarks, journey mapping helps SCE locate customer pain points, which can then be evaluated for impact. SCE can then prioritize the right improvements for its customers to deliver future processes and requirements that better meet customer expectations. As an example, SCE used journey mapping to evaluate the existing PSPS communications experience, resulting in several short-term experience improvements (e.g., more intuitive customer messaging during events) and a long-term vision prioritizing future enhancements to improve the customer experience. As customer interactions increase in number and complexity, expanded journey mapping capabilities will be increasingly critical in diagnosing customer pain points and developing a streamlined customer experience.

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[32] Propensity modeling involves using historical data to predict the probability of whether a customer will choose a particular item (e.g., electric vehicle, solar panels, etc.)

[33] Utility customers that receive an eBill are 10 percentage points more satisfied than those that do not engage in digital billing and payment options. Chartwell 2022 Residential Customer Survey, n=1,516.

[34] Journey mapping involves the development of a customer journey map, which is a visual representation of a customer's path through an experience, to identify customer needs, expectations, and experience gaps through analysis of operational metrics, customer sentiment, and external best practices and insights.

(b) Digital Operations and Management (DOM)

Digital capabilities are a foundational enabler of SCE's strategy for improving the customer experience and achieving internal operational efficiencies. As digital technology has advanced, there is an increased need for SCE to expand its self-service approach and deliver capabilities for SCE's growing base of customers who engage via digital channels, including mobile devices. The Digital Operations and Management (DOM) group primarily: (1) plans and manages end-to-end digital customer experience to meet SCE customers' online needs and expectations; (2) designs and optimizes SCE's digital service delivery channels (e.g., SCE.com and the My SCE mobile app) using customer insights and other inputs to guide the development of features and functions that enable customers to interact with SCE at their convenience via digital self-service, including tools that help customers make informed decisions about their energy usage and participate in programs that enable them to manage their energy usage; and (3) is responsible for the day-to-day operations of the SCE.com customer portal including publishing content that keeps SCE customers and external stakeholders informed about important public safety topics.

SCE currently offers a significant number of self-service capabilities through SCE.com, mobile app(s), and other customer-facing websites. While the transactional capabilities of SCE.com provide customers the opportunity to self-serve, there have been few major enhancements or additions to the channel since 2018. The overall SCE.com design dates to 2014 and the user experience is heavily fragmented across a patchwork of different SCE web properties. As described in Section II.C.1.a.2, these conditions have limited the growth of self-service volume and led to customer dissatisfaction.[35] Although investment has been limited in recent years, the few areas where resources have been allocated have had a meaningful impact and are geared toward customer safety. For example, SCE consolidated its multiple, fragmented outage maps to a single comprehensive and easy-to-use map that allows customers to search by address and view current and planned maintenance, repair, PSPS, and rotating outages in one place.[36] In addition, SCE also launched its Communications Preference Center, which allows customers to manage their notification settings,

[35] *See* Section II.C.1.a.2 for additional details.

[36] User Experience (UX) digital research was conducted in March 2022 to assess customers' reaction to the updated Outage Map. Just over three-quarters of the respondents found the outage map easy to read (78%), and customers were largely successful in reporting outages (88%) and signing up for outage alerts (88%). There is an opportunity to improve the organization (43%) and ease of use (39%) of the map. Just over half (52%) believe the outage map has the "right amount of information".

including setting their channel of choice (email, text, voice) and preferred language for various communications, including outage and account-related notifications.[37]

As customers' expectations continue to evolve in an increasingly digital environment, SCE aims to quickly act upon customer feedback and insights to deliver digital capabilities that provide value to its customers and align with current customer wants and needs. SCE seeks to shift how it delivers digital products from large-scope, longer-duration project implementations to multiple targeted projects with a faster speed-to-market that can more easily be iterated upon as customer feedback and data is collected and analyzed. This approach will enable SCE to rapidly identify digital experience gaps and allocate resources both to addressing those gaps and continuously optimizing experiences to ensure they remain in line with customer needs.

(c) Customer Education and Outreach

Customer Education and Outreach activities consist primarily of multi-channel marketing campaigns to create awareness among customers and encourage adoption of SCE programs and services, provide details about new and existing rate plans and required compliance information (Rate and Compliance Marketing), and create awareness of and encourage adoption of self-service options (Self-Service Marketing).[38]

All multi-channel marketing campaigns involve the planning, creation, and optimization of communications, websites, emails, social media, and print materials to drive customer awareness and adoption of SCE service offerings. Each campaign utilizes information gathered through targeted customer research and analytics to better understand customers' needs, match customers with SCE programs and solutions, and reach customers though the appropriate combination of delivery channels. SCE also collaborates with community-based organizations (CBOs) and third parties to communicate with customers about SCE's service offerings.

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[37] UX digital research conducted in October 2021 and March 2022 found customers' interaction with the Customer Preference Center (CPC) webpage was positive and they understood what was being communicated in each area tested. In March 2022, 71% of study participants were satisfied with the information on the Preference Center page, and the majority of customers found it easy to update program preferences and enroll in programs. Areas that can be improved upon including findability of the CPC, content personalization, and access to contact information for SCE.

[38] Self-Service Marketing drives customer awareness and adoption of self-service capabilities, which include all services that allow customers to conveniently access information and complete routine transactions without the assistance of a live customer service representative. These self-service transactions include bill payment, bill details and history, turn on and transfer of service, outage updates, program enrollment, and viewing usage information.

Rate and Compliance Marketing consists of communications related to (1) mandated and legal notices, such as public participation hearings, rate changes, program applications, terms & condition disclosures, and other regulatory proceedings, (2) education on rate plan options, offering Time-of-Use text alerts, rate increase/affordability communications, and updates to the rate factor pages on sce.com when a rate change occurs, and (3) extreme weather communications to provide customers with relevant safety information, such as tips to stay safe, SCE community resources such as the cooling centers, and ways to curtail energy use to avoid rotating outages.

Self-Service Marketing helps redirect traffic from higher-cost channels (e.g., phone and manual application processing) by educating customers on how to leverage self-service channels (i.e., SCE.com and Interactive Voice Response (IVR)) to learn more about their rate options and energy costs. When applicable, SCE's multi-channel marketing campaigns encourage customer usage of related self-service capabilities. Self-service, in general, delivers the highest levels of customer satisfaction (versus other interaction channels) at the lowest cost to serve customers.[39] Multiple reports support this by finding that customers who interact with their energy provider digitally tend to adopt other programs at a higher rate than customers who do not.[40] Digital channels are also a less expensive channel to market to customers, resulting in better value for each marketing dollar spent. Continued and consistent promotion of self-service capabilities will allow SCE to increase the volume of self-service transactions, shift analog (phone) behaviors to lower-cost digital channels and improve customer satisfaction.

In 2021, SCE made significant advances to more effectively target its education and outreach efforts by leveraging its customer segmentation frameworks, developed as part of its Customer Experience Insights and Analytics work. SCE uses the data and insights provided by a customer segmentation framework to develop messages that are substantively relevant to that customer segment, and deliver them in a manner (i.e., at the right time, through the right channel) that is

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[39] *See* Gartner, "State of the Customer: Customer Service Journeys and Channel Preferences". Published August 9, 2021.

[40] According to a 2020 McKinsey report, across industries, digitally engaged customers have higher customer satisfaction, are more likely to recommend brands, and have higher loyalty. https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/service-industries-can-fuel-growth-by-making-digital-customer-experiences-a-priority. Additionally, Twilio's 2022 State of the Customer Engagement Report, which reflects the findings from a survey of 3,450 business leaders and 4,500 consumers across 12 countries, found that investment in digital customer engagement and personalization technologies has significant, measurable, positive impact on customer retention and trust — and on revenues across service industries. https://www.twilio.com/state-of-customer-engagement.

optimal to that customer segment. For example, customer segments who are categorized as low-income received communication about high bill and affordability programs, whereas customer segments who demonstrate clean energy behaviors received communications on specific rebates and offerings available on these topics.

Since 2020, SCE has also been upgrading its customer marketing and communication tools so that it can begin to automate and personalize its customer communications. This will not only help ensure that SCE's content and communications are more targeted and relevant for customers, keeping them safer and better informed, but it will also lower SCE's outreach costs as these efforts mature.

(2) Assessing Customer Expectations and Experience Gaps

To help California achieve its aggressive GHG reduction targets, SCE must be viewed as a trusted partner and valued electric service provider. SCE must not only deliver on customers' basic utility needs but also better manage more complex challenges, like expanding adoption of electrification, in the years ahead. To understand those challenges, CEM conducted a comprehensive analysis of the changing customer landscape and customer pain points, which will be foundational in meeting customer expectations and providing satisfying experiences.

(a) Changing Customer Landscape

Significant shifts in consumer behaviors in the past few years have impacted nearly all aspects of SCE's customers' lives. The need to increasingly adopt digital solutions, renewed focus on social and environmental responsibility, and a greater focus on their financial bottom line due to price inflation impacting the cost of many goods has led to new and growing customer expectations and priorities that will require SCE to make the appropriate investments to ensure customers find value in the service they are provided.

Shifting age groups are leading toward a shift in engagement: The demographic makeup of SCE's customer base continues to change, and with this change comes a shift in what they expect from their service providers. In 2020, Millennials and Generation Z became the largest demographics in the world and, according to Ernst & Young, are more energy-engaged and about twice as likely to monitor their energy on a weekly basis than older generations.[41] In addition, the digital

[41] *See* Ernst & Young, Navigating The Energy Transition Consumer Survey. https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/power-and-utilities/ey-navigating-the-energy-transition-consumer-survey-v2.pdf.

divide that once existed for older generations no longer appears to be a limiting factor for the Baby Boomer generation.[42] With increased engagement across all generations on multiple fronts, SCE must be prepared to deliver on the varying expectations its customers have in the years ahead.

Continued growth in digital channel engagement: As shown in Table II-6 below, SCE.com experienced growth of nearly 17 million visits from 2019 to 2022, which illustrates that customers are increasingly looking to digital channels for interacting with SCE. Mobile traffic to SCE.com has increased by approximately 19 percent, from 31 million visits in 2020 to 37 million in 2022, making up 50 percent of all web traffic on SCE.com. Additionally, the My SCE mobile app has been downloaded over 316,000 times after its refresh in September 2022. SCE forecasts that mobile traffic will increase to 60 percent of total traffic by 2025.[43]

Table II-6
Digital Operations and Management
Key SCE Online Usage Trends in 2019-2022[44]

Line No.	Metrics	2019	2020	2021	2022
1	SCE.com Visits	58,161,242	61,103,600	63,056,409	75,046,435
2	Mobile Device Traffic		31,268,052	34,356,264	37,267,010
3	Energy Usage Visits	1,566,204	2,303,241	3,131,626	4,872,488
4	Service Turn On/Off/Transfer Requests	373,388	388,179	592,370	595,953
5	Online Billing Enrollment on SCE.com	223,035	364,170	139,680	22,901
6	Electronic Bills Delivered	26,211,963	28,159,300	21,906,406	23,898,797
7	Payment Transactions on SCE.com	11,346,245	11,304,150	11,918,680	11,941,502
8	Outage Center Page Views	14,909,492	14,480,617	11,915,646	11,268,701
9	Mobile App Downloads				316,042
10	Report-An-Outage	172,243	242,198	259,298	327,590
11	Password Reset	402,012	473,065	831,610	795,398

[42] According to Ernst & Young, older consumers are now more likely to use digital channels to interact with their energy provider than younger ones. Of consumers who interacted with their energy provider in the past year, 67% of Boomers report using digital channels compared with 56% of Gen Zs. There is also a gap in the digital experience of younger consumers — on average, 37% of consumers are not confident in their energy provider's digital services, but this increases to 50% for Gen Z. https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/power-and-utilities/ey-navigating-the-energy-transition-consumer-survey-v2.pdf.

[43] The forecast for SCE mobile traffic growth is 10% annually based on historical trends of 10% growth per year from 2020 to 2022.

[44] Line 2: Mobile device traffic is a subset of Line 1, SCE.com visits. Data for 2019 is unavailable due to the implementation of various analytics tagging enhancements for mobile interactions on SCE.com; Line 9: (*Continued*)

However, outside of overall traffic and a few key experiences like usage data and service turn on/off/transfer requests, usage of SCE's digital channels has remained flat or dipped. It is crucial that SCE makes significant and sustained investments in digital to meet customer needs and shift traffic from higher cost channels such as live agent to digital channels, where the cost to serve is lower.

New technologies continue to emerge: The introduction of new technology products and services continues to fundamentally change how SCE is expected to serve its customers. From electric vehicles to battery storage to self-generation to "smart" appliances, as adoption of these technologies continues to increase, customers will come to expect the connectivity between their products and their energy provider to be simple and seamless. SCE must anticipate its customers' varying needs and design experiences that account for the integration of various energy-related technologies for homes and businesses.

Providing accessible solutions for low-income customers: Based on SCE's Residential customer segmentation analysis, customers who fall into lower- or fixed-income segments make up over 43% of its residential customer base. As SCE continues paving the way for customers to electrify their homes and businesses, it is important that low-income customers are equipped with the right information about available programs and services that can make their transition to electrification a reality. To effectively do this, SCE needs to continue extensive research and analysis on this segment of customers, and better engage with them via their channels of choice, like mobile.[45]

(b) Gaps in Customer Experiences

Through SCE operational and customer data – including SCE's Voice of the Customer – CEM has identified and measured the experiences that continue to cause difficulties for customers. These highlighted experiences are the key areas of focus of SCE's customer

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The MySCE mobile app was the web mobile app from 2019 to 2021, which means that mobile app data was comingled with SCE.com. Additionally, the mobile web app did not have a specific identifier in back-end systems to separate the mobile web app from mobile web transactions. As such, SCE does not have app specific data for these years. The native mobile app that went live in 2022 will have its own unique data set moving forward; Line 10: SCE customers experienced fewer outages which resulted in a reduced need to visit the website to report outages or get outage status; Line 11: Password Reset requests experienced a significant increase in 2021 due to technical issues resulting from the implementation of the Customer Service Re-platform Project, which replaced back-end customer information systems.

[45] Lower income Americans have fewer options for online access at their disposal and most often rely on smartphones (76%) for news, day-to-day transactions, and homework. https://www.pewresearch.org/fact-tank/2021/06/22/digital-divide-persists-even-as-americans-with-lower-incomes-make-gains-in-tech-adoption/.

experience improvement effort and should also bring operational efficiencies as these gaps are addressed.

While these pain points result in negative experiences for customers, if solved, they can also offer significant opportunities for increased operational efficiencies as well as gaining trust with customers. When customers have difficulty in completing day-to-day business with a service provider – tasks that they typically do not encounter with other similar service providers – trust in the company's ability to effectively serve them begins to erode. The dissolution of trust now can have a negative effect in future years when customers are making decisions about electrifying their homes and businesses. If SCE does not invest now – not only to "catch up" on years of investments needed to meet basic customer expectations, but to begin to get ahead of the curve on what its customers expect in the future – it ultimately runs the risk of not meeting critical GHG reduction goals.

Service outages are too lengthy, too frequent, and lack adequate communication. In 2022, the average duration for an unplanned service outage was ~6 hours. Planned service outages have also increased since 2019 due to activities related to grid modernization and hardening efforts. Customers may also experience multiple outages throughout the year, with over 12% of surveyed customers reporting that they experienced two or more outages in 2022. Outage-related calls are the third largest call type received by the Customer Contact Center, and lack of adequate outage communications is one of the main drivers for customer dissatisfaction. Approximately 40% of customers state they do not receive timely and/or adequate notifications when an outage occurs.

Receiving and paying bills is not an easy or seamless experience. Customers express confusion with their bill, especially among customers with more complex bills (e.g., TOU, NEM) and lack the information needed to resolve issues on their own (36% of calls from NEM customers involve customers not understanding how their billing and usage works). VOC feedback has also identified difficulties when trying to submit payment, with key drivers of dissatisfaction around limited payment methods available[46] and challenges with the IVR payment process.

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[46] According to Chartwell's 2021 Payment Industry Benchmarks Survey, nearly half of utilities who participated in the survey (n=43) are offering Mobile/Digital wallets (i.e., Google Pay, Apple Pay, PayPal, Zelle, etc.) payment options to customers, and 23% are considering offering within the next two years. Additionally, while 65% of customers use direct bank draft/eCheck/autopay to pay their power bill, almost 70% of

(*Continued*)

SCE's service channels (e.g., website, IVR[47]) are seen as difficult to navigate and lack the ability to share information with each other. When trying to complete a task, such as reporting an outage, the customer averages 15 clicks to navigate and complete their desired action. With a dropout rate of 55%, customers become frustrated and likely seek support from the call center to resolve their issue. Then, when reaching the IVR system for the same task, the customer must again navigate through the system from the beginning – as information has not been shared from the website – requiring an additional 5 keystrokes before completing their task.[48]

The call center experience can be frustrating for customers seeking assistance. In 2022, the average hold time for a customer trying to reach the call center was 3.3 minutes. Once the customer reached an agent, the average handle time (AHT) was an additional 9.4 minutes, while certain call types, like solar and billing questions, led to longer handle times. With a first contact resolution (FCR) rate involving live agents of 53.8 percent, customers often needed to call again, increasing call volumes, hold times, and costs.

Issues with data quality and process flows cause experience breakdowns. Customers rely on SCE to provide accurate and timely communications and services. However, 10-15 percent of customers claimed to have received incorrect information related to outage notifications alone. The collection, storage, and dissemination of data across internal systems must improve for customers to trust the information SCE provides to them.[49]

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customers would be interested in using credit card or digital wallet to pay their power bill if there was no fee (n=1,516, *Chartwell's 2021 Payment Industry Benchmarks Survey*).

47 Interactive Voice Response (IVR) is an automated telephone system that allows users to access information without a live agent. If the IVR system cannot retrieve the information for or complete the transaction with the caller, the system can then route the caller to the appropriate representative for help.

48 Utilities such as Evergy, HydroOne, Consumer Energy have made investments in IVR since 2018 and seen increased in containment rates and customer satisfaction. For example, Evergy was able to increase overall containment to 65% while outage-related containment rose to 84%. The shift led to an overall decrease in call volume and allowed contact center representatives more time for complex calls, as well as an annual cost savings of $2 million. https://www.chartwellinc.com/webinar/consumers-energy-ivr-enhancements-improve-customer-experience/.

49 Multiple studies point to accurate and timely outage communications, through a customer's channel of choice, as one of the key drivers of customer satisfaction. According to JD Power's *2022 Electric Residential Study Best Practice Webcast*, leading utilities provide a variety a means to update customers about outages, with text as the leading preference. Entergy, for example, provides outage alerts via text including when power will be restored, when service crews are dispatched, the cause of the outage, and when power is restored. Additionally, *Chartwell's 2022 Residential Consumer Survey* (n=1,516) shows that customers satisfied with

(*Continued*)

CEM has a clear role to play in providing organizational units across SCE the data and insights needed to mitigate these key pain points, as well as designing easy and intuitive experiences for customers. Additionally, executing on its digital strategy will deliver the self-service capabilities and tools customers expect. SCE plans to make marked improvements over the next several years with short-term solutions to enable investments in problematic areas like the digital experience; however, more consistent and dedicated spending is needed to help ensure the company is able to meet evolving customer expectations throughout this GRC cycle.

It is important to note that customer needs and expectations can change quickly – SCE must be ready and able to shift priorities and resources to deliver for its customers. Effective data collection and the ability to quickly analyze and communicate findings across the organization will allow SCE to key in on what is important to its customers and apply resources to the things that will deliver the most value for customers in an operationally efficient way.

b) Comparison of Authorized to Recorded 2021 O&M Expenses

Figure II-6 below compares the requested and authorized O&M expenses from SCE's 2021 GRC with the 2021 recorded expenses in the Customer Experience Management GRC Activity, in compliance with D.21-08-036.[50] SCE's recorded expenses for 2021 in CEM include $4.203 million that was recorded in the Residential Rate Implementation Memorandum Account (RRIMA). SCE includes these recorded RRIMA expenses because certain RRIMA related activities will remain ongoing in the forecast period after RRIMA closes on December 31, 2024. These activities are discussed in the forecast section below.[51] With this inclusion of RRIMA recorded expenses, the 2021 recorded amount of $21.728 million exceeded the authorized amount by $2.767 million.

When the $4.203 million recorded to RRIMA is excluded, 2021 recorded costs were below the authorized amount by $1.437 million, or 7.6 percent below the 2021 authorized amount. This variance is within normal operating expectations.

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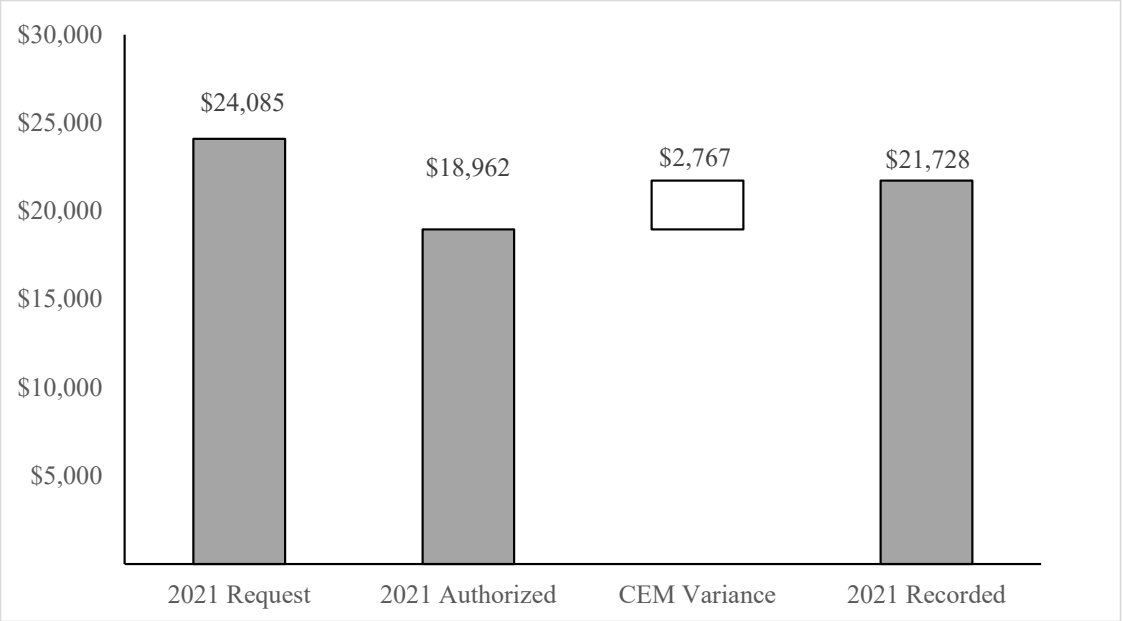
outage communication are more satisfied overall. Customers who are "very satisfied" with outage communication are 21% points more satisfied and those are "satisfied" with communications are 7% points more satisfied than customers overall.

50 *See* D.21-08-036, OP 36.

51 Refer to WP SCE-03, Vol. 03, p. 11 – Residential Rate Implementation Memorandum Account (RRIMA) Historical Adjustments – for details regarding the historical adjustments made to Billing Services to reflect ongoing RRIMA expenses.

Figure II-6
Customer Experience Management
Comparison of 2021 GRC Authorized versus Recorded[52],[53]
(Constant 2022 $000)



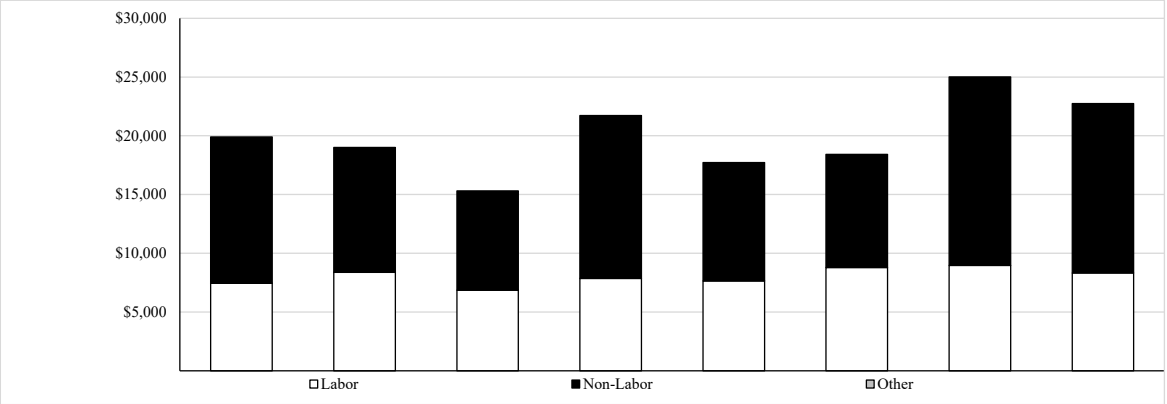
c) Scope and Forecast Analysis

This section describes the historical O&M expenses, the Test Year forecast method, and the adjustments included in the Test Year O&M forecast for the Customer Experience Management activity. The recorded and forecast O&M expenses for Customer Experience Management are shown in Figure II-7 and discussed below.

[52] SCE's recorded expenses for 2021 in CEM include $4.203 million that was recorded in RRIMA.

[53] WP SCE-07, Vol. 01, Authorized vs. Recorded.

Figure II-7
Customer Experience Management
Recorded 2018 to 2022 and Forecast 2023 to 2025 O&M Expenses[54]
(Constant 2022 $000)



	Recorded					Forecast		
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Labor	$7,448	$8,377	$6,846	$7,847	$7,641	$8,783	$8,955	$8,326
Non-Labor	$12,453	$10,631	$8,455	$13,881	$10,070	$9,630	$16,064	$14,406
Other								
Total Expenses	**$19,901**	**$19,009**	**$15,300**	**$21,728**	**$17,711**	**$18,413**	**$25,019**	**$22,732**
Ratio of Labor to Total	37%	44%	45%	36%	43%	48%	36%	37%

(1) Historical Variance Analysis[55]

(a) Labor

Recorded labor costs increased by $0.929 million from 2018 to 2019 due to additional CEM work to better understand customer's wants, needs, and behaviors with the goal of developing methods to increase customer satisfaction. In addition, in 2018 SCE began to add staff in anticipation of the compliance efforts associated with the California Consumer Privacy Act of

54 WP SCE-03, Vol. 03, pp. 1-6 – O&M Detail for Customer Experience Management.

55 SCE's recorded expenses for 2018-2022 in CEM include expenses recorded in RRIMA. Certain RRIMA related activities will remain ongoing in the forecast period after RRIMA closes on December 31, 2024.

2018[56] (CCPA). From 2019 to 2020, recorded labor costs decreased by $1.531 million primarily due to SCE personnel working on CCPA compliance recording their labor in the California Consumer Privacy Act Memorandum Account (CCPAMA).[57] From 2020 to 2021, labor costs increased by $1.001 million due to the shift in staffing costs from the CCPAMA upon completion of the CCPA compliance efforts back to O&M funded activities. From 2021 to 2022, recorded labor costs remained relatively flat.

(b) Non-Labor

SCE's recorded non-labor costs decreased by $1.822 million from 2018 to 2019 due primarily to credits received from vendors SCE paid for in the previous year. Additionally, SCE recorded $4 million in 2019 for RRIMA activities. From 2019 to 2020, non-labor costs decreased by $2.176 million as a result of SCE shifting work to comply with the CCPA, as described above in the labor historical variance analysis. From 2020 to 2021, recorded non-labor costs increased by $5.426 million as a result of additional work undertaken by SCE to communicate to customers about the COVID-19 pandemic, and energy conservation communications due to the excessive heat related events that impacted California. From 2021 to 2022, recorded non-labor costs decreased by $3.811 million due to a decrease in paid media ads. Additionally, the volume of customer communications decreased as concerns related to the pandemic and excessive heat related events eased during 2022.

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[56] The California Consumer Privacy Act (CCPA) was signed by Governor Brown in 2018, and amended in October 2019, which strengthens the rights of California residents to access and have more control over their personal information. The CCPA is the strictest privacy legislation in the country, allowing California residents more control over their personal information. The purpose of the CCPA is to provide customers timely notice, at or before the point of collection known as "Consumers," regarding the categories of personal information collected online or and how companies (such as SCE) use their personal information. This law applies to for-profit entities (including SCE) that both collect and process the Personal Information on customers and do business in the State of California. Personal Information is information that relates, describes, associates or could reasonably link to a customer or household.

[57] *See* D.19-09-026, Decision Authorizing Establishment of California Consumer Privacy Act Memorandum Accounts, September 12, 2019, OP 1, p. 14. OP 1 states, "Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), San Diego Gas and Electric Company (SDG&E), and Southern California Gas Company (SoCalGas) are authorized to file Tier 1 advice letters to establish memorandum accounts to record and track incremental costs to implement the California Consumer Privacy Act of 2018. The effective dates of these memorandum accounts shall be March 27, 2019 for PG&E, March 29, 2019 for SCE, March 28, 2019 for SoCalGas and SDG&E. These memorandum accounts shall be dissolved after recovery is sought. The utilities shall use similar or substantially similar names for these memorandum accounts."

(2) Forecast

SCE forecasts $22.732 million for the Test Year for CEM, an increase of $5.021 million over the Base Year. This increase is detailed in the sections below.

(a) Labor

For the Test Year, SCE forecasts labor expenses of $8.326 million for CEM, which represents an increase of $0.685 million over Base Year recorded costs of $7.641 million. The details and justification for this increase are discussed in the Test Year Adjustments section below.

(b) Non-Labor

For the Test Year, SCE forecasts non-labor O&M expenses of $14.406 million for CEM, which represents an increase of $4.336 million over Base Year recorded costs of $10.070 million. The details and justification for this increase are discussed in the Test Year Adjustments section below.

(3) Basis for O&M Expense Forecast

The 2022 Base Year activities for CEM expenses are described in Section II.C.1.a of this Volume. The Last Recorded Year accurately reflects the expense level associated with current activity levels and is the appropriate starting point for forecasting the Test Year expenses.[58] Due to a number of initiatives and other changes occurring or continuing into the Test Year, the forecast incorporates the adjustments detailed below.

As discussed in the Comparison of Authorized to Recorded 2021 O&M Expenses and Historical Variance Analysis sections above, SCE included expenses recorded to RRIMA from 2018 to 2022 in its recorded CEM expenses for those years. Because the level of activity in the 2022 Base Year to support RRIMA is not continuing into the forecast period, there is a downward adjustment to reflect a reduction in RRIMA activity expenses, as detailed below.

[58] D.04-07-022 and D.89-12-057 recommend that if costs have shown a trend in a certain direction over three or more years, the Last Recorded Year is the appropriate basis for estimating Test Year expenses. For CEM, labor expenses have remained relatively stable during the historic period (2018-2022) and thus the Last Recorded Year is an appropriate starting point for the CEM labor forecast. SCE's CEM non-labor expenses have shown an overall declining trend over the same period, though with significant upward variances in 2020 and 2021 due to COVID and heat events. As shown in Figure II-7, however, recorded non-labor costs returned to a downward trend in 2022. For this reason, the Last Recorded Year is an appropriate starting point for the CEM non-labor forecast.

(4) Forecast Adjustments

SCE's forecast of Test Year O&M expenses for CEM work activities reflects an increase of $5.021 million over the Base Year 2022 recorded costs of $17.7 million in labor and non-labor expenses. These adjustments are shown in Table II-7 and discussed below.

Table II-7
Customer Experience Management
2025 Test Year O&M Adjustments
(Constant 2022 $000)

Line No.	Description	Labor	Non-Labor	Total
1	Customer Experience Insights & Analytics	-	1,370	1,370
2	Digital Operations and Management	-	4,075	4,075
3	Customer Education and Outreach	-	(1,109)	(1,109)
4	Employee Compensation Program	448	-	448
5	Total Customer Experience Management Forecast Adjustments	685	4,336	5,021
The total includes a labor increase of $237,000, which represents a 3 percent increase over the base year and is attributed to standard labor escalation.				

(a) Customer Experience Insights and Analytics

SCE's Test Year forecast incorporates a non-labor annual cost increase of $1.37 million for Customer Experience Insights and Analytics.[59] Customer Experience Insights and Analytics plays a critical role in helping ensure SCE's service meets customers' expectations as detailed in Section II.C.1.a.1.a. While tremendous strides have been made in this area, SCE shall be making additional investments in three areas to sustain that momentum. The increase in non-labor costs is attributable to (1) shifting subscription costs for customer intelligence data, (2) initiatives to update and refine customer segmentation analyses, and (3) additional journey mapping. Each of these elements are described below. Without these investments, SCE risks implementing customer experience improvements that are misaligned with what customers actually need or want. Additionally, these investments enhance the opportunity to identify issues and root causes, the design

[59] *See* Exhibit SCE-03, Vol. 03. p. 12, ("Customer Experience Insights & Analytics Forecast Adjustment") for additional supporting details and assumptions.

and development of additional self-service experiences, and process improvements that help reduce customer service call volume.

Customer Intelligence: SCE has several current subscriptions with third-party providers of customer and market data, which are used to understand our diverse customer base and customers' evolving needs. Specifically, SCE's Acxiom subscription[60] has been used to fulfill ad hoc analytics requests by the CPUC and support various programs such as customer acquisition for low-income programs and PSPS education and outreach. The demographic and behavioral data provided by Acxiom was critical in establishing SCE's residential customer segmentation framework in 2022. Because the data was a core component of the established segmentation framework, SCE must continually update the data to keep the framework current. Otherwise, segmentation models will be outdated and inaccurate, such that they cannot provide meaningful insights to guide customer program teams, jeopardizing SCE's ability to meet program goals. For example, SCE's Building Electrification program, as it scales in the coming years, will rely heavily on the ability to accurately target the right set of customers who would most benefit from electrification upgrades in their facilities. For the expected annual subscription cost, SCE forecasts an incremental $0.370 million annually of non-labor expenses in CEM.

Customer Segmentation: Customer segmentation models are customer profiles at an aggregate level that include demographic and psychographic insights that help SCE develop tailored engagement strategies. To develop the segmentation models in 2022, SCE utilized existing third-party research that was available and conducted limited first-party research to build the data framework needed to create the customer profiles. The lack of first-party research in some areas required SCE to make inferences regarding customer sentiment on varying energy- and service-related topics. Because underlying segmentation data and insights are typically refreshed annually, in this GRC period SCE plans annual refreshes of the existing segmentation frameworks by conducting more first-party studies specifically built for segmentation purposes to better understand and keep pace with the evolving wants and needs of SCE's residential and non-residential customers, resulting in more robust

[60] Acxiom is a third-party vendor that specializes in providing 200+ demographic data points on SCE's residential customers. Examples of such data points include household size, household income, occupation, social media usage propensities, etc.

customer segment profiles.[61] SCE expects that these improved profiles will allow for enhanced engagement and communication strategies to increase adoption of electrification, address affordability/reliability concerns, and improve customer satisfaction with SCE.

In addition, SCE will refine its segmentation framework by improving tracking mechanisms to measure the accuracy of existing customer segmentation. Understanding whether customer profiles are incorrect or outdated will help SCE determine how to conduct data refreshes, such as whether to integrate additional external data sources (e.g., Acxiom). By continuing to refine its segmentation framework, SCE will be better positioned to cut out the "noise" of mass messaging and only target those customer segments that have a higher propensity to adopt any given program or service, resulting in increased efficiencies in marketing activities and associated spend. An inability to properly refresh and refine the segmentation models will result in outdated frameworks and increased errors in customer targeting and messaging, resulting in potential customer dissatisfaction and increased volumes to the Customer Contact Center. To account for these annual refreshments and refinements for the customer segmentation models, SCE forecasts an incremental $0.5 million annually.

Journey Mapping: SCE's forecast also includes $0.5 million annually for journey mapping to support business requirements and customer needs. As previously described, journey mapping assists process improvement efforts by identifying and prioritizing enhancements to improve customer usability and participation. As technology continues to advance, SCE expects additional journey mapping efforts will be needed to quickly identify and address emerging pain points in a landscape with more customer options and touchpoints than ever before. SCE expects to perform such work on key macro customer processes (e.g., billing, payment, outage, digital), detailed customer processes (e.g., electrification, program enrollment), and emergent processes as they arise. In the past, ad hoc journey maps requiring vendor support were funded by special projects. However, due to their increasing importance in developing digital solutions that meet customers and the Commission's expectations, SCE must be proactive in their continuous development with dedicated

[61] In the future, the refresh of customer segmentation models will include first-party research (e.g., survey, customer interviews) that helps SCE better understand its customers' current sentiments towards clean energy, affordability, reliability, communication needs, etc. Historically, SCE has used third-party research and its subsequent profiling which, while critical for broader market insights, does not provide sightlines into what questions were asked to determine customer profiling. First-party research will allow SCE more input and visibility into designing surveys that will provide the specific, targeted insights needed so that its segmentation models reflect the unique and diverse perspectives of customers in SCE's service territory.

spending to prevent undetected customer issues from becoming underlying dissatisfaction drivers and avoid investing time and resources in areas that are not important to the customer.

(b) Digital Operations and Management

SCE's Test Year forecast incorporates an upward adjustment of $4.075 million for Digital Operations and Management.[62] The scope of Digital Operations and Management and how its activities support SCE's strategy for improving the customer experience and achieving internal operational efficiencies is described in Section II.C.1.a.1.b.

The incremental activities detailed below are necessary to meet increasing customer demand for digital capabilities. From 2015 to 2022, SCE's customers increased their digital interactions[63] by an annual average of 16.1%; however, there has only been an average of 7.6% annual growth in self-service transactions[64] for this same period and, as previously described in this section, satisfaction with SCE.com has decreased.[65] As discussed in Section II.C.1.a.2.b., SCE is already behind the curve in meeting customer demand in its digital channels, and if it does not continue to evolve its digital operations to keep pace with customer needs and expectations,[66] self-service growth may become stagnant or decrease, which could result in customer support cost increases beyond what SCE has already included in its forecasts. Notwithstanding SCE's past investments to improve and

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62 Refer to WP SCE-03, Vol. 03. p. 13, ("Digital Operations and Management Forecast Adjustment") for additional supporting details and assumptions.

63 SCE defines digital interactions as site visits to its website, SCE.com, which are measured through Adobe Analytics.

64 Self-service transactions include energy usage visits, Outage Center page views, service turn on/off/transfer, payment transactions, report an outage, electronic bills delivered, and password reset.

65 Based on trends in J.D. Power Residential Electric Utility Customer Satisfaction syndicated studies dating back to 2016. In 2016, SCE ranked in 2nd quartile in overall customer website satisfaction; by 2022, SCE had fallen to 4th quartile.

66 For example, based on SCE Voice of Customer and other research, SCE's customers now expect more options to pay their bills, less/shorter outages and better communications, more notifications/alerts, and additional services compared to previous years.

maintain the reliability of our digital offerings,[67] customers' increasing dissatisfaction is reflected in slower growth of digital channel transaction completion and, as increasingly complex programs and services are offered in the future, this dissatisfaction will grow. If SCE's digital capabilities do not evolve at the same rate as customer needs for digital offerings, customers will become even more dissatisfied due to the gap between what they want to do and what they can do and will have to turn to other higher-cost channels to get to resolution, ultimately leading to decreased trust in SCE and potentially resulting in increased work demand and costs in the future in other areas of the company, such as live agent support, service planning, business customer account managers, and payment processing, which would have to pick up this demand for transaction completion and query resolution using channels that are higher cost than digital. Consequently, SCE requires increases to O&M spending to support the following incremental activities to significantly improve and expand end-user digital capabilities.

Agile Development: During the Test Year, SCE forecasts a non-labor cost increase of $3.825 million associated with SCE's transition to using Agile Development to create digital solutions and services.[68] The more traditional approach is to implement new solutions and changes to existing offerings in large but infrequent "big bang" launches.[69] Agile Development, on the other hand, implements changes in small increments, with plans and designs frequently evaluated so that project teams can quickly respond to evolving customer needs and expectations. This approach will improve SCE's speed-to-market for updates to its digital channels that address customer pain points and reduce the gaps that have persisted within the customer experience due to the lengthy timelines generally associated with large-scale capitalized software CX projects. It will also enable an increased

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[67] In SCE's 2021 GRC, the Commission authorized SCE's portfolio-based forecast for 2021-2023 OU capital software projects. As part of this authorized portfolio, SCE included a "Digital Roadmap" project, which primarily consisted of strategy and planning to improve SCE's digital customer experience and was forecast to cost approximately $1.5 million annually from 2021 to 2023. *See* D.21-08-036, OP 461 and 462, and discussion on pp. 379-381; also *see* A.19-08-013, SCE-06, Vol. 01, Part 2A, pp. 47-50. In SCE's 2015 GRC, the Commission authorized $30.7 million for SCE's Digital Experience Project, which replaced obsolete, on-premises technology that SCE needed to retire in order keep its website reliable and scalable for growing demand. *See* D.15-11-021, OP 1, and discussion at pp. 249-254.

[68] Agile is "an iterative approach to project management and software development that helps teams deliver value to their customers faster and with fewer headaches." https://www.atlassian.com/agile.

[69] In prior years, SCE's digital development projects have largely been "big bang." For example, SCE's last major website redesign occurred in 2015 and was recorded as a capitalized software project. However, the long lag between major redesigns is inefficient and does not afford the flexibility needed to adapt to evolving customer expectations and Commission requirements.

volume of digital projects throughout every year, providing new digital self-service capabilities to SCE customers and more frequent optimization and maintenance of existing capabilities to keep pace with the basic needs and expectations of SCE's diverse customer base. The incremental spending for Agile Development will help close the gap between SCE's current self-service offerings and customers' needs by aligning digital enhancements with customer expectations and changes in the regulatory landscape.[70]

Digital technologies are fast moving, and SCE must be positioned to respond not only to immediate customer needs, but to also anticipate what those needs may be in the future by leveraging the rich customer data and insights available. SCE's ability to remain agile in meeting customer expectations in its digital channels is a key factor to improving satisfaction and enabling sustained self-service use in the future. The Customer Contact Center relies on optimized digital experiences to improve call deflection and avoidance rates, ultimately reducing the burden on, and costs associated with, live agents. To better support our customers in digital, SCE has identified categories of Agile Development activities, including:

- Usability and experience upgrades: Digital channel improvements that address ease-of-use issues, like navigation improvements, template optimization, and system upgrades that can increase self-service efficiencies for customers. According to a study by J.D. Power, SCE ranks 30th out of 36 utilities nationwide in overall website satisfaction.[71]
- Digital enhancements to mobile, web, and tools: Prioritized enhancements based on real-time customer feedback and customer intelligence. For example, SCE is currently adding more outage capabilities in future releases, a direct result of a significant volume of customer feedback received regarding what customers expect from their outage experience in SCE's digital channels

[70] According to J.D. Power's June 2022 Utility Digital Experience Survey, SCE ranks 24 points below the national average on overall customer website satisfaction for large electric utilities, with several usability attributes noted as points of customer dissatisfaction, including navigation (-24 points below national average), appearance (-32 points below national average), and content clarity (-35 points below national average).

[71] Findings included in J.D. Power's 2022 Utility Digital Experience Study.

- Large priority projects: Projects of significant scope requiring time for planning, research, and design, and longer lead times for development and implementation. As an example, SCE is exploring an interactive digital bill with functionality to help customers better understand and manage their electricity usage and how that impacts their costs.
- Net new projects to address emerging needs: Digital capabilities resulting from regulatory mandates, new customer offerings, or identification of opportunities for self-service to address an immediate customer need. As evidenced in past years, record-setting heat and rainstorms require that SCE be positioned to quickly provide critical safety communications during extreme weather events.

By shifting to Agile Development, DOM will deliver a significantly greater volume of "quick-fix" maintenance-type changes, more regular enhancements of existing digital self-service capabilities and content, and more-timely introduction of net-new digital capabilities to address emergent customer needs.

Web Accessibility Improvements: During Test Year 2025, SCE forecasts non-labor cost increase of $0.25 million to expand its ongoing investments in activities that improve the accessibility of SCE.com through more frequent web accessibility audits and implementation of recommended remediation improvements, enhanced employee training curriculum, and in-depth user research studies. These incremental activities are focused on improving access of SCE's digital offerings for SCE customers that require assistive technology and mitigate the need for such customers to rely on non-digital channels to address their questions or concerns.

The activities associated with Agile Development and Web Accessibility Improvements shall be implemented starting in 2025 and continuing through the GRC cycle. As discussed earlier, the incremental O&M costs for DOM would lessen the need to rely predominantly upon capital software expenditures to provide continuous improvement of SCE's digital customer experience, shortening the timeframe for turning customer feedback into actions that result in positive changes to SCE's digital channels and self-service capabilities.

Beyond the clear need for these incremental activities, the proposed O&M forecast adjustment is reasonable from a cost-efficiency standpoint. Assuming SCE can return to its historical 2015-2019 annual digital transaction handling rate of 7.8% into the 2025 GRC cycle, SCE calculated approximately $5.4 million in annual customer issue resolution handling costs that could be avoided through the implementation of the incremental DOM activities forecast at $4.075 million during the Test Year. Therefore, SCE calculates a benefit-to-cost ratio of 1.33 for its DOM forecast adjustment.[72]

Table II-8
Digital Operations and Management
Benefit-to-Cost Ratio

Annual Avoided Costs (a)	**DOM Forecast Adjustment** (b)	**Benefit-to-Cost Ratio** (a/b)
$5.4 million	$4.075 million	1.33

Given the need to continually invest in digital offerings, SCE's transition to more frequent digital updates to meet customer needs (as opposed to large, periodic capital investments), and anticipated operational cost savings (as demonstrated by the positive benefit-to-cost ratio above), the proposed DOM forecast adjustment is reasonable and prudent cost to serve our customers.

(c) Customer Education and Outreach

SCE's forecast for the Test Year adjustment needed for Customer Education and Outreach is a reduction of $1.109 million.[73] The scope of Customer Education and Outreach and how it enables multi-channel marketing campaigns to create awareness among customers is described in Section II.C.1.a.1.c. As outlined in Section II.C.1.c.3, the downward adjustment is driven by the conclusion of Time-of-Use (TOU) default activities related to the RRIMA. Although SCE shall be continuing certain essential activities originally funded via the memorandum account, such as

[72] 1.33 cost-to-benefit ratio = $5.434 million in avoided cost benefits divided by $4.075 million digital operations management forecast adjustment. Refer to WP SCE-03, Vol. 03, p. 14, "Digital Operations & Management (DOM) Benefit-to-Cost Analysis" for more information.

[73] Refer to WP SCE-03, Vol. 03, pp. 15-16, "Customer Education and Outreach Forecast Adjustment" for additional supporting details and assumptions.

educating customers about rate plan options, offering TOU text alerts, preparing customers for high summer bills, and informing customers of rate increases, the closure of RRIMA on December 31, 2024 will result in an overall decline within this activity arising from a significant reduction in targeted paid media spend (Line No. 1 in Table II-9 below). However, this decline will be counterbalanced by the need to dedicate resources to meet new and growing expectations and priorities for customers in the form of education and outreach to increase the adoption digital and self-service solutions (Line No. 2 in Table II-9 below) and to provide emergent safety and extreme weather information (Line No. 3 in Table II-9 below). These investments will allow customers to better understand and access SCE's self-service options and critical account- and safety-related information and pave the way for increased, more meaningful engagement with between SCE and its customers.

Table II-9
Customer Education and Outreach Test Year Adjustment

Estimated Adjusted Spend ($000)		
Line No.	Activity	Annual Spend
1	Residential Rate Implementation Memorandum Account (RRIMA)	$ (2,118)
2	Self-Service Marketing	$ 670
3	Rate & Compliance Marketing	$ 339
4	Grand Total	$ (1,109)

Collect Customer Electronic Contact Information: As detailed in Section II.C.1.a.2.a above, the ability to engage digitally continues to be a growing expectation for customers as the demographic makeup of SCE's customer base continues to change. For SCE to engage customers digitally, SCE must be first be able to reach those customers through electronic means. Presently, however, only 62% of the customer email addresses SCE has on record are validated customer emails. SCE must fill this gap as a foundational step toward expanding electronic communications and other digital engagement with customers in the future. Accordingly, SCE forecasts $0.35 million annually to conduct regular outreach via traditional channels (e.g., printed mail and leveraging its CBO relationships to distribute print collateral to its constituents) in an effort to (1) better understand its customers' channel and language preferences (including which customers are more digitally inclined and prefer electronic communications), and (2) obtain customers' electronic contact information. The inability to conduct this outreach would require SCE to rely on higher-cost traditional channels to reach this significant portion of its customer base. Although certain customers may prefer

analog channels (live agent, IVR, printed mail), this outreach will also help better identify customer preferences and inform future marketing spend to more efficiently deliver communications to the customer's channel of choice. Additionally, by expanding SCE's customer email records, SCE will be able to deliver more timely and personalized information through lower-cost electronic channels in the future, including information on safety, affordability programs and promoting self-service options.

Self-Service Adoption Campaign: As SCE's digital experiences advance in capabilities, there is also a need for increased investments to acquire and retain self-service users of SCE's digital channels. The improvements to SCE's digital channels referenced in Section II.C.1.c.4.b are expected to increase the types of self-service transactions available via the website and mobile app (and improve their respective user experiences) for both residential and non-residential customers. Promotion of these optimized offerings will support growth in the volume of self-service transactions and the usage of lower-cost channels and, in turn, increase customer satisfaction. In addition, SCE will monitor self-service attrition and implement retention strategies, such as automated next-best offer[74] and program email campaigns for customers who unenroll in self-service programs, to support further growth of self-service participation. SCE is forecasting $0.15 million annually to communicate with customers about enhanced digital capabilities.

Enable Automation and Personalization: In addition, SCE will implement automated and personalized email campaigns for new residential and non-residential customers to provide ongoing education on how to read their bills, self-service offerings, program information, seasonal information, and update their communication preferences. SCE's past approach of generically messaged communications to the maximum number of customers has not yielded the desired impact in driving customers to adopt programs and services. By implementing an automated and personalized approach that takes customer profiles, segments, sentiments, and behaviors into account, SCE can better customize communications for customers – from when they establish their electric service and are likely at their most engaged through the duration of their relationship with SCE – and increase the likelihood of adoption of programs and services, such as enrolling in My Account and

[74] Automated next-best offers are enabled by SCE's marketing automation platform, which uses customer data and behaviors to predict what product or service a customer is likely to be interested or enroll in, and then automatically triggers a communication promoting that product or service.

Paperless Billing, setting up convenient payment options, and more.[75] SCE is forecasting $0.17 million per year to enable these new customer campaigns and to allocate funding for third-party (Salesforce) annual software licensing and maintenance fees for email deployments.

Deliver Compliance Notices: SCE forecasts a $0.189 million annual increase in Rate and Compliance Marketing costs associated with escalating printing, postage, paper, and vendor fees. Customers rely on SCE to send legal and compliance notices, including notices of public participation hearings, regulatory proceedings, rate changes, program application filings, and terms and conditions disclosures. This additional funding is needed to meet compliance requirements associated with the timely delivery of these notices to its customers.

Extreme Weather Communications: In recent years, SCE's service territory has experienced an increase in severe heat waves. Accordingly, SCE shall formalize a communication cadence with customers during extreme weather conditions to provide pertinent and useful information to mitigate safety risks. SCE's forecast for Extreme Weather Communications is $0.15 million annually. The scope of this work includes the development and deployment of email communications to customers during extreme weather conditions, such as heat waves and windstorms. These communications will target residential and business customers and include in-language web pages detailing relevant safety and reliability information, including customer actions to curtail energy use and avoid rotating outages during a heatwave. The in-language web pages will be made available to CBOs to educate their constituents in hard-to-reach areas.

(d) SCE Employee Compensation Program Adjustment

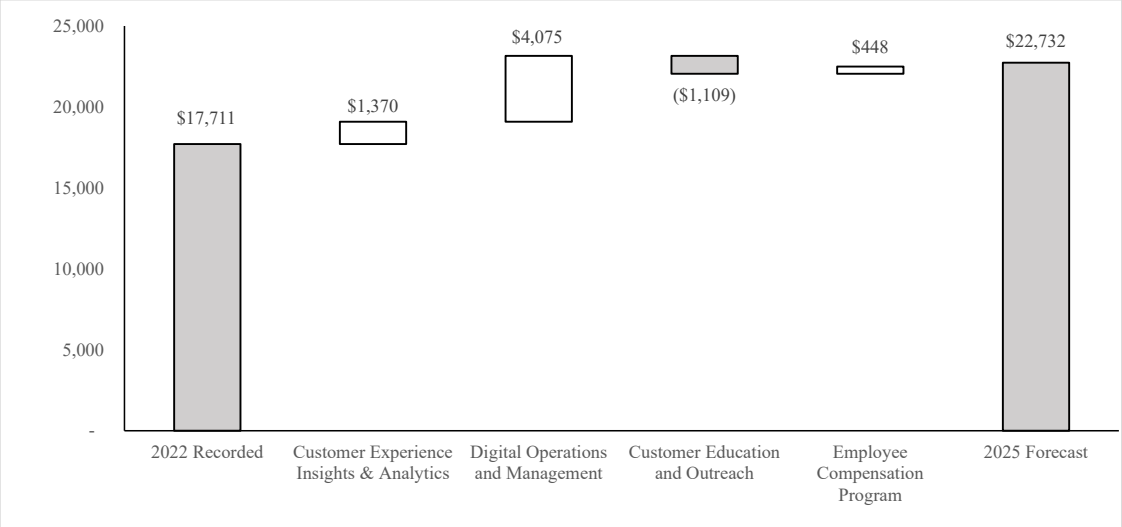
The forecast incorporates an adjustment of $448,000 to reflect certain changes made to SCE's employee compensation program. Please refer to SCE-06, Vol. 04.

[75] Required activities to create effective marketing campaigns that are automated and personalized: (1) *Research and planning* to ensure SCE is accurately leveraging segmentation and propensity modeling to identify the right customers; (2) *Email Campaign Design/Strategy* to ensure SCE is appropriately addressing each unique customer segment at the right time in their welcome journey to maximize likelihood of program/service adoption; (3) *Defining and Executing Behavioral/Event Triggers* that leverage Salesforce to deploy communications powered by individual customers' specific behaviors and needs; (4) *Dynamic Creative Targeting* that uses all of the data collected to market additional programs/services based on customers' personal needs/context/behaviors; and (5) *Analytics/Measurement* to track and analyze data from various sources, (e.g. website visits, mobile app use, and social media interaction).

(e) Summary of CEM O&M Expense Forecast

As shown below in Figure II-8 for the 2025 Test Year SCE forecasts $22.732 million in O&M expenses for Customer Experience Management, an increase of $5.021 million, or 28 percent, compared to the 2022 Base Year O&M expenses of $17.711 million.

Figure II-8
Customer Experience Management
Comparison of 2022 Base Year to 2025 Test Year
(Constant 2022 $000)



The total includes a labor increase of $237,000, which represents a 3 percent increase over the base year and is attributed to standard labor escalation.

2. Customer Programs Management

a) Work description and Need for Activity

Customer Programs Management is managed by the CP&S organization and includes the planning, implementation, and management of customer programs in the areas of program innovation and pilots, energy management tools, rate-based solutions, pricing, decarbonization (transportation and building electrification), and distributed energy resources (DER) programs. DER programs managed by this group include behind-the-meter (BTM) energy procurement for reliability through requests for offers (RFOs) with contract origination and management, as well as the management of renewable tariffs and oversight of all processes and compliance with customer interconnections to the grid. In addition, the management of Customer Care programs, which serve

customers who require electric-powered medical or mobility support equipment in their homes, such as the MBL and Cool Centers also fall in this GRC activity.

(1) Customer Tools

SCE's innovation and pilot activities have enabled the development and management of energy-related programs such as providing TOU peak period alerts to customers, and services such as an Appliance Energy Use Cost Estimator on SCE.com to provide customers with education on the potential benefits of shifting appliance usage to off-peak and super-off-peak periods. These examples add to the existing portfolio of services and energy management tools that this group manages, such as Budget Assistant,[76] Choose Your Due Date (CDD),[77] and SCE Energy Manager.[78] Energy management tools help customers monitor and manage energy costs and energy usage. In addition, many energy management tools (such as projected bill information on SCE.com) are required by the CPUC.[79]

CPM manages Commission-required programs such as Critical Peak Pricing (CPP) for business customers.[80] In D.16-03-030, the Commission required SCE to enable default CPP for business customer service accounts on eligible rate options with energy demands less than 200 kW and agricultural and pumping service accounts over 200 kW. On March 1, 2019, SCE began implementing default CPP for these customer segments.[81] Currently, there are approximately 240,000 service accounts on the program. SCE continues to default eligible service accounts to CPP on October 1 of each year.

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[76] Budget Assistant is a cost management tool for residential and small business customers. The tool provides "projected next bill" information, giving customers advance notification of their projected energy costs and enabling customers to align with an established spending target. In 2022, over 10.8 million Budget Assistant alerts were sent via e-mail, text, and phone to over approximately 446,000 subscribed residential and non-residential customers.

[77] CDD allows both residential and non-residential customers to choose the time of the month that their bill is due. Customers can choose the beginning, middle, or end of the month.

[78] *See* https://www.sce.com/business/tools/energy-manager for more information about EnergyManager.

[79] *See* D.11-07-056, OP 6 for the Commission's direction regarding providing customers with price and usage data.

[80] CPP provides participants a credit on their monthly on-peak demand or energy charges during the summer months and an energy charge when a CPP event is called.

[81] *See* D.18-07-006, p. 6.

(2) DER Program Management

This CPM work activity manages DER energy procurement for reliability through BTM RFOs with contract origination and ongoing contract management. Currently, the group manages 48 contracts totaling 238.2 MW of customer-side preferred resources (*e.g.*, energy efficiency (EE), demand response (DR), distributed generation (DG), Permanent Load Shift (PLS) and energy storage (ES)) driven by Local Capacity Requirements, Preferred Resources Pilot, and Aliso Canyon Energy Storage and Integrated Resource Plan Rulemaking proceedings.

This team has specialized knowledge of customer-side DERs and is responsible for negotiating and settling contracts, scheduling (for DR resources) and enrolling customers for contracted resources as well as completing required regulatory reporting. These activities support SCE's compliance with the CPUC's IRP-LTPP, energy storage mandates, and other regulatory requirements by participating in the procurement, negotiation, execution, and administration of short-term, mid-term, and long-term Energy Savings Agreements (ESAs) for BTM DERs on behalf of SCE's customers.

CPM also supports DER-related tariffs such as the NEM tariff and the newly approved Net Billing Tariff (NBT). CPM oversees cycle times and compliance requirements for the application and processing of all NEM and NBT requests for interconnection by managing the customer and contractor process before, during, and after the interconnection, as well as Commission-mandated reporting related to the NEM and NBT tariffs. This function includes administration and technical support of SCE's interconnection portal, education and training of customers and contractors by providing informational electronic materials (emails, job aids, fact sheets), hosting training classes and webinars for contractors, and interfacing with contractors and customers to address specific project escalations, and addressing any customer concerns or complaints within the process, such as billing and energy credits.

As noted in Section II.A.4 above, the Commission directed "SCE to report how closely its current solar photovoltaic forecast compares with actual NEM solar applications received" as part of this GRC application.[82] Table II-10 compares SCE's 2021 GRC forecast of NEM applications to the actual number received from 2019-2022.

[82] *See* D.21-08-036, p. 310.

Table II-10
NEM Annual Applications Forecast vs. Recorded

Line No.	Exception Type	2018	2019	2020	2021	2022
1	2018 Recorded and 2019-2022 Forecast (A.19-08-013)	46,773	53,146	87,263	94,564	95,646
2	2018-2022 Recorded (Recorded 2018-2022)	46,773	52,838	52,520	76,607	112,976
3	Difference (Line 1 - Line 2)	-	308	34,743	17,957	(17,330)

The number of NEM applications lagged the forecast in 2020 and 2021 primarily due to two factors. First, SCE projected, starting in 2020, an increase in the number of NEM applications as a result of the 2019 Title 24 Building Energy Efficiency Standards, which require new residential buildings whose permit applications dated on or after January 1, 2020, to include photovoltaic systems as part of their energy code compliance. However, because a significant number of permits for new construction were initiated prior to the deadline for the new Title 24 requirements, new construction in 2020 did not trigger the expected solar adoption forecasted by SCE. Second, the COVID-19 pandemic caused a slowdown in roof-top solar installations in 2020, which continued through 2021. Although these unforeseen circumstances delayed the anticipated increase in NEM applications, the volume of NEM application exceeded SCE's forecast during 2022 with a rush of customer installations of photovoltaic systems in anticipation of the expected sunset of the current NEM program and the beginning of a new solar tariff, NBT. In the first quarter of 2023, SCE received over 100,000 NEM applications.

(3) Decarbonization Activities

California is committed to substantial GHG emission reductions by the middle of this century[83] and transportation and building electrification are important elements of meeting California's GHG reduction goals. Achieving California's decarbonization goals will require significant electrification of transportation and buildings coupled with advanced EE.

[83] For example, AB 32 established targets to reduce GHG emissions to 1990 levels by 2020, a target that was later increased to 40 percent below 1990 levels by 2030 in CA Senate Bill (SB) 32 (Pavley, 2016). SB 100 (DeLeón, 2018) mandates that the state's electricity demand be served by carbon-free resources by 2045. In 2018, Governor Brown established a new goal of achieving statewide carbon neutrality by 2045 and maintaining negative emissions thereafter.

On the transportation electrification front, SCE's Pathway 2045 highlights the need for 26 million passenger vehicles, 900,000 medium-duty, and 170,000 heavy-duty vehicles on California's roads and in its freight to realize California's GHG reduction goals by 2045.[84] In 2014, SCE filed its Charge Ready Pilot application and in 2016, the CPUC authorized SCE's implementation of the Charge Ready Pilot[85] to deploy "make-ready" infrastructure to support light-duty electric vehicle charging and provide complementary market education about EVs and the benefits of fueling from the grid. In the last six years, SCE has built on the strengths and lessons learned of the completed Pilot projects and launched a suite of Charge Ready programs.[86]

This comprehensive suite supports clean fueling options for all classes of on and off-road vehicles, including passenger vehicles, public transit, semi-trucks, medium duty vehicles, airport operation ground support vehicles, and forklifts. SCE's eMobility team worked with a diverse group of stakeholders including regulators, consumer advocacy groups, city and state governmental agencies, and customers to develop the parameters and framework of each program. The programs and initiatives focused on addressing three major barriers to EV adoption: availability, affordability, and awareness. SCE worked on these three areas by developing charging infrastructure and rebates for various vehicle types, designing innovative TE rates, partnering with key stakeholders to deploy multi-channel TE education and outreach campaigns to various customer segments, and launched TE Advisory Services to educate and advise customers on their short and long-term electrification plans and increase awareness and access to EV grant funding for small and mid-sized fleets customers in DACs. To date, SCE has deployed infrastructure at workplaces, schools, public places, multifamily dwellings, and fleet depots. Over the next five years, SCE's Charge Ready programs will have directly contributed to the electrification of more than 550,000 vehicles throughout California.

In 2018, SCE established its eMobility team to lead SCE's TE strategy. The eMobility group (1) provides Charge Ready program oversight and monitors ongoing compliance requirements such as data and reporting deliverables; (2) coordinates internal and cross-functional activities involving EVs; (3) generates customer and market programs that overcome barriers to

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[84] *See* SCE's "The Clean Power Electrification Pathway" available at https://s3.amazonaws.com/cms.ipressroom.com/405/files/202210/g17-pathway-to-2030-white-paper.pdf.

[85] *See* D.16-01-023, Charge Ready and Market Education Programs.

[86] *See* D.20-08-045 (Charge Ready 2) and D.18-05-040 (Charge Ready Transport).

adoption and optimize load; and (4) develops and delivers education to customers and internal customer-facing employees. The eMobility team is comprised of three sub-teams:

- The eMobility Decarbonization Standards and Evaluation sub-team conducts their work before and outside of the implementation of SCE's programs. They serve as an essential cross-departmental coordinating team of TE subject matter experts who conduct research and analysis to develop new programs, respond to policy and regulatory changes and support teams across SCE on activities impacted by electrification.
- The eMobility Operations sub-team manages existing infrastructure and incentive programs and ensures short- and long-term program metrics and compliance requirements are met.
- The eMobility Business Development & Partnerships sub-team develops and delivers training, advisory services and education programs targeting specific customer groups like fleet customers, small businesses, multifamily property owners, and tribal communities covering subject areas like EV site readiness, infrastructure, grant writing assistance, rates or load management.

Although SCE's Charge Ready programs are ending in this GRC cycle,[87] the Commission requires that all Charge Ready Programs, which include CR Pilot, Transport, Light Duty, Schools and Parks programs, conduct ongoing post-site installation monitoring and tracking, infrastructure maintenance and repairs, and data reporting through at least 2036. Hence, SCE's Test Year forecast for CPM includes the costs of continuing to implement program-specific compliance activities following the closure of the Charge Ready Balancing Account (CRBA).

On the building electrification (BE) front, as early as 2017, SCE stated in its Clean Power and Electrification Pathway[88] that electrifying up to one third of building space and water heating by 2030 is a cost-effective component of an economy-wide portfolio of solutions to help achieve California's GHG emission reduction goals. The CARB Scoping Plan and recently adopted

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[87] End dates for Charge Ready programs are presented in Table II-13.

[88] *See* SCE's "The Clean Power Electrification Pathway" available at https://www.edison.com/content/dam/eix/documents/our-perspective/g17-pathway-to-2030-white-paper.pdf.

legislation recognize that electrification of residential and commercial buildings is a key strategy to meet the State's carbon reduction goals.[89] In 2018, 26 percent of California's GHG emissions came from the residential and commercial building sectors.[90] The California Energy Commission's (CEC's) 2018 Integrated Energy Policy Report Update notes that "Electrification of space and water heating using highly efficient technologies is a key strategy to reduce or eliminate GHG emissions from buildings."[91] The BUILD and TECH pilot programs directed by SB 1477[92] for which SCE is the contracting agent, and SCE's Building Electrification Application filed in December 2021, play an important role in California's deployment of BE technologies at the necessary scale to transform the market to achieve the State's policy goals, which will require programs significantly larger than these initial pilots.[93]

The CEC's 2019 Residential Appliance Saturation Survey (RASS) estimated that electric heat pump space heating accounted for only four percent of California households in 2020,[94] and current evidence suggests that heat pump sales account for less than 10 percent of the market for space and water heating equipment in California.[95] Increasing heat pump space and water heating equipment market share to 50 percent of sales by 2030 will require rapid transformation of the market for new space and water heating equipment. Due to the long lives of gas water and space heaters (13 to 18 years),[96] achieving the State's GHG emission reduction goals requires significant effort in the

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89 *See* Senate Bill (SB) 1477 (Stern, 2018) and Assembly Bill (AB) 3232 (Freidman, 2018), available at https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB1477.

90 *See* "Final 2018 Integrated Energy Policy Report Update," Volume II. p. 19 available at https://efiling.energy.ca.gov/getdocument.aspx?tn=226391.

91 *See* "Final 2018 Integrated Energy Policy Report Update," Volume II, p. 9 available at https://efiling.energy.ca.gov/getdocument.aspx?tn=226391.

92 *See* Senate Bill (SB) 1477 (Stern, 2018) and Assembly Bill (AB) 3232 (Freidman, 2018), available at https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB1477.

93 *See* SCE's Application for Approval of Its Building Electrification Programs (A.22-12-009) available at https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M432/K773/432773552.PDF.

94 *See* "2019 California Residential Appliance Saturation Study" available at https://www.energy.ca.gov/sites/default/files/2021-08/CEC-200-2021-005-ES.pdf, p. 6.

95 *See* California Energy Commission's "Deep Decarbonization in a High Renewables Future," p. 32, where data shows the majority of residential space and water heating equipment sales are natural gas, liquid propane, and electric resistance units at https://www.ethree.com/wp-content/uploads/2018/06/Deep_Decarbonization_in_a_High_Renewables_Future_CEC-500-2018-012-1.pdf.

96 *See* "Residential Building Electrification in California: Consumer Economics, Greenhouse Gases and Grid Impacts", p. 41 at https://www.ethree.com/wp-content/uploads/2019/04/E3_Residential_Building_Electrification_in_California_April_2019.pdf.

next three to five years developing and implementing programs to spur this market transformation. This transition to efficient electric heating technologies will provide economic benefits for customers. A 2019 study by Energy and Environmental Economics, Inc. showed electrification retrofits of space and water heating reduced lifecycle costs when compared to mixed-fuel (electric and natural gas) alternatives in existing single-family dwellings in climate zones requiring cooling.[97] The study also forecasts bill savings in most existing low-rise, multi-family homes by replacing gas space and water heating with electric heat pump space and water heating.[98] Achieving lifecycle cost savings in this existing multi-family segment remains a challenge due to higher upfront costs. All-electric single-family and multi-family new construction also shows cost savings across the lifecycle relative to mixed-fuel homes with air conditioning. However, despite the positive economic results for many homes, current heat pump market penetrations remain lower than the economic potential.

In order to address BE opportunities and enable consumers to take advantage of electrification to reduce their carbon footprint and save on total energy bills, in 2018, SCE expanded its decarbonization efforts by implementing its BE initiative. These initial efforts focused primarily on establishing SCE's BE project team, developing a program charter, identifying goals and objectives, and initiating a working group to identify multiple areas of focus, as well as identifying information and data gaps. SCE's BE project team primarily focuses on research, analysis, and program development to support California's ambitious climate goals by electrifying building equipment with a concentration on water and space heating utilizing high efficiency electric heat pumps. SCE co-funded the 2019 Residential Building Electrification in California study. SCE is developing programs to transform the market for end-use equipment in buildings to shift from on-site combustion of fuels to clean electricity. The successful shift to electric equipment needs to be integrated with whole-building EE measures as well as DR-enabling technologies to maximize the value proposition of building electrification for customers. BE activities include conducting analyses and research (including data gathering of customers' existing electrical systems to determine the impacts of electrification), to

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97 "Lifecycle cost" represents the sum of capital cost *(i.e.*, water heater) and operating cost (*i.e.*, energy bill). *See* "Residential Building Electrification in California: Consumer Economics, Greenhouse Gases and Grid Impacts" at https://www.ethree.com/wp-content/uploads/2019/04/E3_Residential_Building_Electrification_in_California_April_2019.pdf.

98 "Low-rise, multi-family homes" are assumed to be two-story apartments with varying characteristics depending on vintage. *See* "Residential Building Electrification in California: Consumer Economics, Greenhouse Gases and Grid Impacts" at https://www.ethree.com/wp-content/uploads/2019/04/E3_Residential_Building_Electrification_in_California_April_2019.pdf.

support building electrification policies and strategies, supporting state agencies, like the CEC goal to advance electrification and grid harmonization and developing programs and incentives to drive building electrification, provide technical assistance for applying electric heat pumps and cooking equipment, evaluating technologies that support customer-side building electrification and reliability, and, as appropriate, developing or modifying customer rate options to facilitate adoption of building electrification.

Lastly, SCE is actively participating in the CPUC's Building Decarbonization rulemaking (R.19-01-011),[99] and has provided substantial input including subject matter expertise and analyses. The CPUC has made great progress in the Building Decarbonization proceeding since the rulemaking opened in 2019, including establishing the first large scale building electrification program through BUILD and TECH, creating incentive layering guiding principles, establishing a Wildfire and Natural Disaster Resiliency Rebuild program (WNDRR), and moving to eliminate gas line extension allowances.[100] SCE shall continue to take an active role in the Building Decarbonization rulemaking. Although the BUILD and TECH pilots are funded from natural gas utilities' Cap-and-Trade Program, SCE's BE Application (A.21-12-009) will establish its own balancing account to cover activities supporting the remainder of the Rulemaking and continued scale-up of electrification required for the needed market transformation.

(4) Customer Care

In the extreme climate areas of SCE's service territory, finding relief from extreme heat has a major impact on comfort, health, and safety, particularly for SCE's low-income, elderly, and disabled customers – and particularly those with heat-related health problems. SCE's Cool Center Program[101] assists in providing a safe, cool place for customers in extreme climate areas, offering relief from summer heat conditions for customers who do not have cooling devices in their homes or in lieu of running their own cooling devices. The program provides customers with information for

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[99] *See* http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M264/K629/264629773.pdf.

[100] *See* D.20-03-027 (Establishing Building Decarbonization Pilot Programs), D.21-11-002 (Incentive Layering, the Wildfire and Natural Disaster Resiliency Rebuild Program, Data Sharing, Rate Adjustments for Electric Heat Pump Water Heaters, and Propane Usage), and D.22-09-026 (Eliminating Gas Line Extension Allowances, Ten-Year Refundable Payment Option, and Fifty Percent Discount Payment Option Under Gas Line Extension Rules).

[101] *See* D.16-11-022, where the Commission directed SCE to include Cool Center funding going forward through its GRC filing (OP 116). In compliance with this direction, SCE has included Cool Center in the Customer Programs Management activity since its 2021 GRC (A.19-08-013).

existing Cool Center locations in Los Angeles, Riverside, Tulare, Orange, San Bernardino and Kern counties.[102] Cool Centers open solely based on temperature and operate independently of outage events. The county and city Cool Center administrators work with senior centers, libraries, community centers, and youth centers within their territories to offer relief from extreme heat. SCE's Cool Center team directs program messaging to customers by partnering with organizations such as 211.org and leverages co-marketing opportunities with other SCE programs where feasible. SCE conducts outreach for the Cool Center program through press releases, Customer Contact Center staff, and social media. SCE's website also has a tool for customers to search for Cool Centers near them.

The Customer Care activity also includes the management of the SCE MBL program, which is available to customers who require electric-powered medical or mobility equipment in their homes. Customers enrolled in MBL are granted a greater allocation of the lowest-cost electricity (Baseline Allocation) each month, which reduces their overall energy costs.[103] MBL customers include Critical Care customers, defined as MBL customers who rely on electrically operated life-support devices as stated per their physician. Table II-11 shows MBL enrollment in recent years.

Table II-11
Historical MBL Participants by Type
2018-2022

Line No.	Medical Baseline Enrollment Category (By Household)	2018	2019	2020	2021	2022
1	Critical Care	17,433	16,538	18,104	19,936	17,015
2	Medical Baseline (other than Critical Care)	77,760	75,571	86,788	94,087	76,593
3	**Total Medical Baseline Enrollment**	**95,193**	**92,109**	**104,892**	**114,023**	**93,608**

[102] SCE provides water, snacks, battery-operated personal fans, and informational materials about low-income programs such as the California Alternate Rates for Energy (CARE) program, the Energy Savings Assistance (ESA) program, and Low-Income Home Energy Assistance Program (LIHEAP). The Cool Centers facilities are funded and staffed by cities and counties.

[103] A number of SCE organizations support the Medical Baseline Allowance program. For example, the Customer Programs and Services organization works with community-based organizations (CBOs), government agencies, disability and senior organizations, senior centers, and regional centers to educate customers and service providers about SCE rates, programs, and services, as well as to help identify customers who might qualify for the Medical Baseline Allocation; the CCC's Program Services organization manages the MBL application review process; and CCC ENAs inform individuals who may qualify for MBL on the benefits of the program and how to apply.

(5) Technology Project Management

SCE engineers and test technicians at the TTC Lab who comprise the Technology Project Management team operate and maintain equipment in specialized testing lab areas that are used to measure energy consumption, temperatures, and other data and to assess end-use equipment and appliances for all customers. This includes testing of technologies being considered for future SCE incentive programs, such as HVAC; refrigeration & cooling; advanced lighting; building energy management controls; demand response controls; water heaters; and battery storage devices. These efforts are geared toward the adoption of technologies to reduce GHG-emissions through our BE efforts, including new customer technologies that reduce energy usage.

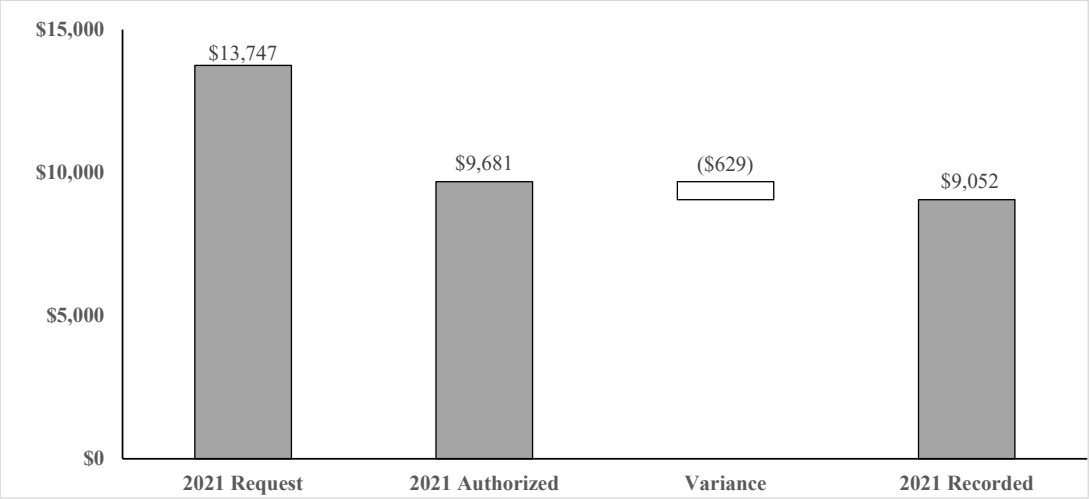
The team provides comprehensive assessments of emerging end-use technologies that may benefit SCE's residential and non-residential customers. They also provide detailed analytical assessments of energy usage and other key operating performance criteria to help our customers and industry partners make informed decisions regarding when and how to adopt new technologies to increase EE and reduce energy demand and annual operating and maintenance costs.

The Technology Project Management team performs a variety of tests and projects each year. Annually, the team performs 8 to 12 tests and projects. Some of these are short term and relatively simple, such as bench testing of a customer end-use device to confirm electrical energy use. Other projects are more complex and may run a year or longer, such as testing specialized customer processing equipment. Such projects may require modification of our testing apparatus and involve extensive monitoring under dynamic test conditions and different customer use cases. Testing of HVAC and refrigeration systems involves a significant number of different test sets, to replicate changing seasonal conditions and various climate zones within SCE's service territory.

b) Comparison of Authorized to Recorded 2021 O&M Expenses

Figure II-9 compares the requested and authorized O&M expenses from SCE's 2021 GRC with the 2021 recorded expenses in the CPM GRC Activity. As shown in Figure II-9, SCE's recorded expenses in 2021 for CPM were $629,000 (approximately 6.5 percent) less than the authorized amount. This variance is within normal operating expectations.

Figure II-9
Customer Programs Management[104]
Comparison of 2021 GRC Authorized versus Recorded
(Constant 2022 $000)

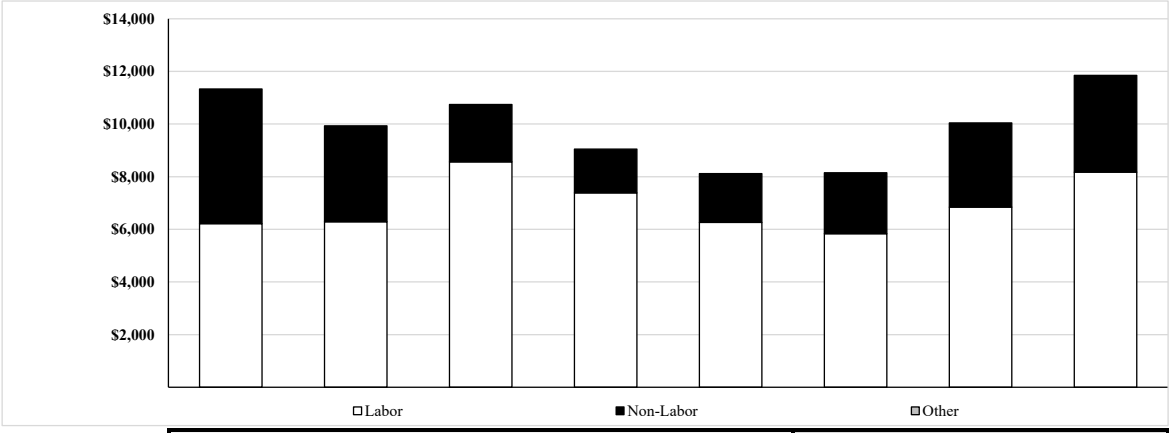


c) Scope and Forecast Analysis

This section describes the historical O&M expenses, the Test Year forecast methodology, and the adjustments included in the Test Year O&M forecast for the CPM activity. The recorded and forecast O&M expenses for CPM are shown in Figure II-10 and discussed below.

[104] WP SCE-07, Vol. 01, Authorized vs. Recorded.

Figure II-10
Customer Programs Management
Recorded 2018 to 2022 and Forecast 2023 to 2025 O&M Expenses[105]
(Constant 2022 $000)



	Recorded					Forecast		
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Labor	$6,213	$6,284	$8,562	$7,389	$6,266	$5,835	$6,846	$8,170
Non-Labor	$5,116	$3,646	$2,180	$1,663	$1,854	$2,314	$3,199	$3,676
Other								
Total Expenses	**$11,329**	**$9,930**	**$10,742**	**$9,052**	**$8,120**	**$8,149**	**$10,045**	**$11,846**
Ratio of Labor to Total	55%	63%	80%	82%	77%	72%	68%	69%

(1) Historical Variance Analysis

(a) Labor

In 2020, labor costs increased by $2.279 million due primarily to increases in TE and DER activities. Regarding TE, SCE increased staffing in advance of launching Charge Ready 2. SCE also increased DER-related labor to support the Local Capacity Requirement (LCR) and Green Tariff program administration. In 2021, labor expenses decreased by $1.174 million primarily due to a transfer of staff to the Charge Ready Phase 2 effort and a reduction in staffing due to a re-organization of the Innovation and Pilots group. In 2022, labor costs declined by $1.123 million, due primarily to three factors. First, additional personnel were shifted to Charge Ready Phase 2. Second, some personnel were transferred to support PSPS activities. Finally, in 2022, SCE was unable to fill vacancies in DER.

[105] WP SCE-03, Vol. 03, pp. 17-22 – O&M Detail for Customer Programs Management.

(b) Non-Labor

Non-labor expenses in this activity decreased during the period 2018 through 2021 by approximately $3.3 million due to multiple factors described here. In 2019, non-labor expenses decreased by $1.469 million, due primarily to a reduction in CPP-related education and outreach upon the completion of the migration of eligible customers to CPP. In 2020, SCE non-labor expenses declined by $1.467 million compared to 2019. This reduction reflects a further decrease in CPP marketing costs, a reduction in pilot activities, and a reduction in expenses associated with reserves for doubtful receivables associated with cost-sharing agreements for Commission-mandated studies.[106] In 2021, non-labor expenses declined by $516,000. This reduction was due primarily to reduction in CPP spending, a reduction in TE website development costs and sponsorships, employee- and division management-related expense due primarily to COVID-19, and a further reduction in expenses for doubtful receivables. These reductions, totaling approximately $970,000 were offset by an increase in Distributed Generation IT-related spend to develop an online NEM system. Finally, in 2022, CPM non-labor expenses increased by $191,000 due primarily to increased expenses related to doubtful receivables and post-COVID 19 increases in travel and related expenses.

(2) Forecast

For the Test Year, SCE forecasts $11.846 million of O&M expenses for CPM, an increase of $3.726 million over the Base Year.

(a) Labor

For the Test Year, SCE forecasts labor expenses of $8.170 million for CPM, which represents an increase of $1.904 million over Base Year recorded costs of $6.266 million. The details and justification for this increase are discussed in the Forecast Adjustments section below.

(b) Non-Labor

For the Test Year, SCE forecasts non-labor O&M expenses of $3.676 million for CPM, which represents an increase of $1.822 million over Base Year recorded costs

[106] SCE estimates doubtful receivables as a percentage of accounts receivable from co-funding agreements that may become uncollectible to establish a Provision for Doubtful Accounts. SCE participates in co-funding agreements with the other California Investor-Owned Utilities to share the costs of Energy Efficiency and Demand Response projects. SCE or one of the other IOUs acts as the lead project manager and co-ordinates and pays the consultant vendors for their services. On occasion, the other IOUs may not pay their portion to SCE in a timely manner. The Provision for Doubtful Accounts nets against SCE's total accounts receivables to reflect only the amounts expected to be paid.

of $1.854 million. The details and justification for this increase are discussed in the Forecast Adjustments section below.

(3) Basis for O&M Expense Forecast

The 2022 Base Year activities for Customer Programs Management expenses are described in Section II.C.2.a of this Volume. As shown in Figure II-, the Last Recorded Year accurately reflects the expense level associated with current activity levels and is the appropriate basis for forecasting the Test Year expenses plus the adjustments detailed below to reflect changes in 2025 compared to 2022.[107] For these reasons, the Last Recorded Year plus adjustments is the appropriate basis for forecasting Test Year labor and non-labor expenses.

(4) Forecast Adjustments

SCE's forecast of Test Year O&M expenses for Customer Programs Management work activities reflects an increase of $3.741 million over the Base Year 2022 recorded costs of $8.120 million in labor and non-labor expenses. These adjustments are shown in Table II-12 and discussed below. In addition to the forecast adjustments described below, the CPM Test Year forecast also includes a reduction of $15,000 in non-labor expenses related to operational improvements eliminating duplicate Budget Assistant text messages.[108]

[107] This is consistent with the direction provided in D.04-07-022 and D.89-12-057 wherein the CPUC stated that if costs have shown a trend in a certain direction over three or more years, the Last Recorded Year is the appropriate basis for estimating Test Year expenses. For CPM, labor expenses have trended downward over the period 2020-2022. For non-labor expenses have shown a decline over the 2018 - 2022 period.

[108] WP SCE-06, Vol. 03 – Operational Excellence Catalyst Program.

Table II-12
Customer Programs Management
2025 Test Year O&M Adjustments
(Constant 2022 $000)

Line No.	Description	Labor	Non-Labor	Total
1	Charge Ready Compliance Activities	620	382	1,002
2	Decarbonization Activities	558	1,455	2,014
3	Technology Test Center	227	-	227
4	Employee Compensation Program	498	-	498
5	Total Forecast Adjustments	1,904	1,837	3,741

* The CPM Test Year forecast includes miscellaneous non-labor cost reductions totaling $15,000 not included in the individual forecast adjustments listed above.

(a) Charge Ready Compliance Activities

All Charge Ready programs[109] are expected to be complete in 2026.[110] Each Charge Ready program, however, has compliance requirements that extend up to ten years beyond the programs' end dates that SCE must meet. These compliance requirements include monitoring the performance of the customers' equipment and assisting the customer with issues they may encounter. As an example, under Charge Ready Transport, SCE is required to verify that fleet customers operate and maintain their equipment for a minimum of 10 years after installation, and impose claw back charges if they do not.[111] Additionally, SCE is required to monitor customers' performance in the CR Pilots and Transport, Light Duty, Schools and Parks programs to verify customers' charging equipment remains operational for a specified length of time.[112] Again, claw back charges must be collected if customers do not meet these requirements. SCE also is required to collect

[109] Charge Ready programs are the Charge Ready Pilot, DC Fast Charging (DCFC), Home Install Rebate, Port of Long Beach Rubber Tire Gantry and Yard Tractor, Transit Bus, Transport, Schools, Parks, and Light Duty Programs.

[110] With the exception of the Charge Ready Transport program, for which SCE submitted a joint Tier 3 Advice Letter (Advice 4761-E) jointly with PG&E in April 2022 to request extending the timeframe to enroll customers to 2026. If the CPUC approves this request, the program and timeframe to construct projects would continue through 2027 or 2028.

[111] *See* D.18-05-040, OP 42.

[112] *See* D. 16-01-023, p. 53; D. 18-05-040, OP 42; D. 19-11-017 p. 74; and D. 20-08-045 pp. 97 and 142.

EVSP session data after final site installations are complete, which would extend out to 2031 at a minimum.[113] A summary of Charge Ready compliance requirements is presented in Table II-13.

Table II-13
Charge Ready Program Compliance Matrix

Line No.	Charge Ready Programs	Program Launch Year	Program End Year [1]	CPUC Decision	Complinace Activity	End of Data Collection & Reporting
1	Pilot/Bridge	2016	2022	D. 16-01-023	1. Data Collection & Reporting - D.20-12-029 OP 1 2. Customer Operation of Charging Stations for 10 years - SCE Testimony approved through D.16-01-023	2031
2	DCFC (Priority Review Program, or PRP)	2018	2020	D. 18-01-024	1. Data Collection & Reporting - D.20-12-029 OP 1 2. Customer Operation of Charging Stations for 5 years - SCE Testimony approved through D.18-01-024	2031
3	Home Install Rebate (PRP)	2018	2019	D. 18-01-024	1. Data Collection & Reporting - D.20-12-029 OP 1	2031
4	Port of Long Beach RTG (PRP)	2018	2020	D. 18-01-024	1. Data Collection & Reporting - D.20-12-029 OP 1	2031
5	Port of Long Beach Yard Tractors	2018	2020	D. 18-01-024	1. Data Collection & Reporting - D.20-12-029 OP 1	2031
6	Transit Bus (PRP)	2018	2020	D. 18-01-024	1. Data Collection & Reporting - D.20-12-029 OP 1	2031
7	Transport	2019	2025 [2]	D. 18-05-040	1. Data Collection & Reporting - D.20-12-029 OP 1 2. Monitor installations customer maintains and operates equipment for 10 years. D.18-05-040, OP 42.	2030
8	Schools	2020	2024	D. 19-11-017	1. Data Collection & Reporting - D 20-12-029 OP 1 2. Customer Operation of Charging Stations for 8 years - SCE Testimony approved through D.19-11-017	2032
9	Parks	2020	2024	D. 19-11-017	1. Data Collection & Reporting - D 20-12-029 OP 1 2. Customer Operation of Charging Stations for 8 years - SCE Testimony approved through D.19-11-017	2032
10	Light Duty	2021	2025	D. 20-08-045	1. Data Collection & Reporting - D 20-12-029 OP 1 2. Customer Operation of Charging Stations for 10 years - SCE Testimony approved through D.20-08-045	2035
11	VGI Reporting for **all** programs	2020	2031	D.20-12-029	1. Data Collection & Reporting - D.20-12-029 OP 1	2031
12	Annual EV Cost and Load Report	2011	Indefinite	D. 16-06-011		Indefinite

Notes:
1. Program end year is the year in whcich SCE anticipates that all projects have been committed.
2. SCE has requested an extension of the Transport program to 2026.

While SCE was authorized funding for the completion of the installation of the charging infrastructure and equipment associated with each program, such funding was not envisioned to cover these long-term compliance activities. To address this need, SCE requests funding in this GRC for labor and non-labor resources for the necessary compliance activities for each program beginning in 2025 or when each program ends, whichever is later. Specifically, SCE requires resources for the following compliance-related activities: completed site project management,

[113] Charge Ready Pilot and Transport requires a customer commitment to share five-year port-level data, Charge Ready Schools and Parks requires a customer commitment to share eight-year port-level data, and Charge Ready Light-Duty requires a customer commitment to share ten-year port-level data. *See* D.18-05-040, OP 42; D.19-11-017 p. 74; D. 16-01-023 pp. 97 and 142.

maintenance and repairs, data collection and reporting, and maintenance of a submetering equipment list. After program completion, site installation compliance activities and associated costs will be recovered through SCE's GRC. Specific Charge Ready post-site installation compliance activities include:

(i) Completed Sites Project Management, Maintenance, and Repairs

Even after Charge Ready program closure, SCE must support ongoing compliance of Charge Ready program rules. SCE has an obligation to monitor the customer's compliance with Charge Ready program rules, equipment maintenance and repairs, and troubleshoot technical issues for existing sites. For example, D.18-05-040 requires that SCE ensure that Charge Ready Transport program participants maintain and operate the Electric Vehicle Supply Equipment (EVSE, aka charging station equipment) for at least 10 years and requires that site hosts provide charging session data for at least five years after the EVSE is installed.[114] SCE also must verify that the customers in Charge Ready Transport adhere to their contracted 10-year Vehicle Acquisition Plans (VAP) that justified site construction and ensure an appropriate number of medium and heavy duty EVs are operated by the customer to avoid stranded assets.

For Charge Ready 2, D.20-08-045 affirmed the reasonableness of the ten-year maintenance requirement for EV infrastructure.[115] In D.20-08-045, that the Commission reaffirmed "...the data collection and reporting requirements adopted in D.18-01-024 and D. 18-05-040."[116] To meet these requirements, SCE must manage post installation processes such as site usage monitoring and analysis, troubleshoot meter data issues, conduct physical site inspections, coordinate repairs and maintenance of EVSE equipment, and compliance enforcement.

(ii) Data Collection and Reporting

As previously stated, SCE is required to provide ongoing post-installation reporting for Charge Ready sites until 2036. This requires data collection and reporting, warehousing, and storage for various Charge Ready program data, including EVSP data.[117] As Charge Ready program sites and the associated data collected continue to grow exponentially, data storage and

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[114] *See* D.18-05-040, OP 42.

[115] *See* D.20-08-045, Finding of Fact 51 at p. 138.

[116] *See* D.20-08-045, FOF, p. 123.

[117] *See* D.18-05-040, OP 42.

system needs will increase to facilitate data tracking, data visualization, and processing of data from many sources. By 2026, as the Charge Ready Light Duty and Charge Ready Transport programs conclude with the installation of more than 22,000 Level 2 charging ports[118] along with thousands of charging ports to support medium- and heavy-duty electric fleet vehicles, massive amounts of usage and charging session data will need to be collected, stored, processed and interpreted in order to comply with ongoing SB350 reporting, program usage reports for a minimum of five years after EVSE installation, and quarterly Energy Division and other compliance reporting requirements. Not only is this data required, it is also valuable in informing future rate design, demand response, VGI/V2X and other potential customer programs and incentives. Failure to make the necessary data storage investments would risk SCE's ability to provide timely and accurate reports required by the Commission, and result in long delays in refreshing reports, inability for concurrent users to access the reports and dashboard, and system issues during periods of heavier workload. Additionally, it would likely result in an increase in manual reporting labor which increases costs. Finally, data governance and quality issues are also risks that increase without the needed data storage investments.

(iii) Maintenance of Submetering Equipment List

In D.22-08-024, the Commission requires utilities to maintain and publish on their websites lists of approved EVSE submeters and/or approved submeter equipment. SCE will continue to maintain the review and approval of submeter equipment including but not limited to EVSE with capable submeters, separate metering devices and telematics-based submetering hardware/software solutions, and updating and publication of the list to the SCE website.

For each proposed compliance activity, SCE used a bottom-up approach to determine the timing and cost for the Charge Ready compliance activities for each program. These activities total a Test Year increase of $1.002 million (normalized) as summarized in Table II-14 below.[119]

[118] Level 2 charging is a piece of charging equipment with power delivered at 240 volts. Level 2 EVSEs come in many configurations: wall mounted, pedestal, curbside, and ceiling mounted, and can be networked to accept payment and communicate charging status.

[119] Refer to WP SCE-03, Vol. 03, pp. 23-30, "Charge Ready Compliance and Decarbonization Activities Forecast Adjustments" for additional details.

Table II-14
Charge Ready Compliance Activities
(Constant 2022 $000)

Line No.	Activities	Type	2025	2026	2027	2028	Test Year Forecast (Normalized)
1	Completed Site Project Management, Maintenance and Repairs	Labor	$ 154	$ 140	$ 615	$ 615	$ 381
2		Non-Labor	40	29	204	213	122
3		Subtotal	194	169	819	828	503
4	Data Collection and Reporting	Labor	46	38	313	313	178
5		Non-Labor	75	62	442	442	255
6		Subtotal	122	100	755	755	433
7	Maintenance of Submetering Equipment List	Labor	133	133	133	133	133
8		Non-Labor	5	5	5	5	5
9		Subtotal	138	138	138	138	138
10	Total Charge Ready Compliance Activities	Labor	334	311	1,061	1,061	692
11		Non-Labor	120	96	651	660	382
12		Total	454	407	1,712	1,722	1,074
13	Base Year Recorded	Labor					72
14		Non-Labor					-
15		Total Base Year Recorded					72
16	**Test Year Forecast Adjustment** (Total Forecast less Base Year Recorded)	Labor					620
17		Non-Labor					382
18		**Total**					**1,002**

(b) <u>Decarbonization Activities</u>

As noted above, decarbonization is critical to meeting the state's GHG goals. To further SCE's ability to drive decarbonization in its service territory, SCE must expand its decarbonization activities. Specifically, SCE plans to continue to monitor market needs through interactions with customers and industry stakeholders and increase activities to facilitate SCE customer participation in decarbonization-related programs and rates. As SCE's Charge Ready programs sunset, SCE plans to increase its general TE education of customers on proper infrastructure site planning, load management, V2X technologies adoption and rates, as well as information on how to operate EVs and EV chargers safely. This increased support is needed to help customers make informed electrification decisions. For example, EV adoption decisions based on current short-term concerns (e.g., capital costs for vehicles and charging stations) versus their long-term fleet needs result in more costly or delayed projects. Without subject matter expertise available to support customers to ensure safe and cost-

effective integration of new technologies, customers may be swayed by lower cost alternatives that pose safety risks, such as options proposed by combustion fuel proponents or vendors who propose inappropriately oversized or unsafe charging solutions. To meet the state's GHG goals, SCE anticipates increased work to serve these customers with informed and impartial information that will continue to benefit customers' operational needs and the utility grid. Specific decarbonization activities SCE plans to undertake in this GRC cycle are described below. Combined, these activities result in a Test Year increase of $2.014 million (normalized) above Base Year expenses of $2.121 million as summarized in Table II-15.[120]

(i) Maintenance of existing educational TE residential and non-residential web content

The TE webpages will be critical to maintain beyond Charge Ready program completion because these pages play an integral role educating customers about TE solutions available to them. As California transitions to increased electrification in the transportation sector, residential and business customers will continue to seek information about how they can play a part in this movement and better understand what participation entails. The TE residential and commercial web pages provide information access to all those who need it, providing self-service TE tools, access to education tools and resources and more. As TE adoption increases over the years, so will SCE's growing base of online customers. For example, in 2021, SCE had 239,501 TE webpage views. SCE then saw a 46% increase in web traffic in 2022 with 349,648 page views. Current Charge Ready program participants represent the small population of early EV charging and EV fleet adopters, and SCE's customer population at large will be seeking information to inform their switch to EV technologies as state mandate target dates approach, such as California's goal that, by 2035, 100% of new cars and light trucks sold in California will be zero-emission vehicles, including plug-in hybrid electric vehicles.

SCE will require internal project management resources and marketing agency support to maintain, update, and expand TE customer webpages for those customers needing support in their adoption of electric vehicles and associated technology. Currently, the SCE's TE website is funded via the Charge Ready Light Duty and Transport programs. SCE proposes that this activity be GRC funded beginning in 2025 as reflected in the forecast.

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[120] Refer to WP SCE-03, Vol. 03, pp. 23-30, "Charge Ready Compliance and Decarbonization Activities Forecast Adjustments" for additional details.

(ii) Employee training and education on emerging decarbonization technology and end-uses

Emerging markets, regulations, and individual site constraints will require ongoing education of customers and front-line employees to better educate and assist customers in meeting their electrification goals. SCE plans to require expanded, ongoing, periodic training for its front-line, customer-facing employees, including but not limited to the Customer Contact Center, Business Customer Division, and Transportation and Distribution planning organization.

As electrification technologies and markets mature, more specialized and application specific trainings and resources that employees will use to engage and educate customers must be developed beyond the current introductory training that provides a high-level overview of electrification technologies.

The purpose of these expanded trainings and resources will be to provide employees with current information on electrical infrastructure processes related to adoption of electric vehicle and heat pump technologies and the electrical upgrades required to support them, emerging market trends, new technologies, and best practices to support customers' decisions for electrification. SCE's Test Year forecast includes the costs for this training, including the required content development, labor, education and training delivery.

(iii) V2X Education - Prepare for greater access to vehicle energy management through pilot/program design and implementation

As the TE market evolves, there is greater interest among consumers, vendors, and regulators in integrating EVs onto the grid. The Decarbonization Standards & Evaluation team will leverage its market knowledge and project management skills to develop, coordinate, and implement internal policies and programs to allow for greater and easier customer access to V2X.[121] In addition, SCE must comply with Commission mandates regarding V2X activities. For example, in D.20-12-029, the Commission implemented SB 676's requirements to "establish strategies and quantifiable metrics to maximize the use of feasible and cost-effective electric vehicle (EV) integration into the electrical grid."[122] To achieve that goal, D.20-12-029 imposed a number of

[121] V2X includes V1G – load management, V2B – vehicle to building for resiliency, and V2G – vehicle to grid.

[122] *See* D.20-12-029, p. 2.

reporting requirements on SCE's Vehicle Grid Integration (VGI) activities[123] and other activities including retail and wholesale rate reform, interconnection reform, V2X customer education, standards development, data collection and evaluation, and developing new pilot proposals. D.20-12-029 did not, however, establish a funding mechanism for these activities. As such, the costs for these activities should be recovered through SCE's GRC.[124] As is clear from the scope of activities directed in D.20-12-029, V2X-related activities will grow in scope and importance through the rest of the decade as technology is more widely adopted and business models advance and become more defined. Expertise and knowledge about V2X functionality and markets is vital in order to leverage vehicles as resources that can be used across CP&S programs such as Emergency Load Reduction Program (ELRP). Appropriate funding will facilitate process development, internal expertise, and collection of customer data to enable SCE's competency in all aspects of V2X. This experience and information is essential to enabling widespread integration of EVs on the system, unlocking lower system costs, and improving reliability across both commercial and residential customers classes. The requested funding will allow SCE to create customer education on emerging vehicle-to-everything (V2X) technologies, and to develop self-service customer tools for both residential and commercial customers to help them calculate the return on investment of V2X technology and realize the benefits.

(iv) TE community outreach and external engagement

In D.20-12-029, the Commission directed utilities to launch VGI and automated load management (ALM) customer education. To date, SCE has leveraged Charge Ready Marketing, Education and Outreach (ME&O) funding to cover the costs of developing and delivering education opportunities to customers, industry, and government stakeholders.[125] As the Charge Ready program ME&O funding will end in 2025/2026, SCE will need funding in order to continue its customer and key stakeholder education and engagement efforts and add new VGI and ALM content. Continued external engagement and community outreach are essential for SCE in the TE space to build trust, gather feedback, and identify areas for improvement. SCE plans to partner with CBOs and industry leaders to deliver educational opportunities via webinars, industry working group

[123] *See* D.20-12-029, OPs 1 and 2, for example.

[124] *See* D.20-12-029, OPs 1, 2, and 6, for example.

[125] Key stakeholders who attended previous educational events included customers, community-based organizations, industry stakeholders such as vehicle and charger manufacturers, regulators (CARB, AQMDs, Energy Division), state and local officials and staff, and other California utilities.

meetings, and community and business association events. As the transportation market continues to mature and embrace new technologies, the need for updated education on transportation electrification becomes increasingly essential. Proposed topics to be covered include VGI, ALM, TE infrastructure development, load management strategies, site planning, and utility engagement. The forecast adjustment for these activities covers labor and travel related costs.

(v) Support for decarbonization standards and evaluation activities, TE market analysis, and program design

TE touches many parts of SCE's business operations including long-term strategic planning, grid forecasting/planning, technology assessment, customer equity needs assessments, rate design, and load management programs. The decarbonization standards and evaluation team is a central hub for coordination, subject matter expertise and strategic thinking that supports EV planning, program development and integration across the organization. The team's market research and analysis has informed new programs, provided information and support for program enhancements[126] and supported advocacy for improvements to codes, standards, and equity-related regulation.[127] Resulting internal and external collaborations are necessary to keep pushing California leadership in the electrification space.[128] Over the past three years, and outside of SCE's infrastructure programs, the team contributed subject and market expertise to develop meaningful comments and data in support of advice letters in regulatory proceedings that are priorities for the CPUC such as TE

[126] Such as TE Framework development and now program design SCE is leading for the state. VGI programs requested in Advice Letters 4542-E and 4610-E. Contributed to program enhancements for Charge Ready Light Duty (e.g., strategy for incorporating DCFC, New Construction Rebates), Charge Ready Transport (e.g., strategy for highway charging needs, Megawatt Charging Standard information). Supported research for inter- and intra-state HD corridor planning.

[127] Title 24, Part 11 (CalGreen), VGI Cybersecurity development (i.e., Advice Letter 4521-E); EVSE Infrastructure Reliability (CEC Docket No. 21-Tran-03); Demand Flexibility OIR (D.22-07-005); Load Management rulemaking (CEC Docket No. 21-OIR-03).

[128] Leading or supporting utility knowledge sharing and collaboration through organizations such as EEI, eSource, CalETC, Utility working groups like West Coast Clean Transit Corridor Initiative, DOE's VGI working group, partnerships with non-profits and trade group associations like CALSTART, Valley CAN, Harbor Trucking Association, and equity groups, and third-party service providers to better design future programs and improve current activities.

Framework,[129] AB841/Rule 29,[130] Submetering implementation,[131] SB676/D.20-12-029,[132] AB2127,[133] High DER OIR.[134] The technologies, customer segments, incentive tools and expected outcomes within California regulations and policies are increasingly overlapping which requires an expanded expertise and knowledge within the utility so that SCE can continue to meaningfully contribute to beneficial and positive programs as we expand electrification beyond 2025. The requested funding will support labor and the purchase of EV market information and light-duty EV sales data, medium- and heavy-duty adoption analytics by zip code; EV industry reports, support and research collaboration on a wide array of topics from EV grid integration, environmental analyses, industry standards, and market data.

(vi) Behind-the-Meter Infrastructure Requirements

The Test Year forecast also includes costs to conduct detailed studies and surveys of residential customer BTM electrical infrastructure upgrade needs prior to electrification, including the identification of, for example, inadequate main electrical panel capacity, undersized conductors, and insufficient over-current devices. This will result in detailed and scalable customer and building segmentation identifying customer-side electrical infrastructure upgrade needs prior to electrification based on demographics and building characteristics. This type of survey-supported customer and building specific segmentation does not exist in the state; the closest proxy is simple top-down assumptions based on home vintage or thresholds based on increased electricity load.[135] These surveys will support SCE's zonal electrification (replacement of gas infrastructure with electrical appliances and infrastructure) opportunity identification, accelerating achievement of state's decarbonization goals with increased electric load. These surveys will also enhance grid planning and load forecasting, improve local and statewide clean energy programs with more precise forecasting of

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[129] E.g., Significant work went into more than two years of comments, workshops and coordination with Energy Division to help shape the TE Framework through R.18-12-006.

[130] *See* Development of Rule 29.

[131] *See* D.22-08-024.

[132] SB 676 (Bradford, 2019) initiated D.20-12-029 and created new requirements for all IOU TE programs to maximize achievable VGI benefits by 2030 and directed the CPUC to issue guidance on VGI strategies, metrics, cybersecurity requirements, need for further research and new pilots. Additional information can be found at https://www.cpuc.ca.gov/vgi/.

[133] E.g., Coordination and support of CEC AB2127 charging infrastructure report.

[134] *See* R.21-06-017.

[135] Example: CEC's "California Building Decarbonization Assessment" (2021) available at https://www.energy.ca.gov/publications/2021/california-building-decarbonization-assessment.

customer adoption barriers involving electrical upgrades (e.g., electrification, solar, storage, smart panels, etc.), and support policy development[136] with more precise estimates for SCE's cumulative customer cost of electrical infrastructure upgrades, particularly for environmental and social justice communities.

(vii) BE Management and Operations

SCE forecasts labor costs to assist the state and SCE achieve ambitious clean energy goals. These activities will expand upon the activities initiated in the prior GRC, including increased regulatory filing guidance, external engagement activities, data gathering and analysis, and strategy design and execution.

SCE forecasts the need to provide increased subject matter expertise and strategies for various building electrification programs that are in flight, ramping down and/or ramping up, execute ad hoc directives, and draft comments on a diverse set of BE-impacting regulatory proceedings that have grown in number and complexity. There is ongoing proceeding support in the Building Decarbonization OIR and Energy Efficiency (EE) OIRs, including the including the development of a statewide BE policy framework and ongoing EE Fuel Substitution policy development. There are additional proceedings SCE's BE labor forecasts supporting, such as the Long-Term Gas Planning OIR, Aliso Canyon OII, Energy Savings Assistance OIR, Self-Generation Incentive Program OIR, Energy Storage & Procurement Investment Plan OIR, Integrated Resources Planning OIR, and the Integrated Distributed Energy Resources OIR. There are additional regulatory filings that may extend into this 2025-2028 GRC period where SCE anticipates leading or supporting, including SCE's Building Electrification Application and PG&E's Zonal Electrification Pilot Application. SCE BE subject matter experts will guide programs within these proceedings with ongoing design improvements and evolutions in their respective future program cycles.

SCE will support non-CPUC regulatory activity impacting BE in SCE territory, such as South Coast Air Quality Management District's and California Air Resources Board's zero emission residential and commercial appliance standards rulemakings. California has seen an increase in state and federal legislative bills impacting BE that SCE forecasts

[136] Many in-development appliance rules, such as South Coast Air Quality Management District's (SCAQMD) 2022 Air Management Plan for Zero or Low NOx Emission rules for Water Heaters, Space Heaters, Cooking Devices, and Other Combustion Sources and California Air Resources Board's (CARB) 2030 Zero Emission Water and Space Heater rules, request policy and program support statewide for preparing accommodating electrical infrastructure.

providing subject matter expertise and strategy guidance. As legislative bills are approved, such as the Inflation Reduction Act, SCE forecasts providing guidance on subsequent proceedings that may be initiated regarding the implementation of key measures related to BE.

SCE plans to continue BE activities initiated during the prior GRC cycle, such as market analysis, electrification feasibility, and customer and grid impacts. SCE will continue its membership in the Building Decarbonization Coalition to remain fully engaged with the latest developments and leverage resources from this broad stakeholder group. The BDC has spawned growing working groups on strategic topics, such as panel upgrades and advanced water heaters, that SCE forecasts providing subject matter expertise and developing long-term strategies and plans for achieving statewide and SCE BE market adoption targets, leveraging the strategy and analytical foundation that created SCE's BE Application.

Table II-15
Decarbonization Program Activities
(Constant 2022 $000)

Line No.	Activities	Funding Source	2025	2026	2027	2028	Test Year Forecast (Normalized)
1	Maintenance of existing educational TE residential and commercial web content	Labor	$ 97	$ 88	$ 88	$ 88	$ 90
2		Non-Labor	225	345	215	140	231
3		Subtotal	322	433	303	228	321
4	Employee training and education on emerging decarbonization technology and end-uses	Labor	94	94	193	193	143
5		Non-Labor	250	250	255	255	253
6		Subtotal	344	344	448	448	396
7	V2X Education - Prepare for greater access to vehicle energy management through pilot/program design and implementation	Labor	675	647	647	647	654
8		Non-Labor	1,092	652	412	392	637
9		Subtotal	1,767	1,299	1,059	1,039	1,291
10	TE community outreach and external engagement	Labor	-	-	-	-	-
11		Non-Labor	132	132	167	167	150
12		Subtotal	132	132	167	167	150
13	Support for decarbonization standards and evaluation activities, TE market analysis, and program design	Labor	414	414	414	414	414
14		Non-Labor	45	45	45	45	45
15		Subtotal	459	459	459	459	459
16	Behind-the-Meter Infrastructure Requirements	Labor	188	188	188	188	188
17		Non-Labor	575	575	575	575	575
18		Subtotal	763	763	763	763	763
19	BE Management & Operations	Labor	754	754	754	754	754
20		Non-Labor	-	-	-	-	-
21		Subtotal	754	754	754	754	754
22	Total Decarbonization Forecast	Labor	2,223	2,186	2,285	2,285	2,245
23		Non-Labor	2,319	1,999	1,669	1,574	1,890
24		**Total**	**4,542**	**4,186**	**3,954**	**3,859**	**4,135**
25	Base Year Recorded	Labor					1,686
26		Non-Labor					435
27		Total					2,121
28	**Test Year Forecast Adjustment**	Labor					558
29	(Total Forecast less Base Year Recorded)	Non-Labor					1,455
30		**Total**					**2,014**

(c) Technology Test Center Staffing

SCE is remodeling its TTC Lab in 2022 and 2023 to incorporate larger and more advanced test equipment, including Dynamic Thermal Test Chambers. (See Section II.D for details regarding the TTC Lab upgrade project.) These chambers will be used to handle more complex testing of low-Global Warming Potential (GWP) HVAC, refrigeration systems, water heaters and other types of customer end-use equipment. The upgraded lab and equipment will be more flexible to adapt to a changing utility environment and SCE's Clean Energy Pathway focus, with greater

emphasis on BE and GHG emissions reduction technologies. The modernized lab and testing capabilities will also better support technology assessments in support of other emerging programs such as EE, DR, and energy storage. This improved lab testing capability will directly benefit SCE's customers by improving our understanding of these new technologies and reducing the risk to customers who may adopt such technologies for their homes or businesses. As these technologies come to market, it is critical that our customers are properly supported with clear and unbiased data on equipment costs and performance to make their purchase choices.

The TTC Lab assessment efforts plus ongoing equipment operation and maintenance require a Technology Project Management team totaling approximately eight FTEs, including engineers and technicians. While the majority of this staff is currently onboard and reflected in 2022 recorded labor costs, the additional lab equipment will require more oversight. The day-to-day operation and maintenance of the additional lab systems described above are more complicated and will therefore require additional technical support totaling two Senior Test Technicians and an allocated portion of a one engineer's services.[137] This yields a Test Year non-labor O&M increase of $227,000.

(d) Employee Compensation Program

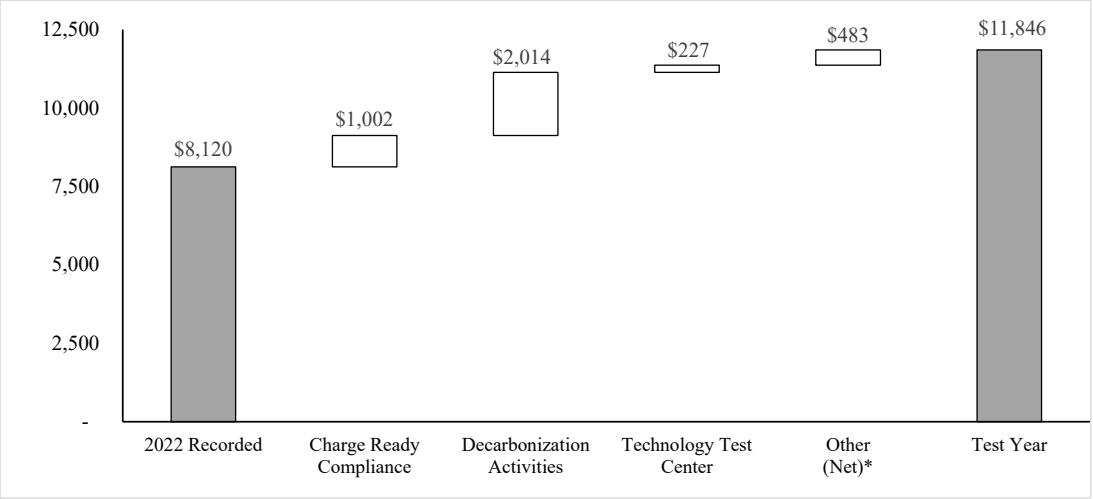
The forecast incorporates an adjustment of $498,000 to reflect certain changes made to SCE's employee compensation program. Please refer to SCE-06, Vol. 4.

(e) Summary of CPM O&M Expense Forecast

As shown below in Figure II-11, for the 2025 Test Year SCE forecasts $11.846 million in O&M expenses for Customer Programs Management, an increase of $3.726 million, or 45.4 percent, compared to the 2022 Base Year O&M expenses of $8.120 million.

[137] Refer to WP SCE-03, Vol. 03, pp. 31, "Technology Test Center Staffing Forecast" for additional details.

Figure II-11
Customer Programs Management
Comparison of 2022 Base Year to 2025 Test Year
(Constant 2022 $000)



* Includes a non-labor cost reductions totaling $15,000 not included in the individual forecast adjustments listed above.

D. Capital Expenditures Forecast

Capitalized software expenditures for Customer Care Services are generally related to providing specialized tools and equipment, new digital capabilities, customer interactions, or other CX-related areas. See testimony below for more information.

1. Comparison of Authorized 2021 to Recorded Capital Expenditures

In the 2021 GRC, the Commission authorized SCE capital expenditures totaling $266,000 for Specialized Tools and Equipment for the Technology Test Centers.[138] SCE solicited proposals for a new test chamber, but was unable to attract qualified bids to complete the project in 2021 due the COVID-related supply chain constraints and the extended lead times necessary for some of the parts.

[138] In its 2021 GRC, SCE's request for the Technology Test Center's Specialized Equipment was combined with the request for Hydraulic Services test equipment for a total of $390,000 for 2021. In D.21-08-036, the Commission adopted SCE's Specialized Equipment forecast. *See* D.21-08-036, p. 315.

2. Specialized Tools and Equipment – Technology Test Center

Engineers within the Technology Test Centers install equipment in specialized testing labs that are used to measure energy consumption, temperatures, and other data for verification of equipment performance. As discussed earlier, the SCE TTC Lab in Irwindale focuses on assessment of end-use equipment and appliances for both SCE's residential and non-residential customers. This includes testing of technologies being considered for future SCE incentive programs, such as HVAC; refrigeration & cooling; advanced lighting; building energy management controls; demand response controls; water heaters; and battery storage devices.

The TTC Lab team performs a variety of short- and long-term projects annually. More complex projects, such as testing of specialized customer processing equipment and HVAC and refrigeration systems (which require a number of different test sets, to replicate changing seasonal conditions and various climate zones), can extend over a year and require modification of our testing apparatus. Such projects require investment in upgraded laboratory testing capability to help foster safe customer use of new technologies being considered in our future DSM programs offerings.

To support these activities, SCE forecasts capital expenditures of $2.600 million from 2023 through 2028 for engineering specialized equipment to support these activities.[139]

Table II-16
Specialized Equipment and Tools – Technology Test Center
WBS# CCS-00-SE-CP-ET-00003
Recorded 2018-2022 / Forecast 2023-2028[140]
(Nominal $000)

Line No.	Description	Recorded					Forecast					
		2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
1	Technology Test Center	$ -	$ -	$ -	$ -	$ 33	$ 780	$ 260	$ 1,165	$ 265	$ 65	$ 65

3. Customer Experience Management Capital Software Projects

The supporting testimony and workpapers for Customer Experience Management capitalized software projects are discussed in SCE-06, Volume 2. These projects help SCE support the

[139] Refer to WP SCE-03, Vol. 03, p. 32-35, "Technology Test Center Capital Forecast (2023-2028)" for additional details.

[140] Prior to 2022, capital expenditures for the TTC and Business Customer Division's field engineering activities were recorded in a single WBS and, thus, historical capital expenditures for the TTC alone are not readily available. The combined recorded capital expenditures for the TTC and Business Customer Division's field engineering activities for the period 2018-2021 are presented in SCE-03, Vol. 2, Section II.D.

overall customer experience by serving as a platform and enabling: (1) digital alerts and notifications phase 2 and 3, (2) digital self-service customer communications, and (3) CX roadmap – digital self-service.