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Witnesses:	K. Borngrebe T. Brady V. Hernandez E. Torres

(U 338-E)

2025 General Rate Case

Wildfire Management
Part 4: PSPS and Other Wildfire Activities

Before the

Public Utilities Commission of the State of California

Rosemead, California
May 12, 2023

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PSPS and Other Wildfire Activities

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I.

INTRODUCTION

A. Wildfire Mitigation Activities

1. Summary of O&M and Capital Request

This volume presents SCE's requests for $116.645 million (constant 2022 dollars) in O&M expenses for the 2025 Test Year and $61.891 million in capital expenditures for 2023-2028 for the activities listed below in Table I-1 and Table I-2.[1] This funding is crucial to implement effective wildfire mitigation programs and activities designed to reduce the number and likelihood of ignitions associated with SCE equipment as well as to increase resiliency of SCE infrastructure to wildfires.

Table I-1
Wildfire Management O&M Expenses
(Total Company Constant 2022 $000)[2]

GRC Activity	TY 2025 O&M
PSPS Execution	$ 20,941
PSPS Customer Support	$ 36,971
Wildfire Mitigation and Vegetation Management Technology Solutions	$ 5,364
Aerial Suppression	$ 35,000
Enhanced Situational Awareness	$ 10,056
Fire Science and Advanced Monitoring	$ 8,032
Environmental Programs	$ 639
Total	**$ 117,003**

[1] An error was identified after the finalization of financial data. Therefore, the financial information that is stated here in testimony does not align perfectly with the financials included in standardized workpapers and the RO model. A list of errata will be submitted to align the financial information in testimony, standardized workpapers, and the RO model at a future date.

[2] An error was identified after the finalization of financial data. Therefore, the financial information that is stated here in testimony does not align perfectly with the financials included in standardized workpapers and the RO model. A list of errata will be submitted to align the financial information in testimony, standardized workpapers, and the RO model at a future date.

Table I-2
Wildfire Management Capital Expenditures 2023 – 2028
(Total Company Nominal $000)

GRC Activity	2023 - 2028 Capital Expenditure Forecst
Fire Science and Advanced Modeling	$6,714
Wildfire Mitigation and Vegetation Management Technology Solutions	$49,143
Enhanced Situational Awareness	$6,035
Totals	**$61,891**

2. Public Safety Power Shutoff (PSPS)

To protect public safety and mitigate the risk of significant wildfires associated with electric facilities, SCE continues to use proactive de-energization of power lines, referred to as Public Safety Power Shutoffs (PSPS), as a last resort when severe fire weather conditions pose a risk to infrastructure. SCE's objective in using PSPS as a last resort is to reduce the risk that our equipment could be the source of a significant wildfire through the use of targeted de-energizations impacting as few customers as possible while still mitigating the wildfire risk. Our goal is to communicate clearly, accurately and in a timely fashion, and to minimize the disruption and hardship of proactive de-energizations through customer programs and support.

In 2018, the Commission opened Rulemaking (R.) 18-12-005 to develop guidelines and rules pertaining to when an IOU uses PSPS to protect public safety. In this proceeding, the Commission issued three decisions, Decision (D.) 19-05-042,[3] issued on June 4, 2019, D.20-05-051,[4] issued on June 5, 2020, and D.21-06-034,[5] issued on June 24, 2021. The decisions issued in R.18-12-005 built upon previous Commission requirements related to the use of PSPS from proceedings dating back to 2008,

[3] D. 19-05-042 available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M296/K598/296598822.PDF (Accessed on April 20, 2023).

[4] D.20-05-051 available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M339/K524/339524880.PDF (Accessed on April 20, 2023).

[5] D.21-06-034 available at https://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=389955672 (Accessed on April 20, 2023).

including Application (A.) 08-12-021,[6] in which San Diego Gas and Electric Company requested authorization to implement proactive de-energizations, and a subsequent Commission Resolution, ESRB-8.[7] In addition in 2019, the Commission opened Investigation (I.) 19-11-013 an investigation on the Commission's own motion on the late 2019 PSPS events. A decision was issued in I.19-11-013[8] on June 7, 2021 that also built on PSPS requirements from R.18-12-005. SCE's PSPS program was designed to meet the numerous requirements related to the execution of PSPS events adopted in these proceedings. Central to these requirements and SCE's associated funding request in this chapter are guidelines for execution of PSPS events, including providing advanced notifications to customers and public safety partners at targeted intervals, support for customers affected by PSPS events (including programs/outreach for Medical Baseline and Access and Functional Needs customers), collaboration with public safety partners/communities, and regulatory reporting and compliance obligations.

Specifically, Appendix A of D.21.06-034 provides the current PSPS guidelines and rules related to aspects of SCE's PSPS program, including the following:

Community Resource Centers (CRCs): Mandates submission of CRC plans, coordination with local officials on CRC siting, and provision of CRC information to customers.

Critical Facilities and Infrastructure (CFCI): Mandates creation of webpage for CFCI customers, CFCI annual report, and maintenance of a CFCI contact list on secure web portal for local and tribal governments.

PSPS Exercises: Requires annual PSPS exercises and filing of reports.

Education and Outreach: Requires IOUs to conduct surveys in prevalent languages, filing of associated reports, and tracking of costs associated with education and outreach.

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6 D.12-04-024 from A.08-12-021 available at https://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/165063.PDF (Accessed on April 20, 2023).

7 ESRB-8 available at https://docs.cpuc.ca.gov/publisheddocs/published/g000/m218/k186/218186823.pdf (Accessed on April 20, 2023).

8 D. 21-06-014 available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M387/K099/387099293.PDF (Accessed on April 20, 2023).

Emergency Operations Centers (EOC): Requires annual training for EOC staff, coordination with agencies for State Executive Calls and PSPS notifications.

Medical Baseline and Access and Functional Needs (AFN) Customers: Requires IOUs to build partnerships with CBOs and healthcare providers, improve outreach efforts, conduct outreach to multifamily building owners/tenants and paratransit agencies, and provide a program to provide resiliency to customers that rely on electricity for necessary life functions.

Notifications: Prescribes advanced notification timelines and procedures to customers and public safety partners, including cancellation notices, and establishment of a public safety partner web portal.

Regional Working Groups: Requires quarterly working group meetings that include IOUs as well as publicly-owned utilities and electric cooperatives.

Reporting: Specifies requirements for pre-season reports, post-event reports, post-season reports, and AFN plans.

Beyond meeting the Commission's requirements related to PSPS events, SCE recognizes that while PSPS lowers the risk of wildfire ignitions, these extended outages can have very real impacts on our customers. SCE expects to continue to reduce the scope, frequency, and duration of PSPS events as we make progress on our grid hardening work and execute our wildfire mitigation initiatives. Efforts to improve SCE's PSPS performance are iterative and ongoing. In 2021, SCE developed a comprehensive Action Plan[9] that described over 130 concrete activities targeted at improving PSPS communications and reducing the frequency, scope, and impact of PSPS during the 2021 fire season. These activities were directly responsive to a letter from CPUC then-President Marybel Batjer dated January 19, 2021 regarding SCE's 2020 PSPS performance. By Spring 2022, SCE had completed all but one of the Action Plan activities.[10] SCE made additional efforts to improve performance in 2022,

[9] SCE's PSPS action plan is available at https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M369/K084/369084054.PDF (Accessed on April 20, 2021).

[10] The only remaining Action Plan milestone is a joint effort with the Rialto Unified School District (Rialto USD) to facilitate development of a behind the-meter microgrid project for a school in Fontana as part of SCE's Community Resiliency Pilot. This project has been delayed due to circumstances beyond SCE's control.

including enhancements to the central data platform (CDP)[11] that was built in 2021 (and launched in 2022) to consolidate and automate PSPS operations.

The funding request presented in this chapter will allow SCE to continue its efforts to protect public safety while further reducing the need for – and improving the execution of – PSPS. The request includes SCE's forecast 2025-2028 O&M expense and 2023-2028 capital expenditures for PSPS Execution, PSPS Customer Support activities, and PSPS Technology Solutions that support these activities.

a) PSPS Execution

Increasing wildfire activity in January 2021 demonstrated the continued urgency of wildfire prevention, event response and emergency preparedness. In fact, four of the twenty largest wildfires in California's history took place in 2021 as drought conditions intensified across the state. In 2021, weather and fuel conditions became so severe that SCE implemented multiple back-to-back PSPS events to mitigate wildfire ignition risks. Still, SCE demonstrated progress in both the reduction of PSPS events and associated impacts to customers, and the protection of public safety, including life and property. During the 2021 fire season, SCE customers experienced a decrease in PSPS impacts compared to the 2020 fire season, with no major wildfires in HFRA associated with SCE infrastructure.

In 2022, SCE's PSPS Incident Management Team (IMT) was activated ahead of forecasted severe weather events six times, but customer de-energizations were only necessary in three of these events. While SCE mitigation efforts played a role in the reduced number of PSPS events, there were also fewer severe weather events in 2022 that included a combination of high winds and extremely dry vegetation.

PSPS execution is made up of sub-activities that drive the design, development, implementation, execution and management of PSPS events. These include staffing of the PSPS Incident Management Team; PSPS Operations; Line Patrols; PSPS Program Development; Live Field Observations (LFO)[12]; Emergency Generator for PSPS Mitigation; Community Resource Centers

[11] CDP is further described in section c) Wildfire Mitigation & Vegetation Management Technology Solutions; (3) PSPS Technology Solutions; (b) IMT Customer Notifications.

[12] Live Field Observations (LFOs) are performed to identify and document obvious safety and reliability conditions that require corrective action and may be performed with one or more vehicles at or near roadway speeds, by aircraft, or on foot, as appropriate, and dependent on congestion, visibility, accessibility, time urgency and topography. LFOs provide real-time data back to SCE's Emergency Operations Center.

(CRCs) and Community Crew Vehicles (CCVs); PSPS Response and Compliance; and In-Event Battery Loan Program, all of which are described below.

(1) Work Description and Need

(a) PSPS Execution Incident Management Team (IMT)

SCE uses the Incident Command System (ICS) as a best practice for emergency response, regardless of incident size or type. This program closely adheres to State and Federal emergency management guidance for readiness standards. ICS has been successfully utilized at SCE for several years. SCE uses an incident management team as its functional structure to respond in a cohesive, integrated manner during any emergency activation, including those related to wildfires and PSPS events. Additionally, SCE maintains a comprehensive annual training and exercise routine to ensure qualified personnel remain ready to respond further described in SCE-06, Volume 04.

SCE has established and trained a dedicated PSPS IMT team staffed to respond to PSPS events and advance operational protocols and enhancements. A dedicated team has more robust skills and deeper PSPS knowledge, leading to higher performance levels under emergency conditions. Additionally, this specialized team is able to quickly codify best practices and lessons learned to improve performance from one event to another. Having a dedicated team supports consistent decision making, deeper PSPS-specific subject matter experience, and greater ability to support continuous improvement, integration of new regulatory requirements and capabilities into existing processes, and advanced planning during non-event periods. This team is supplemented by additional employees from various organizations across the company that provide functional support during a PSPS activation event.

The PSPS IMT oversees and executes PSPS protocols, which detail how PSPS activation, notification, de-energization and service restoration processes work (e.g., roles and responsibilities, decision-making processes, and execution). The team relies on sophisticated tools and technology to monitor ongoing weather conditions that could pose a risk to SCE infrastructure. These tools and technology are used to help SCE anticipate the need for possible PSPS activation, monitor weather events, evaluate real time forecasts, provide communications to affected customers and public safety partners, and enable the IMT under the leadership of the Incident Commander to make complex decisions about when to implement and when to end PSPS events.

When SCE forecasts that windspeed and fire potential index (FPI) conditions are likely to breach circuit-specific thresholds for activation and monitoring for potential

PSPS, SCE activates its PSPS IMT and begins preparations for the upcoming event (notifications, pre-patrols, etc.). The IMT uses a variety of quantitative and qualitative factors to guide its decision on whether de-energization on each circuit or circuit segment is necessary, including the Fire Potential Index (FPI), real-time data from weather station sensors and field observers (when available), and the results of SCE's PSPS In-Event Risk Comparison Tool (which accounts for potential public safety risks of PSPS). When fire weather conditions subside, SCE begins patrolling impacted circuits to check for any damage that could potentially present a public safety hazard when re-energizing circuits. Once field resources confirm that it is safe to re-energize the circuit(s), power is restored, and local government and customers are notified of re-energization. Most circuits or circuit segments can be restored within eight hours, although some circuits, including those requiring helicopter patrol will require daylight for safe inspections.

(b) PSPS Operations

The PSPS Operations group is comprised of functional area managers, power system operations specialists, advisors, and specialists who are responsible for activities that span both 'blue-sky' days and when activated, to execute PSPS events. When not activated for PSPS, the team is focused on the development and continuous improvement of the processes, procedures, protocols and systems that are critical to effective and efficient PSPS event execution. Because the grid is dynamic the team routinely conducts detailed reviews to validate switching mitigation plans, circuit exceptions, thresholds and circuit to weather station assignments, amongst others. The PSPS Operations team is also responsible for the development, maintenance, and operation of the Integrated PSPS Event Management System (iPEMS) and CDP, the two core systems used to manage and execute PSPS events. The team is also responsible for developing, delivering and managing operational training, operational compliance, and other administrative tasks required for event execution.

When activated for a PSPS event, PSPS Operations personnel staff a specialized PSPS Task Force that is part of SCE's overall IMT structure and are responsible for providing oversight and guidance for the execution of PSPS protocols on the transmission, sub-transmission, and distribution circuits in SCE's HFRA. Once activated, the PSPS Task Force reviews and, as needed, updates switch plans and procedures for impacted HFRA circuits, and, when possible, transfers customer loads to non-impacted circuits to minimize customer impacts during PSPS events. The PSPS Task Force also initiates pre-patrols on in-scope circuits prior to the Period of Concern (POC)

to identify potential equipment damage or hazardous conditions that could be a source of ignition during the event.

During the POC, the PSPS Task Force communicates with the Grid Operations Management, Transmission and Distribution management, Air Operations, and Distribution and Operations Engineering teams, among others, regarding circuits on the POC list. They coordinate with field personnel performing LFO to identify possible hazards, obtain real-time situational awareness of field conditions, and request manual device switching, when available, to minimize the de-energization footprint. PSPS activation events include proactive de-energization of circuits with overhead lines within SCE's HFRA, upon approval by the Incident Commander, if, under the circumstances, local weather conditions pose an imminent and significant threat to public safety that cannot otherwise be adequately mitigated. The PSPS Task Force is responsible for providing up-to-date situational awareness of the electric grids and environmental conditions to the Incident Commander throughout the incident. Once the threat to public safety has abated and the hazardous weather conditions have subsided, the PSPS Task Force coordinates restoration activities including circuit patrols by field personnel to identify and remediate any potential damage or hazardous conditions. If no damage is found, restoration efforts continue until all customer load is restored. If damage is found, the PSPS Task Force coordinates switching activities to energize as much customer load as possible, and once repairs are completed, restore the remaining customers. After the event has concluded, the PSPS Task Force is responsible for gathering and submitting operations-related data for various PSPS post-event reporting activities.

(c) <u>Line Patrols</u>

Line patrols are an important part of SCE's PSPS program and are one of many inputs that the PSPS IMT considers when initiating PSPS Protocols. Line patrols provide critical sources of situational awareness information that allow for the safe execution of SCE's PSPS protocols before and during a PSPS event, and after weather conditions have abated. SCE trains qualified electrical workers to perform pre-patrols and LFO for PSPS events. Before an event, line patrols are carried out by Qualified Electrical Workers (e.g., Troublemen, Senior Patrolmen, etc.) to examine electrical equipment and surrounding environment hazards to identify potential issues that may be exacerbated by the upcoming wind event. During an event, qualified personnel can be deployed to HFRA to take live wind readings, visually inspect SCE's overhead circuit integrity, and to watch for other localized environmental hazards (e.g., airborne debris). Personnel performing LFOs may be

deployed to monitor and patrol impacted areas by vehicle, on foot, or by air (via helicopter or drone) as appropriate, depending on congestion, visibility, accessibility, weather, time urgency and topography. LFOs provide real-time data back to SCE's PSPS IMT to inform operational decision making. After concerning weather conditions have abated, SCE dispatches teams to patrol all circuits that were de-energized to identify broken equipment, downed wires or debris in the lines. Circuits found with damage will be repaired prior to restoration.

(d) Emergency Generators for PSPS Mitigation

SCE has implemented programs to help mitigate the impact of de-energization events through the use of mobile generators.[13] In preparation for the 2021 PSPS season, SCE engineered and modified the grid to interconnect mobile generators to serve areas of very low fire risk, should the upstream overhead lines feeding these neighborhoods be interrupted. SCE prepared five circuits with this capability.

SCE continues to work collaboratively with local governments, first responders and essential service providers to provide awareness of PSPS and to educate them on the importance of developing a resiliency plan that addresses back-up power needs for their facilities which provide critical life and safety functions. However, if essential service providers are unable to sustain critical life/safety operations during an extended power outage, SCE will consider requests to provide temporary mobile backup generation.

(e) Community Resource Centers (CRCs) and Community Crew Vehicles (CCVs)

SCE provides in-person local support to its customers through CRCs and CCVs during PSPS de-energization events to provide customers with access to services such as power sources for the charging of devices and medical equipment, and information on the event such as event and circuit status. This support includes access to device charging, restrooms, water, snacks, and resiliency kits (which contain a tote bag, LED lightbulb or flashlight, pre-charged phone battery, ice voucher, personal protective equipment (e.g., masks, hand sanitizers, etc.) but are subject to change based on need and stakeholder feedback). In December 2021, SCE began offering medical thermal bags and ice vouchers for individuals who need to keep medication cool. CRCs also provide an opportunity for customers to sign up for PSPS alerts, update their SCE contact information, and receive answers to

[13] This was previously referred to as mobile generator deployment.

questions regarding PSPS and SCE's customer assistance programs or customer accounts. In Q3 2022, SCE added wheelchair and privacy screen availability to better support AFN customers at CRCs. SCE uses mobile CCVs as needed to reach affected communities that do not have a CRC location in their community or as a supplement to CRCs. SCE currently has eight CCVs which are deployed into PSPS event areas, and in 2023, SCE will purchase two additional vehicles for All Hazard events that could also be utilized to support PSPS events. SCE has deployed these vehicles with the required equipment and technology to enable SCE staff to transport and distribute water, snacks, and resiliency kits. CCVs can be quickly activated to serve customers and can be set up in open areas without a standing facility and/or in remote areas. CCVs have been especially useful in limiting indoor interactions during the COVID-19 pandemic. In 2023, SCE is piloting Starlink as a potential solution to provide access to Wi-Fi for customers who visit CRCs or CCVs in locations where traditional cellular service may be unavailable. Two CCVs will be equipped with Starlink as part of the pilot, prior to ordering the remaining devices to equip the other CCVs.

As of December 31, 2022, SCE had contracts with 63 CRCs in different locations on stand-by and, together with CCVs, SCE can support customers throughout our service area. SCE can simultaneously activate approximately 15 sites across its service area to support customers impacted by PSPS events at any given time. In 2022, SCE activated 11 CRCs for a total of 14 days and deployed CCVs in 25 locations for a total of 36 days in multiple counties (Inyo, Kern, Los Angeles, Mono, Orange, Riverside, San Bernardino, and Ventura counties) to support community members impacted by PSPS events. Approximately 1700 customers visited the CRCs and CCVs during PSPS events in 2022. SCE will continue to work with its public safety partners to identify new sites and needs. SCE anticipates CRCs and CCV activations, and related customer support activities to continue in 2025 through 2028.

(f) PSPS Response and Compliance

In 2019, SCE established a dedicated Wildfire/PSPS Response group within the Business Resiliency Department to provide direct support for PSPS and wildfire mitigation efforts. This includes supporting high-impact work activities for improving and executing the PSPS protocols; implementing enhanced situational awareness tool (e.g., supercomputers, high-resolution forecasting, high definition (HD) cameras, and weather stations); and developing processes and procedures to help ensure compliance with regulatory mandates. Beginning in 2020, SCE onboarded additional full-time resources to staff the dedicated PSPS IMT which was established solely for the

purpose of responding to PSPS events and advancing operational protocols and enhancements during normal daily operations. A dedicated team creates greater consistency across PSPS activations when communicating with customers and public safety partners. Additionally, this specialized team is able to more quickly adapt and make changes from one event to another. Also, in 2021, SCE hired a contractor to help with compliance activities and identified several technology improvements to streamline our operations, provide a common operating practice and enhance timely response operations. In 2021, SCE had 12 full-time resources. SCE forecasts continued support needed for the ongoing design, development, implementation, and execution of SCE's PSPS protocol and compliance program from 2025-2028. This support will also be used to continue quality assurance activities and provide for future technology enhancements.

(g) In-Event Battery Loan Pilot

The In-Event Battery Loan Pilot supports customers with AFN who live in a HFRA and utilize a medical device or assistive technology for independence, health, or safety. Customers who participate in the pilot are those who would not otherwise be eligible or have yet to apply for CCBB. The pilot provides in-event support to customers that escalate a need for SCE to accommodate the provision of temporary power for a medical device or assistive technology during a PSPS activation. Community- and faith-based organizations (CBOs and FBOs) intake customer escalations and provide that information to the contractor, who then coordinates with the customer on the battery delivery. During this process, the contactors provide the customers with an overview of the safe operation of the portable battery and arrange a date and time for battery retrieval. The customers must provide proof of a medical device or assistive technology that supports independence, health, or safety, and are notified of the potential for de-energization as part of a PSPS activation.

SCE will launch the In-Event Battery Loan Pilot in 2023 and use learnings from the pilot to make refinements into the GRC period. SCE plans to work with community- and faith-based organizations to gather feedback from customers and survey customers that participate in the pilot.

(2) RAMP Integration

(a) Safety Policy Division / Intervenor Feedback

SPD and SBUA Recommendation: SPD noted that SCE does not directly quantify exposure to PSPS in terms of the number and type of customers in the RAMP chapter itself. SCE defined tranches at the circuit segment level, but it was not clear to SPD how this level of

granularity helps explain the risk of a PSPS event to its most vulnerable customers. However, analytically speaking, the benefit of the PSPS controls only make sense if SCE creates tranches associated with different types of customers affected by PSPS events. SPD recommends that SCE should consider analyzing PSPS impacts differently from Wildfire Risk by creating tranches to reflect impacts to different types of customers affected by PSPS Risk Events. SBUA noted that Southern California Edison should include the number of small commercial customers that it expects to be impacted by PSPS events. The Commission should take this opportunity to order the analysis of PSPS impacts by customer type, including an estimation of the number of small commercial customers (e.g., GS-1 and TOU-GS-1 customers) that are expected to be impacted from PSPS events. In sum, SBUA agrees with the SPD Report that PSPS impacts should be categorized by number and type of customer.

SCE Response: As noted in the S-MAP Settlement Agreement, "the determination of Tranches will be based on how the risks and assets are managed by each utility, data availability and model maturity, and strive to achieve as deep a level of granularity as reasonably possible." SCE manages and calculates PSPS risk at the circuit/circuit segment level. It is therefore appropriate to tranche the PSPS risk this way. Conversely, the consequences of a PSPS event are impacts to customers, measured in safety, reliability, and financial aspects as illustrated in the PSPS risk bowtie. Given that SCE does not manage the risk and assets by customer class, it seems less useful to tranche by customer class. SCE cannot initiate a PSPS event and de-energize on a customer-by-customer basis. Instead, SCE must take action by isolatable circuit segments.

SCE is sensitive to the fact that PSPS events have different impacts to vulnerable customers – including medical baseline (MBL) and access and functional needs (AFN) customers. SCE has built this consideration into our risk assessment. As noted in Table I-5 in Chapter 4 of SCE's RAMP Report, SCE enhanced the PSPS safety attribute by applying a circuit-specific Access and Functional Needs (AFN)/ Non-Residential Critical Infrastructure (NRCI) multiplier. This multiplier represents the relative ranking of each circuit based on the number of AFN and NRCI customers on the circuit.

The AFN/NRCI multiplier adds an additional weight on the Safety attribute of the MAVF score for a given circuit. In other words, even if two circuits have the same number of customers, the additional vulnerability associated with the circuit with the higher AFN/NRCI multiplier would be reflected in the RSE value compared to the other circuit with the lower AFN/NRCI multiplier. SCE also prioritizes MBL, AFN, and low-income customers when SCE engages in mitigation

efforts such as the Critical Care Backup Battery (CCBB) program, Customer Resiliency Equipment Rebates, and 211 Partnerships.

SPD Recommendation: SCE designates community meetings, marketing, and PSPS Research and Education as Foundational Activities within Controls such as CRC/CCV, CCBB, and Customer Resiliency Equipment Rebates. This designation is problematic. By designating these activities as Foundational, SCE increases the costs of these activities but makes it appear that such foundational activities do not reduce risk. This designation will reduce the RSE of these Controls and potentially send the wrong signal to decision-makers that Controls supported by certain activities, such as community meetings, should not be prioritized. SCE could consider concrete ways to recognize the risk reduction that comes from ensuring vulnerable populations are aware of PSPS events and the consequences to their health that come from a PSPS event rather than designating these activities as Foundational.

SCE Response: SCE disagrees with Staff's statement that the designation of certain PSPS related activities as foundational "will reduce the RSE of these Controls and potentially send the wrong signal to decision-makers that Controls supported by certain activities, such as community meetings, should not be prioritized." First, the costs of the foundational activities are allocated to the programs they support as directed in by D.21-11-009. Second, SCE believes that these activities are foundational and do not *directly* reduce risk (emphasis added).

For example, the Community Meetings activity includes general education and awareness of what a PSPS event is and where customers can find additional information. SCE shares with our communities the types of programs that are offered, however we are not asking for any direct action from our customers during these meetings. Any potential risk reduction relies on our customers taking action and actually enrolling in the programs. SCE believes this clearly shows that this is a foundational activity that supports other controls that directly reduce the consequences of a PSPS event.

The PSPS Research and Education activity helps SCE determine the needs of customers via surveys to influence the content and scope of PSPS controls and mitigations in order to improve our customer's PSPS experience. Once again SCE does not feel that the surveys in and of themselves reduce risk but rather support the design of other controls and mitigations that do directly reduce risk.

The Marketing activity includes efforts by SCE to help educate the public on PSPS events. This includes advertising campaigns, social media, and direct customer mailings where SCE communicates information regarding SCE's decision-making factors for PSPS, and shares material regarding available customer programs and rebates. Once again, any potential risk reduction relies on the customers taking action and actually enrolling in the programs.

SPD Recommendation: SCE asserts that the RSEs in Alternative Plan #2 would be lower because of increasing costs. However, in Table VIII-27, it appears that, except for C22 Weather Stations, all the RSEs are the same or higher than those found in Table VII-16 of the Proposed Plan. Additionally, there are inconsistencies within the RAMP and the work papers regarding which controls will be included in which plans (see Portfolio Inclusion in the workbook). SCE could take steps to reconcile the way they present their Alternative Plans so that they are logical and consistent.

SCE Response: SPD is correct that in general the RSEs are relatively the same between this plan and the Proposed plan. While RSEs were just one consideration we noted that we currently do not employ a broad notification strategy. We have concerns regarding over-notification and customer fatigue due to "false positive" notifications. Previous Commission guidance has emphasized the need to reduce false positive notifications, and only alert those customers who are likely to be de-energized. With regard to customer programs, SCE has developed its current offerings by carefully analyzing customer feedback and participation. Increasing the offerings to customers would be achievable but is not guaranteed to make the additional costs worthwhile.

(b) <u>Reconciliation between RAMP & GRC</u>

Customer Resource Centers and Community Crew Vehicles do not mitigate the drivers of PSPS events, but they do mitigate the consequences. For example, they provide goods and services to customers that the customer may not have or would otherwise have to purchase on their own. Items like small electric chargers, ice vouchers and grocery store gift cards can lessen the burden that de-energization has on a customer. The information provided by trained SCE employees at CRCs and CCVs can also help customers be informed about PSPS protocols, assisting them in terms of preparation for future events.

As shown below in Table I-3, SCE's 2025 GRC forecast reflects relatively minor updated estimates for the level of CRC/CCV activity anticipated to support customers during PSPS events over the GRC period. In 2022, SCE experienced fewer PSPS activation events than

anticipated, resulting in lower usage of CRCs/CCVs and a lower recorded spend than what the RAMP report had forecast. From 2023-2025, the forecast amounts from RAMP and the GRC converge to very similar levels, with minor differences due to the forecast assumptions.

Table I-3
CRC/CCV
RAMP vs. GRC O&M Forecast Comparison - *Nominal $000s*
Risk Spend Efficiencies[14]

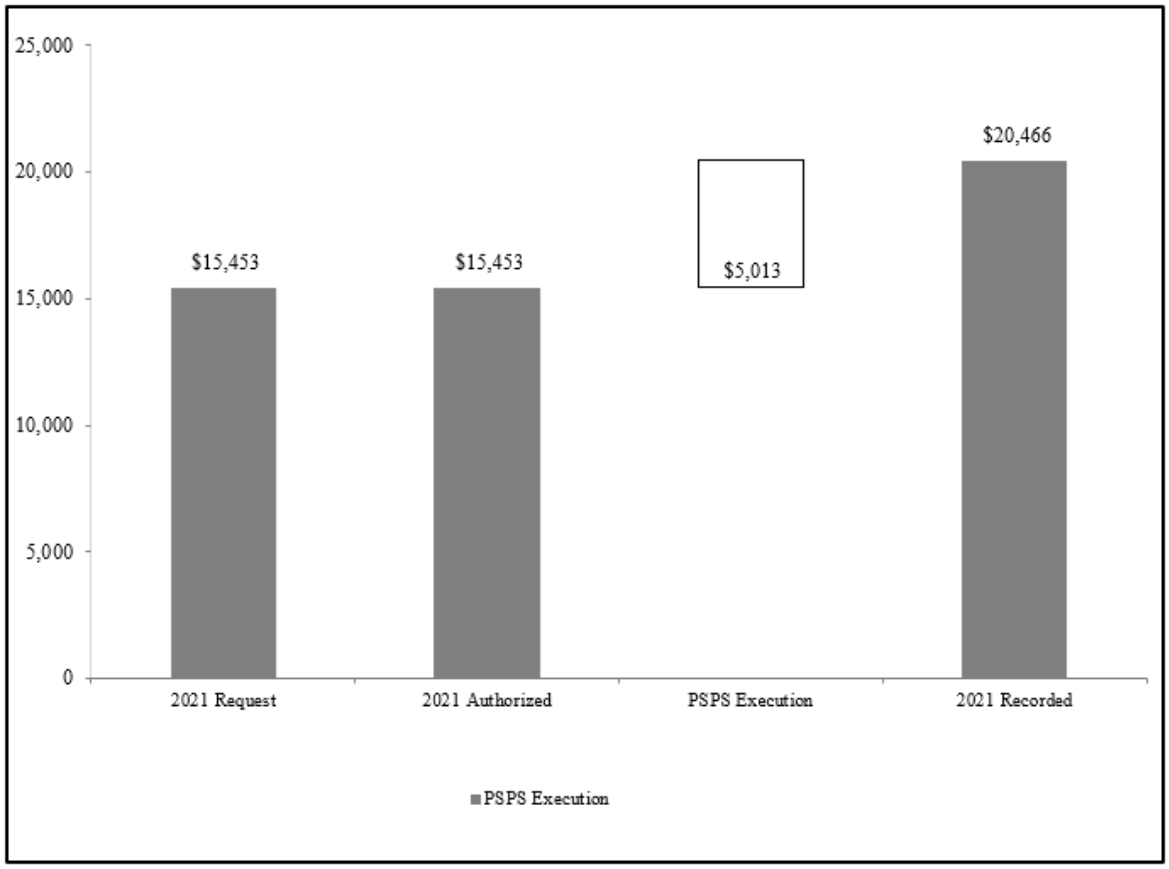
RAMP Risk	RAMP ID	RAMP Control / Mitigation Name	Filing	2022	2023	2024	2025	2025 - 2028 RSE
PSPS	C23	Customer Resource Centers (CRC) /Community Crew Vehicle (CCV)	RAMP	$1,676	$1,731	$1,465	$1,491	0.1
			GRC	$365	$1,298	$1,286	$1,346	0.6
			Variance	($1,311)	($433)	($178)	($145)	0.5

[14] Refer to WP SCE-04 Vol. 05 Part 1 – WF/PSPS RAMP to GRC Integration.

(3) Comparison of Authorized 2021 to Recorded

(a) O&M

Figure I-1
PSPS Execution
Comparison of 2021 GRC Authorized versus Recorded[15]
(Constant 2022 $000)



In 2021, SCE recorded $20.466 million in O&M expense compared to $15.453 million authorized. This was primarily due to the increased spend in Emergency Generators for PSPS mitigation, PSPS Execution IMT, and staffing of PSPS Operations which was not a forecast activity at the time of SCE's 2021 GRC. Since the time of SCE's 2021 GRC application in August 2019, SCE determined that a dedicated PSPS IMT team was required to respond to PSPS events and advance operational protocols during normal daily operations. This concept creates greater consistency across PSPS activations and enables SCE to adapt and make changes from one event to

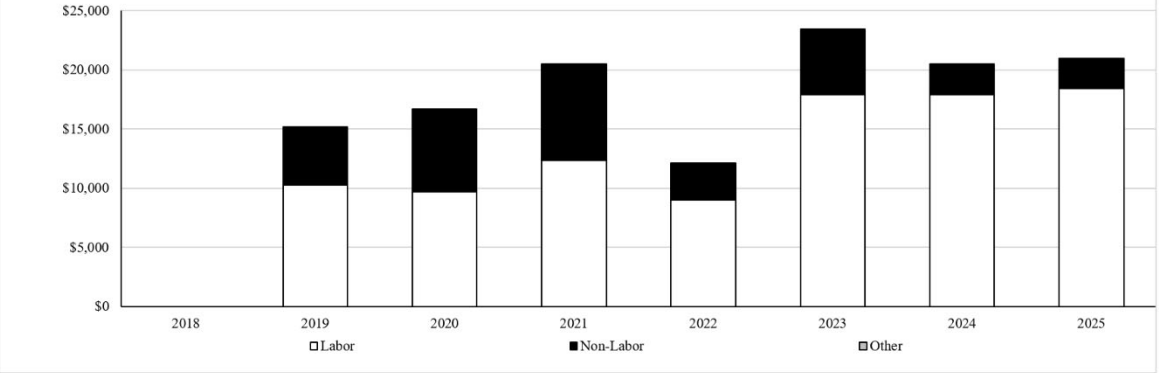
[15] Refer to WP SCE-07, Vol. 01, Authorized vs. Recorded.

another more quickly. SCE's 2021 recorded costs for PSPS Execution IMT included labor and non-labor costs in support of the PSPS IMT activities. Specifically, SCE incurred unanticipated costs for additional full-time employees to address PSPS activities. SCE's costs recorded above authorized were offset by underspending in PSPS-related line patrols, and Community Resource Centers due to fewer PSPS events being called than anticipated.

(4) Forecast Analysis

(a) Historical O&M Variance Analysis

Figure I-2
O&M Expenses for PSPS Execution
(Constant 2022 $000)[16]



	Recorded					Forecast		
	2018	2019	2020	2021	2022	2023	2024	2025
Labor		$10,283	$9,711	$12,346	$9,006	$17,867	$17,880	$18,403
Non-Labor		$4,891	$6,943	$8,120	$3,130	$5,546	$2,589	$2,538
Other								
Total Expenses		**$15,174**	**$16,654**	**$20,466**	**$12,136**	**$23,413**	**$20,469**	**$20,941**
Ratio of Labor to Total	-	68%	58%	60%	74%	76%	87%	88%

[16] Refer to WP SCE-04, Vol. 05, Part 4, pp. 1-6, PSPS Execution Recorded/Forecast O&M Summary.

(i) Labor

Table I-4
O&M Recorded Labor Expenses for PSPS Execution
(Constant 2022 $000)[17]

Recorded 2018 - 2022 Labor O&M Expenses (Constant $000)	2018	2019	2020	2021	2022
Advanced Unmanned Aerial Systems Study			$7	$2	
Community Outreach				$2	$42
Community Resource Centers		$38	$490	$304	$93
Line Patrols		$8,017	$4,394	$3,168	$1,200
Emergency Generators for PSPS Mitigation		$9		$3	$2
PSPS Execution IMT		$2,218	$2,989	$2,879	$1,968
PSPS Operations			$1,085	$4,837	$4,304
PSPS Program Development			$1		
PSPS Response & Compliance			$744	$1,151	$1,396
Total	-	**$10,283**	**$9,711**	**$12,346**	**$9,006**

In 2019, the recorded labor costs consisted primarily of costs for Line Patrols and the PSPS Execution IMT. Line Patrols costs decreased in 2020, 2021 and 2022 as this sub-activity is primarily driven by the level of PSPS activation events, which is largely influenced by the severity of the weather and fuel conditions. Line patrol spending associated with PSPS activation events consist of pre-patrols, LFO and restoration patrols. Another contributing factor to reduced Line Patrol costs was the deployment of grid hardening, switching processes, circuit exception procedures, and improved situational awareness on potentially impacted circuits and circuit segments, which over time has helped to reduce the scope and customers impacted from PSPS events. For example, in 2020-2021, the granularity of PSPS decision making increased and utilized more field sectionalizing devices versus utilizing the source device at the substation to reduce customer impacts and strategically de-energize only the sections of circuits and equipment which pose an elevated fire risk. A dedicated PSPS Incident Management Teams (PSPS IMTs) were established with the necessary tools and technology to help enable effective PSPS execution. During 2020-2021, PSPS Execution IMT labor costs increased as SCE established a dedicated team of resources to effectively plan, manage, and execute PSPS program activity.

In 2021, SCE recorded $12.346 million in labor expenses. Much of the increased spend in 2021 was due to the staffing of PSPS Operations at a cost of $4.837

[17] Refer to WP SCE-04, Vol. 05, Part 4, pp. 1-6, PSPS Execution Recorded/Forecast O&M Summary.

million. In 2021, SCE's Action Plan[18] included the goals of reducing the need for PSPS, executing PSPS events more effectively with transparency into the decision-making process, mitigating the impacts of PSPS events, keeping partners and customers clearly and consistently informed, and enhancing and improving post-event reporting. PSPS Operations team members provide oversight and guidance for the operation of the electrical transmission and distribution system during PSPS, develop tools, processes, and procedures, provide PSPS-specific training, and maintain an operational compliance management program to meet regulatory requirements. These increases were somewhat offset by underspending in PSPS-related line patrols, largely due to fewer PSPS events than SCE had experienced in 2020. In 2021, PSPS Response and Compliance labor expenses increased to $1.151 million from $0.744 million in 2020 due to increased full-time resources required to support compliance and execution activities.

In 2022, SCE recorded $9.006 million in labor costs compared to $12.346 million in 2021. This reduced level of spending was primarily due to fewer PSPS events in 2022 than in 2021, which reduced spending from Line Patrols and PSPS Execution IMT.

(ii) Non-Labor

Table I-5
O&M Recorded Non-Labor Expenses for PSPS Execution
(Constant 2022 $000)[19]

Recorded 2018 - 2022 Non-Labor O&M Expenses (Constant $000)	2018	2019	2020	2021	2022
Advanced Unmanned Aerial Systems Study		$1	$196		
Community Outreach				$105	$79
Community Resource Centers		$12	$595	$293	$272
In-Event Battery Loan Pilot					$159
Line Patrols		$2,499	$1,546	$558	$179
Emergency Generators for PSPS Mitigation		$3	$2,653	$4,661	$923
PSPS Execution IMT		$2,375	$1,045	$989	$618
PSPS Operations			$319	$1,464	$691
PSPS Program Development			$588	$37	$195
PSPS Response & Compliance			$2	$11	$13
Total	**-**	**$4,891**	**$6,943**	**$8,120**	**$3,130**

In 2019, non-labor expenses were largely driven by Line Patrols and PSPS Execution IMT, which experienced increased spending to support PSPS event activations. From 2020 to 2022, these costs gradually declined commensurate with the level of PSPS

[18] SCE's PSPS Action Plan, available at https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M369/K084/369084054.PDF (Accessed on April 20, 2023).

[19] Refer to WP SCE-04 Vol. 05 Part 4, pp. 1-6, PSPS Execution Recorded/Forecast O&M Summary.

event activity. In 2020 and further in 2021, SCE offered its Emergency Generators for PSPS Mitigation program to help minimize customer impacts during PSPS de-energizations, which drove higher non-labor spending. In 2022, SCE reduced the number of Emergency Generators on retainer due to historical analysis of past usage. Non-labor costs in 2022 were also lower than 2021 as SCE experienced fewer PSPS activations.

(b) Forecast – Labor and Non-Labor

SCE evaluated the anticipated work levels associated with each sub-activity described above to develop the overall test year labor and non-labor forecasts for the PSPS Execution GRC activity. We expect to continue to have to use PSPS as a mitigation of last resort to reduce the risk of wildfires to our customers and communities. We will continue to harden our grid, further sectionalize our circuits, and make operating adjustments to try to minimize the frequency, scope, duration, and number of customers impacted by PSPS. However, the use of PSPS is highly dependent on weather and fuel conditions. And while our weather forecasting and fuel assessment capabilities continue to mature, there is still no accurate way of forecasting PSPS events years into the future. Additionally, going forward, the impacts of climate change, drought, and emergent weather conditions have the potential to exacerbate the year-round occurrence of PSPS events. Because of this, SCE must plan for the prudent use of PSPS to mitigate the risk of wildfires during adverse weather events in the future.

SCE leverages historical levels to inform those sub-activity forecasts that are more dependent upon the level of PSPS activity that occurs each year. For other sub-activities, SCE builds upon recent experience to inform the level of resources needed in the GRC period.

SCE's forecast of Test Year O&M expenses for each sub-activity within PSPS Execution is summarized in Table I-6 below.

Table I-6
PSPS Execution Test Year Forecast O&M Expenses
(Constant 2022 $000)[20]

2025 GRC Forecast (Constant $000)	Labor	Non-Labor	Total
PSPS Execution IMT	$3,192	$894	$4,086
PSPS Operations	$5,586	$0	$5,586
Line Patrols	$7,336	$0	$7,336
Emergency Generators for PSPS Mitigation	$0	$476	$476
Community Care Vehicles / Community Resource Centers	$471	$770	$1,241
PSPS Response & Compliance	$1,542	$0	$1,542
In-Event Battery Loan Pilot	$275	$398	$674
Total	**$18,403**	**$2,538**	**$20,941**

(i) PSPS Execution Incident Management Team (IMT)

As described previously, PSPS Execution IMT is a functional structure which allows SCE to respond to emergency activations in a cohesive and integrated manner. This forecast includes two components: (1) labor cost for SCE's dedicated PSPS IMT; and (2) supplemental pay for PSPS IMT employees who are expected to work beyond normal or regularly scheduled working hours during an extraordinary situation.

SCE's dedicated PSPS IMT team prepares for and responds to PSPS events, advances operational protocols, and performs enhancements during normal daily operations. SCE established this dedicated team in Q4 of 2020 with five resources, added three more in 2021, and ramped up to eleven resources through 2022 to effectively plan, manage, and execute the PSPS IMT. SCE has not yet fully staffed this team as one resource was transferred from PSPS Response and Compliance, and one additional resource is required to offset the incremental work attributed to watch office support during PSPS IMT operations. SCE's 2025 forecast reflects staffing of thirteen employees, an increase of two employees relative to 2022 levels. These additional employees will respond to PSPS events, conduct pre-season readiness activities, respond to data requests, support increasingly comprehensive CPUC compliance reporting (e.g., Post Event Reports, Pre- and Post-Season Reports), identify lessons learned, and resolve outstanding corrective actions to help support mitigation efforts to reduce PSPS events in the future. This will allow for SCE to sufficiently plan for and respond to PSPS events through a coordinated, well trained, and dedicated IMT structure. As a

[20] Refer to WP SCE-04, Vol. 05, Part 4, pp. 7-14, PSPS Execution Test Year Forecast O&M Expenses.

result, SCE's 2025 Test year forecast includes an increase of $0.251 million labor cost[21] for SCE's dedicated PSPS IMT for these two incremental resources compared to 2022 recorded labor costs.

To develop the test year forecast component related to supplemental pay for PSPS IMT employees who are expected to work beyond normal or regularly scheduled working hours during an extraordinary situation, SCE leveraged historical costs over the 2020-2022 period. These costs fluctuate with the number and duration of PSPS activation events held each year. In 2020, SCE experienced more PSPS events than in 2022, and therefore higher costs. Because 2021 represented a middle-ground between the levels experienced in 2020 and 2022, SCE used 2021 as a reasonable estimate of costs expected to be incurred in the test year. In total, SCE is forecasting $4.086 million for PSPS Execution IMT sub-activity.

(ii) PSPS Operations

As described previously, SCE's PSPS Operations group is responsible for cross-organizational coordination, circuit switching plan development, operational compliance, training, continuous improvement of processes, and program management for PSPS-related activities. The department is made up of functional area managers, power system operations specialists, and support staff who are all trained and certified to respond in their assigned areas during a PSPS activation. To develop its test year forecast for this sub-activity, SCE used 2022 recorded expenses as basis, with modification to the labor and non-labor components as discussed in the following paragraphs. Overall, SCE is requesting an increase in 2025 relative to 2022 recorded levels.

The scope of work for PSPS Operations has expanded commensurate with the complexity and level of effort required to effectively manage our PSPS activation events and the data, systems and processes associated with them. In 2021 and 2022, SCE made progress in enhancing the processes and technologies used to support PSPS. However, resource levels during that period were not sufficient to adequately manage the increasingly complex operational processes and technologies, growing data quality and maintenance activities, and response to ongoing and new regulatory and compliance requirements. Additional resources were required to effectively and efficiently manage PSPS operational events, appropriately and timely communicate with customers and public safety partners, and provide robust, timely, and accurate data and reports.

[21] Forecast includes Employee Compensation Program Changes. *See* Exhibit SCE 06, Vol 4.

To adequately resource this work, SCE added four employees in 2022, two in the first half of 2023, and has plans to fill one additional vacancy during the second half of 2023. These internal resources will, in part, assume the work and responsibilities that had been previously performed by consultants and contractors in 2022, as well as address the opportunities identified above with a focus on process improvement and automation, technology integration, compliance, data quality, and training. PSPS activation events require a tremendous amount of customer, operational, grid, and weather data to be aggregated, analyzed, and applied in a very short amount of time. This data becomes increasingly complex as the size of a PSPS event increases, as more customers are brought into scope for potential de-energization, and as the weather conditions rapidly change. These additional resources will help to streamline the systems, processes, and data utilization used prior to, during, and after PSPS events, and help to ensure complete and reliable data collection and maintenance. These efforts will also enable improved response to additional compliance requirements and regulatory activity expected in the GRC period. SCE has experienced compounding and escalating PSPS-related regulatory and compliance requirements, particularly those related to data and performance reporting, and expects this to continue.

In early 2022, SCE used non-labor consultants and contractors to augment internal staffing resources to fulfill the PSPS Operations activities detailed above until SCE employees were onboarded later in 2022 and 2023. In the second half of 2023, SCE is planning to engage the services of a third-party vendor to assist in the review and refinement of SCE's windspeed threshold methodology. As a result, SCE forecasts a decrease in non-labor in 2025 associated with staff resource augmentation, and is forecasting $2.998 million in 2023 for the non-labor work associated with refinements to its windspeed threshold methodology. Given the above, SCE forecasts a total (labor and non-labor) Test Year increase for this sub-activity of approximately $0.591 million. In total, SCE is forecasting $5.586 million[22] for the PSPS Operations sub-activity.

(iii) Line Patrols

As described previously, SCE performs line patrols of transmission and distribution circuits during and after PSPS events. The primary driver of line patrolling activities each year is the number of PSPS activation events. PSPS activations are driven by weather and fuel conditions, which are outside of SCE's control and impossible to accurately forecast years into the

[22] Forecast includes Employee Compensation Program Changes. *See* Exhibit SCE 06, Vol 4.

future. Accordingly, SCE developed its cost forecast for both transmission and distribution line patrols by first evaluating historical PSPS activation levels. Due to the variability in the number of PSPS activation events and the fact that it is not possible to accurately forecast wind, weather, and fuel moisture conditions several years out, SCE used a three-year average of labor costs from 2019-2021 to establish the base level of its forecast for 2025. During mid-2022, SCE incorporated adjustments to the labor rates due to its recently negotiated interim agreement applicable to crews that perform the line patrolling work. In this agreement, eligible crews will receive higher overtime compensation for their work patrolling lines when they exceed normal time hours in the GRC period, versus the rates paid in the 2019-2021 period.

It is important to note that once a PSPS activation event begins, where possible, every circuit in scope is patrolled before the arrival of the forecasted weather. Crews visually inspect the entire length of each circuit to find any imminent hazards that require immediate remediation and provide additional up-to-date intelligence on field conditions. If maintenance concerns are discovered on a circuit in scope, repairs are expedited (if possible) before the impending wind event. Patrols may also be performed at the end of the event upon Incident Commander request, even if a line that was originally in scope was not de-energized. For example, an Incident Commander may request the post-patrol of a circuit that experienced extremely high winds (e.g., exceeded 99th percentile wind speeds) but was not ultimately de-energized because the associated fire potential index did not exceed its threshold.

SCE did not include 2022 as a basis for its Line Patrols forecast as 2022 was an abnormally mild weather year compared to the previous two years due to the combination of a persistent monsoon across mountain areas, the remnants of Hurricane Kay in September, and a strong winter storm in early November. These events brought appreciable amounts of precipitation to much of the region which helped to mitigate fire activity. In addition, the lack of Santa Ana winds early in the season resulted in unexpectedly fewer activations than what we anticipate going forward. In total, SCE is forecasting $7.336 million for this Line Patrols sub-activity.

(iv) <u>Emergency Generators for PSPS Mitigation</u>

As described previously, SCE offers targeted assistance to provide supplemental generation, including providing mobile generators to select neighborhoods with underground circuitry should the upstream overhead lines feeding these neighborhoods be interrupted. In the 2020 to 2022 time period, SCE retained multiple mobile generators from vendors to help ensure

availability when need (e.g., in 2021 SCE retained more than 40 mobile generator units for PSPS mitigation). However, SCE's grid hardening progresses, opportunities to interconnect generation on underground circuitry have sharply decreased. As a result, in the 2025 test year, SCE plans to maintain only three 500 kW mobile generators[23] to help ensure quick, efficient deployment to large, essential service customers. Because the need to deploy critically needed backup power is often unforeseeable more than a few hours in advance, it is vital that SCE retain these units, which are more difficult to source for emergent needs[24]. Other smaller units are generally more available on short notice and can be rented, should they be needed. As such, due to the reduced need for this service, SCE's Test Year forecast of $0.476 million represents a decrease of $0.450 million relative to 2022 recorded $0.926 million.

(v) Community Resource Centers (CRCs) and Community Crew Vehicles (CCVs)

During PSPS events, SCE uses Community Resource Centers (CRC) and Community Crew Vehicles (CCV) to provide support to customers in areas most likely to experience shutoffs. During PSPS de-energization events, customers often need access to services such as power sources for the charging of devices and medical equipment and information on the event such as the event duration. SCE uses mobile CCVs to reach communities that do not have a CRC location in their community or as a supplement to CRCs to enable SCE staff to transport and distribute water, snacks, and resiliency kits.

In 2022, SCE activated 11 CRCs and 25 CCVs for a total of 50 days during PSPS events. As of December 31, 2022, SCE had 63 contracted CRCs and 8 CCVs. SCE has identified rural locations that might have a need for CRCs with resiliency in the form of a transfer switch that can connect to a temporary mobile backup generator provided by SCE. Nine CRCs in these remote communities are equipped with resiliency, two of which are equipped with SCE-installed transfer switches.

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[23] Assumes three 500kW units and 10 total 2-day deployments of those units to provide temporary backup before and during a PSPS de-energization.

[24] Larger kW units (typically 500 kW and larger) are scarce in the rental marketplace, particularly cleaner-burning EPA Tier 4 emissions-equipped units, meaning that SCE must keep them on retainer to ensure they are not rented out to other parties.

To develop its 2025 Test Year forecast for CRC/CCVs, SCE built forecasts for (1) CRC and CCV non-labor costs, and (2) CRC labor costs. These forecasts are summarized below.

SCE's total non-labor cost forecast for CRC and CCV of $0.770 million is based on an itemized approach using vendor quotes and actual lease payments. For CCVs, the forecast includes $0.173 million for the lease, maintenance costs, and licensing fees of 8 CCVs. For CRCs, SCE is forecasting $0.597 million for backup generators for two CRC sites, 5,000 customer resiliency kits, 2,000 medical thermal kits, general supplies and expenses related to safety fairs.

For CRC labor, SCE builds upon 2021 recorded amounts to establish its test year forecast of $0.471 million. SCE experienced a high degree of variability in the labor resources supporting this activity in 2022; therefore, 2021 recorded labor more accurately reflects the labor needed to support CRC and CCV activities. Therefore, using 2021 recorded amounts as a forecast basis, SCE adds one additional FTE to support an expanded scope of work including procurement of customer supplies, inventory management, coordination of logistical support and proactive outreach to help customers prepare for potential PSPS. In total, SCE is forecasting $1.241 million for this CRC/CCV sub-activity.

(vi) PSPS Response & Compliance

SCE bases the 2025 test year forecast on 2022 recorded amounts, with an adjustment to account for full staffing levels and the Employee Compensation Program adjustment. In 2025, SCE expects to have 11 full time resources supporting PSPS Response and Compliance work, consistent with overall resource levels experienced in 2022. In 2022, SCE recorded $1.396 million in labor expenses for up to 11 full-time resources. In 2023, this group experienced one vacancy due to attrition, which SCE intends to backfill. This Advisor will work on PSPS related compliance requirements, processes, and procedures. As a result, SCE's test year forecast will continue to fund 11 resources. The increase in the test year forecast by $0.146 million relative to 2022 levels is mainly due to Employee Compensation Programs[25] and the fact that this group was not fully staffed with the 11 resources for the entirety of 2022. SCE forecasts continued support needed for coordinating both SCE's compliance related activities and technology support during a PSPS event from

[25] Forecast includes Employee Compensation Program Changes. *See* Exhibit SCE 06, Volume 4.

2025-2028. This support will also be used to continue quality assurance activities and provide for future technology enhancements. In total, SCE is forecasting $1.542 million for this PSPS Response & Compliance sub-activity.

(vii) In-Event Battery Loan Pilot

As described previously, SCE's In-Event Battery Loan Pilot provides eligible customers[26] with temporary power via batteries for a medical device or assistive technology during a PSPS activation. In 2022, SCE performed limited start-up operations for this activity and will ramp-up these activities over the 2023-2024 timeframe. In 2025, SCE expects this activity to be fully established and continue through the GRC period.

Over the 2025-2028 GRC period, SCE anticipates providing approximately 550 battery deployments annually. The costs to provide this service to customers includes:

- Payments to contractors who will be utilized to provide and pick-up these batteries from customer location (estimated at ~$650 per battery deployment);
- Referral payments to Community-based and Faith-based organizations who identify customers who would benefit from this service (estimated at ~$30 per referral);
- Marketing costs to develop pilot education and outreach collateral; and,
- Program management costs to design, implement, and maintain this service, as well as to provide requisite customer service as necessary.

In total, SCE is forecasting $0.674 million for this In-Event Battery Loan Pilot sub-activity.

[26] As described previously, this service will be provided to AFN customers who live in a HFRA and utilize a medical device or assistive technology for independence, health, or safety; customers who participate in the pilot are those who would not otherwise be eligible or have yet to apply for CCBB.

b) PSPS Customer Support

Disruption to electrical service is detrimental to customers, and SCE does not take lightly its decisions to de-energize customers. However, extreme weather conditions require SCE to proactively de-energize overhead power lines as a measure of last resort to mitigate wildfire ignition risk. When necessary, SCE activates its PSPS event process, which entails implementing a series of detailed notifications to its customers, public safety partners, and other entities on potential PSPS activity. In addition, throughout the year, SCE provides consistent and frequent messaging designed to build customer awareness and understanding of what a PSPS event is, inform customers on how such events may impact them, and encourage and aid customers to build their own resiliency plans for de-energization. SCE's PSPS Customer Support strategy uses a mix of communication channels to provide this awareness and information.

(1) Work Description and Need

(a) PSPS 2-1-1 Service

The Commission requires electric IOUs to administer a program to support resiliency for customers with AFN in preparation for and during PSPS events.[27] As a result, the electric IOUs developed the PSPS 2-1-1 Service pilot as a statewide solution that provides 24/7 live support during PSPS events, as well as information and resource referrals to customers with AFN. The PSPS 2-1-1 Service connects customers with AFN to direct services such as shelf-stable food, hot meal deliveries, transportation, and/or temporary accommodations to help customers stay safe during potential PSPS outages. These services are available during PSPS events to help AFN customers by, for example, providing accessible transportation from a CRC back to the customer's home.

SCE's PSPS 2-1-1 Service (2-1-1) also connects customers with community-based organizations (CBOs). These CBOs offer social services to the community that may mitigate the impact of PSPS events (e.g., referring customers to an organization that could lend a battery for power assistive technology, paratransit agency to schedule accessible transportation, or a food pantry

[27] D.21-06-034 at p. A10 ("Each electric IOU must administer a program to support resiliency for customers that rely on electricity to maintain necessary life functions…[s]uch support and services for each customer may include, for example, free backup batteries that energize such equipment, transportation to a community resource center or other location of the customer's choosing, other forms of support identified in consultation with these customers… Each utility's program must include, at minimum, each of the aforementioned forms of support and services."."), available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M389/K955/389955672.PDF (Accessed on April 20, 2023).

to support food needs). When not providing assistance during a PSPS event, the 2-1-1 effort focuses on outreach to customers with AFN who are living in SCE's HFRA. The 2-1-1 also helps AFN individuals develop personalized safety and emergency plans which are referred to as Care Coordination. As part of the safety and emergency plan, the 2-1-1 connects customers with existing programs that can help them prepare for outages and assist them in completing applications for SCE programs, such as CARE/FERA or Medical Baseline.

SCE launched the 2-1-1 pilot in August 2021 and began providing 24/7 live support to customers during PSPS events in October 2021. From inception to December 2022, PSPS 2-1-1 Service has provided active PSPS response to 168 SCE customers, 52 of which have been confirmed to be AFN customers. Additionally, the PSPS 2-1-1 Service has screened over 69,000 customers who are eligible for Care Coordination. As a result, approximately 16,000 eligible customers expressed interest in Care Coordination and SCE assisted with the preparation of individualized safety plans for over 2,000 customers.

(b) Access & Functional Needs (AFN) Enhancements

AFN Enhancements are activities and services that have been identified to enhance SCE's ability to better support customers with AFN and mitigate the impacts of PSPS. These enhancements include ongoing and new activities based on feedback from external stakeholders as required by D.21-06-034 and directed mandates from the CPUC. These critical enhancements include AFN self-identification surveys, increased engagement with CBOs, direct support services such as food support and resiliency items specific to customers with AFN as further detailed below in Section 4.b.i. SCE will continue to enhance AFN support services for customers before, during, and after PSPS events.

(c) Critical Care Backup Battery (CCBB) Program

The CCBB program addresses the needs of SCE's Medical Baseline Allowance (MBL) program customers residing in HFRA by fully funding the cost of portable backup battery to operate medical equipment during PSPS events. As background, in October 2019, Governor Newsom signed SB 167 into law, which authorizes electrical corporations to deploy backup electrical resources or provide financial assistance for backup electrical resources to those customers receiving medical baseline allowances and who meet specified requirements.[28] In response, in July 2020,

[28] Requirements include residing in Tier 1 or Tier 2 High Fire Risk Areas and being enrolled in the Medical Baseline Allowance program.

SCE launched the Critical Care Backup Battery (CCBB) program to provide fully subsidized portable backup battery to operate critical medical equipment during power outages due to PSPS events or other emergencies. In 2021, in an effort to increase customer participation, SCE expanded the CCBB program eligibility to include customers who are 1) enrolled in MBL (i.e., removed Critical Care requirement which is a subset of MBL); 2) enrolled in either the CARE or FERA program; and 3) reside in the HFRA. Additionally, SCE increased program awareness through marketing and outreach through direct mail, outbound phone calls, door knocking, and increased CBO engagement (CBOs inform and educate their community members). SCE continued to meet monthly with other IOUs to share best practices and, to the best extent possible, align program strategies.

To align with guidance issued in D.21-06-034[29] and to administer a program to support resiliency for customers that rely on electricity to maintain necessary life functions, SCE again expanded the program eligibility in August 2022 to include all customers enrolled in MBL that reside in a HFRA (i.e., SCE removed the requirement for CARE or FERA enrollment). Outreach was also conducted to new customers who had not been contacted to participate in the program previously. Since launching the CCBB program in 2020, SCE enrolled 10,720 customers in the program and deployed 10,207 free portable back-up batteries to eligible customers. In 2021, SCE deployed approximately 6,021 portable back-up batteries. In 2022, SCE deployed 3,460 free portable backup batteries to eligible customers. During the 2025 GRC cycle, SCE plans to continue to offer the CCBB program to eligible customers, deploy backup batteries to eligible customers who choose to participate in the program, and adjust the program outreach and strategy as needed.

(d) Customer Contact Center Support

SCE's Customer Contact Center provides support to customers during PSPS events by answering questions, providing resource information, resolving concerns, addressing emergency issues, escalating potential issues that arise as needed, and delivering safety messaging to keep the public safe. SCE's Customer Contact Center is available to respond to customers during PSPS events and may require extended scheduled work hours for staff to ensure response times are reasonable. The Customer Contact Center also supports community outreach efforts by sending Energy Advisors to community resource centers to answer customer questions, provide area outage

[29] D.21-06-034, p. A10, available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M389/K955/389955672.PDF (Accessed on April 20, 2023).

updates, and deliver safety messaging. In addition to employees, SCE leverages contract call center vendors to handle outage calls and deliver safety messages.

(e) Community Education and Translations

SCE seeks to continuously increase customer awareness and understanding of PSPS events and how to prepare for them. As part of these efforts, SCE has provided a multilingual outreach campaign since 2018. The campaign's objective is to educate customers and the public on PSPS, including the conditions that trigger PSPS, and how to prepare for PSPS and emergencies. In addition, the campaign provides information on SCE's actions to mitigate the risk of wildfires and available programs and resources for customers impacted by PSPS. The campaign includes newspaper, radio, digital, social media, search ads and direct customer mailings. SCE will continue to create new education/advertising campaigns and in-language outreach for wildfire and PSPS-related communications required by the Commission in D.19-05-042, D.20-03-004, and D.21-06-034.[30] These campaigns and other wildfire and PSPS communications are provided in 19 languages (plus 3 indigenous dialects) in addition to English.

(f) Community-Based Organization Outreach

SCE continues to partner with an extensive network of CBOs enlisted to conduct in-language wildfire safety/PSPS preparedness customer education and outreach throughout its service area, with particular emphasis on HFRA. Approximately 50 CBOs conducted outreach in HFRA and were incentivized according to SCE's pay-for-performance framework.[31] SCE also incurs expenses for management of the wildfire-specific CBO performance-based compensation, cross-IOU collaboration, and other critical functions and work required to comply with the Commission-mandated prevalent language requirements as set forth in D.20-03-004. In 2025-2028, SCE plans to continue to comply with the Commission's directive to conduct surveys that assess the effectiveness of its wildfire communication and outreach efforts and continue to partner with CBOs to conduct in-

[30] D.19-05-042, pp. 91-92, available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M296/K598/296598822.PDF (accessed on April 20, 2023), D.20-03-004 pp. 12-16, available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M329/K824/329824881.PDF (accessed on April 20, 2023), and D.21-06-034, p. 93. available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M389/K955/389955672.PDF (accessed on April 20, 2023).

[31] SCE identifies CBOs through a request for proposal process and then incentivizes them to share SCE PSPS and Wildfire preparedness information with constituents. CBOs provide monthly reporting on their outreach efforts to SCE.

language outreach. SCE anticipates forecast expenses similar to costs incurred in prior years to perform these activities.

(g) Mandated Customer Surveys

In addition to SCE's own internal PSPS-focused research and pursuant to D.20-03-004[32] as discussed below, SCE conducts annual pre- and post-wildfire season surveys (as do the other California IOUs) with residential and business customers throughout SCE's entire service territory with a special focus on those living in HFRAs. The purpose of these surveys is to evaluate the effectiveness of our wildfire safety and preparedness communications and outreach (including communications sent to customers before, during, and after PSPS events). These large-scale pre-and-post wildfire season surveys are administered to customers by phone or email in 19 prevalent languages in addition to English.

(h) Customer Research

SCE conducts extensive customer research to understand customers' attitudes/opinions about PSPS-related experiences – and then to determine how best to educate customers at the right time and through the right channels regarding wildfire mitigation and preparedness activities. This customer research work activity includes: (1) annual tracking study used to measure how well SCE performs in notifying customers pre, during, and post event, and how different communication channels perform relative to one another, (2) post-PSPS event Voice of the Customer (VOC) follow-up surveys to customers requesting feedback on their PSPS experience;~~.~~ (3) post-event surveys with customers who attended a community event or interacted with SCE's services provided by Community Resource Centers (CRC) or Community Crew Vehicles (CCV) during a PSPS event; and (4) as needed, research to improve other specific aspects of the PSPS program, such as surveys regarding the content of PSPS notifications or the optimized rebate structure for Portable Power Stations and Backup Generators.

(i) PSPS Newsletter and Outreach

SCE provides an annual PSPS newsletter (with separate versions for HFRA and Non-HFRA customers) to residential and business customers which highlight SCE's wildfire mitigation efforts and what SCE is doing to reduce the impacts of PSPS events on its

[32] D.20-03-004, pp. 19-25.

customers.[33] The Non-HFRA PSPS newsletter focuses on outage safety tips, how customers can prepare for emergencies, and includes an update on SCE's wildfire mitigation efforts. Both newsletter versions include a detachable, leave-behind decal that directs customers to visit sce.com for PSPS information, customer care resources, and emergency preparedness tips. The back panel of the newsletters also contain SCE's contact center phone numbers in multiple languages, in case customers desire to speak with a representative, as well as links to the sce.com/PSPS page so customers can read PSPS information in their preferred language. Electronic versions of the HFRA and the non-HFRA newsletter in 19 languages that are prevalent in SCE's service territory can be accessed by customers, community partners and CBOs on SCE's Wildfire Communications Center landing page.

From 2025 through 2028, SCE's customer communications will expand beyond the PSPS newsletter to include other efforts aimed at driving Wildfire/PSPS awareness and preparedness behavior. For example, SCE plans to send HFRA customers personalized[34] and timely emails before, during, and after PSPS events. The content of the email will be informed by both historical and real-time event data stored in SCE's marketing-data automation software and tools (e.g., information regarding whether a customer received a rebate from SCE for a backup power device, and if the customer is currently impacted by a PSPS de-energization event). To avoid sending customers numerous, disparate communications, PSPS preparedness messaging will be included and cross promoted in other relevant SCE marketing campaigns, as appropriate.

(j) Enabling Personalized PSPS Outreach

This work activity is comprised of marketing-data automation software and tools to make PSPS customer outreach and advertising efforts timelier, more geo-targeted, and relevant for customers. During each stage of a PSPS event, a customer's geography, communication preferences, program enrollments, and customer segment profile (e.g. AFN, MBL), among other variables, are critical in educating and prompting timely action from customers with relevant information. As such, SCE initiated a multi-year, multi-phased project in 2022. This project will

[33] These newsletters included a QR code to facilitate quick access to SCE's PSPS decision-making video, as well as a story highlighting the performance of SCE-funded fire-suppression helitankers.

[34] Personalization means customizing messages for each customer based on their specific data and attributes with the goal of delivering the right message, at the right time, in the right channel for each customer.

consolidate customer data across various systems into a customer data platform[35] and other 3rd party marketing-data automation software tools. Between 2023 and 2028, the multi-phased implementation of this project will integrate real-time PSPS outage events data, SCE call center data, and Voice of the Customer survey data to enable more personalized customer outreach as described in the PSPS Newsletter and Outreach section.

(k) eMobility Phase 2

The mobile electric vehicle charger pilot was initiated to test solutions that keep customers from being stranded during de-energization events. The PSPS OIR Phase 2 Decision required the IOUs to implement pilot projects to investigate the feasibility of mobile and deployable electric vehicle Level 3 fast charging for areas impacted by PSPS events.[36] SCE investigated the commercial availability of mobile electric vehicle chargers (MEVC) and EV driver needs and found that no off-the-shelf MEVC existed that met requirements for charging speeds, deployability, capacity, and customer throughput. A request for information (RFI) and subsequent request for qualifications (RFQ) were released and awarded in 2021 for the development of a custom solution to pilot and test safe and reliable mobile electric vehicle charging in areas impacted by PSPS events.

SCE issued a purchase order in October 2021 for the design and development of a MEVC capable of charging electric vehicles at a rate up to 50kW that is legally transportable on all public roads by a standard shipping container trailer. The MEVC was delivered in Q1 2023. SCE has begun its pre-deployment testing of the MEVC. Pending successful testing, the MEVC will be deployed as a pilot at select PSPS events between 2023 and 2026 to determine its feasibility to provide safe and reliable transportation electrification resilience.[37] Labor efforts include

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[35] A customer data platform is a best practice marketing software tool used by various companies to support efficient education and outreach efforts. This software collects data from multiple sources to build a single, coherent, complete view of each customer, which is used by companies to create targeted and personalized educational campaigns that are coordinated with the timing and content of other educational materials. SCE's customer data platform will also communicate with other SCE systems to initiate such messaging. Note: The customer data platform is a marketing system, which is different than the Palantir Central Data Platform. Refer to the supplemental workpaper for more information.

[36] D.20-05-051 at pp. 54-55, available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M339/K524/339524880.PDF (Accessed on April 20, 2023).

[37] SCE's forecast assumes 1,600 annual labor hours and non-labor to support three deployment events in 2025 and 2026. The forecast also estimates $5,000 per event for third party contracted workers to staff MEVC deployment events.

coordination of accompanying mobile battery deployment which will be used to power the MEVC, coordination with community resource centers to publicize the charger's availability, coordination to transport the charger, and general project management. The pilot is expected to end after 2026.

(l) Portable Power Station Rebate Program

The Portable Power Station Rebate Program (previously referred to as Residential Battery Station Rebates), was initiated when SCE identified the need for customers to utilize battery backup to power small electronics including lighting, TVs, routers and modems, as well as the ability to charge devices such as cell phones, laptops and tablets in the event of an extended outage or a PSPS event. The Portable Power Station Rebate Program is available to all SCE customers residing in a HFRA or served by circuits passing through HFRA that are impacted by PSPS. Under this program, these customers will be issued a rebate by SCE for purchasing qualified power stations. Originally, this program provided up to five $75 rebates to customers for purchasing a portable power station for their general home or small business resiliency needs. As of September 1, 2022, the rebate amount increased up to $150 per portable power station. SCE provided 1,756 and 2,138 Portable Power Station rebates in 2021 and 2022, respectively. SCE anticipates continuing to offer rebates to customers in 2025 through 2028.

(m) Resiliency Zones

In 2020, SCE developed the Resiliency Zones Pilot to target remote communities impacted by multiple PSPS events in 2019. The goal of the pilot was to ensure that customers providing essential services identified in remote communities would remain energized during a PSPS event. The Pilot provided funding for generator deployment and electric infrastructure enhancements to connect to onsite generation for up to three customers in seven remote communities. Customers identified as providing essential services meet basic needs such as fuel, mini-mart / convenience store, or pharmaceutical services. SCE sought the support of County and community leaders to help identify customers to participate in the Pilot. SCE executed eight Resiliency Zones agreements in 2020 and 2021 respectively, and construction on the last site was completed in Q2 2022. Currently, Resiliency Zone sites are in the following remote communities:

- Agua Dulce (3 zones, contracted in 2020)
- Cabazon (1 zone, contracted in 2020)
- Bridgeport/Lee Vining (2 zones, contracted in 2021)
- Mammoth (1 zone, contracted in 2021)

- Tehachapi (1 zone, contracted in 2021)

Although enrollment into the Resiliency Zones Pilot closed in 2021, SCE will continue to fund generator deployment costs for pilot participants until Resiliency Zones' agreements end in Q2 2027. SCE anticipates it may need to renew these agreements beyond 2027 to continue supporting remote communities impacted by PSPS events. Funding to support the Resiliency Zones pilot is included in the PSPS Customer Support forecast.

(n) Portable Generator Rebate Program

The Portable Generator Rebate program (previously referred to as Well Water Generator Incentive program) assists customers living in HFRA communities whose electrical needs extend beyond the limited power supply offered by a portable power station by offsetting the cost of purchasing a portable generator. As background, during community meetings facilitated by SCE in 2019 and 2020, SCE learned that some customers may not have access to well water during PSPS de-energization and required a portable generator to receive water from onsite wells. SCE launched the program in June 2020 by offering a $300 rebate on the purchase of a qualified portable generator ($500 for customers enrolled in CARE/FERA). In July 2021, SCE revised the program eligibility requirements and rebate amounts, based on customer survey feedback. Eligibility based on water-pumping dependency was removed, and the eligibility requirements of MBL program enrollment was added to increase accessibility to the higher rebate amounts. SCE anticipated an uptake in rebate claims associated with MBL, and therefore reduced the rebate amount from $300 to $200 to remain within budget for that program year. As of September 1, 2022, the rebate amount increased up to $600 for income-qualified and MBL-enrolled customers that reside in a HFRA. SCE issued 666 and 991 Portable Generator rebates, in 2021 and 2022, respectively. SCE anticipates continuing to offer rebates to customers from 2025 through 2028.

(o) Disability Disaster and Access Resources (DDAR)

DDAR is a program administered by the California Federation of Independent Living Centers (CFILC) that assists individuals with disabilities and older adults in disaster readiness and recovery, including PSPS de-energizations. There are two categories of DDAR services: services outside of PSPS events, and services during PSPS events (24 x 7 live support in-event). Outside of PSPS events, DDAR will conduct education and outreach to develop or enhance resiliency plans and enroll customers in eligible programs including Medical Baseline Allowance. During PSPS events, DDAR will be able to assist customers with their battery backup needs, food, accessible transportation,

and accessible hotel accommodations. SCE will supplement the offerings made available through 2-1-1 with this program. SCE anticipates implementing DDAR in 2023. SCE is also evaluating the expansion of DDAR to support customers during outages because of All Hazard events or other extended outages.[38]

(p) Town Hall Community Meetings

SCE holds wildfire safety community meetings to share information about its Wildfire Mitigation Plan (WMP), PSPS, customer programs, and emergency preparedness resources. In 2018 and 2019, SCE hosted the meetings in-person in communities in HFRA, where customers had the opportunity to interact with SCE staff and ask questions. From 2020 to 2022, the meetings were held virtually due to the COVID-19 pandemic and were offered to all customers in HFRA. The recordings of the meetings and presentation decks are posted on SCE's website.[39] Starting in 2023, SCE will host a minimum of four virtual wildfire community safety meetings prioritizing HFRA counties, grouping all counties by region. SCE will explore holding in-person targeted community meetings in light of the lifted COVID restrictions, the impact of the previous year's PSPS events, and ongoing wildfire mitigation activities.

(2) RAMP Integration

(a) Safety Policy Division / Intervenor Feedback

SBUA Recommendation: The Commission should require SCE to specifically target small businesses for participation in its customer resiliency equipment rebates. SBUA recommends that SCE take specific measures to target small business customers in its "Customer Resilience Equipment Rebates." SBUA recommends that small commercial customers be specifically offered (and educated on) resiliency measures that can help them, and their communities, better manage emergencies.

SCE Response: SCE appreciates SBUAs recommendations as related to Small Business customers. SCE notes that we currently offer portable generator rebates to small business customers. In order to expand these programs to include additional customers and marketing, SCE would have to increase the funding request of this program beginning in 2025 or significantly reduce the number of residential customers that can receive these rebates. At this time, SCE

[38] *See* Exhibit SCE-04, Vol. 02, section D for more details.

[39] Meeting information is available at www.sce.com/wildfiresafetymeetings (Accessed on April 20, 2023).

does not feel either of these options are warranted but will continue to investigate the expansion of these programs in future Wildfire Mitigation Plans and/or GRCs.

(b) Reconciliation between RAMP & GRC

PSPS Customer Support activities do not mitigate the drivers of PSPS events but these activities do mitigate the consequences of PSPS events. SCE is sensitive to the impacts that PSPS events can have on our customers, including, but not limited to customers that rely on critical, life-sustaining medical devices and those dependent on well water pumping. SCE's CCBB Program provides a free portable backup battery to eligible customers so that they can operate medical equipment during a PSPS event.

As shown below in Table I-7, there are minor variances between estimates in the May 2022 RAMP filing and SCE's 2025 GRC Forecast. The CCBB O&M variance between SCE's 2022 RAMP report and SCE's request in this GRC is due to expansion of the CCBB program in September 2022, after the RAMP filing, which removed the CARE/FERA enrollment requirement. Due to the program's expansion in late 2022, new data identified additional customers that are newly eligible for the CCBB program. Since the RAMP filing, SCE updated its cost estimates for CCBB based on 30% historical participation rates and the cost to procure enough batteries annually to deliver services to roughly 30% of eligible customers each year.

The Community Resiliency (this refers to the Portable Power Station Rebate Program and Portable Generator Rebate Program) O&M variance between SCE's 2022 RAMP report and SCE's request in this GRC, shown in Table I-7 below, is due to SCE's expansion of the rebate programs since the RAMP report. SCE conducted a survey study at the beginning of 2021 to understand the barriers and concerns customers had related to participation. In July 2021, based on the survey results, SCE expanded this program by dropping the well-water dependency for the Portable Generator Rebate category and by adding Medical Baseline Customers in addition to the existing CARE/FERA requirement to qualify for a higher rebate amount. Once expanded, SCE reviewed and compared rebate amounts and program activities with those of the other IOUs. Based on this review, in September 2022, SCE increased the rebate amount offered to CARE, FERA, and MBL customers from $500 to $600 for portable generators. Additionally, SCE increased the rebate amount for portable power stations from $75 to $150 for all customers located in HFRA. These program enhancements as well as updated forecasted operational, marketing, and rebate costs were all captured in the updated GRC filings that were not included in the RAMP filing.

The 2-1-1 Partnerships O&M variance between SCE's 2022 RAMP report and SCE's request in this GRC, shown in Table I-7 below, reflects a change in strategy on PSPS 2-1-1 from the 2022 RAMP report. The RAMP estimate only accounted for partial year services, however, as weather conditions continue to change, SCE has observed that PSPS can affect customers through the year, including winter months. The increased GRC request in 2025 represents an estimate of the costs associated with year-round services available to customers with access and functional needs who reside in HFRA.

The marketing O&M variance between SCE's 2022 RAMP report and SCE's request in this GRC, shown in Table I-7 below, is because of a decrease in cost per piece for the printed HFRA and Non-HFRA PSPS newsletters. For the 2024-2028 timeframe, SCE anticipates transitioning the Non-HFRA version of the PSPS Newsletter from the current printed format to a digitized format which would be readily accessible to customers via the Wildfire Communications Center landing page on SCE.com.

SCE's O&M variance between SCE's 2022 RAMP report and SCE's request in this GRC, shown in Table I-7 below, for Customer Research and Education was reduced to reflect latest estimates to perform the work. The GRC forecast will continue to allow for expansion and optimization of SCE's Customer Data Platform capability launched in 2023 that will ingest real-time data from relevant SCE source systems, including PSPS event/wildfire mitigation data to better orchestrate messaging to customers, prevent customers from receiving conflicting messaging, and enable delivery of personalized messaging based on customers' needs.

Table I-7
PSPS Customer Support
RAMP to GRC Integration - O&M Nominal ($000)
Risk Spend Efficiencies[40]

RAMP Risk	RAMP ID	RAMP Control / Mitigation Name	Filing	2022	2023	2024	2025	2025 - 2028 RSE
PSPS	C24	Critical Care Backup Battery (CCBB)	RAMP	$10,414	$8,159	$7,268	$6,345	0.4
			GRC	$9,809	$13,140	$8,507	$8,670	7.3
			Variance	($605)	$4,981	$1,239	$2,325	6.9
PSPS	C25	Community Resliency	RAMP	$1,100	$901	$906	$916	0.3
			GRC	$930	$1,328	$1,521	$1,391	5
			Variance	($170)	$428	$615	$475	5
PSPS	C26	211 Partnerships	RAMP	$2,487	$927	$927	$927	10
			GRC	$973	$1,604	$1,990	$2,028	27
			Variance	($1,514)	$677	$1,063	$1,101	17
PSPS	F3	Community Meetings	RAMP	$110	$112	$114	$116	N/A
			GRC	$6	$120	$130	$140	N/A
			Variance	($104)	$8	$16	$24	N/A
PSPS	F4	Marketing	RAMP	$11,443	$11,489	$11,509	$11,617	N/A
			GRC	$9,485	$10,786	$10,115	$10,232	N/A
			Variance	($1,958)	($703)	($1,394)	($1,385)	N/A
PSPS	F5	PSPS Research & Education	RAMP	$6,038	$6,299	$6,411	$6,527	N/A
			GRC	$1,880	$4,017	$4,357	$4,337	N/A
			Variance	($4,158)	($2,282)	($2,054)	($2,189)	N/A

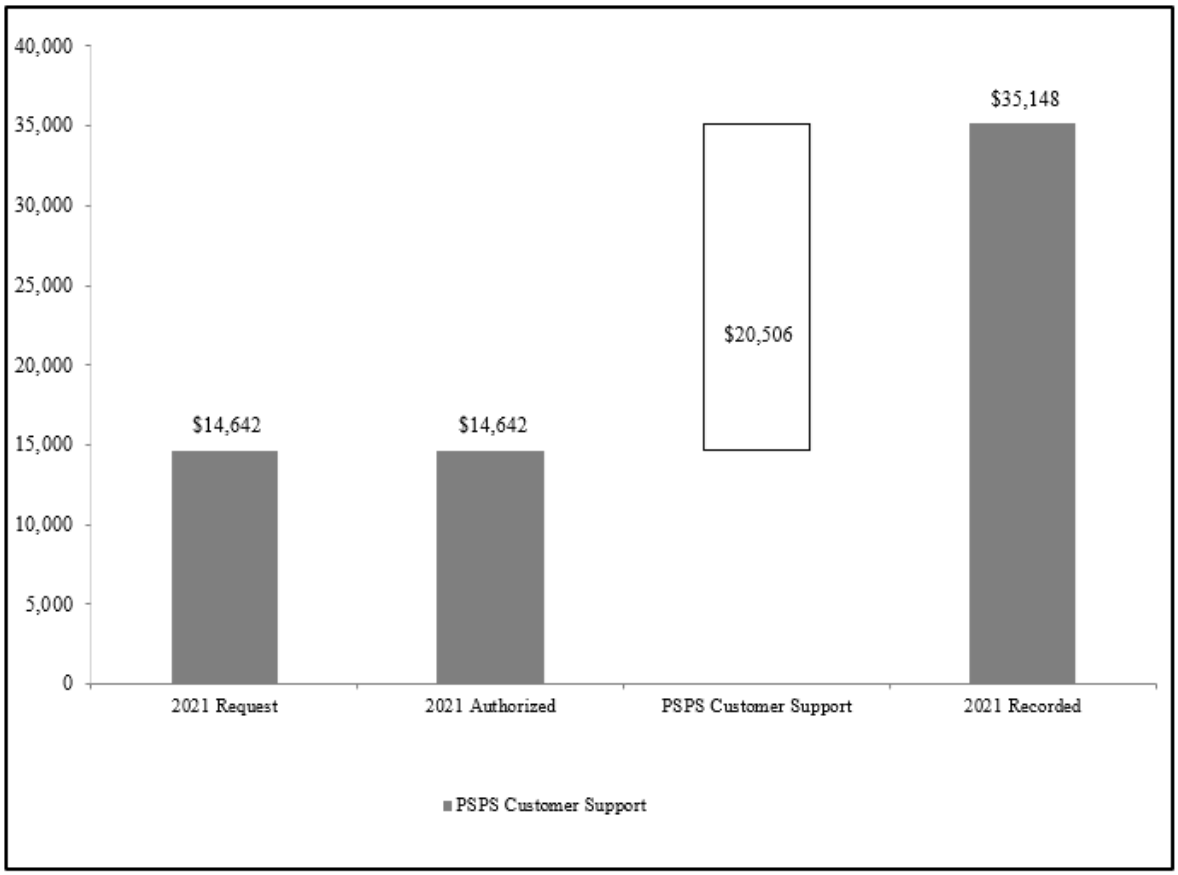
(3) Comparison of Authorized 2021 to Recorded

The Figure I-3 below compares the 2021 authorized O&M expenses with actual recorded 2021 O&M expenses for PSPS Customer Support.[41] As shown in Figure I-3, SCE's recorded expenses in 2021 were $20.505 million more than authorized. A discussion of the 2021 authorized versus recorded amounts is provided below.

[40] Refer to WP SCE-04, Vol. 05, Part 1 – WF/PSPS RAMP to GRC Integration.

[41] The O&M expenses for Emergency Outage Notification System is excluded from 2019 to 2020 and the net impact is $0.054 million.

Figure I-3
PSPS Customer Support
Comparison of 2021 GRC Authorized versus Recorded[42]
(Constant 2022 $000)



The 2021 recorded costs for PSPS Customer Support were approximately $35.148 million in O&M, as compared to $14.642 million authorized. In 2021, SCE substantially increased its efforts to build awareness and reduce customer impacts of PSPS events. As background, in February 2021, SCE developed a comprehensive plan[43] in response to a letter from CPUC then-President Marybel Batjer dated January 19, 2021, regarding SCE's 2020 PSPS performance to that also described activities targeted at improving PSPS communications and customer support. in June of 2021,

[42] Refer to WP SCE-07, Vol. 01, Authorized vs. Recorded.

[43] SCE's PSPS action plan, available at https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M369/K084/369084054.PDF (Accessed on April 20, 2023).

the Commission issued several new PSPS Customer Support compliance requirements through decisions issued in both the PSPS Order Instituting Rulemaking Phase 3 (D.21-06-034) and PSPS Order Instituting Investigation (OII) (D.21-06-014). The additional Commission requirements were, therefore, not anticipated at the time SCE developed its GRC forecasts in calendar year 2019. As such, SCE's 2021 recorded costs increased due to Commission compliance requirements, including guidance issued to administer a program to support resiliency for customers that rely on electricity to maintain necessary life functions, such as free backup batteries that energize such equipment,[44] and transportation to community resources centers[45] or other forms of support identified in consultation with customers.[46] In addition, SCE's recorded costs increased due to the mandated prevalent language requirements set forth in D.20-03-004.[47] SCE's increase in recorded costs was primarily due to SCE's implementation of PSPS support programs including the Critical Care Backup Battery Program ($22 million in 2021), the launch of the PSPS 2-1-1 Service ($1.753 million in 2021), and other programs and pilots to support customers during de-energization events.

The 2021 recorded costs for PSPS Customer Support were approximately $35.148 million in O&M, as compared to $14.642 million authorized. SCE's increase in recorded costs was primarily due to SCE's implementation of PSPS support programs that were not included in SCE's 2021 GRC filing, including the Critical Care Backup Battery Program (CCBB) ($22 million in 2021), the launch of the PSPS 2-1-1 Service ($1.753 million in 2021), and other programs and pilots to support customers during de-energization events. Specific to CCBB, SCE updated program eligibility requirements to expand the offering, allowing additional customers the opportunity to enroll in the program. Initially, the CCBB was offered to a smaller subset of Medical Baseline Allowance (MBL) customers identified as Critical Care[48]. In 2021, SCE expanded the offering to all MBL customers which resulted in greater enrollment in the program.

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[44] For additional details on this program, see section 1(b)(1)(c) Critical Care Backup Battery.

[45] For additional details on this program, see section 1(b)(1)(a) PSPS 2-1-1 Service.

[46] D.21-06-034 at pp. 111, 117, available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M389/K955/389955672.PDF (Accessed on April 20, 2023).

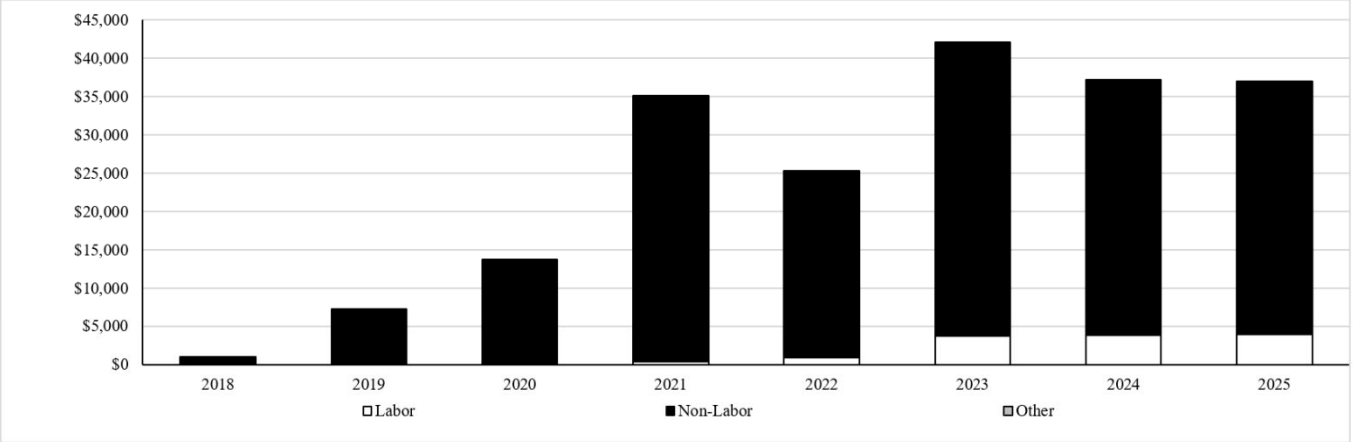
[47] D. 20-03-004 is available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M329/K824/329824881.PDF (Accessed on April 20, 2023).

[48] Critical Care customers utilize life support equipment and cannot be absent the equipment for greater than 2 hours.

(4) Forecast Analysis

(a) Historical O&M Variance Analysis

Figure I-4
O&M Expenses for PSPS Customer Support & Community Resiliency Incentives Recorded 2018-2022 and Forecast 2023-2025
(Constant 2022 $000)[49]



	Recorded					Forecast		
	2018	2019	2020	2021	2022	2023	2024	2025
Labor	$4	$12	$178	$333	$946	$3,697	$3,808	$3,919
Non-Labor	$973	$7,291	$13,636	$34,821	$24,409	$38,380	$33,350	$33,052
Other								
Total Expenses	**$978**	**$7,303**	**$13,814**	**$35,154**	**$25,355**	**$42,076**	**$37,157**	**$36,971**

(i) Labor

From 2018 to 2022, SCE substantially increased its efforts to reduce and mitigate the impacts to customers resulting from PSPS events.[50] As shown Figure I-4 above, SCE recorded labor expenses for PSPS Customer Support of approximately $0.004 million in 2018, $0.012 million in 2019, $0.178 million in 2020, $0.333 million in 2021 and $0.946 million in 2022. SCE's increase in recorded costs from 2018 through 2022 is driven by increased labor support needed for the implementation of PSPS customer support programs such as the Critical Care Backup

[49] Refer to WP SCE-04, Vol. 05, Part 4, pp. 15-20, pp. 30-35, PSPS Customer Support Recorded/Forecast O&M Summary and Community Resiliency Incentives Recorded/Forecast O&M Summary respectively. Community Resiliency Incentives is captured in this Figure I-2. No testimony is required due to program ending in 2024.

[50] The O&M expenses for Emergency Outage Notification System is excluded from 2019 to 2020 and the net impact is $0.054 million.

Battery Program, customer research and education, customer surveys, CBO outreach, and other programs to support customers during de-energization events. SCE's 2020 labor increase was primarily driven by SCE's launch of the CCBB program, which incurred labor cost for program management support for half a year (from July through December 2020). Similarly, SCE's increase in labor cost from 2020 to 2021 is the result of program management support for a full year. Labor costs increased in 2022 as SCE continued to grow its programs which required additional resources to provide analytical support, call center resources for outbound call-surveys, and additional FTE support for the growing focus on new and enhanced services for customers with Access and Functional Needs.

(ii) Non-Labor

From 2018 to 2022, SCE substantially increased its efforts to build awareness and reduce impacts to customers of PSPS events. As shown above, SCE recorded costs of $0.973 million in 2018, $7.291 million in 2019, $13.464 million in 2020, $34.821 million in 2021, and $24.409 million in 2022. Non-labor costs in 2019 were driven largely by Community Outreach activities and PSPS Awareness Advertising Campaign, and to a lesser extent, Town Hall Community Meetings. In 2020, SCE began implementing its CCBB program, which drove increased non-labor costs. Non-labor costs in 2020 also grew due to increased spending on the In-Language Advertising and Translation, the PSPS Newsletter, and additional costs related to Surveys, CBO, and Staffing, as SCE grew its PSPS Customer Support function. In 2021, SCE continued to rapidly increase its focus and investment in PSPS Customer Support in response to PSPS events and regulatory guidance. Overall non-labor cost increases in 2021 were driven largely by the growth in the CCBB program (which increased approximately $19 million year over year due to customer adoption), and to a lesser extent, increases in Community Outreach, Customer Research and Education, the start of the PSPS 2-1-1 service[51], and the growth of the other customer rebate opportunities. In 2022, non-labor costs decreased primarily due to the CCBB program, which recorded approximately $12 million less in 2022 than in 2021 due to lower customer adoption.

(b) Forecast – Labor and Non-Labor

SCE based its PSPS Customer Support forecast of $36.971 million on 2022 recorded costs and the forecast adjustments listed below, SCE anticipates it will continue to

[51] The 2022 recorded cost for PSPS 2-1-1 was a reduced amount from 2021 due to an upfront payment of $0.8 million in 2021 that was posted as a credit in 2022. SCE expects similar services and costs as in 2021 for between 2025 through 2028 for this service.

prepare its customers for de-energization events initiated to reduce wildfire ignition risk at similar relative levels as 2022 recorded costs. SCE's 2022 recorded expenses plus the proposed adjustments described below will be required to provide the appropriate levels of PSPS Customer Support in 2025-2028. SCE's Forecast Test Year Adjustments for PSPS Customer Support are summarized in Table I-8 below.

Table I-8
PSPS Customer Support Test Year Adjustments
Forecast O&M Expenses
(Constant 2022 $000)[52]

2025 GRC Forecast (Constant $000)	Labor	Non-Labor	Total
AFN Customer Enhancements	$ 463	$ 4,328	$ 4,791
Enabling Personalized PSPS Outreach and Customer Research	$ 271	$ 2,133	$ 2,404
Disability Disaster & Access Resources (DDAR)	$ 113	$ 1,849	$ 1,962
Customer Contact Center Support	$1,617	$ -	$ 1,617
Portable Generator and Portable Power Station Rebate Programs	$ 226	$ 139	$ 365
Employee Compensation Program	$ 43	$ -	$ 43
Total	$2,733	$ 8,450	$11,183

(i) Access and Functional Needs (AFN) Customer Enhancements

As described previously, SCE will continue to enhance its Access and Functional Needs (AFN) support services for customers before, during, and after PSPS events. In 2022, SCE ramped up activities in this area, which included implementing AFN surveys,[53] providing direct support to customers with AFN such as transportation and food, increasing partnerships with 25 additional CBOs that serve customers with AFN, and enhancing CRC offerings to improve accessibility by purchasing and providing manual wheelchairs and privacy screens[54] for customers with

[52] Refer to WP SCE-04, Vol. 05, Part 4, pp. 21-29, PSPS Customer Support Test Year Adjustments O&M Expenses.

[53] Surveys are used to gather data directly from SCE's AFN customers, which allows SCE to provide more relevant and targeted marketing and outreach to AFN customers, such as guiding these customers to various programs, service and resources that can help them be prepared, informed, and remain safe during PSPS Outages.

[54] Privacy screens allow AFN customers to use medical and other equipment at indoor CRCs.

AFN to use medical equipment or breastfeed in privacy when visiting a CRC. As such, 2022 recorded costs represent only certain start-up costs associated with this effort, and SCE's 2025 forecast represents the costs associated with full operations.

As described below, SCE will be expanding these services in the 2025 test year to include the AFN Self-Identification Campaign, translating PSPS notifications into American Sign Language, refreshing the Joint IOU PSPS website, increasing AFN-focused CBO Education, Outreach & Engagement,[55] and providing direct support to customers such as food and accessible transportation. SCE's test year forecast adjustment for AFN Enhancements is $5.225 million and is comprised of the items below. See Supplemental Workpapers for more information about each component of SCE's AFN Enhancements' test year adjustment.

AFN Self Identification Campaign.

SCE's test year forecast adjustment includes $1.421 million in the AFN Self-Identification Campaign costs (i.e., costs associated with direct mail and survey processing) necessary to gather data directly from SCE's customers. These costs were estimated based on the AFN Self-Identification Pilot campaign costs in 2022 (with approximately 78,000 residential customers) and in anticipation of expanding the Pilot to a full campaign to reach all account holders in HFRA. With this effort, SCE expects to further expand administration of the AFN Self-Identification Campaign through the remainder of SCE service area through the GRC period. Capturing this survey data will help SCE obtain more detailed and accurate information on its customers with AFN needs. This will enable for targeted outreach of programs and support services to match the needs of individuals with AFN. To keep this information current, and due to the inherent fluid nature of having an access or functional need(s), SCE will conduct annual outreach to customers after the initial completion of the AFN Self-Identification Campaign in SCE's HFRA. This will be a recurring annual campaign cost.

IT Development.

SCE's forecast also includes costs for supporting AFN data system enhancements to appropriately capture, store, and update AFN data that customers provide through the Self-ID Campaign, as well as other IT enhancements needed as the AFN targeted efforts continue to grow. The cost estimate for the data systems enhancements was provided by SCE's IT

[55] This includes tribal communities, direct-to- customer support such as food and paratransit support, and leverage partnerships with CBOs to proactively provide targeted resiliency items for customers with AFN.

subject matter experts and benchmarked against similar IT enhancement costs. SCE forecasts a test year adjustment of approximately $0.754 million for this area, which was estimated based on costs associated with creating new data fields in SAP to append customer information in our systems. These IT costs to support the AFN Self ID Campaign and other IT updates are expected to be incurred annually to support continued enhancements of our systems as customer experience and processing improvement opportunities are identified and implemented.

AFN-Focused CBO Education, Outreach & Engagement. SCE's 2025 test year forecast expands its AFN-Focused CBO Education, Outreach & Engagement activities to include active engagement with tribal communities, increasing engagement with CBOs and leveraging partnerships with CBOs to proactively provide targeted resiliency items for customers with AFN. These resiliency items are intended to complement existing offerings and are tailored to serve individualized needs. Some examples include sensory kits,[56] battery solutions for assistive technology or Augmentative and Alternative Communication (AAC) devices,[57] battery powered blenders, and battery-powered mini fridges to store medication. The ramp up for these activities started in late 2022, and the 2025 forecast reflects the full services for this area. SCE expects to work with an additional 75 CBOs (in addition to approximately 50 CBOs SCE currently supports in this area) which SCE forecasts will cost an incremental amount of $0.735 million.[58]

Food Support. SCE forecasts approximately $0.504 million annually for food support in its 2025 test year. This estimate assumes that SCE work with food bank partnerships in the frequently impacted counties (Inyo, Kern, Los Angeles, Mono, Orange, Riverside, San Bernardino, Santa Barbara, Tulare, Ventura). Based on the best available information, SCE estimated that it would provide approximately 12,500 food boxes annually which cost approximately $40 per food box.

Labor Support In 2025, SCE forecasts 6 FTEs working on AFN customer enhancements. These resources will work on outreach and education, accessible

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[56] Sensory kits are intended to aid customers who may have sensory processing disabilities such as autism spectrum or other intellectual disabilities cope with increased stressors due to the PSPS outage.

[57] Augmentative and Alternative Communication devices are devices used as an alternative means of communication other than (or complementary to) using verbal speech. People who use these devices typically have challenges with verbal communication (e.g., autism spectrum, cerebral palsy, brain injuries, etc.).

[58] As detailed in SCE's Supplemental Workpapers, SCE assumed an appropriate average annual cost of $10,000 per CBO.

marketing and communication. Included in this forecast is an incremental 1.5 FTEs for certified American Sign Language interpreters to expand PSPS services to enable SCE to address the communication needs for customers who are deaf, support customers during All Hazards events, enable improved accessibility across all SCE communications and reduce costs from third party vendors by building these capabilities internally. This incremental labor forecast also includes three FTEs to effectively implement and manage new and expanded AFN Enhancement activities, including targeted marketing and education campaigns aimed at households who self-identify as having an access or functional need, helping to ensure marketing collateral and outage communications are in accessible formats (e.g., large print and Braille for hard copy material; American Sign Language, screen reader and Braille refresh display compatibility, alt-text for digital material), expanding the AFN Self-Identification survey to the SCE service territory and managing ongoing outreach to keep data on household needs current, and collaborating with 75 new CBO partners to continuously amplify SCE messaging and support resiliency of households with AFN. Moreover, additional labor support is needed to effectively establish and administer contracts for a diverse set of services offered before, during, and after a PSPS (e.g., co-fund agreements, vendor contracts, direct partnerships with individual food banks). As a result of the above, SCE test year forecast adjustment for these resources is $0.703 million.

Additionally, AFN Enhancements also includes $0.476 million in test year adjustments for other PSPS program areas (e.g., 2-1-1, Resiliency Zones and Community Outreach). As a result of the items described above, SCE forecasts a test year adjustment of $5.225 million for AFN Customer Enhancements. Without this forecast increase, SCE would not be able to provide and implement a comprehensive strategy to help customers stay safe, informed and prepared before, during, and after PSPS outages, and customers with AFN would not be able to benefit from participating in the many services intended to help keep these customers safe during PSPS outages.

(ii) Enabling Personalized PSPS Outreach and Customer Research

As described below, SCE forecast includes $2.404 million for personalization enablement, customer research, and supporting labor.

Personalization. As described previously, SCE's multi-phased implementation of its customer data platform and other 3rd party marketing-data automation software are being expanded to integrate real-time PSPS outage events, SCE call center data, and Voice of the Customer survey data to enable timelier and more relevant educational materials for SCE's PSPS

customers. As background, during each stage of a PSPS event, a customer's geography, communication preferences, program enrollments, and customer segment profile (e.g., AFN, MBL), among other variables, are critical in educating and prompting timely action from customers with relevant information. With the current processes, SCE analyzes its customer attributes on a "one-off" basis for the distribution of its various educational materials, without necessarily using recent data updates or coordinating with other PSPS and non-PSPS educational materials. This current approach necessarily uses genericized materials and does not utilize real-time PSPS event data so that it can be used for a wide range of audiences (rather than messaging tailored to each customer's situation). To address these deficiencies, relevant customer data – as described above – currently spread across various systems is being consolidated into a customer data platform for use in other marketing-data automation tools. Between 2023 and 2028, these capabilities will enable timelier and more relevant educational materials for SCE's PSPS customers[59]. Such capabilities are expected to include the following:

(1) Delivering the logic/technology to personalize PSPS messages via email, SCE.com, social, and paid media based on profile attributes, triggers, and event data. For example, a customer who is currently impacted by a PSPS event will automatically receive tips/resources via personalized email, be served personalized content on sce.com and messages on their social media feed, in addition to seeing PSPS messages in digital advertising.

(2) Automatically suppressing non-critical marketing messaging to customers impacted by PSPS events. For example, when a PSPS event occurs, SCE will have the ability, in real-time, to stop all marketing outreach that is not PSPS related to customers impacted by the event so they do not receive messages about programs and services, such as heat pumps and electrification while their power is out.

(3) Ability to program multiple email campaigns, based on customer profiles, to automatically trigger when an event occurs in real-time, versus manual email campaign deployments.

(4) Capability to track, analyze, and store data from various sources, such as website visits, mobile app use, call center data, Voice of the Customer surveys, and social media interaction, to better understand how customers respond and utilize that data to optimize communications.

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[59] SCE also plans on using this approach and software tools to support its Demand Response and Building Electrification messaging.

In addition to the examples above, the customer data platform, coupled with other 3rd party marketing-data automation software, enable SCE to make customer outreach, CBO outreach and communications, and paid advertising efforts more timely, more geo-targeted, and more relevant for customers. As such, 2022 recorded costs represent the ramp-up associated with this effort, and SCE's 2025 forecast of $1.790 million represents the costs associated with full operations.

Customer Research. To better support customers affected by PSPS events, SCE's 2025 test year forecast includes approximately $0.303 million in non-labor costs for incremental research that was not planned nor conducted in 2022, including message testing, digital user experience research, longitudinal attitude tracking (i.e., studying the impacts of PSPS on attitudes towards electrification), vendor assisted research analyzing open ended verbatim from PSPS voice of customer surveys, and segmentation research to validate impact of PSPS on willingness to participate in SCE programs and identify emergent needs. The insights and learnings from the research studies will be used to refine PSPS messaging further, and as applicable, the design and delivery of customer support programs to drive deeper levels of customer engagement and satisfaction.

Labor. SCE's 2025 test year forecast includes $0.270 million in labor resources required to perform pre-and-post season wildfire communication effectiveness surveys, CBO outreach, and other PSPS-related project management activities mandated by D.2003-004.

Surveys & CBOs. For 2025, SCE estimates a nominal cost increase of $0.394 million for its contracted vendor cost to perform the mandated pre-and-post PSPS communications and outreach effectiveness survey. This cost increase is based on an overall increase in the cost of goods and services (i.e., inflation) that will be applicable at that time.

(iii) Disability Disaster & Access Resources (DDAR)

As discussed previously, SCE's Disability Disaster and Access Resources (DDAR) services support customers with disabilities and access issues during PSPS events (e.g., battery backup, food, accessible transportation and accessible hotel accommodations) and outside of PSPS events (e.g., education and outreach related to resiliency plans and program enrollments). These services are expected to be implemented and operational in 2023, and there were no recorded expenditures in 2022. As such, SCE's entire DDAR test year forecast relates to the operation of the full program. In 2025, SCE forecasts $1.962 million for DDAR which consists of approximately

$1.849 million of non-labor costs and $0.113 million of labor costs.[60] The non-labor costs were estimated based on a vendor quote to support the DDAR effort, and the labor estimate was based on estimated time required for SCE resources. See Supplemental Workpaper for more information.

(iv) Customer Contact Center Support

SCE's Customer Contact Center (CCC) provides live agent support during PSPS events. In 2022, due to incrementality,[61] SCE recorded only a minimal amount in the PSPS Customer Support. activity. However, in its 2025 forecast, SCE is including appropriate PSPS support costs from CCC. In developing its forecast, SCE assumed 10 PSPS outage events and approximately 1,700 calls per event. Based on these assumptions, SCE estimated that this work would require approximately 42,000 hours and $1.617 million in labor costs to ensure adequate staffing to support PSPS events. The CCC expects to need an additional 20 Energy Advisors to support WMP and PSPS activities throughout the year. In addition to answering inbound calls during events, Energy Advisors will make proactive outbound calls to customers in HRFAs to provide educational messaging, as well as make callbacks for PSPS complaints requiring follow-up and resolution, support deployment to CRC/CCV locations during events to answer questions, explain benefit programs, and provide outage updates. See Supplemental Workpapers for more information.

(v) Portable Generator and Portable Power Station Rebate Programs

As discussed previously, the Portable Generator Rebate Program was developed to assist customers by offsetting the cost of purchasing a portable generator, and the Portable Power Station Rebate Program provides rebates to customers for purchasing a portable power station for their general home or small business resiliency needs. Compared to 2022, SCE's forecast increased by $0.365 million. Non-labor costs are forecast to increase by $0.139 million due to the increased dollar value of the rebates.[62] Labor costs are forecast to increase by $0.226 million due to the addition of 0.5 FTE project manager and various other labor support, including call center support. See Supplemental Workpapers for more information.

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[60] Refer to WP SCE-04 Vol. 05 Part 4, pp. 21-29, PSPS Customer Support Test Year Adjustments O&M Expenses.

[61] In 2022, the CCC spending did not exceed authorized funding.

[62] Customers are eligible for up to five $75 rebates for purchasing a portable power station for their general home or small business resiliency needs.

(vi) Employee Compensation Program

The $0.042 million increase in 2025 is attributable to an adjustment to reflect certain changes made to SCE's employee compensation program. Please refer to SCE-06, Vol. 04.

c) Wildfire Mitigation & Vegetation Management Technology Solutions

This testimony discusses the portion of the overall Wildfire Mitigation & Vegetation Management Technology Solutions GRC activity related to PSPS Technology Solutions. The PSPS Technology Solutions portion of this activity is composed of four software projects that will improve the PSPS programs and protocols to minimize the potential risk of wildfire from electrical infrastructure and minimize customer impacts through technology investments. These technologies include: Emergency Outage Notification System (EONS), IMT Customer Notifications, PSPS Website Improvements, and Line Patrol. These projects are instrumental to improve SCE's execution of PSPS and to communicate with our customers and public safety partners prior to, during, and after PSPS events.

(1) Summary of O&M and Capital Request

SCE's O&M expense and capital expenditure requests for the PSPS portion of Wildfire Mitigation and Vegetation Management Technology Solutions are presented in Table I-9 and Table I-10 below and are based on itemized project cost estimates for the technology software projects contained in the PSPS technology solutions sub-activity.

SCE's 2025 Test Year O&M expense forecast is $5.364 million and $49.140 million in capital expenditures for the 2023 through 2028 period. As discussed in detail below, the development and implementation work in IMT Customer Notification occurred in 2021 and 2022. Through 2028, SCE will continue to improve this system, with capability enhancements and stabilization of the Central Data Platform and expanded IMT functionality. SCE also anticipates improving Customer Notifications and post-event reporting.

Table I-9
O&M Expenses for Wildfire Mitigation & Vegetation Management Technology Solutions
(Constant 2022 $000)[63]

	Recorded					Forecast		
	2018	2019	2020	2021	2022	2023	2024	2025
Emergency Outage Notification System	$243	$1,728	$1,610	$5,133	$4,253	$2,255	$2,211	
IMT Customer Notifications				$406	$1,412	$4,148	$4,114	$4,669
PSPS Website Improvements			$2,950	$2,273	$2,883	$698	$697	$694
Totals	**$243**	**$1,728**	**$4,560**	**$7,811**	**$8,547**	**$7,101**	**$7,022**	**$5,364**

Table I-10
Forecast Capital Expenditures for Wildfire Mitigation & Vegetation Management Technology Solutions
(Nominal $000)[64]

	Recorded					Forecast					
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
IMT Customer Notifications			$3,631	$11,217	$13,210	$13,464	$6,706	$4,670	$3,044	$2,025	$4,545
Line Patrols		$1,181	$1,527	$24	$804	$6,446	$956		$3,247		
PSPS Website Improvements		$585	$2,346	$3,285	$5,066	$4,039					
Totals		**$1,766**	**$7,505**	**$14,526**	**$19,080**	**$23,950**	**$7,662**	**$4,670**	**$6,292**	**$2,025**	**$4,545**

(2) Comparison of Authorized 2021 to Recorded

Figure I-5 below compares the requested and authorized O&M expenses from SCE's 2021 GRC with the recorded expense in compliance with D. 21-08-036.[65] In the 2021 GRC, SCE was authorized $0.931 million in O&M expense for the EONS project compared to its 2021 recorded amount of $5.133 million for the EONS project.[66] The remaining three technology solutions presented in this testimony were not forecast or authorized in the 2021 GRC. The PSPS comprehensive action plan was issued in 2021. In June of 2021, the Commission also issued new PSPS compliance requirements through decisions issued in both the PSPS Order Instituting Rulemaking Phase 3 (D.21-06-

63 Refer to WP SCE-04, Vol. 05, Part 4, pp. 36-41, Wildfire Mitigation & Vegetation Management Technology Solutions Recorded/Forecast O&M Summary.

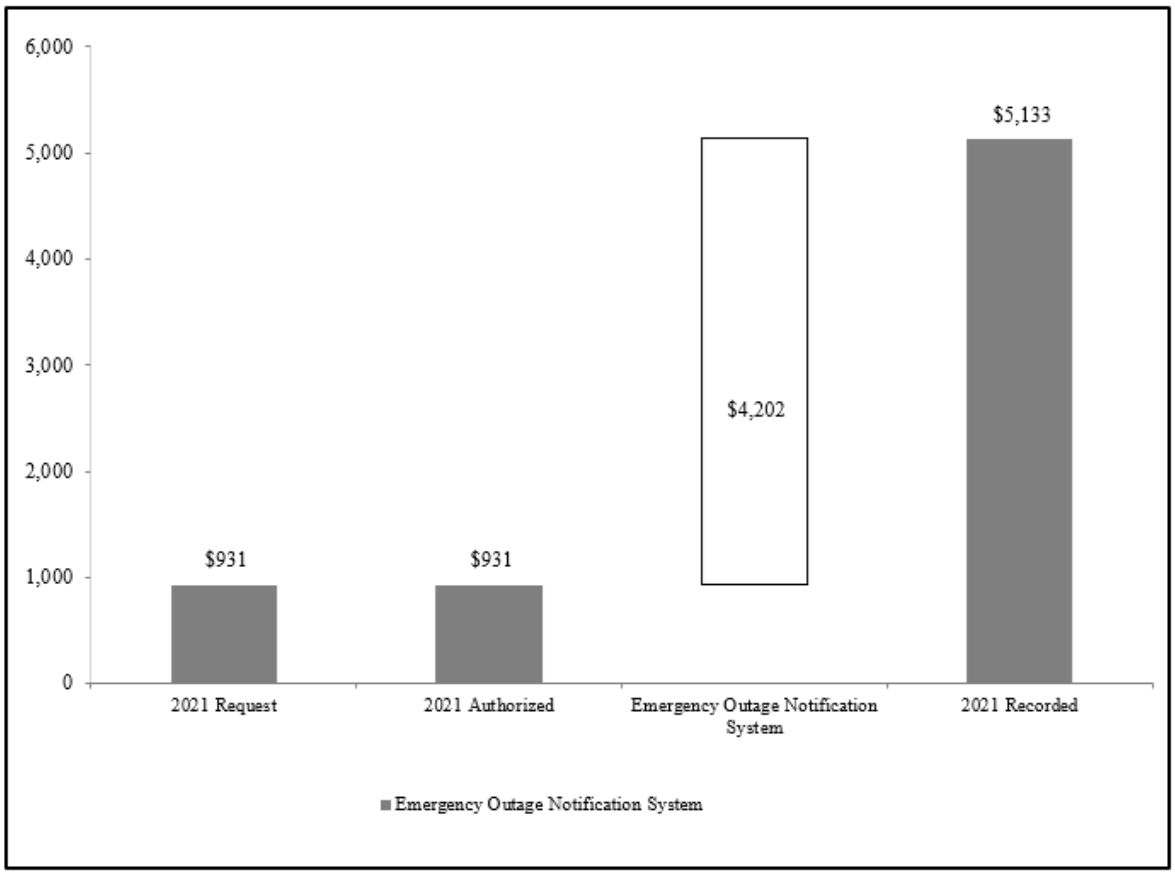
64 Refer to WP SCE-04 Vol. 05 Part 4, pp. 46-55, Wildfire Mitigation & Vegetation Management Technology Solutions Recorded/Forecast Capital Summary.

65 D.21-08-036, p. 684 (Ordering Paragraph 36), available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M401/K299/401299406.PDF (Accessed on April 20, 2023).

66 The O&M expenses for Emergency Outage Notification System under GRC activity "PSPS Customer Support" is excluded from 2019 to 2020 and the net impact is $0.054 million.

034) and PSPS Order Instituting Investigation (OII) (D.21-06-014). The action plan and additional Commission requirements were, therefore, not anticipated at the time SCE developed its GRC forecasts in calendar year 2019. Specifically, the PSPS action plan and D.21-06-034 and D.21-06-014 resulted in the need for additional reporting capabilities and enhancements to the EONS system to effectively respond to CPUC reporting requirements. This required new message templates and the delivery of additional notifications, along with the related operational support costs.

Figure I-5
2021 Authorized & Recorded
(Constant 2022 $000)



(3) PSPS Technology Solutions

(a) Emergency Outage Notification System

(i) Work Description and Need

The Emergency Outage Notifications System (EONS) is the primary tool used to keep customers informed before, during, and after emergency outages,

including PSPS events. EONS allows SCE to communicate to all customer classes impacted by PSPS via their preferred communication channels, whether it is email, voice calls, and/or text messages through EONS's vendor Message Broadcast. In 2021, SCE further enhanced the capabilities of the Message Broadcast system to send notifications in the customer's preferred language, which they can select from the six core languages available in the new preference center on SCE.COM. Additionally, PSPS notifications translations were made available in 23 languages. In 2022, SCE accomplished enhanced reporting, improved data quality, revised content of the notification templates, provided American Sign Language support, and expanded PSPS address level alerts to include email (previously offered voice and text only). For 2023, SCE is expanding the number of languages available in the preference center of SCE.COM from six to twenty-three prevalent languages.

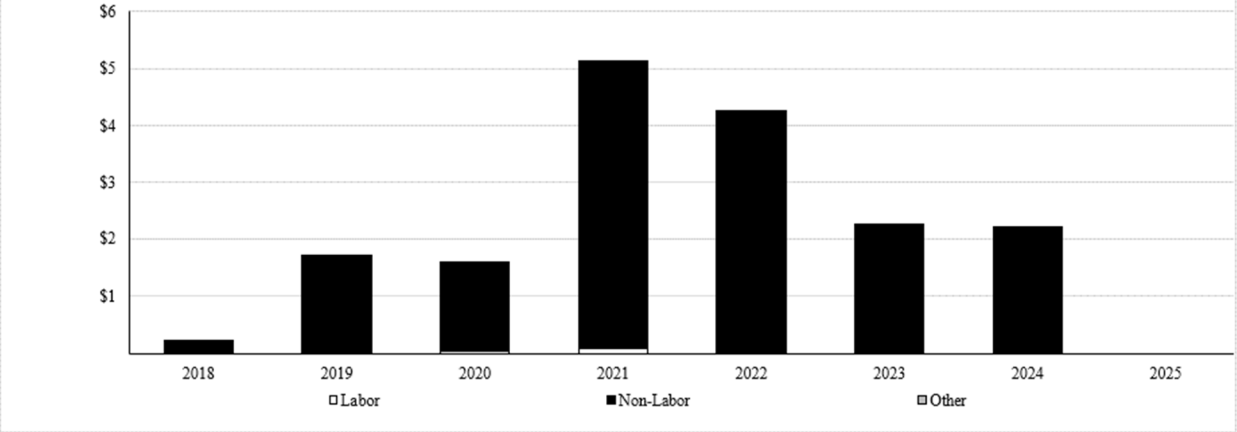
(ii) O&M Scope and Forecast

a. Historical Variance Analysis

Figure I-6 below provides 2018-2022 recorded O&M expenses with a breakdown between labor and non-labor costs related to Emergency Outage Notification System. [67]

[67] The O&M expenses for Emergency Outage Notification System under GRC activity "PSPS Customer Support" is excluded from 2019 to 2020 and the net impact is $0.054 million.

Figure I-6
2018-2022 Emergency Outage Notification System O&M Expenses
(Constant 2022 $000)[68]



	Recorded					Forecast		
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Labor	$	$2	$47	$84	$13			
Non-Labor	$242	$1,726	$1,563	$5,049	$4,240	$2,255	$2,211	
Other								
Total Expenses	**$243**	**$1,728**	**$1,610**	**$5,133**	**$4,253**	**$2,255**	**$2,211**	
Ratio of Labor to Total	0%	0%	3%	2%	0%	0%	0%	-

1. Labor

In 2019 through 2022, SCE incurred minimal labor expenses with fluctuations during this period. SCE does not forecast any labor expenses for this project in the 2025 Test Year forecast.

2. Non-Labor

In 2018, EONS non-labor costs were $0.242 million. These costs increased to $1.726 million in 2019, then stayed relatively flat in 2020, but increased to $5.049 million in 2021 and reduced slightly to $4.240 million in 2022. The increased spend in 2019 through 2022 is primarily attributed to the support of capabilities related to the new message templates and languages, and enhanced reporting capabilities. The new message templates and languages were primarily driven by ongoing improvement efforts to enhance the communication of

[68] Refer to WP SCE-04 Vol. 05 Part 4, pp. 36-41, Wildfire Mitigation & Vegetation Management Technology Solutions Recorded/Forecast O&M Summary.

information to customers. SCE also developed enhanced reporting capabilities due to CPUC data requests and reporting requirements.[69]

(iii) Basis for Forecast

SCE anticipates non-labor O&M expenses of $2.255 million and $2.211 million in 2023 and 2024, respectively, but does not forecast the need for any O&M in 2025.[70]

(b) IMT Customer Notifications

(i) Work Description and Need

One of SCE's goals in the 2021 PSPS Action Plan is to enhance the Central Data Platform (CDP) in IMT Customer Notification activity. It includes improving data and reporting accuracy; establishing PSPS operational workflow, analytics and reporting; and enhancing the notification process. SCE conducted an extensive review of all the ongoing IT processes and systems that support PSPS and identified the need for a CDP that would act as a foundation for PSPS data collection and help achieve the goals listed above. Based on the evaluation of potential solutions and vendors, SCE determined that Palantir was best suited to provide a CDP. In 2021, initial use cases, such as automating the Pre-Approved Monitored Circuit List (MCL) and the Period of Concern (POC) and visualization of weather forecast metrics, were implemented, and began supporting operational PSPS activations. SCE released additional use cases in 2022 to further support the PSPS action plan, expanding upon customer experience and optimizing PSPS operations. In 2023 and 2024 work activities will include completing the existing PSPS CDP use cases, optimizing Post Event reporting, improving data and reporting accuracy, stabilizing systems, and responding to newly identified Public Safety Partners' requests, CPUC requirements, and data requests from numerous parties.

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[69] D. 21-06-034 at pp.144-154, available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M389/K955/389955672.PDF (Accessed on April 20, 2023); D.21-06-014, which is publicly available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M387/K099/387099293.PDF (Accessed on April 20, 2023).

[70] Refer to WP SCE-04, Vol. 05, Part 4, pp. 42-45, Wildfire Mitigation & Vegetation Management Technology Solutions O&M Forecast.

In late 2022, SCE began work on Customer Complaint Tracking pursuant to a CPUC requirement[71] to create a standardized complaint tracking form accessible to all personnel or liaisons that handle incoming complaints to be able to quickly synthesize the data for reporting purposes. This will allow SCE to consolidate and standardize the complaint data in a way that would allow for easy retrieval within the CPUC due dates. The reporting will include the total number and summary of complaints with the ability to segregate complaints by categories. This work will continue into and complete in 2023.

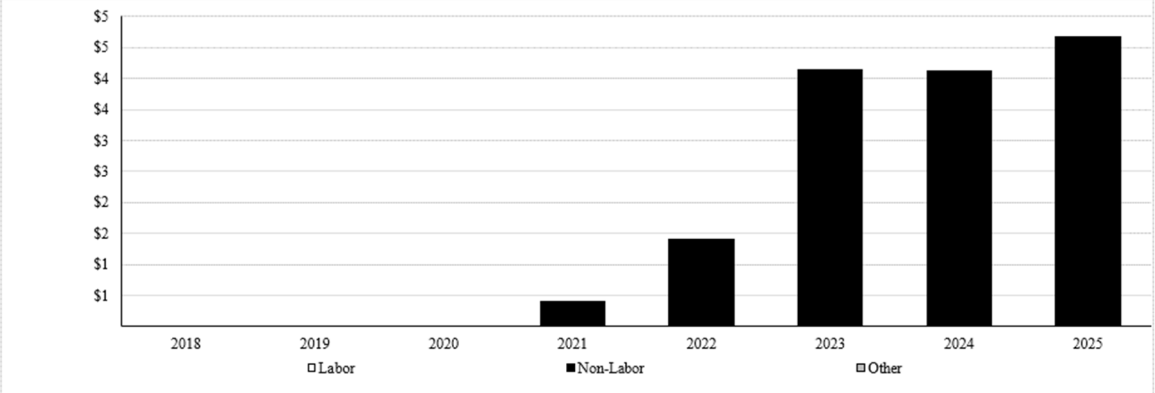
(ii) O&M Scope and Forecast

b. Historical Variance Analysis

Figure I-7 below provides 2018-2022 recorded O&M expenses with a breakdown between labor and non-labor costs related to IMT Customer Notifications project.

[71] Order Instituting Investigation on the Commission's Own Motion on the Late 2019 Public Safety Power Shutoff Events I.19-11-013 D.21-06-014, OP 65 p. 304.

Figure I-7
2018-2022 IMT Customer Notifications O&M Expenses
(Constant 2022 $000)[72]



	Recorded					Forecast		
	2018	2019	2020	2021	2022	2023	2024	2025
Labor				$2	$9			
Non-Labor				$404	$1,403	$4,148	$4,114	$4,669
Other								
Total Expenses				**$406**	**$1,412**	**$4,148**	**$4,114**	**$4,669**
Ratio of Labor to Total	-	-	-	1%	1%	0%	0%	0%

1. Labor

In 2021 and 2022, SCE incurred minimal labor expenses, and the labor costs increased slightly in 2022. SCE does not forecast any labor expenses for this activity.

2. Non-Labor

SCE's O&M non-labor costs for PSPS IMT Customer Notifications increased from $0.404 million in 2021 to $1.403 million in 2022, as SCE began CDP in late 2021 and recorded a partial year of costs. In support of the action plan, in 2022, SCE continued to operationally enhance the process automation effort. The increase was also due to the cloud services subscription costs for the solutions implemented in 2021.

c. Basis for Forecast

The IMT Customer Notifications forecast was developed using an itemized approach taking into consideration vendor contracts. SCE forecasts O&M

[72] Refer to WP SCE-04, Vol. 05, Part 4, pp. 36-41, Wildfire Mitigation & Vegetation Management Technology Solutions Recorded/Forecast O&M Summary.

expenses of $4.669 million for Test Year 2025, normalized across 2025 through 2028.[73] SCE forecasts $4.762 million in 2026, $4.669 million in 2027, and $4.577 million in 2028 for IMT Customer Notifications O&M expenditure. The activities from 2026-2028 consist of the ongoing maintenance and support for CDP and other PSPS sub-activities. On-going maintenance and support are essential post-implementation activities to ensure business application and system availability and reliability. On-going maintenance and support include: (1) access to externally hosted computing platforms; (2) access to break/fix support to ensure software application and systems are available and reliable; (3) version upgrades to ensure software is current and secure; (4) access to vendor updates to provide security updates to protect against cyber threats; and (5) cloud storage and consumption costs.

(iii) Capital Scope and Forecast Analysis

Table I-10 above provides SCE's 2023-2028 capital expenditure forecast related to IMT Customer Notification project, including the CDP. SCE forecasts total nominal capital expenditures of $34.454 million for IMT Customer Notifications in 2023 through 2028. The 2023-2028 capital forecast for the projects within this activity was developed using SCE's budget-based IT cost estimation model.[74] This cost estimation model was utilized to forecast SCE's IT capitalized software projects in SCE's 2021 GRC. This model utilizes industry best practices and SCE subject matter expertise to estimate project cost components. SCE's forecast for these projects includes the cost for SCE employees, supplemental workers, and consultants, as well as software, vendor, and hardware costs.

CDP continues to build upon the functionality of IMT Customer notifications. The 2023-2028 capital expenditure forecast for CDP is $28.232 million and is needed to improve customer notification accuracy and delivery throughout PSPS activation, enhance weather forecasting capabilities, advance automation and reduce manual processes, and improve data management to support accuracy in post-event reporting and data requests. This is anticipated to reduce labor overhead on various PSPS readiness resources. In 2025-2028, the capital expenditure is in support of anticipated CPUC and CAISO requirements and in order to further mitigate PSPS impacts.

[73] Refer to WP SCE-04, Vol. 05, Part 4, pp. 42-45, Wildfire Mitigation & Vegetation Management Technology Solutions O&M Forecast.

[74] The IT cost estimation model is explained in further detail in SCE-06 Vol. 2 IT Capital Software.

As SCE continues to evolve and expand PSPS capabilities to better support SCE's Public Safety Partners (PSPs), the PSP Portal must also be expanded. In 2023-2028, SCE forecasts $5.610 million in capital expenditures to continue to review and refine the PSPS digital experience and support anticipated CPUC and CAISO requirements. Based on the feedback collected from surveys after PSPS events, SCE determines website and outage map improvements necessary for customers to increase awareness of wildfire mitigation activities, receive up to date information regarding events and learn when an event is impacting their area. Website improvements are intended to deliver a simplified user experience for customers. This approach will include the use of end-to-end customer journey mapping, digital user testing and research, content audit, and user experience design improvements. Outage map improvements will include the design, development, and testing of new functionality. It will also include messages, copy, and graphical updates to better educate customers on how to use the outage tools.

Finally, SCE forecasts capital expenditures of $0.613 million for the Customer Complaint Tracker project in 2023. This tool will capture customer complaints for PSPS events and will include additional categories and data fields to track customer complaint types as required by the CPUC.

(c) Line Patrols[75]

(i) Work Description and Need

In 2022, SCE launched an operating restriction and PSPS planning and switching project called the Hazard Event Restriction and Management Emergency System (HERMES), which is a new technology to implement and manage operating restrictions and optimized circuit switching on the distribution system. A common use of HERMES will be to implement operating restrictions for parts of the distribution system with a high risk of wildfires and to lower the potential ignition risk from electrical equipment. As a planned component of the Grid Management System

[75] Although originally conceived as a grid monitoring application that would aid in electronically monitoring--or 'patrolling'--overhead lines on our distribution system, this application should not be confused with actual line patrols performed by in-field electrical workers as described above. In its current form, HERMES is better described as a grid monitoring and management tool to aid in and automate (where possible) operating restrictions and switching to optimize operations during times of increased risk of hazards, including wildfire risk.

(GMS),[76] HERMES is also being developed to utilize automation in the GMS to execute optimized switching programs for PSPS de-energization events while deconflicting planned outages. HERMES seeks to differentiate normal restrictions on parts of the distribution system from restrictions due to more emergent, hazardous conditions associated with wildfire risk mitigation and PSPS. These wildfire-related restrictions include event de-energization on circuits of concern (PSPS), limitations on field work, and imposing limits on certain automated devices (*e.g.*, recloser). HERMES will enable a more surgical application of operating restrictions when and where the risks warrant, while also optimizing switching plans that will assist in reducing the scope, frequency, and duration of PSPS events for our customers.

(ii) O&M Scope and Forecast

SCE provides a description of the IPAD program for the labor data and airtime forecast supporting PSPS projects in SCE-04 Volume 5 Part 3, Chapter I Inspections & Remediations, Technology Solutions.[77]

(iii) Capital Scope and Forecast Analysis

Table I-11
Forecast Capital Expenditures for Line Patrol's Projects
(Nominal $000)[78]

Projects	2023	2024	Forecast 2025	2026	2027	2028
HERMES	$ 3,246	$ 956				
IPAD Deployment & Support	$ 3,200		$	3,247		
Totals:	**$ 6,446**	**$ 956**	**$**	**3,247**		

Table I-11 above provides SCE's capital forecast for 2023-2028 related to Line Patrol projects, including HERMES and refresh of iPad devices. SCE forecasts total nominal capital expenditures of $10.650 million for Line Patrol projects in 2023-2028. The capital

[76] GMS is an advanced software platform that integrates multiple electric system forecasting and analytics applications to enable grid operator to actively monitor and operate SCE's dynamic grid. The Commission adopted funding for GMS in D.21-08-036 (*see* COL 35), available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M401/K299/401299406.PDF (Accessed on April 20, 2023).

[77] $6.284 million in 2023-2025 was discovered to be erroneously mapped to Technology Support Tools sub-activity discussed in SCE-04 Volume 5 Part 3, Chapter I Inspections & Remediations, Technology Solutions O&M Scope and Forecast Analysis and will be revised in the RO model via errata.

[78] Refer to WP SCE-04 Vol. 05 Part 4, pp. 56-59, Wildfire Mitigation & Vegetation Management Technology Solutions Capital Forecast.

expenditures forecast was developed using SCE's budget-based IT cost estimation model. This cost estimation model was utilized to forecast SCE's IT capitalized software projects in SCE's 2021 GRC, and the Commission found SCE's requests to be adequately supported.[79] This model utilizes industry best practices and SCE subject matter expertise to estimate project cost components. SCE's forecast for these projects includes the cost for SCE employees, supplemental workers, and consultants, as well as software, vendor, and hardware costs.

In 2023 through 2024, $4.2 million is forecasted to complete the development and rollout phase of HERMES, a new technology to identify wildfire risk to the Distribution system. This cost is based on supplier estimates and anticipated SCE effort for finalization of detailed design and implementation of the HERMES application.

In addition, SCE forecasts $3.200 million and $3.247 million in 2023 and 2026, respectively, to accommodate the routine refresh of iPad devices used in the field and to further advance capabilities on the HERMES platform.

(d) PSPS Website Improvements

(i) Work Description and Need

SCE plans to improve PSPS Website, including SCE.COM and Public Safety Partner (PSP) Portal. SCE.COM provides a dedicated, interactive, and informative webpage to help customers increase their awareness about PSPS, provide information about becoming more resilient during events and receive up-to-date information regarding events in their area. Other information on SCE.COM includes the impacts of de-energization, what resources are available during events and who the public should expect to hear from and when. The landing page is linked to other pertinent pages on SCE.COM, such as the Outage Map, where PSPS-specific event information is available as well as information on activated Community Resource Centers (CRCs) and Community Crew Vehicles (CCVs).

The information provided on SCE.COM is critical to SCE's customers and stakeholders. Based on the feedback collected in 2020 from surveys used to understand customer concerns, SCE found that customers had difficulty navigating its website for information about the outages. In 2021, SCE's PSPS Action Plan required SCE to deploy a series of features designed to

[79] D.21-08-036 at pp. 379-380, available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M401/K299/401299406.PDF (Accessed on April 20, 2023).

make it easier for customers to access information. The changes for SCE.COM include improving the consolidated outage map, providing current weather conditions and information from SCE's weather stations, and improving the PSPS alerts and customer preference flexibility options to enable customer engagement regarding wildfire-related risks and activities. SCE also deployed the seven-day PSPS Weather Awareness map. To help customers plan for a potential PSPS event, this map displays how counties in our service area could be affected by dangerous weather conditions up to seven days in advance.

Additionally, SCE's PSPS Public Safety Partner Portal launched in June 2021 offers Public Safety Partners the ability to register, view pertinent information related to PSPS events, as well as plan for PSPS events by leveraging the data provided in the Planning portion of the Public Safety Partner Portal. SCE worked throughout 2021 and 2022 and completed the SCE.COM enhancements listed above.

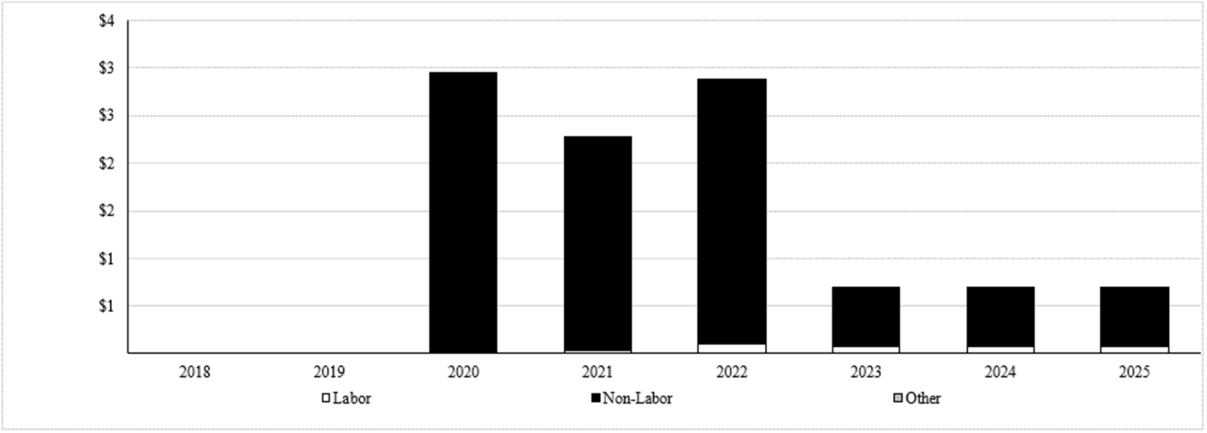
In 2023, SCE will begin work on PSPS Estimated Restoration Time to add a more accurate Estimated Restoration Time (ERT) to the SCE.COM outage map and the Public Safety Partner Portal. SCE is required by the CPUC to share ERT with SCE customers and partners when a circuit is taken offline. The current typical restoration time provided on the outage map pop-ups on SCE.COM is the same for all customers regardless of actual restoration timing information. The ERT effort is intended to improve restoration times and thus improve customer experience across multiple channels, such as SCE.COM and PSP Portal. This will also improve ERT communications with local tribal and government agencies.

(ii) O&M Scope and Forecast

a. Historical Variance Analysis

Figure I-8 below provides the historical 2018-2022 recorded O&M expenses with a breakdown between labor and non-labor costs related to PSPS Website Improvement projects.

Figure I-8
2018-2022 PSPS Website Improvement O&M Expenses
(Constant 2022 $000)[80]



	Recorded					Forecast		
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Labor			$4	$26	$88	$71	$71	$72
Non-Labor			$2,946	$2,247	$2,795	$627	$626	$622
Other								
Total Expenses			**$2,950**	**$2,273**	**$2,883**	**$698**	**$697**	**$694**
Ratio of Labor to Total	-	-	0%	1%	3%	10%	10%	10%

Note: The forecast incorporates accounting adjustments to reflect certain changes made to SCE's employee compensation program. Please refer to SCE-06, Vol. 04.

1. Labor

In 2020 through 2022, SCE incurred minimal labor expenses and the labor costs increased during these years.

2. Non-Labor

SCE's O&M Non-Labor costs for PSPS Website Improvements projects remain relatively consistent in 2020 through 2022. SCE's O&M non-labor costs were $2.946 million in 2020, $2.247 million in 2021, and $2.795 million in 2022. In 2020, there was significant work to upgrade the infrastructure for SCE.COM to support PSPS, along with the application of enhancements and content management. In 2021 and 2022, there were major efforts to support outage and content management in SCE.COM, such as consolidation of outage maps to support PSPS events.

[80] Refer to WP SCE-04 Vol. 05 Part 4, pp. 36-41, Wildfire Mitigation & Vegetation Management Technology Solutions Recorded/Forecast O&M Summary.

b. Basis for Forecast

SCE forecasts O&M expenses of $0.694 million for Test Year 2025, normalized across 2025 through 2028.[81] The forecast is based on customer needs and feedback, and continuing to maintain the capabilities resulting from the 2021 PSPS Action Plans. The team will develop and implement short-term and long-term improvements to the PSPS Digital experiences on SCE.COM, including funding to support ongoing maintenance and bug fixes. SCE forecasts $0.694 million O&M annually for prototyping, design and development, Web Content Accessibility Guidelines (WCAG) audit, and maintenance and defect fixes from 2026 to 2028.

(iii) Capital Scope and Forecast Analysis

Table I-12
Forecast Capital Expenditures for PSPS Website Improvement Projects
(Nominal $000)[82]

Projects		Forecast 2023	2024	2025	2026	2027	2028
SCE.COM & PSP Portal	$	23					
Estimated Restoration Time (ERT)	$	4,016					
Totals:	**$**	**4,039**	-	-	-	-	-

Table I-12 above provides the 2023 capital expenditure forecast of $4.039 million for PSPS Website Improvement projects, which includes SCE.COM and Estimated Restoration Time (ERT). SCE forecasts $0.023 million in 2023 to continue to develop and implement improvements to the PSPS Digital experiences on SCE.COM. SCE forecasts capital expenditures of $4.016 million for the Estimated Restoration Time (ERT) project in 2023 to improve restoration times and thus improve customer experience across multiple channels, such as SCE.COM and PSP Portal. This project will also improve ERT communications with local tribal and government agencies.

The 2023 capital forecast of $4.039 million for the projects within this activity was developed using SCE's budget-based IT cost estimation model. This cost estimation model was utilized to forecast SCE's IT capitalized software projects as part of SCE's 2021

[81] Refer to WP SCE-04, Vol. 05, Part 4, pp. 42-45, Wildfire Mitigation & Vegetation Management Technology Solutions O&M Forecast.

[82] Refer to WP SCE-04 Vol. 05 Part 4, pp. 56-59, Wildfire Mitigation & Vegetation Management Technology Solutions Capital Forecast.

GRC, and the Commission found SCE's requests to be adequately supported.[83] This model utilizes industry best practices and SCE subject matter expertise to estimate project cost components. SCE's forecast for these projects includes the cost for SCE employees, supplemental workers, and consultants, as well as software, vendor, and hardware costs.

3. Aerial Suppression

Multiple concurrent wildfires have stretched the pool of aerial firefighting assets available in SCE's service area at critical times. The limited availability of these suppression resources has increased the potential for wildfires to escape the initial attack stage and become more destructive, putting SCE's customers, communities, and infrastructure at greater risk. To address this risk, since 2019, SCE has partnered with local county firefighting agencies by providing the funding to create a quick reaction force (QRF) of aerial firefighting resources.

The QRF is composed of four aerial firefighting helicopters (three helitankers and one intelligence and reconnaissance aircraft), support personnel, and equipment to bolster firefighting capabilities. These resources are capable of being rapidly deployed virtually anywhere in SCE's service area, either individually or as a fleet. The intelligence and reconnaissance aircraft has the capability to provide safe coordination of operations in both day and night, and as such, the QRF helicopters were among the first in the world to safely conduct nighttime aerial fire suppression operations. As noted in Wildfire Today, the cost of fire suppression on the 2022 Route Fire, using the QRF at night, was an order of magnitude less than the firefighting costs for the Marple Fire in the same area in 1996. The report compares the Route Fire to the 1996 Marple Fire which started in about the same location at the same time of the day and time of year in similar weather conditions. By midnight the Marple Fire had exceeded 10,000 acres and continued spreading for two or three days until it was stopped at 19,860 acres. In contrast, the spread of the Route Fire was stopped at 8 a.m. on Day 2. The three helicopters dropped water and retardant much of the night to hold it at a ridge on the north side, allowing hand crews and dozers to complete a fire line. "It is very difficult to compare the suppression costs of two fires that occurred 26 years apart, but the authors of the QRF report estimated that the cost of the Marple Fire in today's dollars would be somewhere between $70 million and $140 million. The cost of the

[83] D.21-08-036 at pp. 379-380, available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M401/K299/401299406.PDF (Accessed on April 20, 2023).

Route Fire was $7 million to $8 million."[84] The QRF has demonstrated its ability to make significant progress in containing fires at night, when higher humidity and lower wind speeds reduce wildland fire spread and activity, increasing the effectiveness of the water or fire-retardant drops.

While aerial suppression resources will not always be able to stop a fire at the onset, they have also proven extremely effective during the extended attack phase, reducing the area burned and number of structures damaged or destroyed. In doing so, SCE's own emergency response support costs are minimized, as SCE or contract electrical crews are not diverted from previously scheduled maintenance and construction work to emergency response activities.

In 2021, the QRF made 1,369 drops on 56 unique fire incidents, including the first ever helicopter nighttime retardant hover fills and retardant drops on a fire in the U.S. There were 2,975,033 gallons of water dropped in total – with 1.1 million of those gallons dropped at night. The fleet also dropped 139,373 gallons of fire retardant with 38,786 gallons dropped at night, helping significantly reduce the consequences of wildfires, particularly wind-driven wildfires.

As of December 1, 2022, there were a total of 201 day drops and 301-night drops. The fleet dropped 707,940 gallons of water, 34,200 gallons of fire retardant and 23,035 gallons of gel dropped in total.

During 2022, SCE continued to observe that wildfires are occurring outside of the traditional peak fire season, in line with Governor Newsom's declaration that "wildfire season in California is year-round." Since 1992, there have been nearly 1,200 ignitions resulting in fires over 300 acres, for a total of nearly 5.5 million acres burned in SCE's Service Territory. Roughly one-third of the ignitions and one-fifth of the total acreage burned during the time outside of the 165-day QRF lease period, which is roughly aligned with historical peak wildfire season (July to mid-December). This prompted SCE to extend the duration of the QRF program starting in December 2022 through the end of 2023.

a) Work Description and Need

Due to the limited availability of fire suppression resources available statewide, in 2021 SCE partnered with Los Angeles, Ventura, and Orange Counties to support their proposal to fund the stand-by time of aerial suppression resources to reduce wildfire risk to SCE's system and help

[84] Quick Reaction Force (QRF) Report, available at: https://fireaviation.com/2022/10/01/report-shows-use-of-four-helicopter-quick-reaction-force-through-the-night-limited-final-size-of-route-fire/ (Accessed on April 20, 2023).

protect SCE's infrastructure and communities. SCE established a funding agreement with each fire agency, pursuant to which SCE funded the cost of stand-by time for the helicopters, and each fire agency paid for flight time when the helicopters were used to fight fires. Operational decisions regarding where and when the assets are used are at the discretion of the individual fire agencies and are prioritized and deployed by a regional fire coordination center, primarily within the SCE service area. The fire agency officials maintain responsibility for directing the aerial suppression resources, using their existing prioritization and deployment process.

Starting in December 2022, SCE entered a new funding agreement with Los Angeles, Orange, and Ventura County fire agencies and expanded QRF coverage from 165-days to year-round. Although the fire suppression assets are intended primarily for use in fighting wildfires in SCE's service territory, SCE relies on the professional judgment of the agencies to inform day-to-day operations, including determining how and when to deploy the assets.

b) RAMP Integration

As shown below in Table I-13, SCE's forecast for Aerial Suppression has increased since filing the 2022 RAMP report. The increase is attributable to the fact that starting in December 2022, SCE entered into a new Funding Agreement with Los Angeles, Orange, and Ventura County fire agencies to expand QRF coverage from 165-days to year-round.[85]

[85] Traditionally California's wildfire season ran from August to November. With the increasing effects of climate change California faces a year-round fire season. CA.gov website, available at https://www.gov.ca.gov/2022/11/17/governor-newsom-and-cal-fire-announce-the-end-of-peak-wildfire-season-for-most-of-california/ (Accessed on April 20, 2023) - "While we've reached the end of peak fire season in a better position than recent years, wildfire season in California is year-round and we remain vigilant, focused on protecting lives and livelihoods."

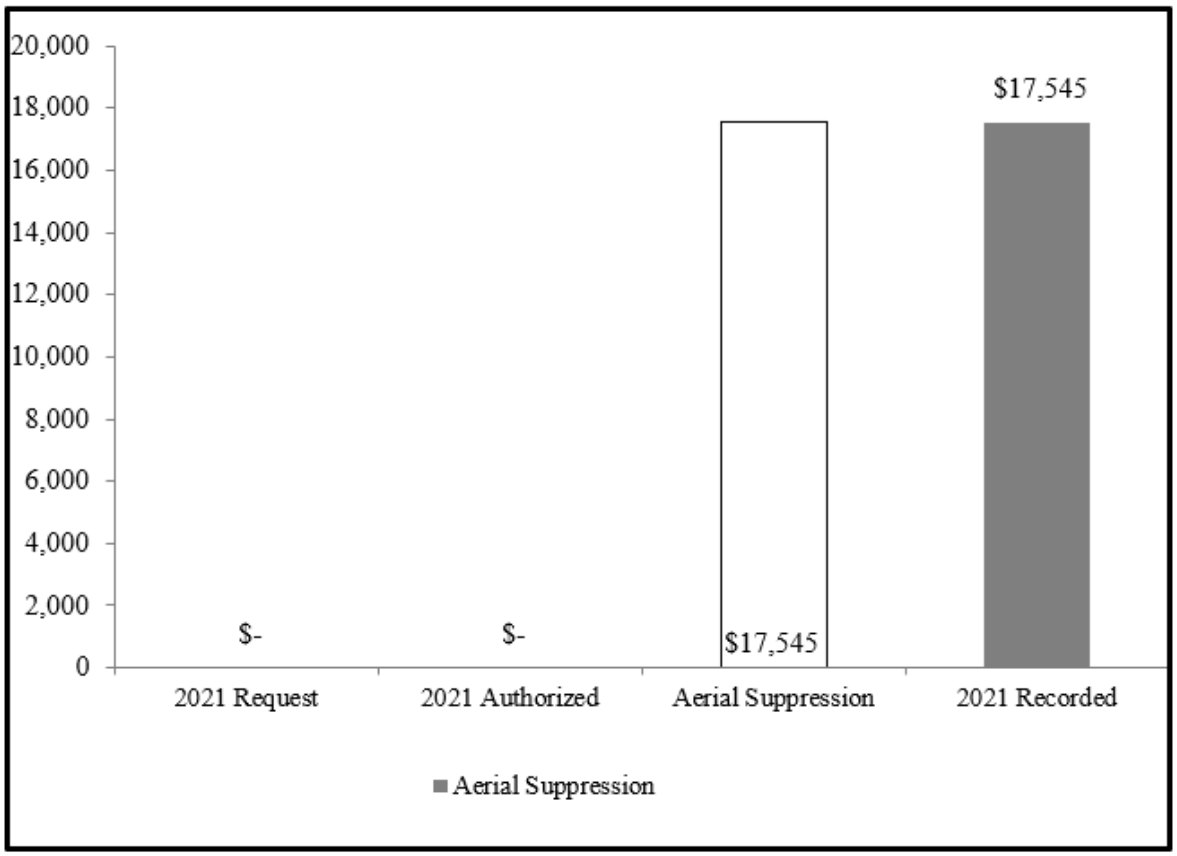
Table I-13
Aerial Suppression
RAMP vs. GRC O&M Forecast Comparison - *Nominal $000s*
Risk Spend Efficiencies[86]

RAMP Risk	RAMP ID	RAMP Control / Mitigation Name	Filing	2022	2023	2024	2025	2025 - 2028 RSE
Wildfire	C21	Aerial Suppression	RAMP	$18,000	$17,707	$17,588	$17,672	2,457
			GRC	$18,200	$35,000	$35,000	$35,000	611
			Variance	$200	$17,293	$17,412	$17,328	(1,846)

[86] Refer to WP SCE-04 Vol. 05 Part 1 – WF/PSPS RAMP to GRC Integration.

c) Comparison of Authorized 2021 to Recorded

Figure I-9
Aerial Suppression
Comparison of 2021 GRC Authorized versus Recorded
(Constant 2022 $000)



In 2021, SCE recorded O&M expenses of $17.545 million and had no authorized O&M in the 2021 GRC as the partnership with fire agencies was not established until 2021. Due to the limited availability of fire suppression resources available statewide, SCE partnered with Los Angeles, Ventura, and Orange Counties to support their proposal to fund the stand-by time of four firefighting helicopters to reduce wildfire risk to SCE's system and help protect SCE's infrastructure and communities. SCE established a funding agreement with each fire agency, pursuant to which SCE funds the cost of stand-by time for the helicopters, and each fire agency paid for flight time when the helicopters were used to fight fires.

d) Scope of Forecast Analysis

(1) Historical Variance Analysis

(a) Other [87]

In 2020, SCE incurred $2.158 million in other expense for a lease to fund stand-by-time for a Coulson-Unical CH-47 helitanker (CH-47), beginning October 1 through December 23, for use by Orange County Fire Authority (OCFA). The CH-47 is the world's largest and most capable heavy-lift fire helicopter, able to drop 3,000 gallons of water or retardant in a single pass. In 2021, SCE incurred $17.545 million in expense as SCE contributed funding for an expanded 180-day coverage window to the QRF in partnership with Los Angeles, Orange, and Ventura County Fire agencies.

In 2022, SCE incurred $18.200 million in expenses for 165-days of coverage as shown in Table I-14.

Table I-14
2022 QRF Recorded O&M Costs[88]
(Constant $2022s)

Number	County	MOU Amount
1	Ventura	$3,638,250
2	LA county	$5,544,000
3	OC	$9,018,100
	Total	**$18,200,350**

[87] The Other O&M includes contract cost without escalation.

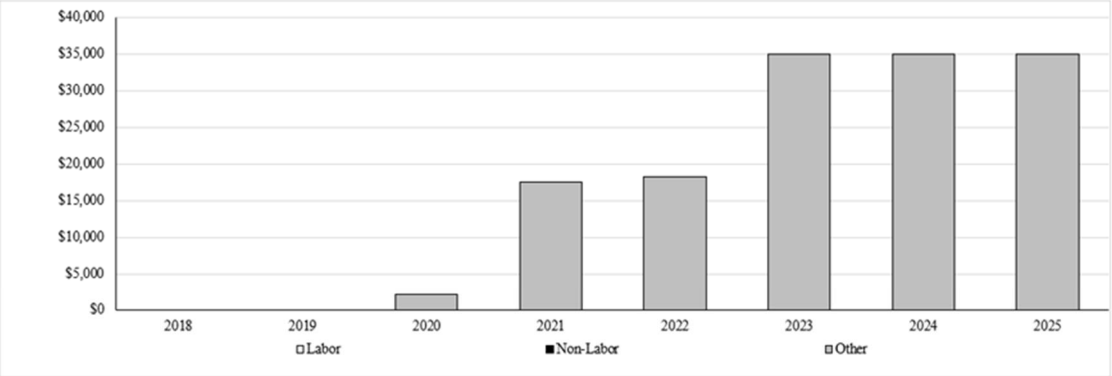
[88] Refer to WP SCE-04 Vol. 05 Part 4, p.66-67, 2022 QRF Recorded O&M Costs.

Table I-15
2025 Test Year QRF Forecast[89],[90]
(Constant $2022s)

Number	County	MOU Amount
1	Ventura	$9,340,000
2	LA county	$9,340,000
3	OC	$15,994,605
	Total	**$34,674,605**

(b) Forecast

Figure I-10
Aerial Suppression - Recorded and Forecast O&M Expenses
(Constant 2022 $000s)[91]



	Recorded					Forecast		
	2018	2019	2020	2021	2022	2023	2024	2025
Labor								
Non-Labor								
Other			$2,158	$17,545	$18,200	$35,000	$35,000	$35,000
Total Expenses			**$2,158**	**$17,545**	**$18,200**	**$35,000**	**$35,000**	**$35,000**
Ratio of Labor to Total	-	-	0%	0%	0%	0%	0%	0%

(2) Basis for O&M Forecast

SCE's itemized forecast is based on new funding agreements and expansion of QRF coverage from 165 days per year to year-round coverage. Starting in December 2022,

89 Refer to WP SCE-04 Vol. 05 Part 4, p.68-69, 2025 Test Year QRF Forecast.

90 Due to rounding, totals may not tie to individual items.

91 Refer to WP SCE-04, Vol. 05, Part 4, pp. 60-65, Aerial Suppression Recorded/Forecast O&M Summary.

SCE entered into a new Funding Agreement with Los Angeles, Orange, and Ventura County fire agencies and the forecast was developed based on contract terms and conditions of the vendor supplying the aerial suppression resources.

Starting in December 2022, $35.000 million of expenses included new funding agreements with Los Angeles, Orange, and Ventura County fire agencies to expand QRF coverage from 165-days to year-round. SCE's 2025 Test Year O&M other forecast is $35.000[92] million for this activity based on a new funding agreement in December 2022. SCE will continue to monitor the access to aerial resources in SCE's service area and will revisit its approach annually to determine if SCE's approach in providing support should be adjusted based on the availability of statewide suppression assets.

4. Enhanced Situational Awareness

Comprehensive situational awareness is fundamental to SCE's operational decision-making, service delivery and all-hazards emergency response. To increase situational awareness, SCE created the Situational Awareness Center Capability (SA Center) where meteorologists provide weather forecasts, analytics, and hazard advisories to support the execution of core business functions. Enhanced situational awareness provides a better understanding of the nuances associated with critical system operations, including granular weather conditions across the system and other external factors that affect the daily operation of the grid and increases SCE's ability to effectively prepare for and respond to emergencies. Additional tools, including access to high resolution weather and fire modeling products, made possible through high-performance computing cluster (HPCC) technology, are utilized by SCE's Fire Science and Weather Services teams to enhance situational awareness. These tools increase SCE's capacity to better forecast elevated weather conditions and potential wildfire activity, which in turn leads to better decision-making information during regular operations and emergencies and are used by our fire management officers as well. Data from these tools also enhances situational awareness by providing real-time information.

[92] An error was identified after the finalization of financial data. Therefore, the financial information that is stated here in testimony does not align perfectly with the financials included in standardized workpapers and the RO model. A list of errata will be submitted to align the financial information in testimony, standardized workpapers, and the RO model at a future date.

a) Work Description and Need

(1) Weather Stations

SCE's weather stations provide data such as sustained wind speed, wind gust speed, direction of wind, humidity, and temperature, to name a few variables. Adding these microclimate[93] monitoring capabilities to the SCE service area has increased our situational awareness for severe weather/high wind events and provides more granular data to existing weather forecast models. This microclimate weather station investment increases SCE's ability to safely and efficiently monitor adverse weather conditions related to electrical assets.

Observations from weather stations are key inputs into machine learning models. The machine learning models help reduce forecast bias (the average difference between forecast and observed values) by using SCE's network to gain understanding of the typical forecast error in past events and applying that knowledge to future predictions from our in-house models. SCE's weather stations will also be used as part of an academic partnership geared towards improving situational awareness during PSPS and non-PSPS events. University collaborators will use SCE's network to derive a high-resolution (sub-kilometer) gridded observation source that can be procured in real time to aid in PSPS decision-making. The research and new output will create actionable weather information in areas that SCE's network does not directly cover and help meteorologists and grid operations specialists make more informed decisions regarding circuit sectionalization investments and PSPS execution. Finally, the weather station observations provide additional circuit climatology information to meteorologists after a sufficient record is obtained, which helps SCE identify circuits that are in typically wind-prone locations or less windy locations and might be subject to weather model errors.

In 2023-2025, SCE plans to install 170 more weather stations within the HFRA. By the end of 2025, SCE anticipates it will have over 1,800 weather stations in its HFRA and will only install new weather stations on a case-by-case basis. SCE will continue to replace end of life components of weather stations upon when end of life is reached, as needed.[94] Partial material replacements will be necessary to keep the weather stations working properly, as well as yearly calibrations for each existing weather station. SCE will continue to incur operation and maintenance

[93] A microclimate is a local set of atmospheric conditions that differ from those in the surrounding areas. For example, Southern California's mountains have rapid elevation changes and differing canyon orientations, which create localized weather zones or microclimates.

[94] The weather station consists of a group of parts which ranges in life span from 5-15 years.

costs to maintain the vast weather station network and continue optimal operations. The calibrations are industry standard and necessary to validate data accuracy, clean equipment, replace bearings and/or cables, perform operating system and program pushes, verify weather station integrity, among other various small details. Annual calibrations ensure impactful decisions are based on accurate data.

(2) High Definition Cameras

HD camera live feed information is critical to fire agencies for effectively deploying air and ground resources to limit and contain fires in their early stages, as well as to SCE's Fire Management team for gathering early information for asset protection. Although SCE has access to fire progression information through other public means (e.g., monitoring news channels, social media, and/or 911 calls information relayed to SCE) and can dispatch SCE personnel to determine fire severity, SCE selected to deploy HD cameras to expedite information gathering regarding fire progression. Fire agencies find the HD cameras extremely beneficial for their fire containment and public protection efforts. SCE will continue to partner with impacted fire agencies and Public Safety Partners throughout SCE's HFRA to provide HD camera live feeds.

Beginning in 2018, SCE began partnering with the University of California, San Diego (UCSD) to procure, install and maintain pan-tilt-zoom HD cameras. UCSD served as technical, research, and execution partners for the deployment of the HD cameras. SCE also works with local and state fire agency personnel to support the deployment of HD cameras. Through 2021, SCE has installed 166 HD cameras, providing visual coverage of approximately 90% of our HFRA. However, SCE has observed gaps in its ability to view certain parts of its service area where wildfires are more prevalent, including in locations where communities and mountainous terrain intersect. Left unaddressed, these blind spots could compromise SCE's ability to provide adequate and timely response to the fires. SCE plans to install up to 20 HD cameras in each respective year 2022 through 2024 to continue to increase coverage. SCE is not forecasting to install additional cameras in 2025 and beyond but will continue to assess whether additional HD cameras are needed to enhance coverage.

SCE plans to continue to collaborate with UCSD on an ongoing basis for the support and maintenance of the HD Cameras. SCE is also evaluating the use of AI technologies on the HD cameras, through its partnership with UCSD. This technology enhances the HD cameras' ability to send timely and more accurate information on fire activity than can be provided by satellite technology. It will also assist fire agency personnel to quickly assess and respond to reported fires in a

timely manner. SCE plans to work with UCSD to set up satellite service and purchase the ability to get satellite-based and/or verified fire alert notifications.

(3) Wildfire Response, Modeling, Analysis & Weather Forecasting

To continue to advance its fire science and weather modeling capabilities to support situational awareness, PSPS execution, and various grid hardening efforts, SCE will require labor to manage its Fire Science and Advanced Modeling program, which is staffed by meteorologists, fire scientists, and other fire management personnel. SCE will continue to implement technology advancements, such as machine learning, probabilistic forecasting, remote sensing, and climate modeling to address extreme weather events, which will either indirectly or directly support SCE's goal of reducing the threat of wildfires associated with utility equipment.

b) RAMP Integration

Within this GRC activity, there are two RAMP Wildfire and PSPS risk controls: HD Cameras and Weather Stations. First, HD camera installations can resolve gaps in SCE's spatial data and provide improved fire confirmation capabilities for first responders and communities. SCE's ability to see wildfires in its service area provides more accurate and timely situational awareness information about the wildfire's location, spread and proximity to communities, buildings, and assets. However, SCE has observed blind spots in its ability to view in certain parts of its service area, including in locations where communities and mountainous terrain intersect. HD cameras help address these blind spots. Left unaddressed, these blind spots could compromise SCE and First Responder's ability to provide adequate and timely situational awareness and responses to fires. The HD cameras help fire response agencies identify incipient stage ignitions and aid in deploying suppression resources, potentially limiting the size and destruction of a wildfire that would otherwise have propagated for a longer period of time before identification and responsive action occur.

Second, weather stations are used to provide critical situational awareness for PSPS decision-making and help improve weather models for more accurate forecasting. Weather conditions can differ significantly at any given time within the HFRA in SCE's service area, due to the large size and diverse topography involved. For example, Southern California's mountains have rapid elevation changes and differing canyon orientations. This creates localized weather zones. SCE needs to monitor and analyze weather data at a granular level across circuits in HFRA to inform critical operational decisions such as deploying PSPS protocols during elevated weather conditions. Because weather stations can identify differing weather patterns across a circuit, SCE's IMT is able to minimize

the PSPS de-energization footprint to only those isolatable segments that are exceeding the wind speed and FPI thresholds. Isolatable segments where wind speeds do not exceed the thresholds can remain energized until conditions change, oftentimes avoiding de-energization altogether.

(1) Reconciliation between RAMP & GRC

(a) O&M

The HD Cameras O&M variance as estimated in SCE's 2022 RAMP report and as requested in this GRC, shown in Table I-16, is due to the updates in SCE's cost forecast. After SCE filed its RAMP report, SCE received updated data subscription fees and network communication fees from its vendor, which are reflected in this updated GRC cost forecast.

The Weather Stations O&M variance between SCE's 2022 RAMP report and SCE's request in this GRC, shown in Table I-16 below, reflects a change in strategy for weather station replacement activities after SCE filed its 2022 RAMP report. SCE re-evaluated its strategy for weather stations and determined that instead of replacing the entire weather station (a capital cost), SCE will replace individual components of the weather station once each component fails or reaches its end of life (an O&M cost). As a result, SCE's O&M forecast for weather stations has increased from its 2022 RAMP report forecast. The RSE for weather stations decreased from the 2022 RAMP as a result of lower useful life and mitigation effectiveness assumption values, which take into account incremental weather station additions only.

Table I-16
HD Cameras and Weather Stations
RAMP vs. GRC O&M Forecast Comparison - *Nominal $000s*
Risk Spend Efficiencies[95],[96]

RAMP Risk	RAMP ID	RAMP Control / Mitigation Name	Filing	2022	2023	2024	2025	2025 - 2028 RSE
Wildfire	C20	HD Cameras	RAMP	$3,906	$4,404	$4,917	$5,006	N/A
			GRC	$1,991	$4,252	$4,715	$4,715	N/A
			Variance	($1,915)	($152)	($203)	($291)	N/A
PSPS	C22	Weather Stations	RAMP	$3,369	$3,394	$3,566	$3,671	201
			GRC	$3,048	$4,106	$5,591	$5,950	3
			Variance	($321)	$712	$2,025	$2,279	(198)

(b) Capital

The difference in capital cost for HD Cameras between SCE's 2022 RAMP report and SCE's forecast in this GRC is shown in Table I-17 below. When the 2022 RAMP report was filed, SCE estimated its capital cost for HD cameras based on the understanding that SCE would need to replace HD cameras as they reached the end of their useful life. However, since SCE filed the 2022 RAMP report, SCE's vendor has agreed to cover certain costs of replacing HD cameras once they become nonoperational, which is reflected in this GRC forecast.

The weather station capital variance between SCE's 2022 RAMP report and SCE's request in this GRC is shown in Table I-17 below. As discussed above, after filing its 2022 RAMP report, SCE reevaluated its strategy for weather stations and determined that instead of replacing the entire weather station, SCE will replace individual components of the weather station once the respective end of life is reached, as needed, beginning in 2024. As a result, the capital cost forecast for weather stations has generally decreased compared to 2022 RAMP report forecast as the component based approach will be deemed O&M costs. The RSE for weather stations decreased from the 2022

[95] Please refer to WP SCE-04, Vol. 05, Part 1 – WF/PSPS RAMP to GRC Integration.

[96] SCE does not have an RSE for HD Cameras because HD Cameras RSE are for new installations only and SCE is not forecasting to install additional cameras in 2025 and beyond.

RAMP as a result of lower useful life and mitigation effectiveness assumption values which take into account incremental weather stations installs only.

Table I-17
HD Cameras and Weather Stations
RAMP vs. GRC Capital Forecast Comparison - *Nominal $000*
Risk Spend Efficiencies[97],[98]

RAMP Risk	RAMP ID	RAMP Control / Mitigation Name	Filing	2022	2023	2024	2025	2026	2027	2028	Total 2025 - 2028	2025 - 2028 RSE
Wildfire	C20	High-Definition (HD) Cameras	RAMP	$128	$129	$130	$661	$672	$681	$691	$2,705	N/A
			GRC	$75	$264	$131	$0	$0	$0	$0	$0	N/A
			Variance	($52)	$135	$1	($661)	($672)	($681)	($691)	($2,705)	N/A
PSPS	C22	Weather Stations	RAMP	$3,021	$1,445	$1,893	$3,599	$5,967	$4,813	$2,239	$16,618	201
			GRC	$3,439	$3,537	$1,171	$448	$414	$33	$37	$932	3
			Variance	$418	$2,091	($722)	($3,151)	($5,553)	($4,780)	($2,202)	($15,686)	(198)

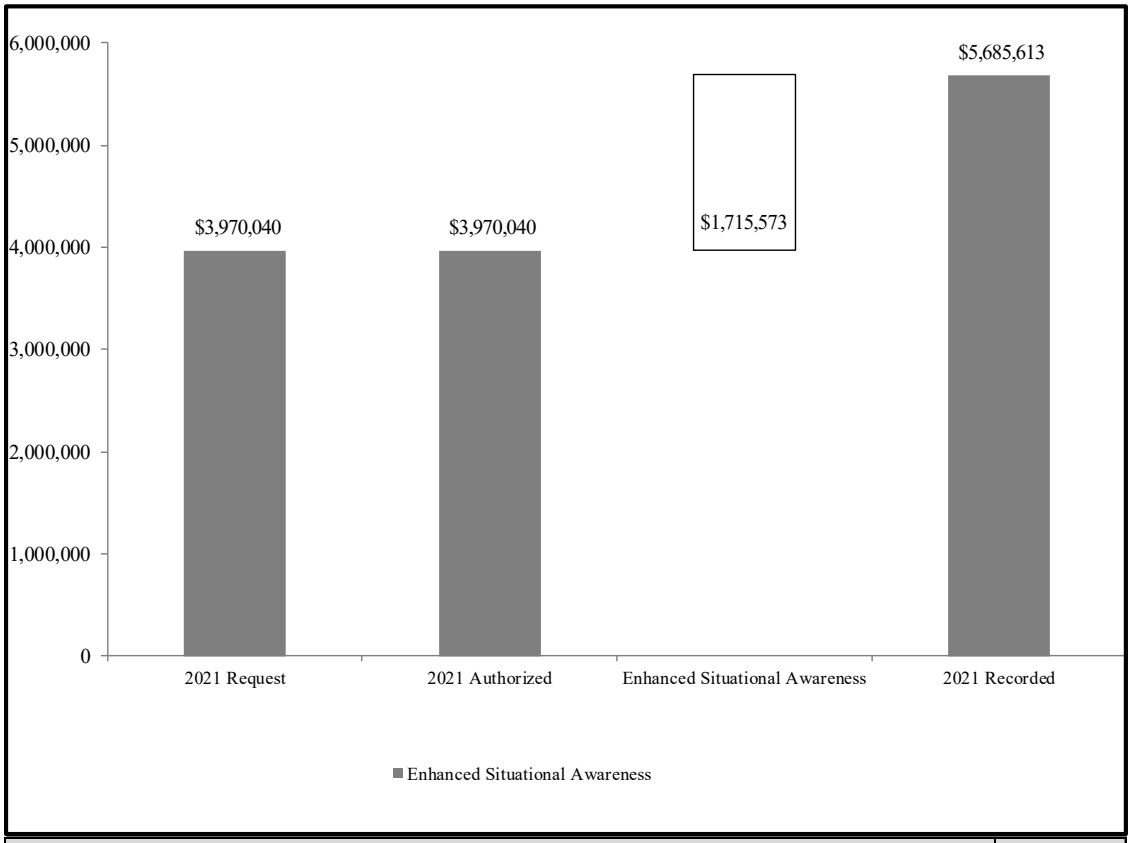
[97] Please refer to WP SCE-04 Vol. 05 Part 1 – WF/PSPS RAMP to GRC Integration.

[98] SCE does not have an RSE for HD Cameras because HD Cameras RSE are for new installations only and SCE is not forecasting to install additional cameras in 2025 and beyond.

c) Comparison of Authorized 2021 to Recorded

(1) O&M

Figure I-11
Enhanced Situational Awareness
Comparison of 2021 O&M GRC Authorized versus Recorded[99]
(Constant 2022 $)



Core Sub Activity	2021 Request	2021 Authorized	2021 Recorded	Variance
HD Cameras	$ 1,815,722	$ 1,815,722	$ 3,143,312	1,327,590
Weather Stations	$ 1,609,186	$ 1,609,186	$ 2,124,086	514,901
Wildfire Response, Modeling, Analysis, & Weather Forecasting	$ 545,132	$ 545,132	$ 418,215	(126,917)
Total	**$ 3,970,040**	**$ 3,970,040**	**$ 5,685,613**	**$ 1,715,573**

In 2021, SCE recorded $5.686 million as compared to $3.970 million authorized in O&M expenses. In 2021, SCE's HD Cameras O&M expense is greater than 2021 authorized because SCE received a late 2020 vendor invoice in the first quarter of 2021, which was approximately $1.000 million and was not accrued during 2020. In addition, during 2019-2020, SCE installed six more cameras than forecasted, which added additional O&M costs in 2021. As a result,

[99] Refer to WP SCE-07, Vol. 01, Authorized vs. Recorded.

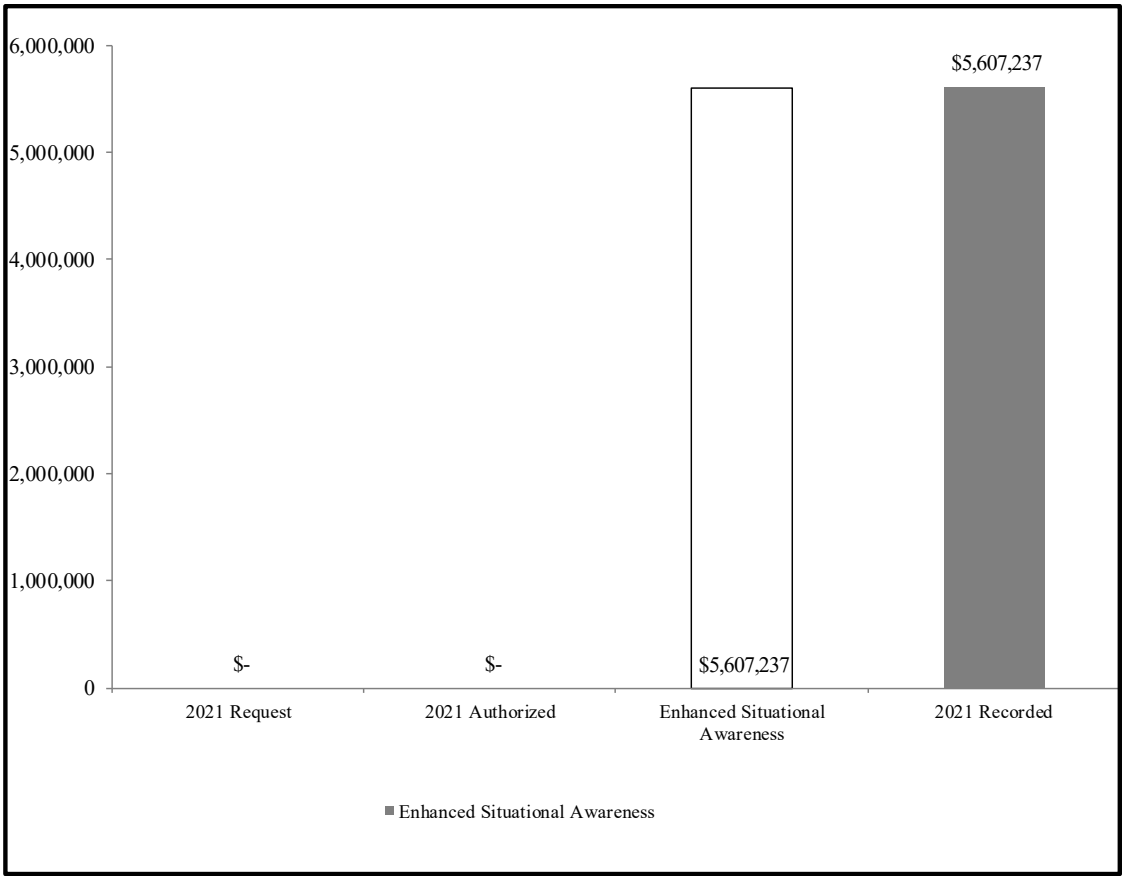
SCE incurred O&M expenses of $3.143 million versus $1.816 million authorized in 2021 for HD cameras.

In 2021, SCE's recorded cost for weather stations was $2.124 million compared to $1.609 million authorized. The primary O&M cost for weather stations is vendor support fees and network subscription fees which are paid per station. As a result, SCE's O&M expense increased due to an increase in support and maintenance cost per station from SCE's vendor, as well as the expansion of SCE's weather station network as SCE installed 593 weather stations in 2020 to gather more granular data in the HFRA. These installations were prudent in order to enhance forecasting capabilities and obtain granular data for circuit segmentation to enhance PSPS operations.

Wildfire Response, Modeling, Analysis, & Weather Forecasting recorded cost was $0.418 million compared to $0.545 million authorized in 2021. The lower recorded cost was due to a vacant position for the majority of 2021.

(2) Capital

Figure I-12
Enhanced Situational Awareness
Comparison of 2021 Capital GRC Authorized versus Recorded[100]
(Constant 2022 $)

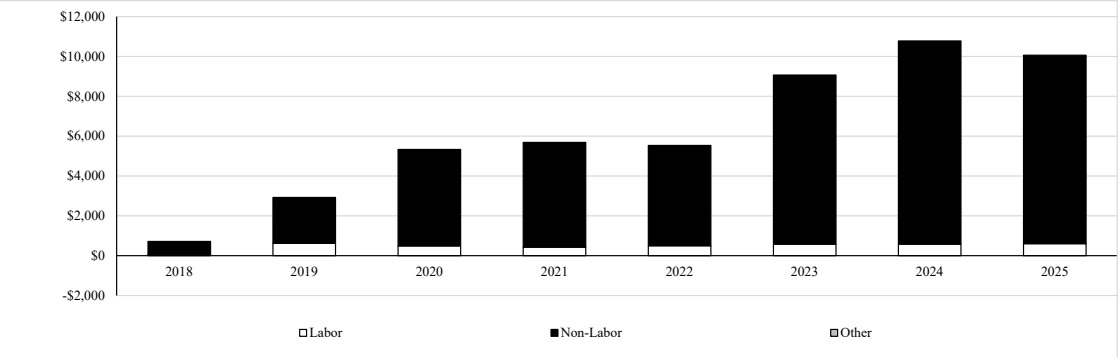


SCE did not include a capital forecast in its 2021 GRC filing and was not authorized any capital expenditures for HD cameras or weather stations. However, after SCE filed its 2021 GRC, SCE identified areas where weather stations and HD Cameras would be beneficial for operational purposes. As a result, SCE installed 406 weather stations and retrofitted 358 weather stations with larger solar panels and larger batteries to increase network communications and stability. SCE recorded $5.607 million in capital expenditures associated with weather stations in 2021.

100 Refer to WP SCE-07, Vol. 01, Authorized vs. Recorded.

(3) Historical O&M Variance Analysis

Figure I-13
Enhanced Situational Awareness
Recorded 2018-2022/Forecast 2023-2025
(Constant 2022 $000)[101],[102]



	Recorded					Forecast		
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Labor	$66	$614	$489	$427	$498	$574	$575	$602
Non-Labor	$649	$2,311	$4,839	$5,258	$5,036	$8,488	$10,194	$9,455
Other		$	($)					
Total Expenses	**$716**	**$2,925**	**$5,327**	**$5,686**	**$5,534**	**$9,062**	**$10,769**	**$10,056**
Ratio of Labor to Total	9%	21%	9%	8%	9%	6%	5%	6%

(a) Labor

SCE's labor cost for Enhanced Situational Awareness activities in 2018 was minimal because SCE had only recently commenced such activities at that time. In 2019, SCE's labor cost increased to $0.614 million because SCE ramped up its weather modeling and situational awareness capabilities to better understand the factors leading to increased wildfire risk. In 2020, SCE's labor costs for Enhanced Situation Awareness activities stabilized, and from 2020-2022, labor costs were relatively consistent.

[101] The GRC Activities, Enhanced Situational Awareness and Weather Stations are included in these figures. Refer to WP SCE-04, Vol. 05, Part 4, pp. 70 – 75, Enhanced Situational Awareness Recorded/Forecast O&M Summary, and pp. 76 – 81, Weather Stations Recorded/Forecast O&M Summary.

[102] An error was identified after the finalization of financial data. Therefore, the financial information that is stated here in testimony does not align perfectly with the financials included in standardized workpapers and the RO model. A list of errata will be submitted to align the financial information in testimony, standardized workpapers, and the RO model at a future date.

(b) Non-Labor

The major drivers of HD cameras' non-labor costs are data subscription fees, network communication fees, and tower lease fees, which are paid on a per-camera basis. As such, the historical variance is largely driven by how many cameras are in operation in any given year, and at what point they are operational during that year. In 2019, because not all 91 cameras were installed for the entire year, SCE only recorded $0.517 million in non-labor expense. In 2020, SCE incurred licensing costs for those 91 cameras as well as an additional five cameras installed that year, which increased SCE's non-labor expense to $2.455 million. In 2021, SCE's HD Cameras O&M expense increased because of a late invoice received in February 2021 that was not accrued during 2020. This late invoice included approximately $1 million in 2020 vendor charges. The $3.136 million recorded expenses in 2021 for HD Cameras encompassed the above referenced 2020 charges, as well as the yearly subscription fees on a per-camera basis for the totality of SCE's camera network (there were no new installs in 2021). In 2022, SCE recorded $1.990 million in non-labor expenses because SCE installed an additional 16 cameras and incurred costs for recurring data, network and lease costs.

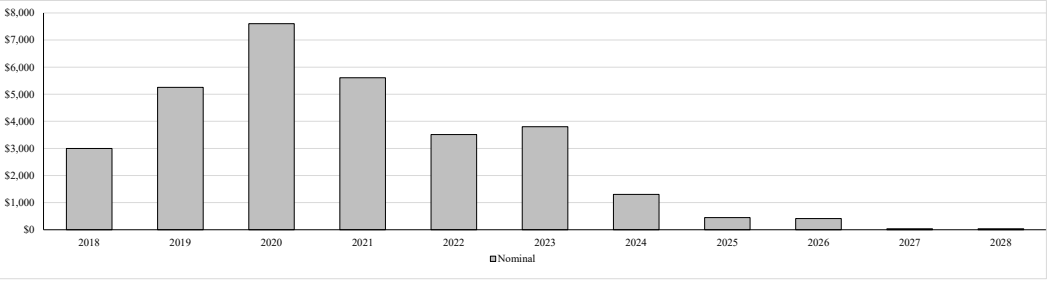
From 2018 to October 2020, SCE installed 1,057 weather stations in HFRA and commenced planning and siting for installations in 2021. In 2019, SCE recorded $1.322 million in non-labor expense due to the increasing installation of weather stations. Most of the incurred costs for non-labor are due to vendor support fees and network subscription fees paid per station. In 2020, SCE's expenses continued to increase to $2.270 million due to the continued expansion of SCE's weather station network, as SCE installed 593 additional weather stations. This trend continued in 2021 with $2.122 million in recorded expenses to install 406 weather stations to gather additional information in the HFRA. These installations were prudent in order to enhance forecasting capabilities as well as provide more granular data for PSPS operations. In 2022, SCE recorded $3.046 million in non-labor expenses related to maintaining SCE's weather station network and the installation of 160 additional weather stations. The increased non-labor costs compared to previous years were due to the higher installation costs for transmission weather stations versus costs related to distribution installations.

In 2018, SCE's non-labor recorded cost for Wildfire Response, Modeling, Analysis & Weather was $0.745 million. In 2019, SCE's non-labor recorded cost was $0.472 million, which was for the initial set up of Application Programming Interfaces (API's) to ingest data from weather stations. In 2020, SCE's recorded cost was $0.114 million due to the charges related to background investigations for NERC access for consultants.

(4) Historical Capital Variance Analysis

Figure I-14
2018 – 2022 Recorded/2023-2028 Forecast Capital Expenditures for Enhanced Situational Awareness
(Nominal $000)[103]

CWBS Element COS00GRBR815900 and COS00GRBR815902



	Recorded					Forecast					
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Nominal	$2,997	$5,252	$7,603	$5,607	$3,514	$3,800	$1,302	$448	$414	$33	$37

SCE incurred $24.973 million in capital costs for HD cameras and Weather Stations from 2018 through 2022, because SCE installed 182 cameras and 1,636 weather stations in HFRA locations to support our wildfire mitigation and response efforts.

Table I-18
Number of Installs per year

	2018	2019	2020	2021	2022
HD Cameras	70	91	5	0	16
Weather Stations	125	352	593	406	160

In 2018, SCE incurred $2.341 million in capital costs to install 125 weather stations, though only 112 were functional due to the lack of cellular reception at certain sites. In 2019, seeing the added benefit and effectiveness of the weather stations, SCE increased its installation plans and installed 352 weather stations incurring $4.282 million in capital costs. In 2020, SCE installed 593 weather stations and incurred $7.509 million in capital costs. In 2021, SCE installed an additional 406 weather stations, retrofitted 358 weather stations with larger solar panels and larger batteries to

[103] Refer to WP SCE-04, Vol. 05, Part 4, pp. 82 – 84, Enhanced Situational Awareness GRC Capital Forecast.

increase network communications and stability, and recorded $5.607 million in capital spend. In 2022, SCE installed 160 weather stations and recorded $3.439 million in capital spend.

As part of SCE's wildfire mitigation efforts, HD camera installations can resolve gaps in SCE's spatial data and provide improved fire detection capabilities. In 2018, SCE determined the wildfire mitigation benefits of installing additional HD cameras and installed 70 cameras, incurring $0.656 million in capital costs. In 2019, SCE installed 91 cameras and incurred $0.970 million in capital costs. In 2020, SCE installed an additional 5 cameras, incurring $0.094 million in capital costs. HD cameras were not installed in 2021. In 2022, SCE installed 16 cameras, incurring $0.075 million in capital costs, for a combined total of 182 cameras.

d) Basis for O&M Forecast

Table I-19
Enhanced Situational Awareness
Forecast O&M Expenses[104],[105]
(Constant 2022 $000)

	Recorded					Forecast		
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
HD Cameras		$518	$2,460	$3,143	$1,991	$4,169	$4,532	$4,315
Situational Awareness	$285							
Weather Stations	($315)	$1,373	$2,282	$2,124	$3,048	$4,026	$5,374	$5,069
Wildfire Response, Modeling, Analysis, & Weather Forecasting	$746	$1,034	$585	$418	$495	$868	$864	$672
Totals	**$716**	**$2,925**	**$5,327**	**$5,686**	**$5,534**	**$9,062**	**$10,769**	**$10,056**

The Enhanced Situational Awareness forecast was developed using a normalized non-labor itemized[106] approach taking into consideration vendor contracts for HD cameras, weather station replacement parts, weather station maintenance, service fees, labor costs for related sub-work activities, cloud services and infrastructure support, and labor for Wildfire Response, Modeling, Analysis, & Weather Forecasting.

In 2024, SCE anticipates it will have up to 226 HD cameras installed and will assess future installations of HD cameras on a case-by-case basis based on operational needs. In 2025,

[104] Refer to WP SCE-04, Vol. 05, Part 4, pp. 85-88, Enhanced Situational Awareness O&M Forecast.

[105] An error was identified after the finalization of financial data. Therefore, the financial information that is stated here in testimony does not align perfectly with the financials included in standardized workpapers and the RO model. A list of errata will be submitted to align the financial information in testimony, standardized workpapers, and the RO model at a future date.

[106] Refer to WP SCE-04 Vol. 05 Part 4, pp. 85-88, Enhanced Situational Awareness O&M Forecast.

SCE forecasts $4.315 million in normalized O&M expenses for HD cameras.[107] The main driver for the O&M expenses is the recurring operating cost of each camera, which is approximately $21,000 per camera for recurring operational data costs and maintenance. The operation and maintenance of the installed HD cameras includes the back haul of the data, maintenance of the cameras, maintenance of the network, providing feed for emergency services, and R&D on the Fireball Artificial Intelligence. These costs are incurred on a per camera basis and will continue on an annual basis even though SCE does not plan to install additional HD cameras in 2025 and beyond at this time. In addition, in 2025-2028, SCE forecasts to spend approximately $0.200 million in normalized O&M expenses for Satellite Fire Detection work, which is further described in the Capital Forecast.

In 2025, SCE forecasts $5.069 in normalized O&M expenses for weather stations.[108] In 2025, SCE plans to install an additional 20 weather stations within the HFRA. By the end of 2025, SCE anticipates it will have over 1,800 weather stations in its HFRA and will only install new weather stations on a case-by-case basis. SCE will continue to replace end of life materials that weather stations consist of when the respective end of life is reached. SCE will continue the operation and maintenance on the current network of weather stations. The maintenance includes calibrations and replacement parts. The operation includes vendor support services and network communication costs, which are charged at a per station cost. SCE will also begin replacing end of life parts on an individual basis, as opposed to full station replacements.

Lastly, in 2025, SCE is forecasting $0.673 million in O&M expenses for Wildfire Response, Modeling, Analysis, & Weather Forecasting.[109, 110] SCE forecasts $0.602 million in labor costs for three meteorologists, one fire scientist and a fire management officer to continue to advance its

[107] An error was identified after the finalization of financial data. Therefore, the financial information that is stated here in testimony does not align perfectly with the financials included in standardized workpapers and the RO model. A list of errata will be submitted to align the financial information in testimony, standardized workpapers, and the RO model at a future date.

[108] An error was identified after the finalization of financial data. Therefore, the financial information that is stated here in testimony does not align perfectly with the financials included in standardized workpapers and the RO model. A list of errata will be submitted to align the financial information in testimony, standardized workpapers, and the RO model at a future date.

[109] Refer to WP SCE-04, Vol. 05, Part 4, pp. 85-88, Enhanced Situational Awareness O&M Forecast.

[110] An error was identified after the finalization of financial data. Therefore, the financial information that is stated here in testimony does not align perfectly with the financials included in standardized workpapers and the RO model. A list of errata will be submitted to align the financial information in testimony, standardized workpapers, and the RO model at a future date.

weather modeling and situational awareness capabilities to better understand the factors leading to increased wildfire risk.[111, 112] In addition, in 2025, SCE forecasts $0.283 million normalized O&M expenses for Google cloud services and infrastructure support for the Weather Visualization tool discussed in Section I.4.

e) Basis for Capital Forecast

Table I-20
Enhanced Situational Awareness
2018 – 2022 Recorded/2023-2028 Forecast Capital Expenditures
(Nominal $000)[113]

CWBS Element COS00GRBR815900 and COS00GRBR815902

	Recorded					Forecast					
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
HD Cameras	$656	$970	$94		$75	$264	$131				
Weather Stations	$2,341	$4,282	$7,509	$5,607	$3,439	$3,537	$1,171	$448	$414	$33	$37
Totals	$2,997	$5,252	$7,603	$5,607	$3,514	$3,800	$1,302	$448	$414	$33	$37

(1) HD Cameras

In 2023, SCE forecasts approximately $0.264 million in total capital expenses made up of $0.124 million to install up to 20 new HD cameras across SCE's HFRA and $0.140 million for satellite and other remote sensing capabilities.[114] In 2024, SCE forecasts approximately $0.131 million to install an additional 20 new HD cameras across SCE's HFRA, leading to a network of 222 cameras. SCE utilized vendor quotes to determine this forecast. These additional cameras will address identified blind spots in viewshed and will better help protect the communities that SCE serves, as well as SCE infrastructure. The vendor providing the current fire detection through UCSD would use current satellite detection service to validate HD camera detection and future use case would be to have the cameras move when a satellite or other remote sensing technology detects a fire

111 Forecast includes Employee Compensation Program Changes. *See* Exhibit SCE 06, Vol 4.

112 An error was identified after the finalization of financial data. Therefore, the financial information that is stated here in testimony does not align perfectly with the financials included in standardized workpapers and the RO model. A list of errata will be submitted to align the financial information in testimony, standardized workpapers, and the RO model at a future date.

113 Refer to WP SCE-04, Vol. 05, Part 4, pp. 89-91, Enhanced Situational Awareness Capital Forecast.

114 Refer to WP SCE-04, Vol. 05, Part 4, pp. 89-91, Enhanced Situational Awareness Capital Forecast.

within the given camera's view. SCE forecasts zero capital dollars for HD cameras during 2025-2028. SCE will evaluate future HD camera needs on a case-by-case basis.

(2) Weather Stations

SCE plans to install 170 more weather stations between 2023-2025. The additional weather stations will assist in providing more granular data for circuit segmentation as well as providing more complete model forecasts due to stations being installed on sub-transmission and bulk-transmission locations. In 2026-2028, SCE will evaluate future weather station installations on a case-by-case basis, dictated by identified needs. In 2023-2026, SCE will also replace handheld weather station devices (Kestrels) used in the field to compliment PSPS operations. Utilizing an itemized approach, SCE forecasts $5.640 million in total capital expenses during 2023-2028 for the installation and equipment costs related to weather stations.[115]

5. Fire Science & Advanced Modeling

SCE's Fire Science and Advanced Modeling activity includes multiple projects and sub-activities that affect situational awareness, PSPS, and various grid hardening efforts, all of which either indirectly or directly support the goal of reducing the threat of wildfires associated with utility equipment.

a) Work Description and Need

(1) Advanced Modeling Computer Hardware

The use of high-performance computing is necessary to run SCE's in-house weather models, which consists of billions of computations to generate 1-kilometer hourly outputs of weather, fuel moisture, and fire potential data daily. Each of SCE's High-Performance Computing Clusters (HPCCs) is the equivalent of approximately 250 laptop computers and generates tens of millions of data points per day. SCE initially purchased two HPCCs in 2019, then acquired two more HPCCs in 2021. To operate these high-performance computers, SCE hired a third-party vendor to provide maintenance services and has annual subscription services from Technosylva and Atmospheric Data Solutions, LLC (ADS). Between 2025 and 2028, SCE is planning to replace its existing HPCCs because each HPCC's expected life cycle is five to six years.

[115] Refer to WP SCE-04, Vol. 05, Part 4, pp. 89-91, Enhanced Situational Awareness Capital Forecast.

(2) Fire Science Enhancements

SCE's fire science enhancements are comprised of the continuation of the Santa Ana Wind Outlook and Self-Organizing Maps (SOMS). SCE's Santa Ana Wind Outlook subscription allows SCE to continue receiving 1-month and 3-month ahead forecasts of Santa Ana winds over the service territory. The model consists of several components, including a machine learning approach to help determine the approximate number of days over the forecast period in which Santa Ana wind conditions will occur. These forecasts are used in combination with SCE's seasonal outlooks to help inform the frequency of these events when planning for inspections and remediations across SCE's service area.

SOMS are a form of pattern recognition used to identify meteorological scenarios that lead to extreme weather events. For example, SOMS may be used to identify Santa Ana winds and their characteristics, such as magnitude, duration, and location. SOMS can also relate weather patterns to fire activity to show which fires may exhibit extreme fire behavior based on weather scenarios. This type of pattern recognition can be used as a predictive tool in helping identify potential PSPS events and situations where multiple large fires can occur simultaneously. SOMS can be incorporated into climate change modeling to show what trends exist in critical weather patterns that may pose a threat to SCE's infrastructure.

(3) Fire Potential Index (FPI)

SCE's current FPI is a direct input into PSPS decision-making and provides an estimate of fire potential risk at the circuit level. Since the FPI is one of the pillars for determining when or if to initiate PSPS, it is imperative that work to improve the accuracy of wildfire assessment continues. One such improvement occurred in 2021, in which the FPI was calibrated to better understand the index output in the context of historical fire activity. This has helped to enable more targeted PSPS decision-making with the potential to reduce the number of customers impacted by PSPS. In 2022, SCE formulated a new FPI (2.0) by placing more emphasis on wind speeds and adding a new fuels component to account for the diversity of fuel conditions across SCE's service area. SCE will evaluate FPI 2.0's performance against the current FPI with the long-term goal of slowly integrating FPI 2.0 into the PSPS decision-making process.

(4) Fire Spread Modeling

SCE continues to make important investments in fire spread modeling technology to help identify areas that are at high risk for large wildfires, which can have devastating

consequences. For example, in 2021, a Surface and Canopy Fuels Mapping layer that accounts for vegetation types and amounts was completed. This fuels layer is a required input into all fire spread modeling calculations and therefore it is critical that it be as up to date as possible. Fire spread modeling is currently being used to help assess fire potential, although it is not currently being used as part of the decision-making process for PSPS events. SCE has identified additional functionality that is needed in order to meet that critical goal. More analysis and refinement will be needed before anticipated integration into PSPS decision-making by the end of 2025. This includes accounting for fire suppression, as well as including an estimate of the number of structures that could potentially be destroyed by a wildfire. SCE will coordinate closely with its vendor to ensure this added functionality will meet SCE's needs. SCE's Fire Science team will review the proposed methodology with the vendor and evaluate the enhanced capabilities during real-time PSPS events.

Other improvements, such as crown fire (fire within tree-tops) behavior predictions and urban conflagration modeling are expected to occur but with less certainty of completion dates. These improvements will pave the way for a smoother integration of consequence information into the PSPS decision-making process. In addition, these advancements will also help provide better fire spread predictions using historical data, and potentially using downscaled climate model data, to aid with the prioritization of long-term grid hardening projects.

(5) Fuel Sampling Program

Dry fuel conditions contribute to increased wildfire risk. As such, SCE incorporates fuel moisture conditions in its PSPS decision-making process. While local fire agencies conduct fuel sampling, SCE determined it would be beneficial to sample in areas where major gaps exist both spatially and temporally. SCE takes real-time measurements of vegetation moisture at 15 sites across its service area. Live fuel moisture sampling provides ground truth observations biweekly that: 1) help assess how receptive the fuels are to fire, 2) help align FPI values when forecasts of live fuel moisture are misaligned with observations, and 3) help train machine learning models that provide estimates of live fuel moisture on a grid. Other than the possibility for a slight expansion, the live fuel moisture sampling program will continue in its current state through 2028.

(6) Remote Sensing

Remote sensing is a rapidly expanding, diverse industry that contains a broad array of applications, some of which can be used to obtain information on the characteristics and health of vegetation. Having this knowledge in semi-real time is important in understanding how much

vegetation is on the ground, how old it is, what type it is, and how much moisture is in it, since these are all factors that play a significant role in the initiation and spread of wildfires. SCE anticipates a more concentrated effort in 2025 and beyond to leverage this technology to determine the status of the vegetation for the development of SCE's Seasonal Outlooks, AOCs, and which Fire Climate Zone operating restrictions are put in place and when. In 2022, SCE began to work with Earth Lab in association with the University of Colorado at Boulder to develop the Vegetation Buildup Index, which is a heat map showing the approximate areas where the dynamic combustibility of fuels is greatest. The Vegetation Buildup Index considers vegetation moisture, type, and amount, as well as the long-term climatological affects upon the vegetation. This product will allow for an objective, quantifiable process to inform where and when to perform inspections and if any potential remediations should be accelerated.

Other applications of remote sensing include observing the atmosphere vertically. For example, SCE began implementing a lower atmospheric wind profiler pilot project in 2021 with San Jose State University (SJSU) to conduct multiple deployments of SJSU's LiDAR system. During these deployments, a LiDAR is positioned to vertically scan the atmosphere to detect wind speed and direction at various elevations above the ground. This allowed for winds to be measured in the lower atmosphere on an ad hoc basis during several wind events. SCE anticipates this project will be completed in 2023.

(7) Climate Change Modeling

With the rapid change in climate and its impact on wildfire activity, it is imperative that SCE have detailed projections of weather and fuel conditions to determine changes in fire potential and fire activity in the future. This information will help drive decision-making regarding grid hardening activities and will help SCE be better prepared for future changes in wildfire activity.

Starting in 2025, SCE will downscale[116] multiple Global Climate Models (GCMs) to a higher resolution with hourly temporal resolution of various weather and fuel parameters such as temperature, relative humidity, wind, fuel moisture, and FPI. These datasets will allow for detailed analysis of trends in weather, fuels, and fire potential. This data may also help determine trends in the number of PSPS events in the future. The result of these analyses will not only help to improve

[116] Downscaling is the process of creating high-resolution data from low-resolution variables. This technique is used in meteorology and refers to increasing spatial resolution (decreasing pixel size within model output).

SCE's weather and fuels modeling but will also help inform how SCE designs its equipment and grid structure moving forward.

(8) Academic Research Partnerships

SCE is partnering with the academic community in 2022 to devise a new method to derive more complete wind risk profiles along infrastructure during PSPS events and to develop local nowcasting techniques. This tool will initially be developed in 2022-2023, but maintenance of the operational system will be necessary beginning in 2025, including potential adjustments of the tool based on new research or data from SCE's expanding surface observational network. In addition, SCE is a member of the Wildland Interdisciplinary Research Center through San Jose State University in which various projects related to wildfire science are funded and supported. SCE is also part of the Wildland Urban Interface (WUI) Fire Institute through Cal Poly at San Luis Obispo which makes significant contributions to solving the WUI fire problem through research and education that innovates; informs policy; disseminates information; and educates students, professionals, and stakeholders to reduce WUI fire consequences, costs, and losses. SCE plans to expand partnerships with the academic community in 2023 and 2024 with the goal of improving weather forecasting capabilities by exploring innovative forecasting models and techniques that could increase forecast accuracy.

(9) Weather and Fuels Modeling

SCE's in-house weather and fuels modeling is foundational to PSPS and grid operations. Because knowing when and where severe weather conditions will impact SCE's infrastructure is important for an appropriate proactive response, it is vital that current operational weather and fuels modeling capabilities are maintained and that planned improvements to SCE's in-house modeling capabilities continue. For example, in 2022, SCE expanded its machine learning weather forecast capability, procured the ECMWF weather model output, and completed updating its Live Fuel Moisture (LFM) models by incorporating additional vegetation species. In the future, many of the additional improvements will be driven by AI technology, statistical methods, and new dynamic models. In 2025 and beyond, SCE will focus on improvements to wind speed and humidity forecasts at site-specific locations using machine learning modeling, possible additional improvements of LFM models, improvements in probabilistic forecasting to help with forecaster confidence using machine learning, and the use of SOMS to better forecast which circuits may be impacted by PSPS and for how long.

In addition to improved modeling capabilities, SCE is developing a Weather Visualization Tool that, along with a more robust graphic user interface (GUI), will allow users to view and analyze large amounts of internal and external weather and fuel data quickly and efficiently. This will represent a marked improvement over the current process in which users are retrieving information, primarily in static map form from vendors and cannot effectively overlay SCE infrastructure on top of the forecast weather outcome to understand the risk profile. This new tool will allow SCE to visualize in-house and external weather and fuels model sources in a single location, will be dynamic, and will have access to SCE GIS layers important for making PSPS decisions. This will facilitate meteorologist/fire scientist analysis and improve communication of the expected weather impacts.

Likewise, SCE will maintain the currency of its historical dataset with annual updates beginning in 2025 through its Data Manager. To enable a quicker and more efficient retrieval process of SCE's 40-year historical dataset, Data Manager was developed in 2021 by SCE's vendor Atmospheric Data Solutions, LLC. This tool allows users to query large amounts of data for use with analytics and data requests. The Data Manager improves data analysis by providing users with the ability to interact with SCE's historical data set quickly and efficiently to retrieve only the data needed for the analysis. SCE will also extend its gridded historical dataset in 2025 and beyond to maintain data currency and may possibly add additional datasets into the Data Manager as needed for archival and improved data querying. The gridded historical data will also be used to refresh historical wind percentiles which help provide historical context around incoming storms.

In 2023, SCE plans to add an additional meteorologist position to support situational awareness and weather forecasting activities. This includes supporting Energy Procurement and Management weather forecast needs, PSPS weather forecast and monitoring needs, providing meteorological support during IMT activations, and generally assisting with situational awareness focused on weather and climate conditions.

b) <u>RAMP Integration</u>

Within this GRC activity, there are two RAMP PSPS risk controls: (1) Weather and Fuels Modeling and (2) Fire Science. Weather and Fuels modeling provides critical information for PSPS events, such as information about whether a circuit is expected to exceed the thresholds necessitating PSPS. This information may inform de-energization decisions, customer notifications, and external coordination, among other uses. Inaccurate or outdated weather models may impact PSPS

decision-making by, for example, having a bias or error that impacts the circuits forecast to exceed PSPS criteria.

SCE combines its suite of interrelated forecasting and modeling activities (Fire Science Enhancements, Fire Potential Index, Fire Spread Modeling, Fuel Sampling Program, Remote Sensing, and Climate Change Modeling) into one activity called Fire Sciences which provides the framework for certain wildfire mitigation decision-making. Fire Science informs the strategy and the prioritization of grid hardening efforts. It also informs where and when inspections, remediations, and vegetation management practices should occur in preparation for peak fire season. Fire Science information such as fuel conditions are also incorporated into SCE's PSPS decision-making process, helping identify which circuits might be subject to proactive de-energization and when. Overall, fire Science enhancements allow for more informed decision-making in the aforementioned areas with additional focus on longer range wildfire mitigations associated with climate change.

(1) Reconciliation between RAMP & GRC

(a) O&M

Table I-21 below compares the O&M forecasts for Weather and Fuels Modeling between SCE's 2022 RAMP report and SCE's request in this GRC. The variance between the two forecasts is due to updates in SCE's cost forecast since the filing of the RAMP report to include the cost of a Weather Visualization Tool that was not previously anticipated and the cost of Technosylva subscription fees that were inadvertently omitted from the 2022 RAMP report.

The Fire Science O&M variance between SCE's 2022 RAMP report and SCE's request in this GRC, shown in Table I-21 below, is due to updates to SCE's cost forecast. Since the filing of the RAMP report, SCE updated its cost forecast to remove the Risk Associated with Value Exposure (RAVE) project because it is not anticipated to continue. In addition, in this GRC forecast, SCE is including the cost of the Climate Change Modeling project that is expected to begin in 2025.

Table I-21
Weather and Fuels Modeling and Fire Science
RAMP vs GRC O&M Forecast Comparison - *(Nominal $000)*
Risk Spend Efficiencies[117]

RAMP Risk	RAMP ID	RAMP Control / Mitigation Name	Filing	2022	2023	2024	2025	2025 - 2028 RSE
PSPS	C27	Weather and Fuel Modeling	RAMP	$2,056	$1,749	$1,843	$1,791	46
			GRC	$5,347	$5,921	$5,652	$5,657	49
			Variance	$3,291	$4,172	$3,808	$3,866	3
PSPS	C28	Fire Science	RAMP	$2,682	$2,850	$2,901	$2,953	20
			GRC	$2,130	$2,427	$2,360	$3,698	71
			Variance	($552)	($423)	($541)	$744	51

(b) Capital

The Weather and Fuels Modeling capital variance as estimated in SCE's 2022 RAMP report and as requested in this GRC, shown in Table I-22, is due to SCE inadvertently omitted its HPCC cost forecast in its 2022 RAMP report. SCE has updated this GRC forecast to include $2.5 million in capital expenditures, relating to replacing the two HPCCs originally purchased in 2019 and $2.5 million in year 2027 to replace the two purchased in 2021.

[117] Refer to WP SCE-04, Vol. 05, Part 1 – WF/PSPS RAMP to GRC Integration.

Table I-22
Weather and Fuels Modeling
RAMP vs GRC Capital Forecast Comparison - *(Nominal $000)*
Risk Spend Efficiencies[118]

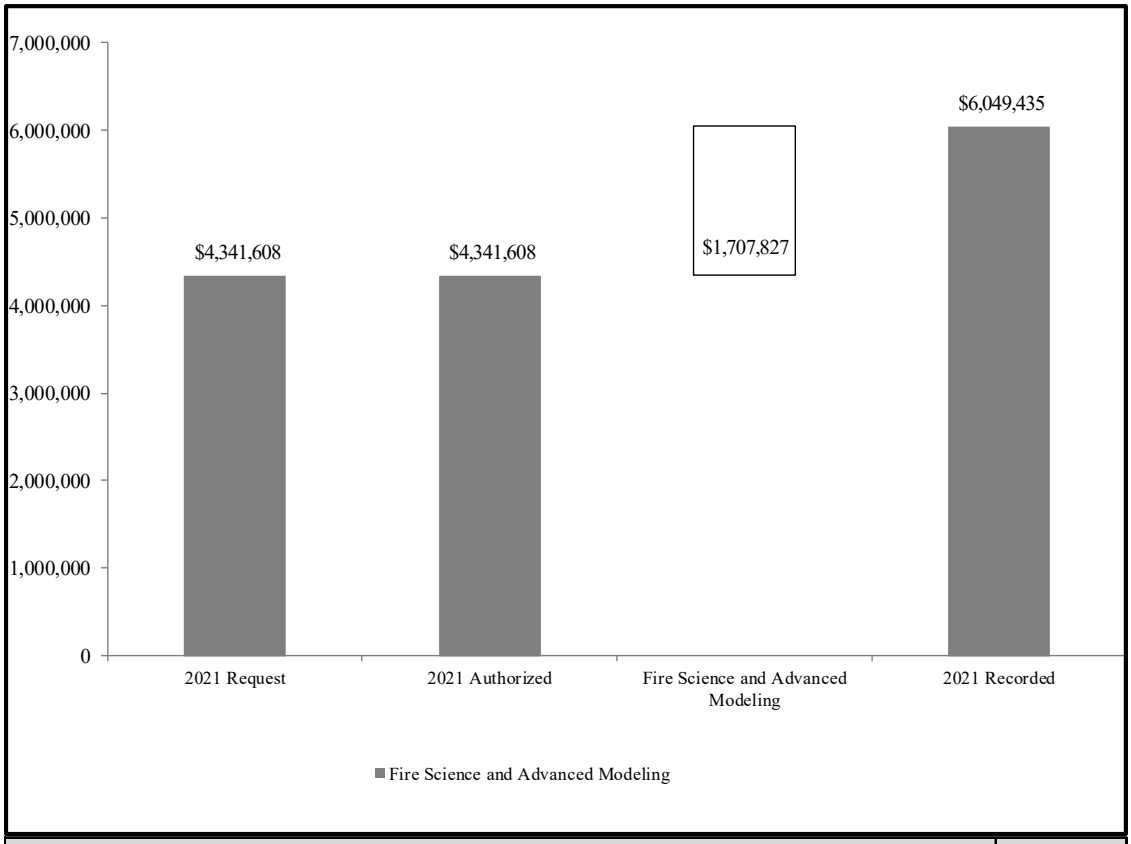
RAMP Risk	RAMP ID	RAMP Control / Mitigation Name	Filing	2022	2023	2024	2025	2026	2027	2028	2025 - 2028 RSE
Wildfire	C27	Weather and Fuel Modeling	RAMP	$0	$0	$0	$0	$0	$0	$0	46
			GRC	$766	$704	$0	$2,500	$0	$2,500	$1,010	49
			Variance	$766	$704	$0	$2,500	$0	$2,500	$1,010	3

[118] Refer to WP SCE-04, Vol. 05, Part 1 – WF/PSPS RAMP to GRC Integration.

c) Comparison of Authorized 2021 to Recorded

(1) O&M

Figure I-15
Fire Science & Advanced Modeling
Comparison of 2021 O&M GRC Authorized versus Recorded[119]
(Constant 2022 $)



Core Sub Activity	2021 Request	2021 Authorized	2021 Recorded	Variance
Advanced Modeling Computer Hardware	$ 1,849,308	$ 1,849,308	$ 2,567,473	718,165
Advanced Weather Modeling Tool	$ -	$ -	$ -	-
Fire Science Enhancements	$ -	$ -	$ 583,462	583,462
Fire Spread Modeling	$ -	$ -	$ 1,573,577	1,573,577
Fuel Sampling Program	$ 215,061	$ 215,061	$ 217,200	2,140
High Resolution Weather Related Study	$ -	$ -	$ (207)	(207)
Remote Sensing	$ 1,612,954	$ 1,612,954	$ 18,093	(1,594,861)
Surface and Canopy Fuels Mapping	$ 664,286	$ 664,286	$ 495,596	(168,690)
Weather and Fuels Modeling	$ -	$ -	$ 594,240	594,240
Total	**$ 4,341,608**	**$ 4,341,608**	**$ 6,049,435**	**$ 1,707,827**

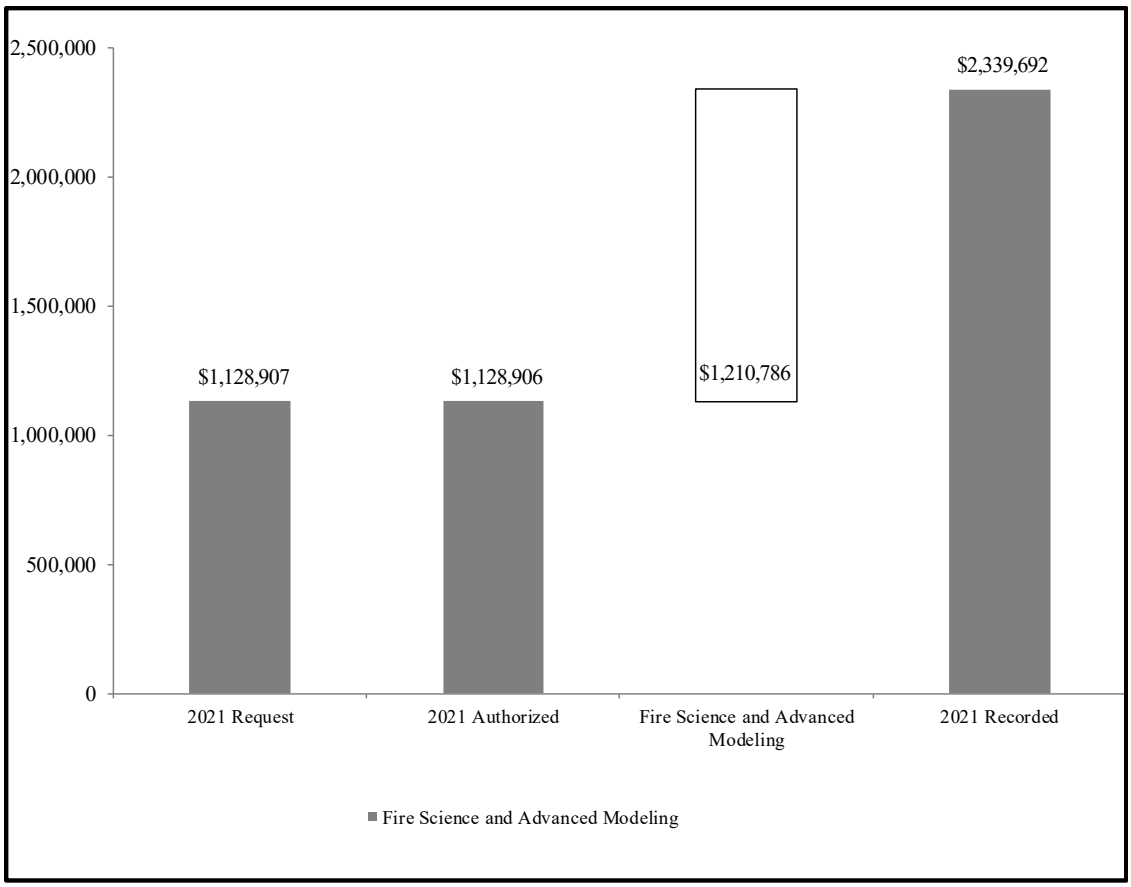
[119] Refer to WP SCE-07, Vol. 01, Authorized vs. Recorded.

SCE was authorized $4.342 million for 2021 O&M expense in connection with Fire Science and Advanced Modeling. SCE incurred recorded costs of $6.049 million due to necessary and prudent spending on Advanced Modeling Computer Hardware, Fire Science Enhancements, the Fuel Sampling program, Remote Sensing, Surface and Canopy Fuels Mapping, Fire Spread Modeling, and Weather and Fuels Modeling activities. To have more granular and more accurate weather, fuels, fire spread modeling, and fire potential forecasts, SCE incurred additional operating costs to enhance its in-house modeling capabilities with vendors Technosylva and Atmospheric Data Solutions, LLC (ADS) in 2021. SCE's recorded O&M costs for the Advanced Modeling Computer Hardware in 2021 were $2.567 million compared to $1.849 million in authorized O&M expense. The increase above authorized was due to a combination of projects such as the PSPS Asset Risk Analysis, Risk Associated with Value Exposure (RAVE)[120] with Technosylva, and other efforts associated with the PSPS Action Plan (See Section A.1).

[120] Rave is the Risk Associated with Value Exposure which considers egress, demographics, social vulnerability, etc., to determine which areas are most exposed to high wildfire risk.

(2) Capital

Figure I-16
Fire Science & Advanced Modeling
Comparison of 2021 Capital GRC Authorized versus Recorded[121]
(Nominal $)



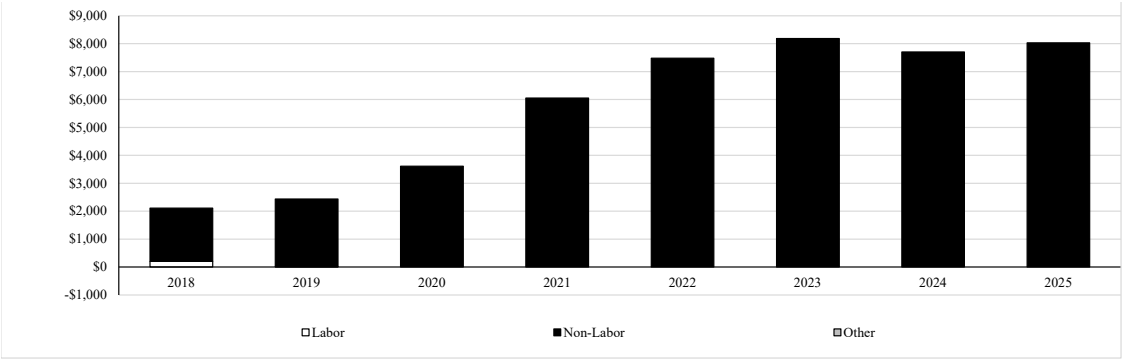
In 2021, SCE's recorded capital costs were $2.340 million as compared to $1.129 million authorized, based on a forecast for a HPCC in 2021. This change in cost was due to the procurement of two HPCCs in 2021, instead of the originally planned purchase of a single HPCC. The additional HPCC was needed to help produce high resolution ensemble model output with the required amount of computing power.

[121] Refer to WP SCE-07, Vol. 01, Authorized vs. Recorded.

d) Scope of Forecast Analysis

(1) Historical O&M Variance Analysis

Figure I-17
Fire Science & Advanced Modeling
Recorded and Adjusted 2018-2022/Forecast 2023-2025
(Constant 2022 $000)[122]



	Recorded					Forecast		
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Labor	$206	$22	($)					
Non-Labor	$1,905	$2,412	$3,613	$6,049	$7,477	$8,184	$7,701	$8,032
Other								
Total Expenses	**$2,111**	**$2,434**	**$3,613**	**$6,049**	**$7,477**	**$8,184**	**$7,701**	**$8,032**
Ratio of Labor to Total	10%	1%	0%	0%	0%	0%	0%	0%

(a) Labor

In 2018, SCE's recorded labor cost of $0.206 million for Fire Science and Advanced Modeling. During 2018-2019, SCE recorded minimal labor costs to support the design and set up of an SCE data center and the final deployment and testing of the first set of HPCCs.[123] Also during this time, SCE recorded charges for ADS to develop and test the weather research forecast software on the two HPCCs. Beginning in 2020, labor expenses associated with this activity are included in Enhanced Situational Awareness, which is discussed in section I.3 above.

[122] Refer to WP SCE-04, Vol. 05, Part 4, pp. 92-97, Fire Science & Advanced Modeling Recorded/Forecast O&M Summary.

[123] In 2018, SCE recorded $0.007 million labor cost in Asset Reliability Risk Analytics activity for the design and development of a system to notify customers for wildfire related emergencies. In 2019, SCE recorded $0.003 million labor cost in Asset Reliability Risk Analytics activity for the hosting costs related to the deployment of the two HPCCs. SCE is not forecasting any expense in this activity in 2025.

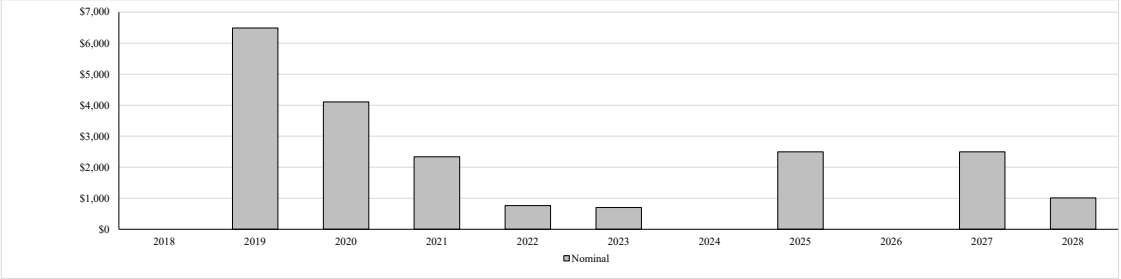
(b) Non-Labor

In 2018, SCE recorded a non-labor cost of $1.905 million to build a portal to visualize weather to track alerts, wind speed calculation, and FPI.[124] In 2019, SCE's recorded non-labor cost of $2.412 million compared to $1.905 million in 2018. This increase is due to SCE developing its Fire Science program by commencing its fire science enhancement activities, fuel sampling program and maintenance costs and subscription fees related to the purchase of two HPCCs. In 2020, recorded non-labor expenses increased to $3.613 million because SCE continued to develop and build upon its Fire Science program. SCE began its Surface and Canopy Fuels Mapping project and its subsequent subscription fees which help to maintain this data layer have increased due to higher vendor costs. Due to the increasing demands to have more granular and more accurate weather, fuels, fire spread modeling, and fire potential forecasts, in 2021, SCE recorded $6.049 million in non-labor costs. The increase cost was due to enhancing Fire Science Enhancement activities, additional service and maintenance cost and subscription fees for SCE's four high performance computers, and enhancement of its in-house modeling capabilities with vendors Technosylva and Atmospheric Data Solutions, LLC (ADS). In 2022, SCE's recorded costs were $7.477 million, higher as compared to 2021 recorded costs, due to the increased spend in Weather and Fuels Modeling and Research projects except for the surface and canopy fuels mapping activity which was complete. In 2022, SCE expanded its machine learning model capabilities to a total of 564 weather station locations and additionally built-out new probabilistic forecasts using machine learning at these same locations. SCE also procured new weather model data from the European Centre for Medium-range Weather Forecasts to increase in-house weather model capabilities. SCE continued to expand its gridded historical data record through twice-yearly updates and improved the functionality of the Data Manager tool. SCE also kicked-off research efforts with UCSB on a gridded observations model and nowcasting tool and additionally began development of the Weather Visualization Portal.

[124] In 2018, SCE recorded $0.137 million non-labor cost in Asset Reliability Risk Analytics activity for the design and development of a system to notify customers for wildfire related emergencies. In 2019, SCE recorded $0.52 million non-labor cost in Asset Reliability Risk Analytics activity for the hosting costs related to the deployment of the two HPCCs. SCE is not forecasting any expense in this activity in 2025.

(2) Historical Capital Variance Analysis

Figure I-18
Fire Science & Advanced Modeling
Recorded and Adjusted 2018-2022/Forecast 2023-2028
CWBS Element CIT00GRDM815902 and COS00GRBR815901
(Nominal $000)[125]



	Recorded					Forecast					
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Nominal		$6,487	$4,106	$2,340	$766	$704		$2,500		$2,500	$1,010

In 2019, SCE's recorded capital spend was $6.487 million for Advanced Modeling Computer Hardware, Asset Risk Modeling, and Operational Analytics. During 2019, the Advanced Modeling Computer Hardware cost of $5.679 million included purchase of two HPCCs for $2.400 million dollars as well as start-up costs of $0.600 million along with their related licensing fees and support costs and weather modeling analysis. In 2019, Asset Risk Modeling capital expense of $0.767 million was for wireless infrastructure to provide cellular back up internet to enable system connectivity for field inspections during outage events. Additionally, in 2019, SCE also pursued fire spread modeling capabilities through Technosylva, which included the software applications of FireCast, FireSim, and the WRRM in $2.473 million recorded spend. In 2020, SCE's capital expenditure of $4.106 million included additional modeling data, licensing fees, and support fees for design, set up of SCE data center and the final deployment and testing of the first set of HPCC's. It also had charges for ADS to develop and test the weather research forecast software on the two HPCC's. During 2020, SCE recorded $1.806 million dollars for Asset Risk Modeling and Operational Analytics for design, development and testing the integration of SCE's Enterprise Data warehouse System (Hadoop) to the new Weather Research Forecast System and store the SCE's deterministic weather forecasts into Hadoop. The recorded spend in 2020 also included expenses for the automation of GIS data used in

[125] Refer to WP SCE-04, Vol. 05, Part 4, pp. 98-100, Fire Science & Advanced Modeling GRC Capital Forecast.

PSPS to align with customer counts for PSPS Team as well as automation of reports and customer notification, customer count and mapping validation. In 2021, SCE's recorded capital costs were $2.340 million because SCE purchased two HPCCs for advanced modeling to facilitate the installation and operationalization of the Next Generation Weather Modeling System, allowing for more precise, higher resolution output.[126] In addition, SCE performed additional work with Technosylva and ADS that included capital expenditures for asset risk analysis, additional subscription fees, and enhancements to previous modeling efforts. In 2022, SCE's recorded capital costs were $0.766 million for Operational Analytics and Asset Risk Modeling activities for design and development, testing and implementation of SCE's New Weather Visualization Portal to support the weather services team for extreme weather events.

e) Forecast

(1) Basis for O&M Forecast

Table I-23
Fire Science & Advanced Modeling
Recorded and Adjusted 2018-2022/Forecast 2023-2025
(Constant 2022 $000)[127],[128]

	Recorded					Forecast		
	2018	2019	2020	2021	2022	2023	2024	2025
Advanced Modeling Computer Hardware		$831	$1,764	$2,567	$2,128	$2,400	$2,353	$2,453
Advanced Weather Modeling Tool	$900	$447	$17					
Climate Change Modeling								$441
Fire Science & Advanced Modeling	$1,211							
Fire Science Enhancements		$858	$455	$583	$372	$368	$318	$641
Fire Spread Modeling				$1,574	$1,236	$966	$1,018	$1,086
Fuel Sampling Program		$103	$210	$217	$220	$294	$297	$304
High Resolution Weather Related Study		$196	$37	($)				
Remote Sensing		($)		$18	$141	$397	$288	$160
Research Projects					$291	$481	$472	$330
Surface and Canopy Fuels Mapping			$1,132	$496				
Weather and Fuels Modeling				$594	$3,089	$3,277	$2,954	$2,617
Totals	**$2,111**	**$2,434**	**$3,613**	**$6,049**	**$7,477**	**$8,184**	**$7,701**	**$8,032**

[126] In addition, during 2021, SCE recorded $1.161 million capital expenditures in the Asset Reliability Risk Analytics activity for design, development to enhance our data accuracy across SCE's GIS systems to help improve data consistency which helped improve the conductor and circuit association in the HFRA areas and enabled SCE to effectively prioritize the inspection and remediation work in the HFRA areas. SCE is not forecasting any spend for this activity in 2023-2028.

[127] Refer to WP SCE-04 Vol. 05 Part 4, pp. 101-110, Fire Science & Advanced Modeling O&M Forecast.

[128] An error was identified after the finalization of financial data. Therefore, the financial information that is stated here in testimony does not align perfectly with the financials included in standardized workpapers and the RO model. A list of errata will be submitted to align the financial information in testimony, standardized workpapers, and the RO model at a future date.

As discussed above, Fire Science & Advanced Modeling is comprised of multiple projects and sub-activities. In 2025, SCE forecasts to spend $8.032 million in normalized O&M expenses for these activities.[129] To develop its O&M forecast, SCE utilized vendor quotes, project based historical costs and itemized forecasting for each of the sub-work activities.[130] Please see Table I-24 for a description of the forecasted costs associated with each sub-activity.

[129] An error was identified after the finalization of financial data. Therefore, the financial information that is stated here in testimony does not align perfectly with the financials included in standardized workpapers and the RO model. A list of errata will be submitted to align the financial information in testimony, standardized workpapers, and the RO model at a future date.

[130] Refer to WP SCE-04, Vol. 05, Part 4, pp. 101-110, Fire Science & Advanced Modeling O&M Forecast.

Table I-24
Fire Science and Advanced Modeling Activities

Line #	Fire-Science Subactivity	Description
1	Advanced Modeling Computer Hardware	Itemized forecasted cost which includes annual software license fee and annual support for HPCC.
2	Fire Science Enhancement	Itemized forecasted cost for vendor support.
3	Fire Potential Index (FPI)	Itemized forecasted cost for vendor support.
4	Fire Spread Modeling	Itemized forecasted cost includes subscription fees and vendor support
5	Fuel Sampling Program	Itemized forecasted cost for live fuel moisture sample based on 15 fuel sampling sites every two weeks.
6	Remote Sensing	Itemized forecasted costs for project collaboration with Universities
7	Climate Change Modeling	Itemized forecasted cost for vendor support.
8	Weather and Fuels Modeling	Itemized forecasted costs which includes licensing fees, vendor support and subsciption fees.

(2) Basis for Capital Forecast

Table I-25
Fire Science & Advanced Modeling
Recorded and Adjusted 2018-2022/Forecast 2023-2028
CWBS Element CIT00GRDM815902 and COS00GRBR815901
(Nominal $000)[131]

	Recorded					Forecast				
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Advanced Modeling Computer Hardware		$5,679	$2,300	$2,340				$2,500		$2,500	
Asset Risk Modeling		$767	$1,536		$8						
Operational Analytics		$40	$271		$759	$704					$1,010
Totals		$6,487	$4,106	$2,340	$766	$704		$2,500		$2,500	$1,010

SCE's capital forecast includes costs for obtaining and integrating new and/or improved science and technology to support wildfire mitigation activities across SCE's HFRA. In particular, a substantial portion of forecasted capital expenditures is directed towards replacing SCE's existing HPCCs, which provide the necessary computing resources to support SCE's in-house weather

[131] Refer to WP SCE-04, Vol. 05, Part 4, pp. 111-112, Fire Science & Advanced Modeling Capital Forecast.

and fuels modeling capabilities. This aging hardware infrastructure will not only need to be replaced but will likely need to be replaced at a higher level to support expanding and improving modeling capabilities and to add redundancy. In 2025, SCE forecasts to spend $2.5 million in capital expenditures to replace the two HPCCs originally purchased in 2019 and additional $2.5 million in 2027 to replace the two HPCCs purchased in 2021.[132]

In 2023, SCE forecasts capital costs of $0.704 million for Operational Analytics activity for the continued design and development, testing, and implementation of SCE's New Weather Visualization Portal to support the weather services team during extreme weather events. In 2028, SCE forecasts to spend $1.010 million for a necessary upgrade to the Weather Visualization Portal.

6. Environmental Programs

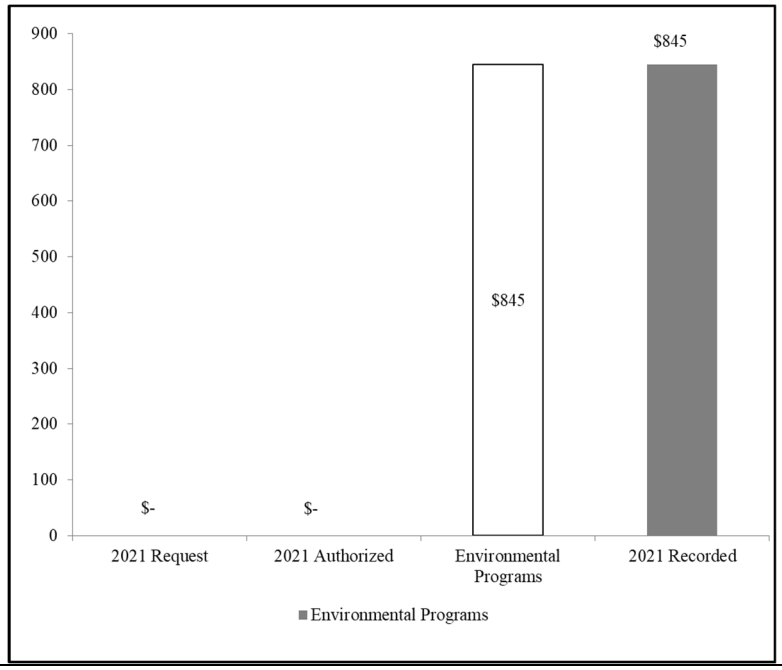
a) Work Description and Need

SB 901 mandated certain activities for the State Water Resources Control Board (SWRCB), such as overseeing regulatory compliance with certain "dredge and fill activities conducted by electrical utilities, electrical corporations and electrical cooperatives pursuant to a wildfire mitigation plan" on lands adjacent to waters of the state and a requirement to file a report to the Legislature. The SWRCB recognized that the construction and maintenance activities conducted by the utilities to mitigate wildfire risks in areas under their jurisdiction required an expedited permitting process, as well as modifications to the standard permits normally issued by the SWRCB. The SWRCB received approval for budgeting and hiring to address the utility needs through the fee-funded Water Discharge Permit Fund. Pursuant to that authority, the SWRCB adopted an annual fee that funds SWRCB staff to develop a statewide permit for utility work required under SB 901 and ensure priority processing to support utilities' efforts to implement wildfire mitigation plans.

[132] Refer to WP SCE-04, Vol. 05, Part 4, pp. 111-112, Fire Science & Advanced Modeling Capital Forecast.

b) Comparison of Authorized 2021 to Recorded

Figure I-19
Environmental Programs
Comparison of 2021 GRC Authorized versus Recorded[133]
(Constant 2022 $000)

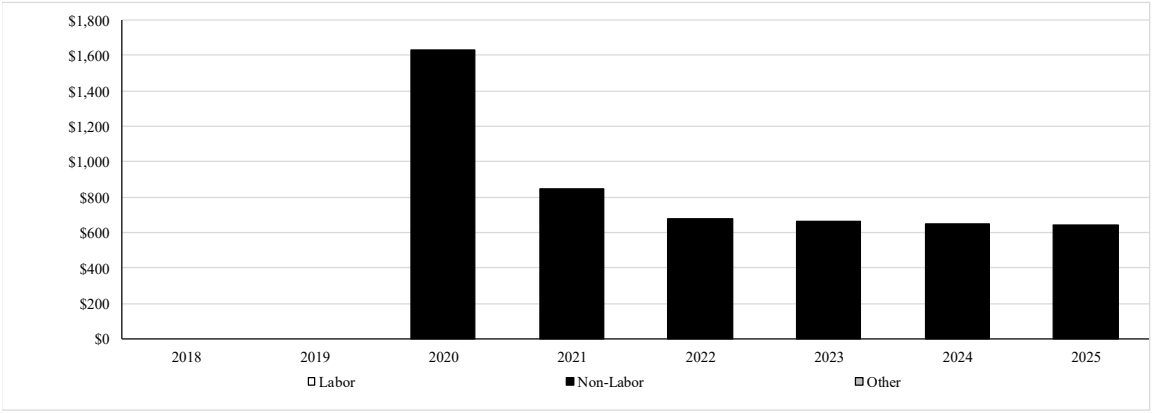


The 2021 GRC Decision requires SCE to compare the 2021 request and authorized amounts to recorded. Figure I-19 shows 2021 requested, authorized, and recorded O&M expenses. 2021 GRC decision did not authorize an amount for GRC Activity Environmental Programs in this volume and SCE recorded $0.845 million. The variance between 2021 authorized and recorded expenses of $0.845 million was due to the new SB 901 fee payment required by the State Water Resources Control Board.

[133] Refer to WP SCE-07, Vol. 01, Authorized vs. Recorded.

c) O&M Scope and Forecast

Figure I-20
Environmental Programs
Recorded 2018-2022/Forecast 2023-2025
(Constant 2022 $000)[134]



	Recorded					Forecast		
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Labor								
Non-Labor			$1,632	$845	$678	$665	$652	$639
Other								
Total Expenses			**$1,632**	**$845**	**$678**	**$665**	**$652**	**$639**
Ratio of Labor to Total	-	-	0%	0%	0%	0%	0%	0%

(1) Historical Variance Analysis

The recorded O&M expenses for Environmental Programs are shown in Figure I-20. SCE did not incur any costs for this activity in 2018 and 2019. 2020 included $1.632 million for this GRC activity.[135] In September 2019, State Water Resources Control Board (SWRCB) added a new annual fee for electric utilities with prepared wildfire mitigation plans as a requirement of Utility Wildfire Mitigation Plans (SB901). SCE received a letter for this fee payment from the SWRCB dated November 21, 2019 (for the Fiscal Year 2019-20). SCE processed a payment of $0.780 million in 2020, and the fee was calculated from 14,181 miles at $43 per mile. In 2021, SCE incurred $0.845

[134] Refer to WP SCE-04, Vol. 05, Part 4, pp. 113 – 118, Environmental Programs Recorded/Forecast O&M Summary.

[135] $0.852 million was recorded to this Wildfire Management BPE in 2020 for environmental support of vegetation management activities. SCE also incorporated these costs into the historical variance analysis for environmental support of vegetation management activities in SCE-02, Vol 10 and in the supplemental workpapers for recorded expenses in the volume.

million for this fee payment, and the fee was calculated from 16,962 miles at $43 per mile. In 2022, SCE incurred $0.678 million for this fee payment, and the fee was calculated from 16,960 miles at $40 per mile.

(2) Forecast

In 2022, SCE's agency fee payment was $0.678 million in O&M expense, based on a total number of 16,960 relevant overhead conductor miles included in SCE's WMP, multiplied by a rate of $40 per mile. The 2025 forecast of $0.639 million for this fee payment is calculated utilizing a similar methodology as 2022 recorded spend.

d) Basis for O&M Forecast

In D.89-12-057, and subsequently in D.04-07-022, the CPUC stated that if recorded expenses have been relatively stable for three or more years, the last recorded year is an appropriate base estimate. SCE utilized the last year recorded plus adjustments forecast methodology to develop the forecast.